HEALTHY COMMUNITIES INITIATIVES

Local/Regional

Sacramento County and Design 4 Active Sacramento (D4AS) A cross sector Health & Built Environment Team – Active Design http://www.walksacramento.org/more-about-us/d4as/

- National Leadership Program for Public's Health (CDC). 1 of 19 teams nationally.
- Housing Element, Zoning/Development Code, Design Guidelines - Sacramento County
- Codified Health into Development Code and Guidelines July 2015 http://centerforactivedesign.org/sacramentoactivedesignpolicy

WALKSacramento, Design for Active Sacramento

- D4AS moved under umbrella of WALKSacramento to do more local and regional work
- SGC3 funding in partnership with SACOG to provide technical assistance to jurisdictions on advancing active design and healthy communities. Currently available to interested jurisdictions. Work with developers, policy review, training, and presentations to community groups and elected, etc.
- Plan4Health grant from American Planning Association/American Public Health Association to bring together Planners and Health. Funded by the CDC. 1 of 17 teams nationally. Do similar work as in SGC3 grant, Sacramento focus. http://www.plan4health.us/plan4health-coalitions/sacramento-county-ca-design-for-active-sacramento-coalition/
- Engaged with Ca Dept of Public Health, Chronic Disease and Let's Get Healthy California Plan.
- Engaged with Ca Governor's Office of Planning and Research-General Plan Guideline update and Healthy Planning Leadership series.

Plan 4 Health/SGC3 & Related Work – SACOG, APA, AIA/ASLA, ULI, CCLHO/CHEAC

- Bringing together Planning and Health – started with 7 county PHO
- SACOG hosting Planners and Health staff to attend Planner meetings, webinar another example, working at intersections. Continuing engagement.
- Regional PHO & Planning Director Convening May 26, plus 2 other convenings
- 6 Speaker Series –"Vital Signs: On the Pulse of Planning for Healthy and Equitable Communities"
- SACOG Urban Footprint

State

Governor's Office of Planning & Research

- Draft General Plan Guidelines – healthy communities policies and optional element
- Hazard Mitigation Plan – must address climate adaptation, health is significant
- Safeguarding California Action Plan – includes public health, significant
- Other related legislation implementation

California Dept of Public Health, CCLHO/CHEAC

- Let's Get Healthy California website and initiative
- Health in All Policies, Equity
- Statewide survey of Local Health Department leadership & Regional Convening late summer; http://cclho-cheacchronicdiseaseleadershipproject.com/
- BRACE Building Resiliency Against Climate Effects) Framework – Health and Climate 10 regions http://www.cdph.ca.gov/programs/Pages/ClimateChange.aspx

The California Endowment, Robert Wood Johnson & Knight Foundation, San Francisco Federal Reserve Bank – has been funding work in the $10 millions, imbedding health into community development for years.

California Planning Roundtable (CPR)

- Social Determinants of Health for Planners: http://www.cproundtable.org/publications/social-determinants-health-planners/
- Healthy Communities Work Group – Defining Healthy Communities and Other Resources: http://www.cproundtable.org/publications/healthy-communities-definition/

The Institute for Local Government (ILG) Online Guide to Planning Healthy Neighborhoods
http://www.ca-ilg.org/online-guide-planning-healthy-neighborhoods

Understanding the Basics of Land Use and Planning: A Guide to Planning Healthy Neighborhoods
http://www.ca-ilg.org/sites/main/files/file-attachments/2010_-_healthy_neighborhoods.pdf

National/Federal
Affordable Care Act – changes the traditional delivery of healthcare services, rewards prevention, success will rely on healthier communities and populations.

CDC – BRACE Framework http://www.cdc.gov/climateandhealth/brace.htm

American Planning Association (APA) Planning and Community Health Center – advances practices that improve human environments to promote public health through active living, healthy eating, and health in all planning policies. Learn more about projects and priority areas
here: https://www.planning.org/nationalcenters/health/

Urban Land Institute (ULI) Building Healthy Places Toolkit – outlines evidence-supported opportunities for enhancing health outcomes in real estate developments and decision making to create places that contribute to healthier people and communities and to enhance and preserve value by meeting growing desires for health-promoting places. For more information, link here: http://uli.org/research/centers-initiatives/building-healthy-places-initiative/building-healthy-places-toolkit/

HOW PEOPLE DIE IN THE SACRAMENTO REGION

County	Leading Causes #1	Leading Causes #2	Leading Causes #3
Sacramento	Heart Disease	Cancer	Stroke
Nevada	Cancer	Heart Disease	Chronic Lower Respiratory Disease
Yolo	Heart Disease	Cancer	Chronic Lower Respiratory Disease
Yuba	Heart Disease	Cancer	Chronic Lower Respiratory Disease
Placer	Cancer	Heart Disease	Chronic Lower Respiratory Disease
Sutter	Cancer	Heart Disease	Chronic Lower Respiratory Disease
El Dorado	Cancer	Heart Disease	Unintentional Injury

IN-ACTIVITY IS THE NEW SMOKING !

CENTER FOR ACTIVE DESIGN

PROMOTING HEALTH THROUGH DESIGN

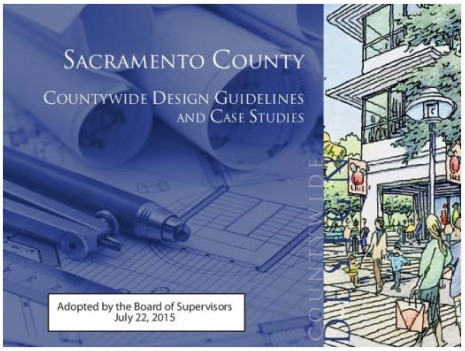
Sacramento Codifies Healthy Design at All Scales

Sacramento County is one of the pioneering regions to have successfully introduced Active Design into a comprehensive array of building and planning policies, most notably the updated zoning code that was adopted in July 2015. This two-year effort was spearheaded by a small but enthusiastic cross-sector team known as “Design 4 Active Sacramento” (D4AS). D4AS convened a wide range of unique expertise, mobilized local networks, and leveraged the timing of new policies to create the framework for a healthier future for the county and region. The team successfully codified Active Design strategies within housing, zoning, and design regulations, ensuring that health is a primary component for development in the county.

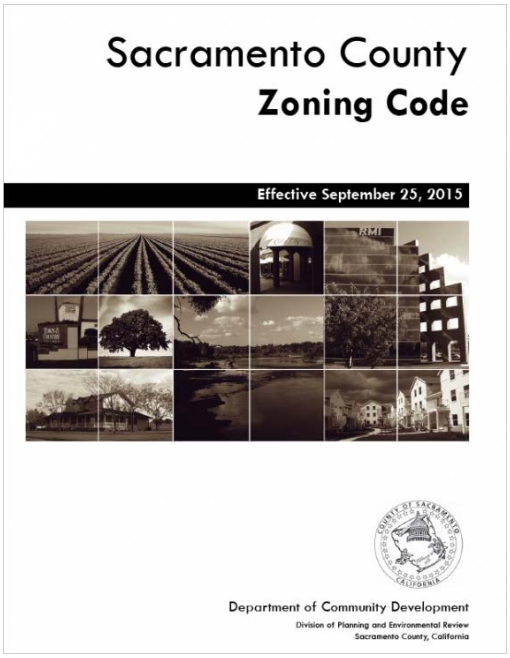
The work began when the original members of D4AS came together in Atlanta in January 2013 to participate in a yearlong national public health leadership program sponsored by the CDC. Inspired by the Active Design Guidelines, they returned to Sacramento and selected four Active Design tenets for emphasis in Sacramento: 1. Walkable and bikeable streets for connectivity and accessibility; 2. Mixed land uses with walkable destinations; 3. Increasing landscape and urban forest; and 4. Safety. Over a two-year period, the team looked for opportunities to integrate these Active Design tenets into policies and codes.

D4AS found an opportunity to review Sacramento County’s Design Guidelines and identify which existing policies promoted Active Design and health. Identified policies were highlighted with an icon to bring attention to the breadth of guidelines that directly impact healthy communities, even without specifically mentioning the word “health.” At the same time the County was also updating its Housing Element, a primary component of its General Plan that sets forth a plan for meeting upcoming housing needs. D4AS used this opportunity to have Public Health, Safety, and Livability adopted as a core objective for all new housing in the region. The team also helped strengthen the language of Active Design and health-relevant policies in the Housing Element.

Most crucially, for the first time in over 30 years, the County was also updating its Zoning Code, which arguably wields the most influence over the building and planning landscape. D4AS jumped on this opportunity to write new zoning language that codified the work they had done with Housing Element Policies and added new Active Design guidelines. They encouraged like-minded stakeholders across the county to write letters of support to the Board of Supervisors, stating the importance of healthy communities and requesting adoption of the Design Guidelines with the use of the Active Design icon. Ultimately, the Sacramento County Board of Supervisors adopted the Zoning Code and Design Guidelines that includes Active Design, on July 22, 2015.



D4AS reviewed Sacramento County’s Design Guidelines and identified which existing policies promoted Active Design and health.



D4AS worked with stakeholders across the county to help the new Design Guidelines become adopted into the County's Zoning Code, which was updated for the first time in over 30 years.

Year-Round

Designing for Workplace Wellbeing

Considering the Health Impacts of Climate Change

NPR - One Step to Combat Obesity: Make Stairs More Attractive

A Prescription for Physical Activity

FitLondon Builds Upon the Global Conversation on Active Design

The Steady Increase in Obesity Worldwide

The Food Trust's Fresh Food Initiative

Walkability and Neighborhood Wealth

Health-Promoting Stair Bill Passes in NYC

Vision Zero: Learning from Sweden's Successes

U.S. Obesity Rates Decline in Young Children

Collaboration with the Urban Land Institute

NYS Prioritizes Bike and Pedestrian Paths

2013 Highlights from the Center for Active Design

A Policy Win for Active Transportation

From Melbourne to Oslo, Global conversations on Active Design

Research Review: How Neighborhood Design Affects Walking Patterns

Success stories from the NYC Health Department Community Workshops

Mayor Bloomberg's Announcement

The eclectic D4AS represented a range of perspectives and talents. Members included the County's public health officer, a county planner, a regional planner, a transportation engineer, the executive director of the non-profit WALKSacramento, a neurosurgeon, and a landscape architect. In January 2014 D4AS moved under the umbrella of WALKSacramento, and has grown to 11 members, bringing even more expertise, diverse talents, and a shared passion for healthy built environments. The organization plans to continue its work across the region and state, continuing to transform the future landscape of California. For more information, please contact Judy Robinson, Sacramento County, Robinsonju@saccounty.net; 916.874.4551.

D4AS MEMBERS

Judy Robinson, Principal Planner at Sacramento County
Dr. Olivia Kasirye MD , Public Health Officer at Sacramento County
Teri Duarte, MPH, former Executive Director of WALKSacramento
Adrian Engel, Civil Engineer at Echelon Transportation Group
Monica Hernández, Associate Public Information Coordinator - SACOG
Dr. Mark Horton MD, NLAPH Coach – Health Consultant
Dr. Edie Zusman MD, Neurosurgeon – Medical Director, Sutter Health East Bay Neuroscience Institute, Eden Medical Center
Dr. Sara Jensen Carr, PhD – Professor, Landscape Architecture at Univ of Hawaii
Dr. Charlene Hauser, MD, Family Medicine – Sutter Health
Dr. Glennah Trochet, MD, Public Health Consultant, former Public Health Officer
Dr. Caroline Peck, MD, Chronic Disease Control Chief, Ca Dept of Pubic Health

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Judy Robinson is a Principal Planner and the Sustainability Manager for Sacramento County. She has over 25 years of experience with local government, community planning, and development. She is the Team Leader for "Design 4 Active Sacramento", which does focused work on using the built environment to improve the public's health, and was instrumental in the adoption of Healthy Communities policies and zoning codes for Sacramento County. She also is an Executive Committee Member of California's Health Planning Leadership Committee and the Capital Region Climate Readiness Collaborative.

Sara Jensen Carr is an Assistant Professor at the University of Hawaii Manoa with a joint appointment in the Schools of Architecture and Public Health. Her primary research interests include the connection between landscape and wellness, urban ecology, and the role of data in design. Sara holds an M.Arch. from Tulane University, and an MLA and PhD in Environmental Planning from UC Berkeley. Her work has been exhibited at SF Planning and Urban Research (SPUR)

Founding members of D4AS (l to r): Monica Hernández, Associate Public Information Coordinator at SACOG, Teri Duarte, MPh, former Executive Director of WALKSacramento, Adrian Engel, Civil Engineer at Echelon Transportation Group, Olivia Kasirye MD , Public Health Officer at Sacramento County, Judy Robinson, Principal Planner at Sacramento County, and (inset) Edie Zusman MD, Neurosurgeon, Medical Director, Sutter Health East Bay Neuroscience Institute, Eden Medical Center

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Moving toward implementation: The potential for accountable care organizations and private–public partnerships to advance active neighborhood design ☆

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ABSTRACT

The 2010 Affordable Care Act's (ACA) aims of lowering costs and improving quality of care will renew focus on preventive health strategies. This coincides with a trend in medicine to reconsider population health approaches as part of the standard curriculum. This intersection of new policy and educational climates presents a unique opportunity to reconsider traditional healthcare structures. This paper introduces and advances an alignment that few have considered. We propose that accountable care organizations (ACOs), which are expected to proliferate under the ACA, present the best opportunity to establish partnerships between healthcare, public health, and community-based organizations to achieve the legislation's goals. One example is encouraging daily physical activity via built environment interventions and programs, which is recommended by numerous groups. We highlight how nonprofit organizations in Sacramento, California have been able to leverage influence, capital, and policy to encourage design for active living, and how their work is coordinating with public health and healthcare initiatives. In conclusion, we critically examine potential barriers to the success of partnerships between ACOs and community organizations and encourage further exploration and evaluation.

Introduction

As defined by the American Academy of Family Physicians, an accountable care organization (ACO) is a "group of health care providers who agree to share responsibility for the quality, cost, and coordination of care for a defined population of patients" (American Academy of Family Physicians, 2014). Patients who join an ACO are assured that once they pay their fixed fee, the organization will provide all of the outpatient and inpatient care they need, with all healthcare parties sharing savings (Berwick, 2011; Calman et al., 2012). As the Affordable Care Act (ACA) unfolds, ACOs are expected to proliferate. The model, which incentivizes health maintenance rather than healthcare provision through a system of reimbursements and penalties, is a logical outgrowth of health reform measures designed to improve patient outcomes and reduce costs.

ACOs now number more than 400, covering four million Medicare enrollees and millions more people with private insurance (Lowrey, 2013). While ACO structures may vary, they are most often anchored by one or multiple hospitals and encompass physician practices. Many have looked to Geisinger Health and Kaiser as longstanding integrated ACO-type models of health care delivery. Some ACOs have also partnered with corporations such as Walgreen's pharmacies (Gamble and Punke, 2013). While early data on ACO model style healthcare shows significant reductions in costly inpatient care, for a nationwide savings of almost $400 million in 2012, lack of precedent structures has left the model at a crossroads (Muhlestein, 2013; US Department of Health and Human Services, 2014; York et al., 2014). As hospital

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administrators and insurance companies grapple with the new healthcare landscape, we suggest that future ACOs look toward the community development sector, particularly those groups focused on active living, to reinvigorate the model and improve community health outcomes.

The economics of ACOs

Under the ACA, doctors and hospitals, traditionally paid for healthcare rendered regardless of the outcomes, now face more financial accountability for patients (McClellan et al., 2010). Hospitals with lower readmission rates are eligible for larger reimbursements from the pool; higher subject them to penalty. Medicare has already introduced a version of this reimbursement system under the Medicare Spending Per Beneficiary (MSPB) metric (Chen and Ackerly, 2014). This model is a dramatic departure from traditional fee-for-service medicine, in which physicians and hospitals earn more for seeing more patients and doing more procedures (Shortell et al., 2010).

For the ACA and ACOs to be successful, they will have to focus primarily on preventive care for chronic disease, which now accounts for 75% of the nation's healthcare spending (Robert Wood Johnson Foundation, 2014). For example, a consumer with chronic obstructive pulmonary disease can reduce his or her risk of pneumonia if he or she is supported in efforts to quit smoking and start an exercise regimen. However, patients require support outside the doctor's office for successful outcomes, particularly when it comes to changing lifestyle behaviors. Practitioners can look to some non-ACO integrated models as precedent and for proven results. In 2013, Kaiser Permanente was able to reduce the average days per beneficiary in post-acute facilities to 30% of the days Medicare would normally pay for by emphasizing preventive care upfront, aided by programs such as a 7-week Self-Management Program for chronic disease patients and their families, developing preventive care apps, and community programs such as the HEAL initiative, discussed in more detail below (Davidson, 2013; Lorig et al., 2001).

Expanded realms of health

The ACA is also strongly enforcing nonprofit hospitals' obligation to provide community benefits, which usually consist of community needs assessments but can also include health improvement activities and support of community-based organizations (CBOs) (Rosenbaum et al., 2013). This comes at a time where urban planning, design, and transportation decisions are increasingly acknowledged as having a tremendous impact on a wide range of public health issues, including air and water quality, traffic safety, mental health, and social justice (Dannenberg et al., 2011; Jackson et al., 2013), although interventions in these arenas are often overlooked by the healthcare sector. ACO structures are in a unique position to bridge between these built environment-focused fields and the healthcare community, as the ACA incentivizes upstream prevention practices (Evans, 2013). As ACOs gain more market share, they will cover wider geographic areas. Community development initiatives to encourage active living such as increasing green spaces, sidewalk and complete street improvements, pedestrian safety measures and tree planting are all types of infrastructural improvements that benefit the population as a whole.

The public health sector has traditionally been underfunded or at worst neglected. Federal dollars funneled into public health programs have in large part been directed toward clinical care of the disadvantaged, not toward population-oriented efforts to prevent disease or promote health (Bovbjerg et al., 2011). To address these issues, Congress ensured that the federal healthcare reform law included public health investments and incentives for a shift in focus. By expanding insurance coverage to more people, the public health sector can focus less on clinical care and more on community-based prevention efforts. Part of the first two years' $1.25 billion investment will be in the form of grant awards to demonstrate the effectiveness of varying initiatives to improve diet and physical activity to reduce the incidence of and complications from chronic conditions such as diabetes and heart disease (Bovbjerg et al., 2011). The increasing amount of money dedicated to these initiatives as well as the fundraising power of CBOs, as discussed below, is a yet untapped resource for ACOs.

Partnering for public health

The Chronic Care Model (Bodenheimer et al., 2002) is a widely utilized framework for integrating different clinical teams to deliver daily care for chronic disease patients. A successful CCM intervention promotes changes in six areas: self-management support, decision support, delivery system design, clinical information systems, health care organization, and community resources (Coleman et al., 2009). Changes to neighborhood infrastructure and programs to promote active design not only fall in the community resources sector, but also assist with decision support. The newness of ACO structures can be beneficial in forming partnerships between health organizations and community organizations, recognizing that there are often geographic overlaps between high areas of need for both health and development (Berwick, 2011). Alignments of public health departments with local government planning agencies, CBOs, and private sector organizations will be key for public health and ACO personnel to learn about managing and making tradeoffs, while the private sector can learn to appreciate the importance of public health and its relevance for their professional goals (Bovbjerg et al., 2011).

We see a great potential for the ACA and ACOs to stimulate health innovations in the realm of active living. While this is an area heretofore unexplored by these initiatives, we suggest that they look to the following three examples to expand their scope, which remains somewhat narrow.

1) CBO and Public Health partnerships: Acting on research on the role of walkable neighborhoods on physical activity and health (Ewing et al., 2003; Frank, 2006; Heath et al., 2006; Let's Move, 2010; Mozaffarian et al., 2012; The National Physical Activity Plan Alliance, 2010), Sacramento County's public health and community development departments, along with the air quality district, park departments, private sector and several non-profits have partnered to implement healthy design initiatives. Design 4 Active Sacramento (D4AS), a cross-sector CBO composed of planners, designers, engineers, public health officials, and medical professionals, has implemented healthy design standards into the county's planning policies, development codes, and design guidelines. Sacramento County's public health officer, a member of D4AS, engaged with 18 recreation and park agencies for a “park prescriptions” program, in which residents are given written prescriptions to spend 30 min five days a week in local parks walking or participating in an activity of their choice. The public health department's partnership with the Sierra Sacramento Valley Medical Society has led to “Walk with a Doc” events, where physicians give short health talks in different park locations, and lead groups on strolls (Sierra Sacramento Valley Medical Society, 2014). Another CBO, WALKSacramento works to build awareness of safe and walkable design, reviews plans, and runs Safe Routes to School programs (WALKSacramento, 2014).
2) Broader interpretations of the Community Benefit Initiative: In South Sacramento, Kaiser Permanente funded a three-year Healthy Eating Active Living (HEAL) Zone initiative in a low-income neighborhood near their hospital. HEAL is coordinated by the CBO Health Education Council and has numerous partners including WALKSacramento, and the City and County of Sacramento. It is funded by Kaiser's own Community Benefit Initiative. While hard data has been difficult to compile due to the nature of the interventions, qualitative follow-up has shown improvements in increased

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exercise in youth, access to healthy foods, and more walkable neighborhoods (Cheadle et al., 2010).

3) The Accountable Care Community: The accountable care community (ACC) is an alternative model which concentrates on geographic as opposed to beneficiary communities. Funded as part of CMS Center for Medicare and Medicaid Innovations (CMMI) grants, ACCs engage a broader group of stakeholders across multiple sectors, and focus on generating returns from secondary prevention that can be reinvested via health and wellness trusts and primary prevention. The model influences the spectrum of health determinants, both physical and social, as well as inventories local assets and resources (Hester and Stange, 2014; Trust For America's Health, 2013). The Austen Bioinnovation Institute in Akron (2012) has also laid out a number of metrics to measure success, including community participation, burden of disease, and care coordination which could be utilized to get data on future initiatives. A Massachusetts ACC is already looking at investments in active community environments as a complement to a focus on improving care coordination (Kaiser Permanente Community Benefit, 2014).

Increasing funding and evidence to come

Community development leaders not only bring local knowledge but are also experienced in attracting capital. The Robert Wood Johnson Foundation and the Federal Reserve have dedicated large funding streams solely to research and initiatives for improving health via the built environment (Braunstein and Lavizzo-Mourey, 2011). The California Endowment has a $10 million, 10-year investment in a "Building Healthy Communities" program in several communities around the state (The California Endowment, 2014). Funding from California's Cap and Trade program can be leveraged to implement strategies from community needs assessments for health access and active design improvements, particularly in communities with the greatest health disparities. As these organizations start to report back on the results of this funding, and their health partners contribute expertise in evidence-based interventions and outcome measurement, the growing body of empirical evidence and continued funding streams will make them increasingly appealing partners to ACOs.

Potential barriers

Should ACOs widen their scope to include public health and community development, there will be barriers. Hospitals and physician practices are still somewhat inexperienced with population health and community wellness programs (Raff, 2013), as medical schools have focused more on hospital-based care and scientific research from the 19th century, and isolated public health as separate discipline. The definition of "population health" is still unclear in terms of its relationship to ACOs. The ACA uses the term "population" to refer to diagnosis subgroups within an ACO's patient panel, while public health uses the term to refer to all residents of a geographic area. (Hacker and Walker, 2013). This may limit the activities the ACO is willing to undertake if the immediate goal is to realize short-term cost savings within the specific population. Moreover, because health plan membership changes over time, some ACO leadership may feel that it is not cost-effective to invest in longer-term behavior change strategies (Kaiser Permanente Community Benefit, 2014).

However, it is ultimately in the interest of ACOs to support community-wide change that promotes active living; the healthier the general population, the more cost-effective the ACO's care delivery system and the more affordable health insurance products will be overall. As ACOs look at the potential of active living centered initiatives, they will also have to become more familiar with the languages of other fields, even further beyond public health. Successful active living interventions require an ecological approach, requiring changes to policy, infrastructure, and health promotion which will benefit not only present populations but future ones as well (Kaiser Permanente Community Benefit, 2014; Sallis et al., 2006). ACOs must come to recognize that healthy patients require healthy places.

Conclusions

The development of relationships between the public health sector, ACOs, and community groups will likely develop incrementally. As ACOs increasingly take on specific projects to improve population health, these cross-sector collaborations will provide precedent models, but only if outcomes data are rigorously evaluated and widely published in order to improve services and establish best practices.

These alignments will evolve over time, as the roles of each stakeholder come into clearer focus. Further payment reforms to value quality over volume, engage patients in their own care, and keep people healthy will be required, but momentum is building. The current climate of health care economics is excellent for incentivizing collaborations across all sectors and health care for the benefit of both people and places.

Conflict of interest statement

Some co-authors of this paper are affiliated with the non-profit organization, WALKSacramento, mentioned in this paper as examples of community based organizations focused on encouraging active living. No personal or financial gain has occurred, nor has it influenced this work. This paper is not evaluating the effectiveness of WALKSacramento nor does it promote it for financial gain. Co-authors Edie E. Zusman, Sara Jensen Carr, Judy Robinson, Olivia Kasirye, Teri Duarte, Adrian Engel, Monica Hernandez, and Mark Horton are members of Design 4 Active Sacramento (D4AS), which is volunteer advisory council as part of WALKSacramento. Co-author Teri Duarte is the executive director of WALKSacramento and co-author Adrian Engel is on the Board of Directors of WALKSacramento.

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Appendix D: Active Design

Active Design for a Healthy Sacramento County

Active Design Guidance: Purpose

Active design strategies are identified by this icon.

The purpose of this chapter is to promote quality design that enhances community aesthetics, reflects the community character and reinforces the community's and County General Plan goals of sustainable design. When these guidelines are properly applied to projects, we achieve quality design and we also improve the public's health, safety and livability. There is a need to improve the health of our communities. Application of the Active Design strategies will help to achieve these goals, provide overall planning and design principles, and guidelines for commercial districts.

Decisions on how and where to build homes, businesses, shopping centers, parks and schools all have significant impacts on human health. Mixed land uses (job/housing/retail proximity), densities, community connectivity, and active transportation (walking and bicycling) choices can all promote and increase walking and physical activity. By incorporating Active Design strategies into the built environment, physical activity and improved health can be achieved.

Active Design is not only healthy, it is also sustainable design. While enhancing the public's health, it also reinforces the goals of environmental sustainability by reducing energy consumption and greenhouse gas emissions, improving air and water quality, and preserving the natural environment. These strategies and guidelines are grounded in the data that the design of the built environment can have a crucial and positive influence on improving public health and is an essential tool in reversing the most pressing public health problems of our time.

The Chronic Disease and Obesity Epidemic: Health Issues

For the last few decades, environmental and public health professionals have made great strides in helping to build and maintain a healthy society. Whereas infectious diseases were the gravest health threats of an earlier era, the biggest killers of our time are non-infectious, chronic diseases such as heart disease and stroke, cancer, chronic lung disease and diabetes, for which the leading risk factors are obesity, physical inactivity, poor diets and smoking. [1, 2]

Over the last two decades, obesity has become epidemic in California and the United States. Overweight/obesity, defined by a Body Mass Index or BMI over 25, now affects two-thirds of the adult population in California and Sacramento County. About one in three California children (31%), ages 10-17, is overweight or obese, and 43 percent of elementary school children in Sacramento County are overweight or obese. [3] (BMI is a measure of body fat that classifies adults into four categories: underweight, normal weight, overweight and obese.)

Obese children are ten times more likely to be obese adults than normal-weight children. The underlying causes of obesity — physical inactivity and a surplus of dietary calories — are second only to tobacco as the major causes of premature death.

Obesity increases the chances of developing type 2 diabetes, [4] which has more than doubled in recent years and leads to complications such as blindness, limb amputations, cardiovascular disease, and kidney failure. Type 2 diabetes is increasingly found among children, leading to medical complications in early adulthood, with serious consequences for quality of life and health care costs.

1 2010 California Obesity Prevention Plan: A Vision for Tomorrow, Strategic Actions for Today. Sacramento, CA. California Department of Public Health, California Obesity Prevention Program, 2010.
2 Mokdad AH, et al. Actual causes of death in the United States, 2000. Journal of the American Medical Association. 2004;291(10): p. 1238–1245.
3 Babey SH, Wolstein J, Diamant AL, Bloom A, Goldstein H. A Patchwork of Progress: Changes in Overweight and Obesity Among California 5th, 7th-, and 9th-Graders, 2005-2010. UCLA Center for Health Policy Research and California Center for Public Health Advocacy, 2011.
4 Narayan KM, et al. Lifetime risk for diabetes mellitus in the United States. Journal of the American Medical Association. 2003; 290(14): p. 1884–90.

The California Health Interview Survey [5] showed that 63 percent of Sacramento County residents fail to meet recommended guidelines for physical activity — 30 minutes a day, 5 days a week — putting them at high risk for being overweight and obese. According to the CDC only about 20 percent of U.S. adults are meeting both the aerobic and muscle strengthening components of the federal government's physical activity recommendations.

Chronic disease and obesity exact a toll not only on our health but also on our economy in the form of rising health care and disability costs and declining productivity and workforce availability. In 2000, the total direct and indirect health care costs attributable to obesity in the United States were estimated to be $117 billion, [6] which is equal to each U.S. resident in the year 2000 paying $415 each. In 2006, the California Center for Public Health Advocacy estimated that the health care costs related to obesity in California were close to $41 billion. [7] More far-reaching economic consequences include fuel expenses and costs from insurance, disability, absenteeism, and decreased productivity for the business sector. [8] This economic burden is only anticipated to grow. If the current rate of increase in obesity continues, the total health care costs attributable to obesity are anticipated to double every decade, reaching $860 to $960 billion by 2030.

Lack of Physical Activity and a Supportive Built Environment: Connecting Design and Health

Part of the reason for today's lower rates of physical activity compared to the past is the changed built environment. Over the past 60 years, development patterns have been focused on the ease and speed of movement for automobiles and the dramatic separation of uses. Neighborhoods and communities are built with large distances between homes, jobs, schools, and shopping centers, forcing people to use vehicles for everyday trips. As a result, people use cars today for nearly every trip from home, even when the distances they need to travel are short. In fact, according to the National Household Travel Survey 28% of all trips today are less than one mile and yet 72% of those trips are taken by automobile.

5 California Health Interview Survey: http://healthpolicy.ucla.edu/chis/Pages/default.aspx

6 U .S. Department of Health and Human Services. The Surgeon General's Call to Action to Prevent and Decrease Overweight and Obesity. 2001.

7 Chenoweth & Associates, Inc. The Economic Costs of Overweight, Obesity, and Physical Inactivity Among California Adults. 2006. California Center for Public Health Advocacy. 2009.

8 Thompson D, et al. Estimated economic costs of obesity to U.S. business. American Journal of Health Promotion.1998;13(2): p. 120–127.

The design of our communities encourages this dependence on cars, which in turn leads to a number of health hazards in the built environment. Increased auto use contributes to elevated pollution levels, and fast-moving vehicles make the roads hazardous for the pedestrians and bicyclists that choose active transportation.

In recent years, physical activity levels at work, at home, and from transportation have decreased. The design of our buildings, streets, neighborhoods, and communities often makes physical activity difficult to achieve. Physical activity, once part of our normal lives, has been designed out of daily routines. [9] Sedentary jobs have taken the place of manual labor, cars have replaced walking or bicycling, elevators and escalators have supplanted stair climbing, and televisions, computers, social media and video games have displaced active leisure pursuits, especially among children.

The biggest opportunity for improving public health may lie in changing these daily lifestyle norms. Community design that encourages the replacement of automobile use with walking and bicycling not only increases physical activity and ensures pedestrian safety, but also addresses numerous other health issues. The less we drive, the fewer collisions we have, resulting in fewer traffic injuries and deaths. As automobile use decreases, vehicle emissions decline, resulting in cleaner air. Chance interactions on the street lead to stronger social connections and mental wellness. [10]

Well-designed public transit systems and access to transit can also help to increase physical activity levels and community health. Americans who use transit spend an average of 19 minutes a day walking between transit stops and destinations; and 29% meet the U.S. Surgeon General's recommendation of at least 30 minutes of physical activity per day by walking to and from transit. [11, 12]

9 Brownson RC, Boehmer TK, Luke DA. Declining rates of physical activity in the United States: what are the contributors? Annual Review of Public Health. 2005;26:p. 421–443.

10 Leyden, K. M. Social capital and the built environment: the importance of walkable neighborhoods. American Journal of Public Health. 2003; 93(9): p. 1546-51

11 Besser LM, Dannenberg AL. Walking to Public Transit: Steps to Help Meet Physical Activity Requirements. American Journal of Preventive Medicine 2005; 29(4) 273-280.

12 Wener, RE and Evans GW. A morning stroll: levels of physical activity in car and mass transit commuting. Environment and Behavior. 2007; 39: p. 1–13.

Community design can also address concerns over public safety and fear of assault, which are reasons given by people for choosing not to walk, use public transit, use recreational facilities or allow their children to play outside or walk to school. While many variables influence violence and crime in communities, aspects of the physical, built environment can also be designed to discourage crime. Appropriately placed landscaping, lighting, windows, porches, signs and more all contribute to a safer built environment. Crime Prevention Through Environmental Design (CPTED) provides additional design guidance to create safer communities.

Creating an Active Sacramento: The Key Issue

The design of a neighborhood influences how its residents will live. Planners, designers and architects can foster physical activity by designing spaces and streets that encourage walking, bicycling, and other forms of active transportation and recreation. A diverse mix of land uses, co-location of food markets and other retail, green belts and parks, along with a well-connected street system, and a good public transit system all facilitate increasing physical activity among residents. Narrow, quiet, well-shaded streets can encourage walking and bicycling among young and old alike. Streets that are safe for all will encourage more active use.

It is important to recognize that Sacramento County is very diverse and that the planning and design techniques that follow may apply differently depending on the context. In general, the more urban the context, the easier it will be to create these active communities since urban areas typically provide a well-connected network of streets with sidewalks and nearby destination. However, many of these concepts can also work well in suburban areas if careful attention is given to the layout of streets, parks, trails and commercial areas. In rural parts of the County, attention needs to be paid to providing places for people to walk or ride a bicycle either on the shoulder of roads or on separated trail networks.

It is also important to note that the design criteria that support active lifestyles discussed below depend on one another to have the most impact. Creating a compact, mixed use community that lacks good connectivity or a neighborhood with great streets but no nearby destinations will not support active lifestyles as well as a community that brings together all these key elements.

Active Design Strategies

Compact, Mixed-Use Communities

People are more likely to meet recommended levels of moderate physical activity if they can incorporate such activity into their daily routines. This means people are choosing to walk, bike or take transit to reach daily destinations (i.e., work, school, and home) rather than driving. Therefore, creating environments where walking and biking is the easy choice means providing a greater mix of destinations located closer together. As a general rule of thumb, people are reasonably willing to walk 5 – 15 minutes (approximately ¼ to ¾ mile) and are more likely to consider riding a bike for trips between 1/2 to 3 miles. Research has shown that residents living in mixed-use, compact communities are four times more likely to walk for trips under 1 mile in length. [13]

Compact, mixed-use communities also increase the accessibility of transit by placing more "customers" within proximity of transit stops. It is important to note that not all areas in Sacramento County are currently served by bus or light rail. Therefore, building "transit-ready" communities that are compact, walkable, and have a mix of uses will help ensure the success of future transit expansion. Access to public transportation is linked to increased physical activity, since transit use typically involves walking or bicycling to a bus or light rail stop. [14] Transit riders tend to walk 19 minutes a day, which is three times the amount of the average American. Commuting by transit rather than the automobile has been shown to increase as residential density increases, especially in neighborhoods designed around transit stations. [15]

Uses can be mixed vertically or horizontally. The first photo shows a mixed use project in Davis, CA, with apartments over a restaurant. The second shows a shopping center in Salinas, CA, where housing has been built next to a supermarket. (Photos: Local Government Commission)

13 L. Frank et al., Linking Objectively Measured Physical Activity with Measured Urban Form: Findings From SMARTRAQ, American Journal of Preventive Medicine, at 117-1255 (February 2005).

14 Ewing R. Pedestrian- and Transit-Friendly Design. Washington, DC : Urban Land Institute/American Planning Association; 2009.

15 2010 California Obesity Prevention Plan: A Vision for Tomorrow, Strategic Actions for Today, Sacramento (CA): California Department of Public Health, California Obesity Prevention Program, 2010.

Communities designed to provide greater opportunity for transit use, walking or bicycling can also help improve opportunities for physical activity among low-income people. Access to fitness facilities is more prevalent among certain groups in the population — typically, individuals with higher levels of education and income. However, when walking and cycling as part of transportation are considered, socioeconomic discrepancies in physical activity are reduced. [16] In addition, those that live in compact, mixed-use communities are found to drive less or not own a car at all, which are significant benefits to those with restricted incomes.

Compact, mixed-use communities are especially important for the health and vitality of seniors. Currently, one out of five seniors does not drive. Research has found that individuals aged 65 and over who live closer to shops and services are more likely to walk and use public transportation, and take more total trips outside the home. [17, 18] By 2030, it is projected that 25% of the adult population in the greater Sacramento region will be over the age of 65. The land use patterns, housing options, and mobility options we currently have, and will be developing in the coming years, will play a significant role in affecting — for better or for worse — the growing senior population's ability to remain active, independent, and engaged with family, friends, and community.

Choosing to walk or bike depends on more than just distance and proximity but also sense of safety, comfort, topography, and overall aesthetics.

Connectivity

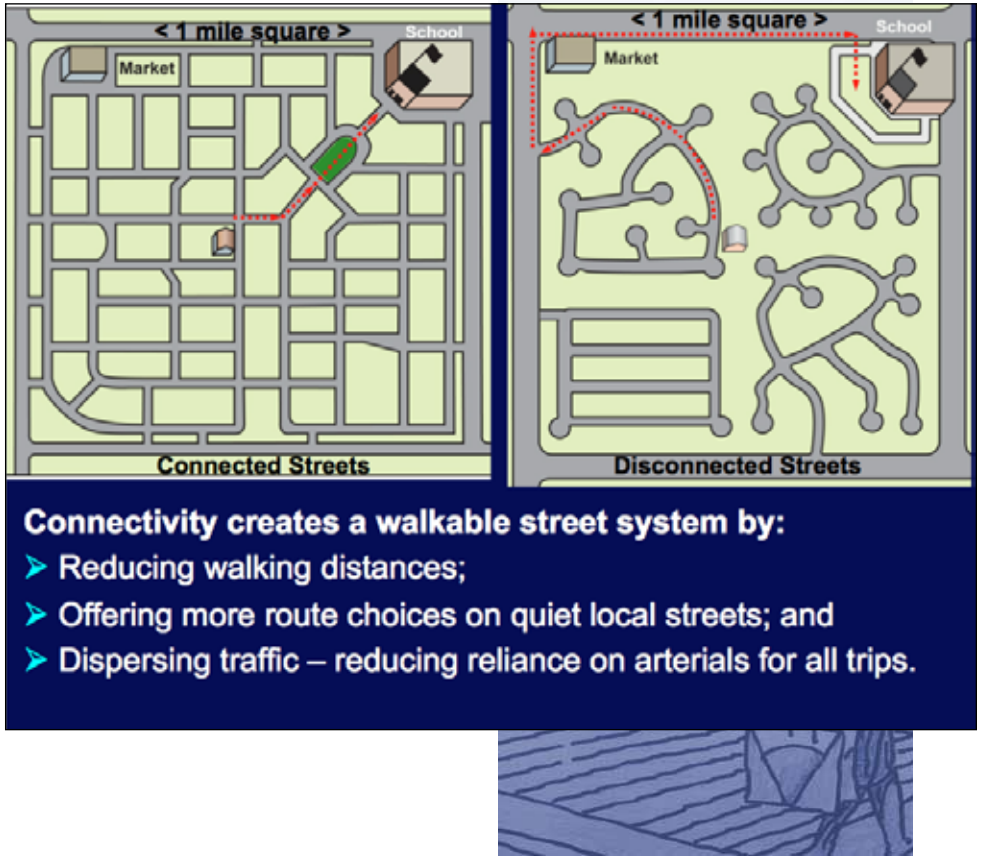
A roadway network should be designed with pedestrians and bicyclists in mind. An average person walks about 3 miles per hour and on a bicycle, can travel up to 8 – 10 miles per hour. Therefore, a key component of creating healthy communities and neighborhoods is ensuring a well-connected network of roadways and trails that provide residents short, direct routes to destinations.

16 Berrigan D, Troiano RP , McNeel T,DiSogra C, Ballard-Barbash R. Active transportation increases adherence to activity recommendations. American Journal of Preventive Medicine. 2006;31(3): p. 210–216.
17 Jana Lynott, et al. Planning Complete Streets for an Aging America. Washington, DC: AARP Public Policy Institute; 2009.
18 Bailey L. Aging Americans: Stranded without Options. Washington DC : Surface Transportation Policy Project; April 2004.

The term connectivity is often used to describe how a roadway network is laid out and connected. In general, a roadway network with high connectivity will have short street blocks, numerous intersections, and minimal dead-ends (cul-de-sac). This type of roadway configuration will help reduce travel distance, increase route options, and allow for direct travel routes to destinations. All of these measures make walking and bicycling more feasible. Recent studies have underscored this point by demonstrating the association between increased pedestrianism and high street connectivity. [19, 20]

In comparison, a neighborhood with low connectivity will deter walking or biking. A poorly connected roadway often looks like a configuration of "loops and lollipops" that creates more circuitous trips and longer distance trips. This type of roadway layout funnels traffic onto a few arterial roadways resulting in wider roads that carry more cars travelling at higher speeds. This creates a hostile and dangerous environment for everyone, including motorists, cyclists and pedestrians. A study of 24 California cities in 2009 found a higher risk of fatal or severe crashes in cities with very low street network density. [21] In addition, homes and businesses located next to these high-volume roadways usually require soundwalls, which can create additional physical barriers to pedestrian connectivity and decrease the overall visual appeal of the pedestrian environment.

In a traditional, well-connected street system it is possible for a child to walk to school from the neighborhood since there is a direct route on slow, local streets. On the right, with disconnected streets, kids are typically driven to school. This means more traffic on the arterials. The trip home requires three left turns, which often creates the need for traffic lights. This, in turn, causes more congestion and wider streets, as virtually all trips must be made on arterial streets. On the left, even if people drive, they are less reliant on the arterial system, as they have more access points. (Graphics: Courtesy of Federal Highway Administration "Design for Pedestrian Safety" course)



19 Hess PM, Moudon AV , Snyder MC, Stanilov K. Site design and pedestrian travel. Transportation Research Record.2001;1674: p. 9–19.

20 Baran PK, Rodriguez DA , Khattak AJ.Space syntax and walking in a new urbanist and suburban neighborhood. Journal of Urban Design. 2008;13(1):p. 5–28.

21 Study by Wesley E. Marshall and Norman W. Garrick, "Street Network Types and Road Safety: A Study of 24 California Cities," August 2009

A roadway network that works for bicycles and pedestrians also works for other modes of travel. Transit use is improved in communities with high connectivity. Recent research has indicated that transit stops in areas with well-connected street grids are used more heavily than those in areas with less connected streets. [22] Transit service can include light rail, bus rapid transit, regular bus service and local or neighborhood shuttles. Creating a more connected street network that includes shorter route options also has a positive impact on overall performance of the network since it provides more redundancy and route choices. A system with low levels of connectivity will typically require several large arterial roadways and longer signal cycles at intersections while a well-connected street system relies on smaller streets, shorter blocks, slower speeds, fewer stops and signals and shorter signal cycles when signals are required.

A highly connected roadway network also improves the delivery of key local government services, such as emergency response. This type of network offers far more links and approaches for fire trucks and police rushing to an emergency. This is especially important when one route may be blocked. Research has also shown that a fire station is able to serve three times as much area with a connected roadway network as in an area with unconnected streets. [23] Other benefits include increases in the efficiency of services such as garbage collection and street sweeping.

In terms of crime and safety, it is important to note that connectivity should be considered and applied differently based on the settings (i.e. urban, suburban, and rural). For example, high connectivity might best deter personal crime in a more urban area with heavier foot traffic and "eyes on the street." However, a lower level of connectivity might better serve a suburban area with less foot traffic and concern centered on property crime prevention. [24] Regardless of community type, good pedestrian connectivity using street networks, separate pathways and trails are key elements in providing active transportation choices.

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22 Lund H, Wilson RW, Cervero R. A reevaluation of travel behavior in California TODs. Journal of Architectural and Planning Research. 2006;23(3): p. 247–263.

23 Susan Handy, Robert G. Paterson and Kent Butler (2004), Planning for Street Connectivity: Getting From Here to There, Planning Advisory Service Report 515, American Planning Association.

24 Paulsen, Derek J. "Crime and Planning" CRC Press, 2013.

Plazas, or public places, can come in all shapes and sizes. This small plaza in Monterey, CA, (on the left) takes space that might otherwise be used for the street and creates a seating area for a coffee shop and other local businesses. In a residential setting, the plaza in the Doe Mill neighborhood in Chico, CA, (on the right) is organized around residents' mailboxes. (Photos: Local Government Commission)

Site and Street Design that Foster Health

The measures discussed above — density and connectivity — are general tools used to characterize physical environments that foster active living. There are additional measures, which are subtler and speak to how people perceive and interact with their physical environment. The urban design qualities discussed below refer to how people feel when they walk, bike, or drive along a street, and are good measures of site and street design that facilitate healthy lifestyles:

The photo at the top is from a small town in California and captures urban design qualities that can create a great environment for walking. The buildings and trees enclose the street but the store windows allow for transparency. Architectural details, awnings and benches give the street a human scale and the different materials and textures make the street imageable and complex. The photo on the bottom, Michigan Avenue in Chicago, IL, shows how these qualities can also apply to a dense urban environment. Although the buildings fronting this street are high-rise, the awnings, doorways and landscaping help to create a human scale setting in which pedestrians feel comfortable. (Photos: Local Government Commission and Dan Burden)

Imageability is the quality of a place that makes it distinct, recognizable and memorable. A place with high imageability is unique; it contains physical elements arranged in a way that captures attention, evokes positive feelings, and creates lasting impressions. Public plazas illustrate the potential health benefits of imageability. A public plaza is a publicly accessible space that excludes cars and promotes walking by providing pedestrians with a safe, comfortable space to gather, play, or simply watch things go by. Plazas often constitute welcome "interruptions" or places of respite from the urban grind, and provide destinations for those engaged in active transport. [25]

Enclosure describes the degree to which urban design elements visually define streets and other public spaces. Adding tree canopies, on-street parking and placing buildings closer to the street to create a sense of enclosure, or an "outdoor room," slows cars and improves pedestrian comfort. [26]

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25 Ewing R. Pedestrian- and Transit-Friendly Design. Washington, DC : Urban Land Institute/American Planning Association; 2009.

26 Dan Burden, et al. "Street Design Guidelines for Healthy Neighborhoods" 1999.

Human Scale refers to size, texture and articulation of physical elements that match the size and proportion of humans, and correspond to the speed at which humans walk. Elements such as building detail, pavement texture, street trees, and street lights and furniture contribute to the human scale of a space.

Transparency describes the degree to which people can see or perceive what lies beyond the edge of a street or other public space. Windows and entrances along the street create an interesting and engaging environment that draws pedestrians along the sidewalk. Being able to see beyond the edge of buildings and being seen creates a safer environment for people on the street and inside buildings.

Complexity refers to the visual richness of a place. Complexity can be achieved in a number of ways. For example, the incorporation of temporary and permanent public art installations into the streetscape provides for a more attractive and engaging environment. Artistic bike racks are available that can incorporate art with functionality. Increasing the number of outdoor cafes enhances street activity. These examples contribute to the attractiveness of urban places, which in turn can encourage their use by pedestrians and bicyclists. [27]

SITE DESIGN

Several site design features can be integrated into a community in order to help achieve imageability, enclosure, human scale, transparency, and complexity—and, in turn, encourage walking and biking trips:

Shorter Building Setbacks

When buildings are set back far from the street edge, the roadway appears to be very wide. This may result in excessive vehicle speeds, creating an unsafe environment for pedestrians, bicyclists, and drivers. Conversely, buildings set closer to the street edge foster a sense of enclosure. The addition of buildings and

As streets get wider and faster, the tendency is to set buildings further back from the street and locate parking between the buildings and the street. This creates an automobile-dominated environment in which buildings are surrounded by a sea of parking and walking is discouraged. However, more communities are redesigning their shopping centers as shown above with parking located behind and alongside the buildings to create more of a main street environment. (Photo and Graphic: Dan Burden)

27 Identifying and Measuring Urban Design Qualities Related to Walkability (Ewing R, Clemente O, Handy S, Winston E, Brownson RC. Active Living Research, 2005.)

trees that are adjacent to the sidewalk create a "street wall" that frames the street and narrows a driver's field of vision. Taller buildings placed close together create a solid street wall and add to the sense of enclosure. People tend to feel more comfortable walking on streets with a sense of enclosure. [28] People also tend to drive slower and more safely.

Street-Facing Building Entrances

Crime Prevention Through Environmental Design (CPTED) utilizes strategies to deter criminal behavior and increase peoples' sense of safety through the design of the built environment. Utilizing CPTED strategies as part of active design standards can reduce crime and increase community safety. These principles including natural surveillance, natural access control, and territorial reinforcement relate to building entrances.

Good site design utilizes natural surveillance. Building entrances designed to face the street helps maximize visibility and natural surveillance. Providing easily identifiable store and building entrances helps foster positive social interaction among legitimate users of private and public space. Creating an atmosphere that does not encourage or invite unlawful activity can help reduce opportunities for criminals. Other physical elements can support natural surveillance including well-designed and placed landscaping, and lighting that provides for nighttime illumination of parking areas, walkways, entrances and exits.

Good site design also utilizes natural access control. The placement of exits, fencing, lighting and landscaping and the clear differentiation between public and private space is used to limit or control access and reduce the opportunity for crime. This can be achieved by providing sidewalks, pathways, pavement, lighting, landscaping and signage that clearly guide the public to and from entrances and exits.

By clearly delineating private space, a sense of ownership among residents is established, and creates an environment where "intruders" are more easily identified. Buildings, low fences, landscaping and other features can be used to express ownership and define public, semi-public and private spaces. Territorial reinforcement can be achieved with pavement treatments, landscaping, elevated porches, steps, signage, screening and fences that define and outline ownership of property.

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28 Streets and Sidewalks, People and Cars: The Citizens Guide to Traffic Calming.

Parking Design that Considers Active Transport

In general, when parking is available, people use it. Research in California indicates that increased parking supply may result in reduced active transportation and public transit use. [29] An oversupply of parking increases the walking distances between business and other destinations, and reduces land available for other uses. Furthermore, parking lots increase heat island effect. This effect occurs when on hot, sunny days the sun heats dry, exposed surfaces, such as roofs and pavement, to temperatures hotter than the air, while shaded or moist surfaces — often in more rural surroundings — remain close to air temperatures. Heat island effect can compromise human health, contributing to respiratory difficulties, heat cramps and exhaustion, non-fatal heat stroke, and heat-related mortality. [30] Heat island effect can also increase air pollution and impacts to water quality. Well-designed car parking will reduce unnecessary automobile travel, particularly when walking, bicycling, and public transit are convenient alternatives. Pedestrian and bicycle access points should be well identified. Parking should be provided for people with disabilities to support their needs for access and physical activity.

In multifamily and commercial settings:

- Parking located behind or on the side of buildings, with adequate lighting and security provided for safety will provide access to buildings but will not dominate the frontage along a street. If parking must be placed next to sidewalks it should be buffered with landscaping or low walls.
- Well-designed pedestrian access and connectivity from transit stops through parking lots to retail and businesses is important in providing safe passage and encouraging people to walk and utilize transit for their shopping trips.

Sustainable Landscaping

Native, water-efficient, and climate-appropriate landscaping is a site design feature that offers numerous health benefits. Sustainable landscaping practices lower heat island temperatures and improve air and water quality. In various settings, views that include landscaping have a positive impact on health: College students with more natural views from their dorm windows score higher on attention tests; [31] workers with a view of nature from their desks claimed 23% fewer sick days than workers without views

29 Lund H, Wilson RW, Cervero R. A reevaluation of travel behavior in California TODs. Journal of Architectural and Planning Research. 2006;23(3): p. 247–263.

30 US EPA. "Heat Island Effect: Basic Information" http://www.epa.gov/hiri/about/index.htm

31 Tennessen, Carolyn M., and Bernadine Cimprich. "Views to Nature: Effects on Attention." Journal of Environmental Psychology 15.1 (1995): 77-85.

of nature; [32] patients recovering from surgery in hospital rooms with window views of natural scenes had shorter postoperative hospital stays, received fewer negative evaluations in nurses' notes, and took fewer potent painkillers than matched patients in similar rooms with windows facing a brick wall. [33]

Trees can play an important role in reducing crime rates and domestic violence, and can also increase social ties. In a study of Chicago public housing residents, University of Illinois researchers found that buildings with high levels of greenery had 52% fewer property and violent crimes than apartment buildings with little or no vegetation. Green spaces draw people outdoors, increasing surveillance and discouraging illegal activity. The green and groomed appearance of an apartment building is a signal that owners and residents care about a property, and watch over it and each other. Greener common areas also facilitated stronger social ties. The more trees and landscaping in the common spaces, the more those spaces were used by residents. Those individuals living closer to green spaces enjoyed more social activities, had more visitors, knew more of their neighbors, and reported committing fewer acts of aggression toward household members than those living near barren spaces. [34]

STREET DESIGN

Poor street design results in physical environments that are dangerous to pedestrians and bicyclists. When people do venture out to walk on poorly designed streets, they often face high-speed traffic and dangerous situations that result in high rates of pedestrian injuries and fatalities. These conditions further discourage people from walking and bicycling.

Walkable streets form the backbone of friendly, interactive, safe and secure neighborhoods. Along these streets, people know their neighbors. Walkable streets allow responsible motorists who live in or travel through the neighborhood to feel most comfortable at lower rather than higher speeds. Motorists traveling too fast for the neighborhood feel uncomfortable on curves, at intersection turns, and with the short length of blocks. Motorists who go the correct speed feel relaxed and in tune with the neighborhood. Neighbors, in turn, feel comfortable and safe walking, riding a bicycle, or chatting with neighbors along such streets. [35]

32 Kaplan, Rachel, and Stephen Kaplan. The Experience of Nature: a Psychological Perspective. Cambridge: Cambridge UP, 1989. Web. \.
33 Ulrich, R. S. "View through a Window May Influence Recovery from Surgery." Science 224.4647 (1984): 420-21.
34 Human – Environment Research Laboratory, University of Illinois at Urbana Champaign.
35 Dan Burden, et al. "Street Design Guidelines for Healthy Neighborhoods" 1999.

Appendix D: Active Design

In residential neighborhoods where traffic volumes are low, streets should be designed to be narrow and slow to create an environment where pedestrians and cyclists can fit in. Ideally, the design of the street should establish that motorists will feel most comfortable at about 25 mph. The wide residential street shown on the top allows motorists to feel comfortable traveling at much higher speeds. By contrast, the narrow street shown on the bottom will allow cars to move more slowly and calmly through the neighborhood and will also work well for people walking or riding a bicycle. (Photos: Local Government Commission)

Healthy streets are walkable streets, best measured by how pedestrians act and feel when walking along them. Strolling along healthy streets, pedestrians feel relaxed. They enjoy the experience of walking in this environment and feel connected to their surroundings. Pedestrians in healthy street environments feel confident and in control, and do not feel threatened when encountering strangers.

Another measure of successful streets is the number of people walking along them. Streets are working especially well when pedestrians are using them and when people stop and talk with others. Walkable streets also foster a sense of ownership by everyone who uses them. People who feel comfortable on well-designed streets have the desire to protect and look after them. When a healthy street gets "sick," the people who live on it want to nurture it back to health rather than move away. The health of a community can often be measured by the health of its streets. [36]

Complete Streets

The Complete Streets approach ensures that roads are designed and operated to enable safe access for all users: pedestrians, bicyclists, motorists, and

36 Dan Burden, et al. "Street Design Guidelines for Healthy Neighborhoods" 1999.

public transportation users of all ages and abilities. Sacramento County requires complete streets as part of its adopted improvement standards. This approach encourages communities to begin retrofitting poorly designed roads by adding sidewalks, trees, and bicycle lanes. Additional features that include reducing crossing distances, installing crosswalks and better bus stops all make walking and bicycling safer and more inviting for users of all ages and abilities. Good redesigns help reduce speed and conflict points, two big causes of crashes. [37] Safe environments for pedestrians and bicyclists maintain visual and sensory attention; streets are calm, narrow, and complex.

Traffic calming is a way to retrofit existing streets that are often too wide and that encourage motorists to travel at higher speeds than are desirable. It is a way to reduce the negative effects of automobile use, alter driver behavior and improve conditions for the property owner, retailer, walker and bicyclist. Maintaining slower speeds allows drivers to be more aware of their surroundings. [38] Traffic calming treatments affect the driver's perception of the street, and cause a change in his or her behavior. [39] Traffic calming treatments make use of horizontal and vertical deflection to slow motorists. Horizontal deflection treatments include curb extensions, medians, mini-circles and roundabouts. Vertical deflection refers to the use of speed humps or raised intersections or crossings. [40]

Roads designed with the minimum width and minimum number of lanes practicable reduce traffic speeds and pedestrian crossing distances. [41] Continuous medians or short median islands on multilane streets simplify the crossing and reduce pedestrian crashes by up to 40%. Shorter crossing distances are especially beneficial to the elderly and people with disabilities, who may require more time to cross the street.

Complete streets support physical activity among people with disabilities by making streets and paths accessible to them. A number of environmental design factors have been shown to increase leisure-time activity among people with disabilities, including the quality of the walking path, the provision of targeted

37 National Complete Streets Coalition and Local Government Commission. "It's a Safe Decision: Complete Streets in California." 2012.
38 Local Government Commission and Center for Livable Communities. "Streets and Sidewalks, People and Cars: The Citizens Guide to Traffic Calming." 2007.
39 Local Government Commission and Center for Livable Communities. "Streets and Sidewalks, People and Cars: The Citizens Guide to Traffic Calming." 2007.
40 Huang HF, Stewart JR, Zegeer CV .Evaluation of lane reduction "road diet" measures and their effects on crashes and injuries. Transportation Research Record. 2002;1784: p. 80–90.
41 Ewing R. Pedestrian- and Transit-Friendly Design. Washington, DC : Urban Land Institute/American Planning Association; 2009.

Traffic calming comes in many shapes and sizes. The simplest tool is the speed bump, which can be effective on low-volume local streets but can be a challenge for emergency responders. Less severe treatments that use horizontal instead of vertical deflection tend to be equally effective and can also provide additional benefits. For example, the curb extension shown above not only slows vehicles entering and exiting the street but reduces the crossing distance for pedestrians and improves visibility. The mini-circle show above can be used at intersections to slow vehicle speeds on all approaching streets and with attractive landscaping or public art can beautify the neighborhood and create a gateway. (Photos: Local Government Commission)

signage, and the accessibility of destinations and transportation along the path. [42, 43, 44] Specific measures include: smooth, sufficiently wide paths that can accommodate a wheelchair or walker; paths with auditory crossing signals, adequate crossing times, clear signage, visible access ramps, and connections to walking, bicycling, and public transit routes.

42 Spivok M, Gauvin L, Brodeur J. Neighborhood-level active living buoys for individuals with physical disabilities. American Journal of Preventive Medicine. 2007;32(3): p. 224–230

43 Spivok M, Gauvin L, Riva M, Brodeur J.Promoting active living among people with physical disabilities: evidence for neighborhood-level buoys. American Journal of Preventive Medicine. 2008;34(4):p. 291–298.

44 Spivok M, Gauvin L, Brodeur J. Neighborhood-level active living buoys for individuals with physical disabilities. American Journal of Preventive Medicine. 2007;32(3): p. 224–230

Street intersections also need to be designed with all users in mind. In urban areas, that means building compact intersections that slow turning vehicles and shorten the crossing distance for pedestrians. Intersections of streets with on-street parking provide an opportunity to add curb extensions on the corners where vehicles are not allowed to park to shorten the crossing distance, improve visibility and slow vehicles making turns. Pedestrian crossings, especially at uncontrolled intersections, should include high-visibility crosswalk markings and signs alerting motorists to the crossing. At higher speed locations, additional tools including rapid flash beacons should be considered.

In healthy neighborhoods, people should feel comfortable walking at all hours. Street lighting helps pedestrians feel safer at night. Many neighborhoods prefer more numerous, smaller street lamps to the larger, more widely spaced, high-intensity lights often found in conventional neighborhoods. Low-angle, pedestrian scale lamps that emit full-spectrum light allow for more realistic colors at night, and they also reduce glare, letting people see the night sky. [45]

Appropriately-Sized Sidewalks, Buffered from the Street

Good sidewalk design recognizes that sidewalks have many functions beyond providing a place for people to walk. Sidewalks need to provide space for all the "stuff" that we need on our streets including hydrants, lampposts, signs, trash receptacles, transit shelters, landscaping, trees, etc. Sidewalks also provide direct access to stores and businesses, and have become extensions for outdoor dining, shopping, and socializing. Pedestrians feel safer when separated from parking flows and parking spaces. Because of these different functions, it is important to design sidewalks that include the following zones: a curb zone that creates a vertical separation between the street and sidewalk; a furniture zone for all the "stuff" discussed above; a pedestrian zone for walking; and a frontage zone adjacent to buildings, doors and fences. The furniture zone provides an important buffer between moving automobiles and pedestrian spaces; landscaping and trees may be incorporated into this zone, as well as the frontage zone.

The incorporation of sustainable landscaping and trees into street design provides numerous health benefits. Trees make streets more attractive for active transport by providing a sense of enclosure. The

45 Dan Burden, et al. "Street Design Guidelines for Healthy Neighborhoods" 1999.

The design of sidewalks in residential neighborhoods affect the pedestrian environment. The top photo shows the problems with an attached sidewalk with a rolled curb: cars will tend to park on the sidewalk and create a hostile environment for people walking. This design fails to recognize that a comfortable sidewalk needs to have a well-defined curb zone, typically with a vertical curb that separates the street from the sidewalk. It also needs a "furniture zone" to provide a buffer to the street and space for trees, landscaping, hydrants, benches, etc. By contrast, the bottom image shows a well-designed sidewalk with a good furniture zone, ample and unobstructed space for walking, and a buffer for buildings and private spaces. (Photos: Local Government Commission and Dan Burden)

presence of trees on streets has been associated with higher rates of walking to school among children. [46] Trees also improve air and water quality and can reduce asthma rates in children by sequestering particulates, carbon and other emissions. [47] Trees reduce exposure to ultraviolet light from the sun, lowering the risk of skin cancer and cataracts. Noise can reach unhealthy levels in urban areas – trees reduce noise pollution by acting as a buffer and absorbing urban noise, especially high-frequency sounds that are the most distressing to people. [48]

Trees calm traffic and, in turn, encourage walking. A treeless street can encourage higher speeds, increasing the frequency and severity of accidents. Street trees provide both visual interest and obstacles near the road edge, which encourage safer speeds and quieter neighborhoods. Closely spaced trees help

46 Larsen K, et al. The influence of the physical environment and sociodemographic characteristics on children's mode of travel to and from school. American Journal of Public Health.2009;99(3): p. 520–526.

47 American Lung Association (ALA). 1997. Childhood Asthma: A Matter of Control. Pamphlet.

48 McPherson, Gregory, James Simpson, Paula Peper, Qingfu Xiao, Dennis Pettinger, and Donald Hodel. Tree Guidelines for Inland Empire Communities. Rep. Western Center for Urban Forest Research and Education, USDA Forest Service, Pacific Southwest Research Station, 2001.

motorists gauge and control their speeds. Narrower streets combined with street trees also slow drivers down, while maximizing shading of heat-absorbing asphalt. Trees planted between the curb and sidewalk improve safety by adding a buffer between moving vehicles and pedestrians.

The provision of seating, drinking fountains, restrooms, and other infrastructure supports increased frequency and duration of walking. [49, 50, 51] In focus groups, seniors reported that benches and restrooms would support them in walking more, while tripping and traffic hazards were deterrents.

Sidewalk width, an important aspect of good sidewalk design, is best when consistent with its use. [52, 53] Sidewalks should be at least 5 feet wide to allow two adults to walk side by side. In front of schools or in commercial areas they should be wider to accommodate higher pedestrian volumes. In general, sidewalks should be wide enough to accommodate a range of pedestrian users safely, while not as wide as to feel empty. The needs of people with strollers, wheelchairs, or luggage should be considered.

MAINTENANCE

Good maintenance should follow good site and street design, and arguably impacts all of the urban design qualities discussed above. Maintaining public and private spaces helps reinforce ownership, pride and a sense of order. Poor maintenance or deterioration signals greater tolerance of disorder. Many law enforcement agencies subscribe to the "Broken Window Theory," which emphasizes that the sooner broken windows are fixed or graffiti is removed or trash is collected, the less likely it is that vandalism will occur in the future. Design features that can facilitate better maintenance of a space include low-maintenance landscaping and lighting treatments, as well as signage indicating who to call when maintenance is required, for such issues as light bulb replacement and plant overgrowth.

49 Ewing R. Pedestrian- and Transit-Friendly Design. Washington, DC : Urban Land Institute/American Planning Association; 2009.
50 Whyte WH. The Social Life of Small Urban Spaces. Washington, DC : The Conservation Foundation; 1980.
51 Lockett D, Willis A, Edwards N. Through seniors' eyes: an exploratory qualitative study to identify environmental barriers to and facilitators of walking. Canadian Journal of Nursing Research. 2005;37(3):p. 48–65.
52 Cervero R, Kockelman K. Travel demand and the 3Ds: density, diversity, and design. Transportation Research Part D.1997;2(3): p. 199–219.
53 Rodriguez DA , Joo J. The relationship between non-motorized mode choice and the local physical environment. Transportation Research Part D. 2004;9(2):p. 151–173.

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- A grid or modified grid pattern to provide connectivity and walkability is the preferred street and block pattern. Modifications may be approved to match existing neighborhood context.
- Where residential subdivisions are located adjacent to an open space preserve, street and block patterns should achieve visual and physical access to open space areas.
- Street patterns that create long uninterrupted sound walls should be avoided.
- Residential streets within the subdivision design should be slower and pedestrian-oriented. Incorporate traffic calming measures such as traffic circles, chokers, enhanced crosswalks, and narrower streets.
- Block lengths should be no more than 500 feet, especially for smaller lot developments (RD-5 and higher). For blocks that exceed 500 feet in length, mid-block paseos or pedestrian paths connecting to walking paths, bicycle lanes, schools and parks should be provided to ensure the walkability within the community. Larger lot subdivisions may have longer block lengths up to 750 feet.
- Street layout shall allow for adequate fire protection of all housing.
- Existing healthy mature trees should be preserved and incorporated into site design to add to the neighborhood character.
- Cul-de-sacs that side on to through streets or greenbelts should provide pedestrian access to connect to the adjacent through street. "Live-end" cul-de-sac design should be used to complement these areas and can include landscaping and benches.
- Access walkways and/or off-street trails should be provided to community destinations such as open spaces, parks and schools, and commercial centers from the neighborhood, to enhance the pedestrian and bike movement and safety.
- Each parcel of land should front on a public street or be served by a private road approved pursuant to the Zoning Code which is a component of an approved local street pattern. Lots with homes that back onto a street are only allowed where traffic volumes render lots with homes that front onto a street as unsafe.
- Gated communities are allowed when consistent with community goals.

Project proponents should review the entire set of design guidelines prior to beginning the project's design process.

development storm water features using River Friendly Landscaping, and more.

Promoting active transportation, including walking and biking, along with improving access to transit, lowers household transportation costs, reduces greenhouse gas emissions and air pollution, decreases traffic congestion and encourages development of jobs, housing, services and other amenities in close proximity to each other. Sustainable practices also accommodate the changing weather patterns and provide relief on the increasing hotter and drier days, while also capturing and infiltrating storm water from storm events. These sustainable practices contribute to building healthy communities. The most important part of building sustainable communities is creating neighborhoods that are healthy. That is why the County is calling out "Active Design" with this icon in the design guidelines.

Throughout the Guidelines, standards and policies that incorporate active transportation and contribute to a built environment that supports public health have been highlighted with the walking person icon. The purpose of this icon is to identify "Active Design." Active Design shall be incorporated into all projects in order to reinforce the community's and County's goal to create a built environment that is healthy, sustainable, livable and promotes active transportation choices such as walking, bicycling, and accessing transit. There are many factors of the built environment that influence healthy choices and no single aspect of design can achieve this goal; however, by incorporating Active Design strategies into the built environment, physical activity and improved health can be achieved. More information about the synergies of the guidelines that support active design can be found in Appendix D.

The guidelines and standards outlined in the following sections have been based on national best practices in implementing design solutions and successful examples of guidelines from other jurisdictions. The Guidelines facilitate design review by helping applicants and County staff to identify major design issues and devise solutions early in the application process. In summary, the design guidelines are provided to:

1. Implement the objectives, policies and tools of the County General Plan and Housing Element;

2. Supplement and implement the contents of the County Zoning Code on matters of design and aesthetics;

3. Enhance, protect and maintain the value of property;

CHAPTER 5: DEVELOPMENT STANDARDS

5.1. INTRODUCTION

5.1.1. Purpose

Chapter 5 describes the development standards applicable for all land use zoning districts in the unincorporated area of Sacramento County. These standards are established to preserve or enhance the urban design character of the community. They define the relationship of buildings and structures to the lot, street, parking, existing site and neighborhood context while considering the human interaction and use.

The development standards contained in this chapter seek to promote coordinated, sound development, effective use of land, and high quality site planning that considers the unique character and context of each unincorporated community and implements the goals and policies of the 2030 General Plan. These standards also seek to encourage innovation in development and renewal to provide quality communities that meet anticipated demands for housing, services, employment, and industry; while allowing a variety of approaches to design that preserves or establishes a sense of place for each community, but does so in a healthy, safe and sustainable manner.

Decisions on how and where to build homes, businesses, shopping, parks, schools all have significant impacts on human health and the natural environment. Mixed land uses (job/housing/retail proximity), community connectivity, and active transportation choices all promote and increase walking and physical activity. By incorporating Active Design, identified by the icon at left, and other design considerations into the built environment, physical activity and improved health can be achieved. Utilizing Crime Prevention through Environmental Design (CPTED) strategies can also enhance the urban design character by discouraging crime and an enhanced sense of community safety. The County Design Guidelines seek to promote quality designs that reflect the community character and among other things promotes public health, safety, and livability through design of the built environment. Active Designs and CPTED strategies are discussed further in the County's Design Guidelines.

Due to the wide range of communities in unincorporated Sacramento County, concepts of community character and context are introduced in this chapter to balance the need to be sensitive to differences among communities, with the need for flexibility and understandable and manageable guidance for development. It is recognized that some standards will not always work for all situations. Thus, the Design Review process, required for single-family and multi-family residential and non-residential development projects, will be used to approve alternative standards or solutions that differ in some respects, but are substantially consistent with the County's development standards and design guidelines. Project applicants should consult with the County early in the design stages of the project to ensure compliance with all applicable Code requirements.

5.1.2. Chapter Format and Use of Development Standards

This chapter contains General Standards, Off-Street Parking, and Sign Regulations that are applicable to all land use zoning districts in the County; and development standards applicable to each of the land use zoning districts in the County:

SACRAMENTO COUNTY

HOUSING ELEMENT OF *2013-2021*

Sacramento County
Municipal Services Agency
Department of Community Development

SACRAMENTO COUNTY

stringent CALGreen standards, the County will consider requiring Tier 1 compliance in 2014. (Modification of Existing Program 60(e))

- Advertise certified green buildings on the "Green Sacramento County" website. (Modification of Existing Program HE-60(c))

- Develop and implement a Property Assessed Clean Energy (PACE) program for commercial, industrial and multifamily (four or more units) properties and will consider a similar program for residential properties of less than four units. PACE allows property owners to voluntarily agree to a special tax assessment to finance the installation of energy efficiency and/or renewable energy generation improvements that are permanently fixed to their property. Property owners repay these assessments through their property tax billing system. If the property owner sells the property, the assessment balance may be transferred to the next owner. (New Program)

  Implements Which Policy(ies): HE 6.1.2, HE 6.1.3
  Responsible Department: Community Development - Building Permits and Inspection Division, Planning and Environmental Review Division
  Funding: Building Permit Fees, County General Fund
  Objective: Increase energy efficiency in existing and new residences.
  Target Date: June 2014 for mandatory Tier 1 compliance in 2014. June 2021 for PACE program. Ongoing 2013-2021 for advertising certified green buildings.

Notes: Basic CalGreen requirements only include compliance with current Title 24 energy efficiency standards. Implementation of more stringent requirements above Cal Green minimum (Tier 1 or 2) would result in energy savings of 15% to 30% beyond current Title 24 energy efficiency requirements.

Currently (2012), federal guidance may impede local governments' ability to provide PACE financing for owners of single family homes. However, there are programs such as the CHF Residential Energy Retrofit Program that provides loans and grants to assist homeowners with making energy efficiency improvements to their homes.

STRATEGY HE 7: PROMOTE THE HEALTH AND SAFETY OF RESIDENTS

Goal

Improve the health and safety of residents in Sacramento County's neighborhoods.

Introduction

Statistics indicate that 53 percent of Californians fail to meet recommended guidelines for physical activity, putting them at high risk for illness and premature death. Limited physical activity is a primary risk factor for heart disease, cancer, stroke, diabetes, and Alzheimer's disease – five of the top ten causes of death in California. It is also a primary risk factor for being overweight, which now affects two-thirds of the adult population in California. Obesity, an advanced state of overweight, has reached epidemic proportions, now affecting more than 20 percent of adults in California. Medical experts agree that overweight and obesity increases the risk for a number of health hazards, including heart disease, stroke, Type 2 diabetes, and some cancers. The economic impact of overweight and obesity, including their influence on chronic disease prevalence, reaches $21.68 billion a year in California, including $10.2 billion in medical care, $11.2 billion in lost employee productivity, and $338 million in worker's compensation costs.

The economic impact of obesity is also reflected in County General Fund expenditures. For example, in calendar year 2007, visits to County health clinics by County residents with diabetes and no health insurance cost the County $367,470, not including the cost of inpatient care, specialty services, overhead, or treatment for conditions that resulted from diabetes. More than 90 percent of diabetes in County residents is Type 2, which is generally linked to overweight.

In regards to public safety, fear of assault is a major reason people choose not to walk, use public transit, use recreational facilities, or allow their children to play outside. While many variables influence violence and crime in communities, aspects of the physical environment can be designed to discourage street crime.

The County is responsible for protecting the public health, safety, and welfare of its citizens, and has the ability to do so through implementation of land use and transportation plans, policies, and programs to meet the needs of its communities. The built environment and land use decisions play an important role in shaping the pattern of community development and in either promoting or discouraging physical activity, nutritious food choices, and street safety.

Sub-Strategy 7.1: Promote Public Health, Safety and Livability through Community Design and the Built Environment

Objective: *Master plans, residential developments, mixed use, commercial, office and retail developments, in existing and new communities; that are designed, built and maintained so as to promote the health, safety and livability of residents, employees, visitors and the community.*

Policies

HE 7.1.1 Advance a built environment that promotes and supports physical activity.

HE 7.1.2 Advance a built environment that promotes and supports improved air quality and multiple transportation modes.

HE 7.1.3 Advance a built environment that promotes and supports access to locally-grown fresh food, parks, schools, shopping, jobs, health care and community services.

HE 7.1.4 The County will continue to support walking, bicycling and transit use, reducing auto dependency in order improve the health of its citizens and improve the region's air quality.

HE 7.1.5 The County will continue to support walking and bicycling by requiring complete streets (bike lanes, and sidewalks separated from the roadway with tree planted landscaping) in transit priority areas and in new communities and developments wherever practicable.

HE 7.1.6 The County will endeavor to protect homes from major sources of outdoor air pollution and will mitigate for impacts by improving indoor

air quality in residences, planting trees that help to filter particulates and other measures.

HE 7.1.7 The County will encourage the provision of safe, convenient opportunities to purchase local fresh fruits and vegetables by ensuring that sources of healthy foods are accessible to neighborhoods. In urbanized communities access should be within a half-mile of transit priority areas.

HE 7.1.8 The County will advance residential subdivision and commercial building design that supports crime prevention by utilizing Crime Prevention through Environmental Design (CPTED) principles.

HE 7.1.9 The County will participate in the Healthy Sacramento Coalition, whose goal is to reduce tobacco use, obesity, death and disability due to chronic disease, reduce health disparities, build a safe and healthy physical environment, and improve the social and emotional well-being of Sacramento County residents.

STRATEGY HE 7: IMPLEMENTATION PROGRAMS
Sub-Strategy HE-7.1: Promote Public Health, Safety and Livability through Community Design and the Built Environment
G1. The County will evaluate Healthy Sacramento Communities measures promoting physical activity, access to services and healthy foods and creating safer communities and reducing crime through environmental design measures for inclusion into the County's Design Review Guidelines. The Healthy Communities measures will be those recommended by the Healthy Sacramento Coalition Community Action Plan. (New Program) **Implements Which Policy(ies):** HE 7.1.1, HE 7.1.3, HE 7.1.7, HE 7.1.8 **Responsible Department:** Community Development – Planning & Environmental Review Division, with support from the County's Public Health Officer **Funding:** Strategic Growth Council Sustainable Communities Grant, Safe Routes to School Grants, Healthy Sacramento/Communities Grants, County General Fund **Objective:** Incorporate Healthy Communities and crime reduction measures into the County's Design Review Guidelines. **Target Date:** June 2016
G2. The County will continue to provide and promote the use of bicycle and pedestrian trails, lanes and sidewalks, through: master planning walk-ability principles and connectivity in project planning, capital projects and strategic partnerships. Within existing communities, efforts shall be made to reduce driveways, promote cross access agreements, shared parking and identify new pedestrian access/easements that reduce block length, provide sidewalks and bike lanes where absent, promote connectivity and advance smart growth streets where appropriate. New residential and residential mixed use infill development should help promote walk-ability, physical activity and create bicycle and pedestrian connectivity through:

- Creating and providing open space connections for multiple residential projects utilizing stormwater quality, utility easements and other opportunities to integrate trails within urban development.

- Invest in transit-oriented and non-motorized residential and residential mixed use development projects that promote urban density, economic vitality, street connectivity and attractive public transportation choices.

- Trail system linkages to roads and park-and-ride facilities, sidewalk projects that create more walkable residential communities and safe bicycle lanes.

- Allow neighborhood retail, service and public facilities within walking distance of residential areas, where residents will be able to walk to meet their daily needs, whenever appropriate.

- Consider services that reduce the need for residents to drive to meet their daily needs. Such services might include: grocery and fresh food access within walking distance, mobile or virtual health clinics, retail near residential,

- Supporting shorter block lengths.

. (Existing Program HE-55(a)

Implements Which Policy(ies): HE 7.1.1, HE 7.1.2, HE 7.1.3, HE 7.1.4,
Responsible Department: Community Development – Planning & Environmental Review Division
Funding: Planning Entitlement Fees, Master Plan Developer Funds, County General Fund
Objectives: Provide and encourage walking, bicycling and use of transit in residential communities. Diminish auto dependency. Improve air quality and minimize environmental impacts.
Target Date: Ongoing, 2013-2021

G3. The County through the Planning and Environmental Review Division will increase opportunities for locating providers of fresh produce (grocery stores, farmers markets, produce stands) near existing neighborhoods, particularly low income neighborhoods, and also in new master plan areas. For example, the Department of Community Development is proposing to increase the number of land use zones that allow grocery stores. (Modification of Existing Program HE-57(b).

Implements Which Policy(ies): HE 7.1.3, HE 7.1.7
Responsible Department: Community Development – Planning & Environmental Review Division
Funding: Planning Entitlement Fees, County General Fund
Objective: Encourage providers of fresh produce to locate near existing and new neighborhoods.
Target Date: June 2016

G4. The Planning and Environmental Review Division through the updated Zoning Code will allow community gardens as an amenity in required open space areas of new multifamily projects. (Existing Program HE-57(c).

Implements Which Policy(ies): HE 7.1.3, HE 7.1.7
Responsible Department: Community Development - Planning & Environmental Review Division
Funding: County General Fund
Objective: Amend the Zoning Code to include community gardens in multifamily projects.
Target Date: June 2016

G5. The County will participate in the Healthy Sacramento Coalition, whose goal is to reduce tobacco use, obesity, death and disability due to chronic disease, reduce health disparities, build a safe and healthy physical environment, and improve the social and emotional well-being of Sacramento County residents. (New Program)

Implements Which Policy(ies): HE 7.1.1, HE 7.1.3
Responsible Department: Community Development - Planning & Environmental Review Division
Funding: County General Fund
Objective: Participate in the Healthy Sacramento Coalition.
Target Date: Ongoing, 2013-2021

G6. When the opportunity arises, the Planning and Environmental Review Division will ensure that some of its staff members take classes in reducing crime through environmental design. ((Existing Program HE-58(b))

Implements Which Policy(ies): HE 7.2.1
Responsible Department: Community Development – Planning & Environmental Review Division
Funding: County General Fund
Objective: Review of development plans to discourage crime.
Target Date: June 2014

G7. The County will incorporate reducing crime through environmental design (CPTED) measures into the County's Design Review Guidelines to discourage crime, and encourage compatible uses. (New Program)

Implements Which Policy(ies): HE 7.2.1
Responsible Department: Community Development – Planning & Environmental Review Division
Funding: HUD Grants, SGC Grant, County General Fund
Objective: Review of development plans and uses to discourage crime and increase safety.
Target Date: June 2016

SUMMARY OF QUANTIFIED OBJECTIVES

As required by State law governing Housing Elements, **Table 3-1** lays out the County's quantified objectives for the development, improvement, maintenance, preservation of housing, and other housing activities for the period 2013-2021.

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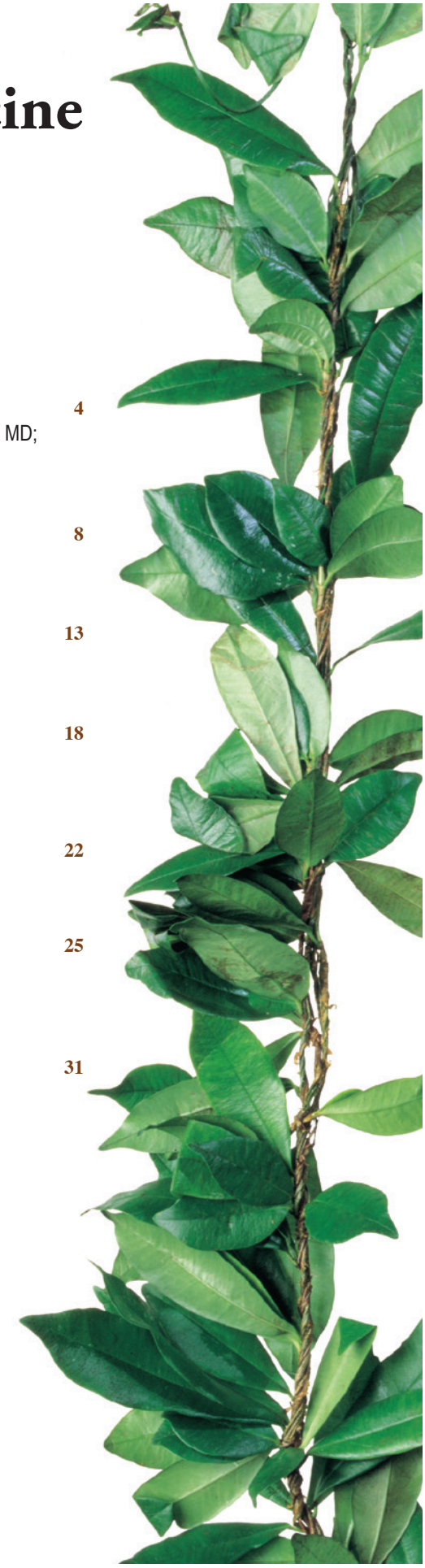

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Hulu Ula (D. Varez)

Building Well-Being: Linking the Built Environment to Health

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Insights in Public Health is a monthly solicited column from the public health community and is coordinated by HJMPH Contributing Editors Tetine L. Sentell PhD from the Office of Public Health Studies at the University of Hawai'i at Manoa and Donald Hayes MD, MPH from the Hawai'i Department of Health in collaboration with HJMPH Associate Editors Ranjani R. Starr MPH and Lance K. Ching PhD, MPH from the Hawai'i Department of Health.

Background

The World Health Organization's Alma-Ata Declaration of 1978 redefined health as not simply the absence of disease, but a state of physical, mental, and social well-being, and declared this to be a fundamental human right.[1] This signified a major shift from looking at internal causes of disease to including the external aspects that shape our everyday lives. While many other factors influence health defined broadly, including genetics, behavior, and nutrition, an important and growing interdisciplinary field of research and policy highlights the particular role of the built environment in creating and fostering health.

The built environment encompasses the design of buildings and urban landscapes, land use, and transportation systems.[2] In the 1970's and 1980's, researchers such as Robert Ader, who traced lines from environmental influence and individual perception to the manifestation of disease,[3] and Roslyn Lindheim and Leonard Syme, who connected the social and spatial conditions of neighborhoods to health outcomes,[4] provided seminal evidence of the important relationship of the built environment to well-being. While related areas of research consider the role of economic, social, and political environments in health,[5] the realm of the built environment has been of particular interest in the past decade. A recent literature review found that between 1993 and 2002, there were only 39 studies examining built environment and health, but between 2003 and 2013, there were 675.[6]

This field of study has delineated important and specific connections between certain health-related behaviors, health outcomes, and the correlating dimensions of the built environment. For instance, safe sidewalks providing access to daily destinations such as schools, grocery stores, and retail can encourage daily walking,[7,8] which in turn can decrease obesity and associated diseases. Being in the presence of, or even just viewing trees and green, lush landscapes, can reduce stress and aggression.[9,10] Accessible and well-designed public spaces can encourage neighborhood interaction, which in turn builds social capital.[11]

In the United States, it has become clear that the traditional separation of the fields of urban planning, architecture and design, and public health combined with several decades of fast and cheap development without health in mind have left us in a vast landscape that inhibits healthy habits.[12] To quote the recent publication *Making Healthy Places* (2011): "The modern America of depression and loss of community has not 'happened' to us; rather we legislated, subsidized, and planned it."[13] While this poor community planning takes a toll on all Americans, it disproportionately impacts minorities and immigrants, who often have less access to safe walkable areas, parks, and grocery stores.[14-16] As sprawling neighborhoods are increasingly deemed unhealthy, they become cheaper, and as a result, are increasingly occupied by these often economically disadvantaged populations.[17]

Along with the improved evidence base on this topic there is increasing interest and political will to address this issue. The growing importance of this issue has been recognized by the United States Surgeon General, Vivek Murthy, who recently issued a call to action to build more walkable communities.[18] With a broad body of evidence and increasingly innovative technologies for spatial analysis, the diverse areas of expertise of designers, planners, and public health professionals are well-positioned now more than ever to work together to implement interventions. What comes next?

The Next Era of Built Environment and Health

As we continue to specify the connections between aspects of the built environment and health outcomes, there remain several challenges to coordinating transdisciplinary practice. Chief among them is surmounting the differences in foundational concepts and language, as well as reconciling quantitative and qualitative methods from each sphere. The heterogeneity of study methods in evaluating the built environment, not only within the field of public health but across fields, makes it difficult to draw common conclusions across studies.[19] Additionally, given the multiple genetic, biologic, and environmental contributors to chronic disease, the pathways from health origins to outcomes can be murky. While the role of the built environment in human well-being has become much more expansive in the past several years, it remains difficult to prove its direct "causality," so understanding its impact may be difficult on an epistemological level for many to accept.[20,21]

That said, as research on health and the built environment proliferates the public sphere, more states, counties, and cities are starting to integrate health as a priority in development and including design guidelines to build sustainably and safely, re-orient the public realm to the pedestrian, and ensure equitable access to healthy foods and parks.[22] Here in Hawai'i, a Complete Streets bill, which seeks to "reasonably accommodate convenient access and mobility for all users of the public highways… including pedestrians, bicyclists, transit users, motorists, and persons of all ages and abilities" was signed into law in 2009.[23] The law tasks the state and each county with adopting Complete Streets policies, which, to date, all of the counties have done through either resolution or ordinance. These policies are in various stages of implementation, with Kaua'i leading the way and Honolulu close behind. In Honolulu, the City and County Department of Transportation Services (DOTS) is taking advantage of widespread construction related to the new rail transit project and the anticipated launch of a large bikeshare system in urban Honolulu to implement their Complete Streets policy and principles.[24] The state Department of Health (DOH) has supported policy implementation by partnering with state and county agencies and advocacy groups (such as the Hawai'i Bicycling League and American Association of Retired Persons) to encourage safer, multimodal streets that provide opportunities for physical activity.

It will take years, if not decades, to truly see how these policy changes will affect building and planning, and even longer to gauge population health impacts. However, studies have already shown that both existing and new walkable neighborhoods are also more expensive than auto-oriented ones.[25,26] While the higher property values signify widespread public support for pedestrian-friendly environments, it also limits access for the economically disadvantaged. As more neighborhoods change, provisions for affordable housing must be made to ensure healthful environments for those who need it most.

Lastly, professionals in all fields must realize that simply building better is not enough. Built environment change is most effective when it comes hand in hand with coordinated educational programs aimed at behavior change. An example is Walk with a Doc, a nonprofit program which has medical doctors prescribe walks to patients and then meet them at a designated site to join them in the activity. Walk with a Doc programs can now be found in over 160 locations, including Hilo, Hawai'i.[27] Programs like this not only institute healthy habits, but build awareness of the neighborhood environment, increase social capital by helping residents connect to their neighbors, and increase stewardship of streets and parks for sustained community investment.

Now is a crucial time to move forward with innovative environmental interventions. To apply the adage, "If we want more evidence-based practice, we need more practice-based evidence,"[28] only by literally building on the current body of research and detailed post-occupancy analyses can we begin to hone in on best practices for building healthy places. A few professional organizations in the architecture and planning fields have begun to take up this mantel. The American Institute of Architects (AIA) has recently launched a 10-year Design and Health initiative that aims to educate architects about the effect of buildings and urban design on human well-being, as well as bring schools with joint health, planning, and architecture programs together in a research consortium to share projects and findings.[29] The Urban Land Institute, a real estate-focused research and education organization, has similarly started their Building Healthy Places initiative, and recently published a toolkit for developers and planners.[30] It will be important for both public health researchers and the designers utilizing these guidelines to evaluate their impact.

Action on the Built Environment and Health in Hawai'i

Beyond the transdisciplinary partnerships around Complete Streets mentioned above, Hawai'i has a number of innovative initial efforts to confront health issues related to the built environment supported by diverse partners including the Office of Public Health Studies and the School of Architecture at University of Hawai'i, Manoa and the State DOH. For instance, the DOH has been instrumental in supporting small programs like the Kalihi Valley Instructional Bike Exchange (KVIBE), a youth earn-a-bike outreach program promoting bicycle riding, safety, and repair in a traditionally disadvantaged community. It also recently coordinated the second Pacific Northwest Mobile Study Tour to the Seattle and Portland areas, taking 55 people representing all four county transportation planning and public works departments, the state transportation department and other public and private sector partners to meet with peers and see innovative best practices for the built environment. Participants were able to see not only what Complete Streets and walkable environments looked like, but ask questions about how project leaders found funding, built community support, and maintained projects. DOH also recently helped coordinate a special panel on Health and the Built Environment at the Hawai'i Public Health Association annual conference, held on October 9, 2015. Topics presented included enhancing pedestrian and bicycling street environments in O'ahu and Kaua'i, reconnecting communities to local healthy food sources, and the Hawai'i Medical Service Association's (HMSA) Blue Zones effort to branch outside of the healthcare setting into community-based programs. The Office of Public Health Studies (OPHS) at the University of Hawai'i at Manoa, in conjunction with the Department of Health, is conducting a follow-up study on a significant statewide assessment of the walking and biking accessibility of Hawai'i's streets, engaging the Department of Transportation in the research. They are also looking at food environments and related health disparities across the state. A joint position between the School of Architecture (75%) and OPHS at the University of Hawai'i at Manoa was created to solidify the link between these two traditionally distinct research areas. The first cross-listed course between the departments will commence in Spring 2016, and will bring together graduate students in Public Health and Architecture to critically engage transdisciplinary issues and

learn how to evaluate the built environment for health. They will also work with the Native Hawaiian Health Program at Queen's Medical Center to learn about traditional Hawaiian gathering spaces and survey neighborhood residents to design an outdoor community center for the traditionally underserved west side of O'ahu.

In a national effort to bring these disciplines together fruitfully, the Association of Collegiate Schools of Architecture (ACSA) and the Association of Schools and Programs of Public Health (ASPPH) will come together for the first time in Fall of 2016 to co-sponsor a conference, "Building Well-Being: Buildings Cities Systems," at the University of Hawai'i at Manoa. The academy is in a unique position to advance the health and built environment agenda. Rigorous empirical research will be central to thoughtful interventions to accomplish this, but government agencies and design and planning professionals often lack time or resources to conduct research or analyze data. The goal of the ACSA/ASPPH conference is to connect practitioners and policymakers to academics in order to form transdisciplinary partnerships to build healthy communities. Hawai'i's delegation also plans to showcase relevant efforts in Hawai'i including the state plan for aging, resilience planning in the face of sea level rise, and new pedestrian and transit-oriented developments surrounding Honolulu's planned rail project.

Conclusion

The past decade has seen an exponential expansion of publication and discussion regarding the built environment's influence on health. Given the long timeframe required to make changes in the public realm, the time to act on that research is now. Yet doctors, public health professionals and researchers, architects, landscape architects, urban designers, and planning professionals have several challenges to face, including but not limited to building a shared vocabulary, testing tools and measures, and ensuring equitable environments in the face of change. However, it is still imperative to come together and thoughtfully employ evidence to build healthy places and programs, as only then can we truly evaluate impacts and hone best practices. The current conversation on health and the built environment overwhelmingly focuses on it as a source of illness. We should equally concentrate on its vast potential to prevent disease, and improve population health.

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HOW PEOPLE DIE IN THE SACRAMENTO REGION

County	Leading Causes #1	Leading Causes #2	Leading Causes #3
Sacramento	Heart Disease	Cancer	Stroke
Nevada	Cancer	Heart Disease	Chronic Lower Respiratory Disease
Yolo	Heart Disease	Cancer	Chronic Lower Respiratory Disease
Yuba	Heart Disease	Cancer	Chronic Lower Respiratory Disease
Placer	Cancer	Heart Disease	Chronic Lower Respiratory Disease
Sutter	Cancer	Heart Disease	Chronic Lower Respiratory Disease
El Dorado	Cancer	Heart Disease	Unintentional Injury

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