



ISSUE BRIEF

**The Built Environment and Health in Phoenix:
Understanding the Connections to Healthy Eating and Active Living**

Acknowledgements

This issue brief is submitted by a multidisciplinary health team, convened by St. Luke's Health Initiatives (SLHI), as part of Reinvent PHX. Funded by the U.S. Department of Housing and Urban Development, Reinvent PHX is a partnership between the city of Phoenix, Arizona State University, and SLHI to develop a holistic, long-range sustainability plan for the neighborhoods along the light rail.

The scope of SLHI and the health team's work is to gather information from "underserved, particularly non-English speaking, residents in each district." From information gathered from residents, along with other primary and secondary data, the health team will produce a "health impact assessment of each district's existing built-environment conditions" with a focus on "healthy food and recreation access, walking and bicycling safety, and exposure to excessive heat." After assessing the current conditions, the health team will recommend "intervention strategies focused on improving public health."

The Reinvent PHX health team includes the following members: Dean Brennan, FAICP; Mariana del Hierro, SLHI; Dr. Ernesto Fonseca, The Elemental Group, LLC; Dr. Pam Goslar, Dignity Health; C.J. Eisenbarth Hager, SLHI; Dr. Debarati "Mimi" Majumdar Narayan, Catalyze Research and Consulting, LLC; Stephen Reichardt, Arizona State University; and Kim Steele, The Elemental Group, LLC.

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SLHI's mission is to inform, connect and support efforts to improve the health of individuals and communities in Arizona. In all that we do, St. Luke's Health Initiatives seeks to be a catalyst for community health.



St. Luke's Health Initiatives

A Catalyst for Community Health

Where we live affects our health.

The classic real estate broker's mantra "location, location, location" should be every civic leader's clarion call, because where we live has a substantial effect on how healthy we can be. And intuitively, we know this.

The influence of the built environment on health is abundantly clear when looking at achievements in sanitation and infectious disease control, or more recently in eradication of lead-based paint. Policy-making and attendant innovation dramatically improved health and increased longevity.

The lens on the built environment has changed since then, but the same common sense applies: our surroundings impact how we live, and therefore influence our health. In just the last 25 years, we have learned a lot about how key elements of the places where we live, work and play—such as available recreation space, structures that promote community, streets that encourage walking and biking, and access to healthy foods—measurably and dramatically impact behavior and quality of life. For too many, the built environment discourages physical activity and healthy food consumption, resulting in a variety of unintended negative physical and mental consequences.

Distance matters. Accessibility matters. Safety—actual and perceived—matters.

Built Environment and Health

General planning, zoning decisions, and transportation patterns need to be seen as health assets, because they are. Their impact on health is well documented, most specifically on obesity and chronic diseases (Surgeon General of the United States, 2012; Kettel Khan, et al., 2009; Leadership for Healthy Communities, 2011; Arizona Department of Health Services, 2011; Cohen, McKenzie, et al., 2007). Thoughtful and purposeful urban planning can help address some of these health issues.

Public health experts see neighborhoods where we spend our time, schools our children attend, and homes in which we live as so influential on our overall health that these environments are considered a determinant of health (U.S. Department of Health and Human Services, n.d.). Some estimate that only 20 percent of our health is influenced by access to and the quality of health care services we receive (County Health Rankings, n.d.). Upwards of 50 percent of our health can be traced back to how our communities are designed, as well as other social and economic factors, such as income and education.

What we know intuitively has been studied and proven to be true. People do not often (if at all) travel "out of their way" to obtain healthy foods. Parents will not let children use a park if it is isolated or on the other side of a busy street. We will not ride a bike or walk if we worry about neighborhood gangs.

The built environment is a powerful tool that can reinforce and encourage healthy habits for Phoenix residents.

Intuitively, it also makes sense that changing our built environment will not magically result in a healthy lifestyle. Modification of the built environment is not a panacea. Yet, eating and physical activity habits are influenced by a complex web of factors. And the built environment is a powerful tool that can reinforce and encourage healthy habits for Phoenix residents.

Walkable and Bikable Streets

Travel choices are simply not a matter of personal preference. Whether the mode is walking, biking, taking public transit or driving alone in a car, these choices are driven by economics and the built environment. Communities that are more walkable tend to have more people who walk (Saelens, Salis, Black, & Chen, 2003). One study found a nearly five percent reduction in the likelihood of obesity for every mile walked each day (Frank, Andresen, & Schmid, 2004). Conversely, every hour spent in a car is associated with a six percent increase in the likelihood of obesity.

What makes a community walkable? For some, it is being surrounded by enjoyable scenery during the walk (Brownson, Brennan Ramirez, Hoehner, & Cook, 2003). For others, personal safety or “eyes on the street” is the most important (Leadership for Healthy Communities, 2011). A nearby destination, such as a school, place of worship, or public transportation hub, encourages walking or biking during daily activities (Shay, Spoon, & Khattak, 2003). The right walking infrastructure is key: wide, well-maintained sidewalks with clearly-marked crosswalks across busy streets. A small median or other barrier between sidewalks and the street provides a safer walking environment for pedestrians. In a hot desert climate like Phoenix, where temperatures are consistently over 100° F for five months of the year, we should never forget shade as an indispensable ingredient of a walkable community.

One measure of walkability and bikability is pedestrian and bicyclist injuries. Injuries and death due to collisions with a vehicle are higher in lower income neighborhoods (Morency, Gauvin, Plante, Fournier, & Morency, 2012). Moreover, environmental factors—such as more streets and more vehicular traffic—are more frequently found in poorer neighborhoods.

Parks and Recreation Spaces

Opportunity is the first ingredient of success, and yet today’s built environment often limits the opportunity for active recreation, particularly in denser urban settings. Over one-third of adults who exercise use a park to do so (Brownson, Brennan Ramirez, Hoehner, & Cook, 2003). The mere presence of a park within walking distance of home is positively associated with physical activity.

Parks play an important role in creating social capital and increasing the cohesion of neighborhoods (The Trust for Public Lands, 2006). Parks provide an opportunity for neighbors to get to know one another, increase social ties and create a shared, community space. While social connectedness may be difficult to measure, it is an essential ingredient in sustainable, stable neighborhoods.

For low-income communities, parks are even more important. Considering residents in low income communities may not have the resources for access to some forms of recreation and exercise, public parks fill this gap. Residents of predominantly minority or low-income communities who live within one mile of a park exercise 38 percent more than those who lived farther away, and were four times more likely to visit a park at least once a week (Leadership for Healthy Communities, 2011). Moreover barriers, such as busy streets or unsafe areas, are associated with lower usage of recreation amenities like bike paths (Kettel Khan, et al., 2009).

Obesity occurs more often in those whose stress hormones are elevated or who walk or play outdoors less frequently—all of which is true for residents who live in unsafe neighborhoods.

As with streets, personal safety plays an important role in park usage. While availability of nearby parks is crucial, park and neighborhood surroundings affect usage. Neighborhood environmental factors, such as the extent of neighborhood crime—perceived or actual—and dangerous traffic patterns can negate the positive effects of having a public park nearby (Weiss, et al., 2011). Those who perceive the park and its surroundings as unsafe are less likely to use a park.

The perception of neighborhood safety, in fact, is related to obesity in several ways (Fish, Ettner, Ang, & Brown, 2010). Obesity occurs more often in those whose stress hormones are elevated or who walk or play outdoors less frequently—all of which is true for residents who live in unsafe neighborhoods. The body mass index—a tool used to measure if a person is overweight—is over 10 percent higher for those who live in unsafe neighborhoods.

Healthy Food Retailers

We are what we eat, and we are conditioned to eat what is convenient. Access to healthy food retailers, such as supermarkets or corner stores that sell fresh fruit and vegetables, is correlated with better eating behaviors among nearby residents (Kettel Khan, et al., 2009). For every additional 3.3 feet of shelf space dedicated to fresh vegetables, residents consumed an additional 0.35 servings of vegetables daily (Leadership for Healthy Communities, 2012).

Minority or low-income families are more likely than Whites to live in communities that are “food deserts,” which are characterized by limited or no access to healthy, affordable food (U.S. Department of Agriculture, Economic Research Service, 2009). However, access to unhealthy fast foods is higher in these same communities (Lee, 2012). Not surprisingly, residents who live in food deserts, where access to healthy food is low and access to fast food is often high, are more likely to be obese or overweight and have other serious health conditions (Leadership for Healthy Communities, 2012).

Health Status

Nothing is inherently simple about health improvement. The complex set of influences that play into good health require a comprehensive response, and changes to the

built environment must play their part, most notably in terms of obesity. Obesity is a gateway to a host of other high-cost chronic health diseases.

Obesity

Childhood obesity’s connection to a lifetime of chronic and costly health conditions is unquestionable, although the extent of that impact is only just becoming understood. The Arizona Department of Health Services (ADHS) (2011) provides a sobering summary about obesity in our state: approximately 40 percent of Arizona adults are overweight and one-fourth are obese. Those of Hispanic heritage and those with lower incomes and less education are more likely to be obese. For Arizonans with incomes below 130 percent of the federal poverty level (which for a family of four is \$29,965) 70 percent are overweight or obese.



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According to the Centers for Disease Control and Prevention (2009), adult obesity rates are 51 percent higher for African Americans than Whites and 21 percent higher for Latinos. African American and Latino children are more likely to be obese than White children, as are low-income children. Twenty percent of low income children are obese, compared with about 12 percent of children from more affluent families.

Obesity is associated with diabetes, high blood pressure, high cholesterol, stroke, heart disease, asthma, arthritis, some types of cancer, and overall poor health (Frank, Andresen, & Schmid, 2004). In 2010, 1,828 Arizonans were hospitalized because of morbid obesity (Arizona Department of Health Services, 2011). Another 31,228 hospitalizations listed morbid obesity as a complication, and 6,188 emergency room visits were for morbid obesity-related problems. In Arizona alone, hospital-related costs associated with morbid obesity totaled approximately \$2 billion in 2010.

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We are only beginning to understand that the consequences of childhood obesity extend beyond an increase in the number of obese adults. Overweight children are associated with poorer health, such as allergies and asthma; lower emotional functioning, such as depression; and school-related problems, such as absenteeism or disruptive classroom behavior (Halfon, Larson, & Slusser, 2012).

Diabetes

Obesity substantially increases the incidence of diabetes. Over just a six-year timeframe, diabetes among adults went up 44 percent in Arizona (Arizona Diabetes Coalition, 2008). In 2006, 8.5 percent of adult Arizonans had diabetes. Some populations are affected more than others. Over nine percent of Latinos have diabetes in comparison to 7.8 percent of Whites. Over 11 percent of adults without a high school diploma have diabetes in comparison to the 6.2 percent who have a college degree.

Diabetes can cause a range of critical health conditions such as heart disease and stroke, high blood pressure, kidney disease, amputations, and depression. Diabetes also puts a substantial strain on Arizona's economy. According to the Arizona Diabetes Coalition, in 2005 alone, state residents spent \$3 billion for inpatient hospital stays for cases related to diabetes.

Cardiovascular Disease

As the leading cause of death and a leading driver of health care cost in the U.S. and Arizona, heart disease demands our attention, as should the built environment's role in creating the conditions that encouraged it. Cardiovascular disease, which includes coronary heart disease, congestive heart failure, and stroke, is the leading cause of death in the U.S. and in Arizona (Arizona Department of Health Services, n.d.). Minorities have higher rates of premature death due to cardiovascular

disease, with 68 percent of American Indians, 64 percent of African Americans and 56 percent of Latinos dying prematurely, in comparison to 37 percent of Whites.

The difference of prevalence in populations is associated with socioeconomic status, with individuals reporting incomes less than \$15,000 being four times more likely to suffer from cardiovascular disease than those reporting incomes more than \$75,000. Moreover, Arizonans who did not complete high school experience higher levels of cardiovascular disease than those with a college level education.

In 2005, hospital charges totaled nearly \$3.8 billion for cardiovascular disease in Arizona. This figure does not include outpatient treatment costs or any indirect costs associated with missed work.

Heat-Related Illness and Death

Heat-related deaths are on the rise in Arizona and Maricopa County, and the built environment can have a say in helping to prevent those deaths. According to the ADHS (2010), over a 17 year period, 444 deaths in Maricopa County were attributed to weather-related heat exposure. While the number of deaths due to heat exposure varies from year-to-year, the trend is increasing, from three deaths in 1992 to 31 in 2009.

Each year nearly 1,400 Arizonans experience a heat-related illness so serious that they visit the emergency room or are hospitalized. In 2008, the average treatment cost for heat-related illnesses was about \$7,500 per person, totaling \$11 million for the entire state.

Low income, elderly, and minority residents have been shown to be particularly susceptible to heat-related illnesses (Hamilton & Erickson, 2012). Several analyses have demonstrated this link in Phoenix (Harlan, Brazel, Prashad, Stefanov, & Larsen, 2006; Jenerette, Harlan, & Stefanov, 2011). Those living in the hottest area of cities are more likely to be low-income or persons of color. Those with higher incomes are able to afford strategies that mitigate the effects of extreme heat—such as continuous air conditioning, lush landscapes, and cooling technologies.

Intuitively, we know that where we live affects our health. Where we live affects how much physical activity we get on a regular basis, how frequently we visit a park, and the types of food we eat. Poor eating habits and lack of physical activity can lead to obesity. Obesity opens the door to a host of deadly—and preventable—chronic diseases. As cookbook and food author Mark Bittman succinctly puts it, “Chronic disease kills, wrecks lives and wrecks havoc on our health care system and our economy. We have the power, collectively, to further reduce disease and improve longevity” (2012).

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Reinvent Phoenix is our opportunity to examine how our built environment affects our health and develop strategies to create a healthier and safer future.

Works Cited

- Active Living Research. (2009). Walking and Biking to School, Physical Activity and Health Outcomes.
- Arizona Department of Health Services. (2010, March). Deaths from Exposure to Excessive Natural Heat. Retrieved December 17, 2012, from <http://www.azdhs.gov/plan/report/heat/heat09.pdf>
- Arizona Department of Health Services. (2011, December 11). The Obesity Epidemic. Retrieved December 17, 2012, from http://www.azdhs.gov/phs/bnp/nupao/documents/ObesityInArizona_121611.pdf
- Arizona Department of Health Services. (n.d.). The Burden of Cardiovascular Disease in Arizona. Retrieved December 17, 2012, from <http://www.azdhs.gov/azcvd/documents/pdf/az-burden-of-cardiovascular-disease.pdf>
- Arizona Diabetes Coalition. (2008). Arizona Diabetes Strategic Plan, 2008-2013. Retrieved December 4, 2012, from Arizona Department of Health Services: http://www.azdhs.gov/azdiabetes/documents/pdf/az-diabetes-strategic-plan_2008-2013.pdf
- Balling, R., & Brazel, S. (1987). Time and Space Characteristics of the Phoenix Urban Heat Island. *Journal of the Arizona-Nevada Academy of Science*, 75.
- Bittman, M. (2012, December 18). Dietary Seat Belts. Retrieved December 18, 2012, from New York Times: http://opinionator.blogs.nytimes.com/2012/12/18/dietary-seat-belts/?nl=todaysheadlines&emc=edit_th_20121219
- Brownson, R., Brennan-Ramirez, L., Hoehner, C., & Cook, R. (2003). Analytic Audit Tool. Retrieved October 15, 2012, from Active Living Research: <http://www.activelivingresearch.org/node/10616>
- Centers for Disease Control and Prevention. (2005). Heat-Related Mortality—Arizona, 1993-2002 and United States, 1979-2002. Retrieved October 1, 2012, from *Morbidity and Mortality Weekly Report*: <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5425a2.htm>
- Centers for Disease Control and Prevention. (2009). Differences in Prevalence of Obesity among Black, White and Hispanic Adults, U.S. 2006-2008. Retrieved December 19, 2012, from *Morbidity and Mortality Weekly Report*: <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5827a2.htm>
- Centers for Disease Control and Prevention. (2012). Adult Obesity facts. Retrieved October 9, 2012, from <http://www.cdc.gov/obesity/data/adult.html>
- Centers for Disease Control and Prevention. (2012). Health Effects of Limited Access to Healthy Food: Obesity, Chronic Disease and Poor Nutrition. Retrieved December 5, 2012, from <http://www.cdc.gov/healthyplaces/healthtopics/healthyfood/obesity.htm>
- Cohen, D., McKenzie, T., et al. (2007). Contribution of Public Parks to Physical Activity. *American Journal of Public Health*, 509-514.
- County Health Rankings. (n.d.). Data and Methods, Our Approach. Retrieved February 12, 2013, from <http://www.countyhealthrankings.org/our-approach>
- Ewing, R., Schmid, T., Killingsworth, R., & Raudenbush, S. (2003). Relationship between Urban Sprawl and Physical Activity, Obesity and Morbidity. *American Journal of Health Promotion*, 18(1), 47-57.

- Fanger, P. (1970). *Thermal Comfort, Analysis and Applications in Environmental Engineering*. Lyngby, Denmark: McGraw-Hill Book Company.
- Fish, J., Ettner, S., Ang, A., & Brown, A. (2010, November). Association of Perceived Neighborhood Safety on Body Mass Index. *American Journal of Public Health*, 100(11), 2296-2303.
- Frank, L., Andresen, M., & Schmid, T. (2004). Obesity Relationships with Community Design, Physical Activity and Time Spent in Cars. *American Journal of Preventative Medicine*, 27(2), 84-96.
- Halfon, N., Larson, K., & Slusser, W. (2012). Associations between Obesity and Comorbid Mental Health, Developmental and Physical Health Conditions in a Nationally Representative Sample of US Children Aged 10 to 17. *Academic Pediatrics*.
- Hamilton, B., & Erickson, C. (2012, Summer). Urban Heat Island and Social Work: Opportunities for Intervention. *Advances in Social Work*, 13(2), 420-430.
- Harlan, S., Brazel, A., Prashad, L., Stefanov, W., & Larsen, L. (2006). Neighborhood Microclimates and Vulnerability to Heat Stress. *Social Science and Medicine*(63), 2847-2863.
- Health by Design. (n.d.). How Walkable Is Your Neighborhood? Retrieved October 15, 2012, from http://www.healthbydesignonline.org/documents/WalkabilitySurvey_HbD.pdf
- Jenerette, G., Harlan, S., & Stefanov, W. (2011). Ecosystem Services and Urban Heat Riskscape Moderation: Water, Green Spaces, and Social Inequality in Phoenix, USA. *Ecological Applications*, 21(7), 2637–2651.
- Kettel Khan, L., Sobush, K., Keener, D., Goodman, K., Lowry, A., Kakietek, J., & Zaro, S. (2009, July 24). Recommended Community Strategies and Measurements to Prevent Obesity in the United States. Retrieved October 9, 2012, from *Morbidity and Mortality Weekly Report*: <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5807a1.htm>
- Leadership for Healthy Communities. (2011). *A Guide for Local and State Leaders Working to Create Healthy Communities and Prevent Childhood Obesity*. Retrieved October 11, 2012, from Leadership for Healthy Communities: [http://www.leadershipforhealthycommunities.org/images/stories/LHC_Action_Strategies_Toolkit_100222\[1\].pdf](http://www.leadershipforhealthycommunities.org/images/stories/LHC_Action_Strategies_Toolkit_100222[1].pdf)
- Leadership for Healthy Communities. (2012, February). *Making the Connection: Linking Policies that Prevent Hunger and Childhood Obesity*. Retrieved December 17, 2012, from http://www.leadershipforhealthycommunities.org/images/stories/lhc_hunger_obesity_02.14.12.pdf
- Lee, H. (2012, April). The Role of Local Food Availability in Explaining Obesity Risk among Young School-Aged Children. *Social Science and Medicine*, 74(8), 1193-1203.
- Morency, P., Gauvin, L., Plante, C., Fournier, M., & Morency, C. (2012, June). Neighborhood Social Inequalities in Road Traffic Injuries: The Influence of Traffic Volume and Road Design. *American Journal of Public Health*, 102(6), 1112-1119.
- Saelens, B., Salis, J., Black, J., & Chen, D. (2003). Neighborhood Based Differences in Physical Activity. *American Journal of Public Health* (93), 1552-1558.
- Shay, E., Spoon, S., & Khattak, A. (2003). Walkable Environments and Walking Activity. Retrieved December 14, 2012, from <http://www.stc.utk.edu/STCresearch/completed/PDFs/walkfinal.pdf>

- Surgeon General of the United States. (2012). Overweight and Obesity: What You Can Do. Retrieved October 9, 2012, from http://www.surgeongeneral.gov/library/calls/obesity/fact_whatcanyoudo.html
- The Trust for Public Lands. (2006). Retrieved October 4, 2012, from The Health Benefits of Parks: http://www.eastshorepark.org/HealthBenefitsReport_FINAL_010307.pdf
- Transportation Research Board; Institute of Medicine of the National Academies. (2005). Does the Built Environment Influence Physical Activity? Examining the Evidence. Retrieved January 8, 2013, from Transportation Research Board of the National Academies: <http://onlinepubs.trb.org/onlinepubs/sr/sr282.pdf>
- U.S. Department of Agriculture, Economic Research Service. (2009). Access to Affordable and Nutritious Food: Measuring and Understanding Food Deserts and their Consequences, Report to Congress. Report to Congress. Retrieved October 11, 2012, from http://www.ers.usda.gov/media/242675/ap036_1_.pdf
- U.S. Department of Health and Human Services. (n.d.). Social Determinants of Health. Retrieved March 1, 2013, from Healthy People 2020: <http://www.healthypeople.gov/2020/topicsobjectives2020/overview.aspx?topicid=39>
- Victoria Transport Policy Institute. (2010). Retrieved October 4, 2012, from Evaluating Public Transportation Health Benefits: http://www.apta.com/resources/reportsandpublications/Documents/APTA_Health_Benefits_Litman.pdf
- Weiss, C., Purciel, M., Bader, M., Quinn, J., Lovasi, G., Neckerman, K. (2011). Reconsidering Access: Park Facilities and Neighborhood Disamenities in New York City. *Journal of Urban Health*, 88(2), 297-309.