

# HEALTHY COMMUNITIES, GREEN COMMUNITIES

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118 Almost 2,500 years ago, the legendary Greek physician Hippocrates wrote his classic *Treatise on Air, Water, and Places*. He offered careful observations on the placement of towns and cities, on wind, sunlight, soil, ground cover, and topography, and on how these factors influenced the health of people who resided there. Writing as both physician and geographer, he knew the important effects of place on health.

More than two millennia later, Frederick Law Olmsted had the same insight. The father of landscape architecture, he was keenly attuned to human health, even serving as secretary-general of the United States Sanitary Commission (forerunner of the Red Cross) during the Civil War. In such projects as New York's Central Park—the “lungs of the city”—and Boston's Back Bay Fens—a landmark in civil engineering, sewage management, and health protection—he viewed his creations as acts of public health. Working as both designer and health activist, he, too, knew the important effects of place on health.

Olmsted was prescient. Life expectancy in the United States rose from 47.3 years in 1900 to 77.8 in 2005, and historians attribute much of the increase not to medical care but to the way communities were designed, built, and operated.<sup>1</sup> Clean water, sewage disposal, solid and hazardous waste management, limits on overcrowding, zoning that separated homes from noxious industries—these strategies reshaped cities and helped reduce mortality from such killers as typhoid, cholera, yellow fever, and tuberculosis.

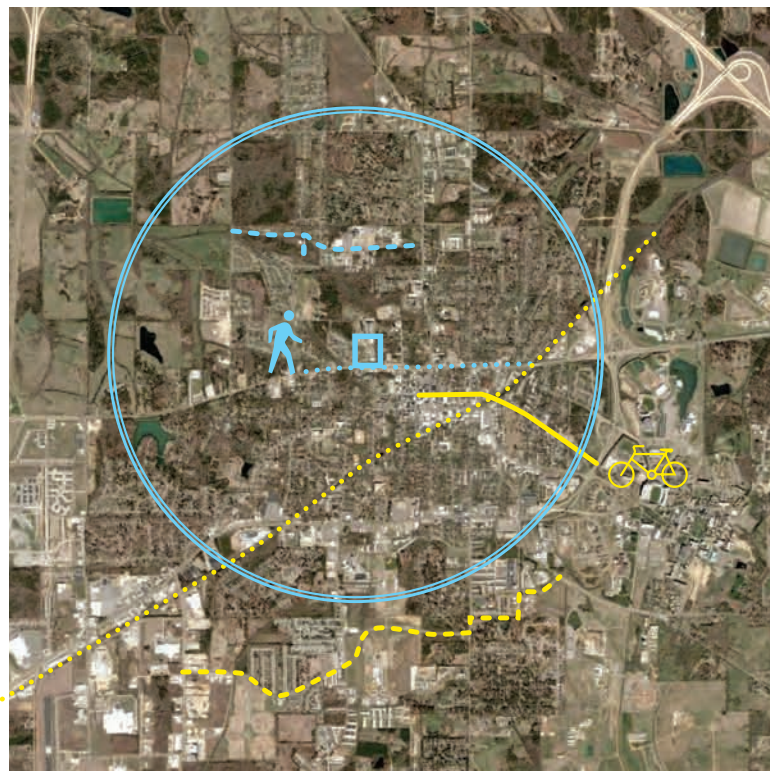
## Emerging Challenges

But that was then, and this is now. We still need to combine architecture and planning with public health, but we confront a vastly different set of challenges. At least four issues are important.

First, a schism has opened, with architecture, planning, and civil engineering on one side and medicine, nursing, and public health on the other.<sup>2-3</sup> The two domains once overlapped considerably; believe it or not, drainage and sewage treatment were part of the medical curriculum a century ago. Now there are separate languages, separate schools, separate meetings, separate journals.

Second, health challenges have evolved. The major causes of death, suffering, and disability have changed greatly since Olmsted's time. Heart disease, cancer, strokes, injuries, asthma, diabetes, obesity, and depression have edged out such conditions as tuberculosis, dysentery, influenza, and pneumonia. Our population is far larger and older than it was a century ago. Accordingly, different public health strategies are needed.

Third, it's become clear that design strategies that once seemed modern, salubrious, and convenient have downsides.<sup>4</sup> For the last few generations, urban sprawl has defined our approach to community design. Cities have expanded over vast geographic areas. Land-use patterns at the urban edge have changed, from traditional farm and forest to residential subdivisions. Land-use mix has declined; housing developments are built far from schools, stores, and workplaces. Land-use density has also declined; some communities can measure residential density in acres per family



Improved connectivity plan for Starkville, Mississippi.

### BIKE STARKVILLE

- Rails with Trails from Wal-Mart to Research Park.
- - - A path along Lynn Lane continues on South Montgomery and Locksley Way to connect with Blackjack Road and the university.
- Painted lanes on University Drive and Main Street continue the campus path and end at Jackson Street.

### WALK STARKVILLE

- - - A sidewalk on Hospital Road connects with North Jackson Street.
- Sidewalks and bike lanes on Highway 82 anticipate the opening of the bypass.
- The Henderson School; a Starkville pilot for Safe Routes to Schools.
- == A radius around the Henderson School that defines the Safe Routes to Schools zone.

rather than families per acre. Traditional downtowns have given way to long stretches of multilane roads lined by big box stores perched in vast parking lagoons. Transportation systems have changed as well, with the vast majority of trips—even short ones—made by automobile, with a concomitant drop in walking, bicycling, and transit use. Amenities that were routine in an earlier age—sidewalks, plazas, parks—are commonly omitted in contemporary subdivisions. At the scale of individual buildings, ever larger homes have required more and more energy to heat and cool them. Tight buildings, intended to conserve energy, have led to stubborn indoor air quality problems. Innovative building materials “bite back” by emitting volatile organic compounds.<sup>5</sup> From the scale of metropolitan areas, to the scale of neighborhoods, down to the scale of buildings, seemingly good ideas can be bad for health.

Fourth, the context has changed. We face global challenges that Olmsted and his contemporaries could scarcely have imagined. The energy source that powers nearly all our transportation—petroleum—is reaching a global peak in production and will become increasingly scarce and expensive in coming years.<sup>6,7</sup> The global climate is changing, apparently at a sharply accelerating pace, with potentially catastrophic consequences for weather, coastal lands (where many cities are built), agriculture, health, and countless other human domains.<sup>8</sup> The energy source that powers much of our electric grid—coal—contributes to climate change, and we need to reduce its use; no large-scale replacement source of energy is readily available. Many regions face severe shortages of water, fertile topsoil, and other natural resources. Population pressure continues to mount. Together these challenges require a commitment to sustainability.

It is not enough to design places that promote the health of those who live, work, and play in them. We also need to design places that respect ecological limits, that use resources wisely, and that thereby promote the health of our great-grandchildren.

### Designing Healthy Places

Happily, there is a growing evidence base that points the way to healthy community design. The SMARTAQ (Strategies for Metro Atlanta’s Regional Transportation and Air Quality) study in metro Atlanta followed more than 10,000 adults, assessing their neighborhood characteristics, their means of travel, and certain health outcomes. Greater land-use mix, more walking each day, and less time spent in the car each day were each associated with a lower risk of obesity.<sup>9</sup> Land-use and transportation patterns predict physical activity, and physical activity is important for health.

The National Household Travel Survey, a study of more than 100,000 Americans, found that people who use mass transit benefit from substantial amounts of routine physical activity. Walking from home to the originating bus or train stop, and from the destination stop to work, school, or shopping, and reversing that journey on the way home, involves an average of 24 minutes of walking per day. Nearly one in three transit users gets the recommended full 30 minutes of daily physical activity, simply by using transit.<sup>10</sup> In an increasingly sedentary and overweight nation, mass transit promotes needed physical activity.

Walkable neighborhoods appear to offer benefits that extend beyond physical activity. In one study, people in more walkable neighborhoods were more likely to know their neighbors, participate politically, trust other people, and be engaged in social interactions.<sup>11</sup> These outcomes together reflect social capital—the glue that binds communities together and that, incidentally, is a powerful predictor of good health.<sup>12</sup>

A study in Atlanta during the 1996 Olympic Games took advantage of a natural experiment. Atlantans were urged to refrain from driving during the 17 days of the Games. Many complied, and peak morning traffic counts dropped by 22.5 percent. Peak daily ozone levels promptly dropped by 27.9 percent. And acute asthma events in children dropped by as much as 44.1 percent.<sup>13</sup> All three parameters returned to their baseline at the conclusion of the Olympics. Transportation affects air quality, and air quality affects health.

# ATLANTIC STATION

Like many American cities in the second half of the 20th century, Atlanta found itself in a cycle of contamination and abandonment: downtown factories closed, leaving dirty land and water, while citizens moved farther out of the city, resulting in longer commutes, more tailpipe emissions, and worse air quality. One of those factories, Atlantic Steel, left behind a 138-acre brownfield in Atlanta's Midtown neighborhood when it closed, after nearly a century, in 1998. Now cleaned, the site is Atlantic Station, a neighborhood with 10,000 residents, green space, offices, and shops, connected to Midtown by a new bridge.

## Remediation Efforts

Cleaning the site's contaminated soil and water was only part of the challenge. Developers were also committed to cleaning the air by creating a transit-oriented neighborhood to reduce reliance on private automobiles. A nearby rapid-transit stop was inaccessible across the interstate. Thus, the project hinged on constructing a bridge across the highway, which would require permission from the federal government. But Atlanta's air quality at the time did not meet federal standards, prohibiting the city from spending funds on any project requiring federal permission—even if it was intended to improve air quality. The Environmental Protection Agency broke this impasse using an innovative program, Project XL, to address the complex relationships among transportation, land use, and environmental and public health.



## New Site

By 2000, the last toxic traces of Atlantic Steel were removed.

A one-acre pond is part of the project's stormwater management system to reduce runoff and provides a centerpiece for the community commons. Generous sidewalks, car-sharing programs, and the new pedestrian bridge connecting to the rapid-transit station and the attractions of Midtown all help to wean Atlantic Station's residents from their car dependence, improving personal health as well as that of the natural environment.





Researchers at the Carl Small Town Center noticed that construction of new sidewalks in their town of Starkville, Mississippi, had almost ceased after 1945, even as the town continued to grow. They proposed an infrastructure of new sidewalks and bike paths around the town to improve the safety, health, and quality of life for the local community.



In sprawling communities where people spend much time in their cars, motor vehicle fatality rates and pedestrian fatality rates are high.<sup>14</sup> This is a pressing public health challenge; motor vehicle crashes are the leading cause of death among young people nationwide. Not surprisingly, reducing driving can help prevent these tragedies. In fact, when gasoline prices rise, people drive less, and highway death rates decline<sup>15</sup>—an effect that seems to have operated to save lives during the summer of 2008.<sup>16</sup> With less driving there are fewer traffic deaths.

Common sense suggests that parks are an asset for communities. They provide a venue for physical activity, social interaction, and relaxation, which all promote health and well-being. But a recent study of parks in Copenhagen provided further evidence of health benefits. People who live near parks not only use the parks more frequently than those at a distance, but they have lower stress levels and weigh less—an effect *not* fully explained by visits to the park!<sup>17</sup> Nearby parks are salutary.

And it isn't just parks that promote health. Simply the presence of nearby trees offers benefits. In a landmark series of studies at a former low-income housing complex in Chicago, researchers at the University of Illinois compared buildings with and without trees nearby. People living in buildings with trees showed a remarkable range of social and psychological benefits: a greater sense of community,<sup>18</sup> higher levels of attention and greater effectiveness in managing major life issues,<sup>19</sup> substantially lower levels of aggression and violence among women (both as victims and as

perpetrators),<sup>20</sup> and less crime.<sup>21</sup>

Community design, then, can do a great deal to promote health. Good sidewalks and trails, mass transit, nearby destinations, parks and other green spaces, safety, and the presence of other people all play a role. To support these design features, many of the principles of “smart growth” are relevant: density, connectivity, mixed land use, vibrant activity centers, transportation alternatives, and preservation of green spaces. Community design is increasingly recognized as a public health strategy.<sup>22</sup>

### **Planning and Public Health: Different Toolboxes, Shared Tools**

Planners and public health professionals have available a set of common tools that permit them to work together to reach shared goals. One example is the “health impact assessment,” a set of methods used to evaluate the impact on health of policies and projects in community design, transportation planning, and other areas outside traditional public health concerns.<sup>23</sup> Another example is a walkability audit, one of several methods that convene planners, health officials, and members of the public to evaluate community infrastructure and identify opportunities for improvement. Charrettes accomplish a similar goal, but prospectively instead of retrospectively. Mapping exercises using GIS can pinpoint hot spots of motor vehicle crashes, asthma, and other health outcomes and help identify space-based solutions. Health professionals can serve as members of planning commissions, and planners can serve on boards of health.<sup>24</sup>

## The Beauty of Synergy

One appeal of this approach is the synergy it offers. We don't have a drug that prevents heart disease, cancer, asthma, diabetes, depression, or injuries. (If we did, we'd be adding it to the water supply!) But we do have community design strategies that offer all of this and more. The simple act of a child walking to school—with all the precursors, environmental and behavioral, that lie behind it—reduces the risk of each of the conditions listed above. The simple intervention of planting trees in a community offers many of these health benefits, directly and indirectly. At a time when health care costs are rising and health care coverage eludes many Americans, such synergistic preventive strategies are more important than ever.

The beauty of this synergy extends beyond direct health benefits. In many cases, the interventions that define healthy communities also define green communities. Shifting transportation from driving to walking, bicycling, and transit does more than promote health. It improves air quality, and it reduces carbon dioxide emissions. Building more compact communities, balanced by the preservation of green space, does more than promote health. It protects waterways and floodplains, conserves rural and agricultural land, and promotes biodiversity. At a smaller scale, “green” buildings that utilize sustainably produced, nontoxic materials and effective insulation do more than improve indoor air quality; they reduce energy consumption, which in turn reduces pollutant and carbon dioxide emissions from power plants.

The benefits of green, healthy communities do not accrue only to those who live in them, or even to their contemporaries. They accrue over time. The decisions we make today—not only in community design but in energy, transportation, agriculture, and a host of other arenas—will have implications for our grandchildren and their grandchildren. The United Nations Commission on Environment and Development in 1987 defined sustainable development as development that “meets the needs of the present without compromising the ability of future generations to meet their own needs”—a recognition that we need to be good stewards, for the



The Bike Starkville & Walk Starkville initiative proposes adding sidewalks and bike lanes to link many adjacent but currently disconnected town neighborhoods. For instance, by connecting the Mississippi State University campus to downtown, to shopping, and to a proposed new business park, the organization hopes to make it easier for people to leave their cars in their garages.

sake of those who will follow us. This is a recognition found in many cultures and credos. The Great Law of Peace of the Hau de no sau nee (the Six Nations Iroquois Confederacy) mandated that chiefs consider the impact of their decisions on the seventh generation yet to come.<sup>25</sup> Contemporary religious leaders have called for “creation care”—stewardship of the earth as both a religious obligation and an obligation to future generations.<sup>26</sup> Ethicists have asserted intergenerational justice as a moral basis for action on climate change.<sup>27</sup> We need to look to the future.

Green communities, then, are in many ways healthy communities—promoting good health and well-being directly for those who reside in them, indirectly for their neighbors, and indirectly for those who come after. They offer a wide range of health benefits, corresponding to the major contemporary causes of morbidity and mortality. They offer “co-benefits” that extend beyond health to the environment and the economy. Those who care about health, and those who work in design, architecture, and planning, can celebrate their growing convergence of interest and the enormous opportunities to collaborate in achieving shared goals: green, healthy, and sustainable communities for all people.

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