



THE MARIPOSA HEALTHY LIVING INITIATIVE



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MITHŪN

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Executive Summary

The Mariposa Healthy Living Initiative is an effort to advance the health and quality of life of residents through redevelopment.

Denver Housing Authority and their partners will redevelop nearly 900 new mixed-income housing units in a community called Mariposa, located in the La Alma/ Lincoln Park neighborhood near downtown Denver.

The Mariposa Healthy Living Initiative began in 2009, when the Denver Housing Authority and its master planning team established physical, mental, and community health as a proxy to understand how redevelopment actions would change the quality of life for residents. The Initiative recognizes that the built environment is a determinant of health outcomes, which ultimately influence the quality and length of life for residents. The Initiative uses a responsive and rigorous approach to address environmental and social determinants of health, which include Healthy Housing, Environmental Stewardship, Sustainable and Safe Transportation, Social Cohesion, Public Infrastructure, and Healthy Economy. The Initiative framework is intended to be a living implementation tool for designers, developers, and practitioners.

In 2009, a rapid Health Impact Assessment was performed that examined the relationship between health and the built environment at the existing South Lincoln Homes, and then established a baseline needs assessment for the public housing residents. As master plan options were developed, a customized version of the Healthy Development Measurement Tool was used to evaluate those options. The Tool was used to confirm that the final redevelopment master plan included strategies to address

Mariposa's priority issues, to: increase physical activity; improve pedestrian and bike opportunities; increase mobility and traffic safety; improve access to healthy foods; increase safety and security; and improve access to health care. The Healthy Development Measurement Tool also resulted in a series of recommended next steps and actions. These steps included redevelopment and services to help to improve health determinants for residents, and policies that incentivize healthy behavior and opportunities.

In the three years since the master plan was adopted, the first phase of construction has been completed and two other sites are now under construction. In 2012, a new effort was launched to further integrate health into every aspect of implementation by monitoring progress, refining recommendations, and developing implementation plans. A progress report has been completed that updates and refines the previously used health indicators and tracks health focused initiatives that have been completed to date. The progress report has informed priority initiatives, that focus on what is important for the health of residents now.

Progress to date

Monitoring has shown positive trends in many of the indicators of a healthy community, such as the total crime rate, which has dropped from 246 per 1,000 people in 2005, to 157 in 2011 for the La Alma/ Lincoln Park and Auraria neighborhoods, or the average transit commute time, which has dropped from 24 minutes in 2010 to 20 minutes in 2012 for the La Alma/ Lincoln Park neighborhood, as compared to 27 minutes in 2010 or 25 minutes in 2012 citywide. In the first phase of development, Tapiz, a 100-unit multi-family building, several elements were incorporated to improve health of residents, such as the 8-story building integrated mural that celebrates the cultural diversity and history of the neighborhood, the community gardens available

to residents to grow their own fresh foods in partnership with Denver Urban Gardens, and Connections@Tapiz, a community facility open to all that hosts a variety of programming through non-profit partners, including entrepreneurship and health classes.

Mariposa Healthy Living Initiative

The Mariposa Healthy Living Initiative includes:

- **Campaigns for Action:** campaigns with a specific goal and series of effective strategies to improve health. Each campaign is organized by a checklist and work plan.
- **Assessment and Indicators:** a 2009 baseline assessment, a 2012 status update on indicator trends, implementation completed to date, and lessons learned.
- **Mariposa Healthy Living Toolkit:** a comprehensive evaluation tool and implementation guide for practitioners to incorporate health into design, redevelopment, and construction, drawing on health evidence and standards. The Tool is intended to promote cross-sector partnerships, to use a participatory approach that values resident and stakeholder experience, and to provide the best available evidence to decision-makers.

Campaigns for Action

With this Initiative, the Denver Housing Authority is launching five Campaigns for Action to improve health and well-being at Mariposa. These campaigns, which are already underway, provide the structure and framework for DHA staff, property managers, residents, community partners, and others to get involved in health focused initiatives at Mariposa. They include:

1. **Get Connected:** Improve physical, economic, and social connectivity to improve access to services, jobs, education, health care, arts and culture. Promote community engagement and social cohesion, and celebrate cultural diversity.

2. **Healthy Places:** Create vibrant places that encourage physical activity and increase safety and security. Create living environments that support wellbeing.
3. **Healthy Eating:** Improve access to healthy and locally grown foods, promote healthy eating habits, celebrate cultural diversity, and improve social cohesion.
4. **Healthcare and Wellness:** Improve access to health care and services, support activities and programs to enhance wellbeing, and improve access to recreation facilities.
5. **Lifelong Learning:** Improve access to educational programs for all life stages, improve access to job training and career pathways, and improve financial literacy.

As design and construction moves forward at Mariposa, **now is the time to act on what's important** to improve health for the residents, and catalyze positive change for the broader La Alma/ Lincoln Park neighborhood.

Mariposa has an enormous opportunity to become a leadership community for healthy living, not only in Denver, but across the country.

The Mariposa Healthy Living Initiative, Campaigns for Action, and Toolkit provide the resources and framework for developers, community partners, and residents to be active participants in this continually evolving journey.



FRIENDS

opportunity

creativity

POSITIVE PLACE

FUN

Learning

INDIVIDUALITY

COMMUNITY

Peace

DISCOVERY

RESPECT

1 Mariposa: A Healthy Living Community



Background

The Mariposa Healthy Living Initiative began in 2009, when the Denver Housing Authority and its master planning team established physical, mental, and community health as a proxy to understand how redevelopment actions would change the quality of life for residents. The Initiative recognizes that the built environment is a determinant of health outcomes, which ultimately influence the quality and length of life for residents.

In 2009, a rapid Health Impact Assessment was performed that examined the relationship between health and the built environment at South Lincoln Homes, and then established a needs assessment and baseline. As master plan options were developed, a customized version of the Healthy Development Measurement Tool was used to evaluate those options and ensure the adopted redevelopment master plan was designed to address priority health issues.

Today, with the first phase of construction completed and two other sites under construction, the goal of this initiative is to integrate health into every aspect of implementation. A progress report has been completed to update health indicators and track efforts completed to date. These have informed what the current priorities are, so that redevelopment and implementation actions can focus on what is important for residents now. The Mariposa Healthy Living Initiative seeks to create information and tools that are accessible to a wide range of users, and to garner support for a few focused campaigns as we continue to transform Mariposa into a Healthy Living Community.

This effort has been largely shaped and influenced by a wide range of partners, participants, advisors, and experts. In 2012, we worked with a Peer Review team of technical experts and leaders to refine our tools, and with Advisory Panels of residents, community stakeholders, policy

experts, and jurisdictional officials, to guide our priorities, incorporate their lived experience, and help identify next steps and actions.

Why Health?

We know that place matters – where you live has a dramatic affect on the length and quality of your life.

Building on the mission of the Denver Housing Authority and the project goals for Mariposa, there is a tremendous opportunity to improve healthy opportunities, including physical, mental, and social well-being¹ for residents. Figure 2 shows the relationship between health determinants in the built environment and health outcomes. Evidence of health impacts is not always available, due to the complex pathways between the implementation of a project or strategy, and the long-term health outcomes with many contributing factors.

Therefore, the Mariposa Healthy Living Initiative focuses decision-making and action around health determinants, which are known to improve opportunity for better health. Our approach to health in the built environment builds on the research and expertise of public health professionals, and on the premise that there are multiple factors which contribute to health and well being.

To understand these pathways and effective solutions, we studied these areas to define and measure the health goals of the Mariposa Healthy Living Tool.

1 Preamble to the Constitution of the World Health Organization as adopted by the International Health Conference, N.Y., 19-22 June, 1946; signed on 22 July 1946 by the representatives of 61 States (Official Records of the World Health Organization, no. 2, p. 100) and entered into force on 7 April 1948.

KEY TERMS

Determinants are conditions that affect the health status of a community, and that can help make people healthy (e.g. access to parks). There is evidence or research showing that some determinants, or specific conditions, do impact intermediate and eventually long-term health outcomes. In the Mariposa Healthy Living Tool, we have grouped determinants into several dimensions (i.e. public infrastructure), that reflect a range of sectors or realms of decision-making.

Health Outcomes include the health status of a community or an individual, encompassing physical, mental and social well-being (e.g. obesity rates). Health outcomes are long-term and caused by a range of factors, including: 1. Biology and genetics, 2. Individual behavior, 3. Physical environment, 4. Social environment, and 5. Health services² The Mariposa Healthy Living Tool primarily focuses on physical environment and social environment factors.

Indicators are a measure of success related to objectives (e.g. percent of residents within ½ mile walking distance to a public park). The indicators represent the known facts about what helps make people healthy. Each indicator includes a baseline condition that existed prior to redevelopment activities, a target describing the future desired condition, and a 2012 status of current conditions.

Strategies include programs, projects, or policies that will likely positively impact health determinants and can contribute to improved resident health (e.g. build a new pocket park in an under served neighborhood). Strategies are things we can do to improve conditions that make people healthy.

Campaigns are action plans with a specific mission and effective strategies to guide what kind of development is accomplished. Campaigns include “bundles” of strategies that are organized around a theme for the Denver Housing Authority, organizations, residents, and agencies to take action and positively impact health determinants.

² U.S. Department of Health and Human Services, Healthy People 2020 Draft, 2009, U.S. Government Printing Office.

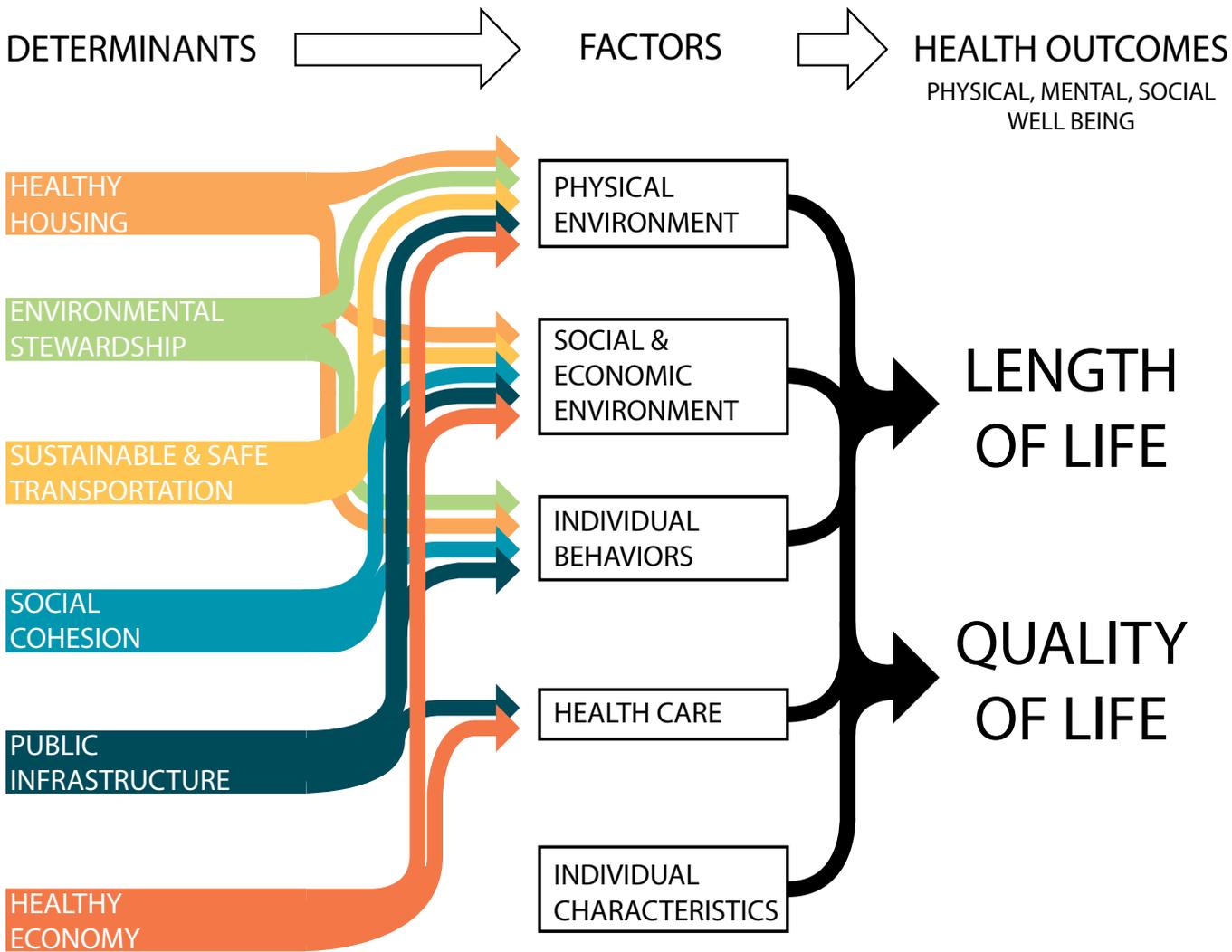


Fig. 2 Relationship between health determinants and health outcomes



Health Determinants

Determinants of health are influenced by policies, projects, or programs that we can change as developers, designers, and practitioners. We have organized

determinants into the following dimensions, or sectors, of a healthy community:



Healthy Housing - Provide a range of

housing options: size, tenure, affordability; protect from involuntary displacement; decrease concentrated poverty; ensure

access to healthy, quality housing and home environment.

Academic research and scientific evidence shows the following connections with health: High housing costs relative to the income of an individual or household result in one or more outcomes with adverse health consequences: spending a high proportion of income on housing, living in overcrowded housing conditions, accepting lower cost substandard housing, moving to where housing costs are lower, or becoming homeless. Spending a high proportion of income on rent or a mortgage means fewer resources for food, heating, transportation, health care, and child care³. Homes with inadequate heating or ventilation can lead to the growth of mold, and dust mites, leading to asthma and respiratory allergies⁴. Exposure to greenery and the natural world has

³ The Healthy Development Measurement Tool, Urban Health and Sustainability Indicators, San Francisco Department of Public Health, <http://www.thehdm.org/indicators/view/118>

⁴ Institute of Medicine. Clearing the Air: Asthma and Indoor Air Exposures. National Academy Press. Washington D.C. 2000.

additional benefits to health. Research shows that living in proximity to green space is associated with reduced self-reported health symptoms, better self-rated health, and higher scores on general health questionnaires^{5,6}. Homeownership positively impacts the social cohesion and civic participation of a neighborhood, which in turn can impact health. A higher rate of homeownership in a neighborhood has been associated with fewer years of life lost due to cardiovascular disease for residents⁷.



Sustainable and Safe Transportation

Reduce vehicle miles traveled (VMT); provide accessible, affordable public transportation; create

safe, quality environments for walking and biking.

Academic research and scientific evidence shows the following connections with health: Environments that support walking, biking and transit trips as an alternative to driving have multiple potential positive health impacts. Quality, safe pedestrian and bicycle environments support a decreased risk of motor vehicle collisions and an increase in physical activity and social cohesion with benefits including the prevention of obesity, diabetes, and heart disease as well as stress reduction and mental health improvements

⁵ Vries S, de Verheij RA, Groenewegen PP, Spreeuwenberg P. Natural environments - healthy environments? An exploratory analysis of the relationship between green space and health. *Environment and Planning A*. 2003;35(10):1717-1731.

⁶ Parks for People: Why America Needs more City Parks and Open Space. San Francisco: The Trust for Public Land, 2003.

⁷ Franzini L, Spears W. Contributions of social context to inequalities in years of life lost to heart disease in Texas, USA. *Soc Sci Med*. 2003;57(10):1847-1861.

that promote individual and community health⁸. Physical activity among children is higher when they have access to sidewalks, desirable destinations to walk to, and when children face fewer traffic hazards⁹. Encouraging and facilitating active transportation – walking or cycling - as a form of travel for utilitarian trips is a key strategy for increasing daily physical activity¹⁰. Motor vehicle emissions contribute to predominant sources of fine particulate air pollution (PM2.5), which is associated with detrimental cardiovascular outcomes, including increased risk of death from ischemic heart disease, higher blood pressure, and coronary artery calcification¹¹.



Environmental Stewardship -

Restore, preserve, and protect natural areas and open space; preserve clean air quality and water quality; maintain safe levels of community noise.

Academic research and scientific evidence shows the following connections with health: Open space and natural areas have direct effects on physical and mental health.

8 The Healthy Development Measurement Tool, Urban Health and Sustainability Indicators, San Francisco Department of Public Health, <http://www.thehdmt.org/indicators/view/43>

9 Bauman A, Bull F. Environmental Correlates of Physical Activity and Walking in Adults and Children: A Review of Reviews. London: National Institute of Health and Clinical Excellence; 2007.

10 Transportation Research Board, Institute of Medicine of the National Academies: Committee on Physical Activity, Health, Transportation, and Land Use. 2005. Does the built environment influence physical activity?: Examining the evidence. Special report 282. Washington, DC: Transportation Research Board.

11 Simkhovich BZ, Kleinman MT, Kloner RA. Air Pollution and Cardiovascular Injury: Epidemiology, Toxicology, and Mechanisms. *J Am Coll Cardiol.* 2008; 52(9):719-26.

One review of studies showed that access to places for physical activity combined with outreach and education can produce a 48% increase in the frequency of physical activity¹². Evidence also shows that contact or views of the natural environment can improve functioning in children with Attention Deficit and Hyperactivity Disorder (ADHD) and problem solving and cognitive function in people living in public housing¹³. Noise levels of 55 decibels outdoors and 45 decibels indoors are identified as preventing activity interference and annoyance. Long term exposure to moderate levels of environmental noise can adversely affect sleep, school and work performance, and cardiovascular disease¹⁴. Several large-scale studies demonstrate that increased exposure to PM2.5 is associated with detrimental cardiovascular outcomes, including increased risk of death from ischemic heart disease, higher blood pressure, and coronary artery calcification¹⁵. Additionally, in June 2012, the International Agency for Research on Cancer updated their classification of diesel engine exhaust to a human carcinogen, based on sufficient evidence that exposure can increase the risk of developing lung cancer and is positively associated with an increased risk of bladder cancer¹⁶.

12 Kahn EB. The effectiveness of interventions to increase physical activity. *Am J Prev Med.* 2002;22(4):73-107.

13 Kuo FE. Coping With Poverty Impacts of Environment and Attention in the Inner City. *Environment and Behavior.* 2001;33(1):5-34.

14 Dora C, Phillips M, eds. Transport, environment and health. WHO Regional Publications, European Series, No. 89. 1999. <http://www.euro.who.int/document/e72015.pdf>

15 Simkhovich BZ, Kleinman MT, Kloner RA. Air Pollution and Cardiovascular Injury: Epidemiology, Toxicology, and Mechanisms. *J Am Coll Cardiol.* 2008; 52(9):719-26.

16 International Agency for Research on Cancer. Diesel Engine Exhaust Carcinogenic. 12 June 2012. World Health Organization Press Release No. 213. Available at: http://press.iarc.fr/pr213_E.pdf



Social Cohesion - Promote a socially cohesive community; support a diverse population; promote a safe and secure community; support community gathering

and spaces for interaction; support mental health.

Academic research and scientific evidence shows the following connections with health: Parental concerns about neighborhood crime strongly influence their willingness to allow their children to actively commute (e.g. walk or bike) to school, influencing children's levels of physical activity¹⁷. In a study about neighborhood environment, if political engagement was low, people had 52% higher odds of reporting poor health¹⁸. Group membership and political participation is associated with improved human health outcomes. For example, for one standard deviation increase in group membership in a community, mortality was illustrated to decrease by 83.2 individuals per 100,000¹⁹. Witnessing and experiencing community violence causes longer term behavioral and emotional

17 Kerr J, Rosenberg D, Sallis JF, et al. Active commuting to school: Associations with environment and parental concerns. *Med Sci Sports Exerc.* 2006; 38(4):787-79

18 Cummins S, Stafford M, MacIntyre S, Marmot M, Ellaway A. 2005. Neighborhood environment and its associations with self-rated health: evidence from Scotland and England. *Journal of Epidemiology and Community Health* 59:207-213.

19 Kreuter MW, Lezin N. 2002. Social Capital Theory: Implications for Community-Based Health Promotion. In *Emerging Theories in Health Promotion Practice and Research*. Eds. DiClemente RJ, Crosby RA, Kegler MC. San Francisco, CA: Jossey-Bass.

problems in youth^{20,21}. There is a link between performing arts attendance and positive community engagement, and visual arts and music have been found to reduce stress and blood pressure²².



Public Infrastructure - Promote access to, and affordability of quality public infrastructure: education, child care, public health and recreation facilities, daily goods

and services; promote affordable and high-quality food access.

Academic research and scientific evidence shows the following connections with health: Academic performance is related to educational achievement, which both predicts positive health outcomes directly as well as the effects of education on lifetime earnings²³. Children with low neighborhood amenities or those lacking neighborhood access to sidewalks or walking paths, parks or playgrounds, or recreation or community centers had 20 to 45 percent higher odds of obesity and overweight, compared with

20 Perez-Smith AM, Albus KE, Weist MD. 2001. Exposure to violence and neighborhood affiliation among inner-city youth. *J Clin Child Psychol* 30(4):464-72

21 Ozer EJ, McDonald KL. 2006. Exposure to violence and mental health among Chinese American urban adolescents. *J Adolesc Health* 39(1):73-9.

22 Hill Strategies Research, *Social Effects of Culture: Exploratory Statistical Evidence*, 2008. P. 7-8

23 Backlund E, Sorlie PD, Johnson NJ. A comparison of the relationships of education and income with mortality: the National Longitudinal Mortality Study. *Soc Sci Med.* 1999; 49(10):1373-84.

children who had access to these amenities²⁴. The impact of the built environment was particularly strong for younger children (ages 10 to 11) and for girls. Girls, ages 10 to 11, living in neighborhoods with the fewest amenities had 121 to 276% higher adjusted odds of obesity, compared with children who had access to these amenities²⁵. Access to healthy food choices is directly correlated to obesity and diabetes rates, which occur in higher rates among people living in low-income communities with worse food environments²⁶.



Healthy Economy - Increase quality, healthy employment opportunities and access for residents; Increase equity in income and wealth; promote entrepreneurship, locally and resident owned businesses.

Academic research and scientific evidence shows the following connections with health: Income is one of the strongest and most consistent predictors of health and disease in the public health research literature. Nationally, individuals with average family incomes of \$15-20,000 are three times more likely to die prematurely as those with family incomes greater than \$70,000²⁷. The

24 Gopal K. Singh, M. Siahpush, M. D. Kogan. Neighborhood Socioeconomic Conditions, Built Environments, and Childhood Obesity. *Health Affairs*. 2010; 29, no. 3: 503-512.

25 Gopal K. Singh, M. Siahpush, M. D. Kogan. Neighborhood Socioeconomic Conditions, Built Environments, and Childhood Obesity. *Health Affairs*. 2010; 29, no. 3: 503-512.

26 Regents of the University of California, PolicyLink, and the California Center for Public Health Advocacy. *Designed for Disease: The Link Between Local Food Environments and Obesity and Diabetes*. April 2008. <http://www.policylink.org/documents/DesignedforDisease.pdf>.

27 Sorlie PD, Backlund E, Keller JB. US mortality by economic, demographic, and social characteristics: the National Longitudinal Mortality Study. *Am J Pub Health*. 1995; 85(7):949-56.

average household income in the Auraria/Lincoln Park neighborhood in 2009 was \$38,480 and \$20,703 in La Alma in 2012^{28,29}. A higher level of education not only benefits one's health but also that of family members^{30,31}. Completing more years of education is associated with better health outcomes³², and independent of income, education level is associated with improved health outcomes: each additional year in school is associated with increased life expectancy³³. The relationship between income and health is mediated through nutrition, employment conditions, parenting resources, leisure and recreation, housing adequacy, and neighborhood environmental quality, community violence, and stress^{34,35}.

28 Piton Foundation for Auraria/Lincoln Park

29 <http://htaindex.cnt.org/map/>

30 Egeland GM, Tverdal A, Meyer HE, Selmer R. 2002, A man's heart and a wife's education: 12 year coronary heart disease mortality follow-up in Norwegian men. *International Journal of Epidemiology* 31: 799-805.

31 Lamerz A, Kuepper-Nybelen J, Wehle C, Bruning N, Trost-Brinkhues G, Brenner H, Hebebrand J, Herpertz-Dahlmann B. 2005. Social class, parental education, and obesity prevalence in a study of six-year-old children in Germany 29(4): 373-380.

32 Sanchez-Vaznaugh EV, Kawachi I, Subramanian SV, Sánchez BN, Acevedo-García D. 2009. Do Socioeconomic Gradients in Body Mass Index Vary by Race/Ethnicity, Gender, and Birthplace? *American Journal of Epidemiology* 169(9): 1102-1112.

33 Lleras-Muney A. 2005. The relationship between education and adult mortality in the United States. *Review of Economics Studies* 72: 189-221.

34 Duncan GJ, Yeung WJ, Brooks-Gunn J, Smith JR. How much does childhood poverty affect the life chances of children? *American Sociological Review* 1998; 63: 406-423.

35 Morris JN, Donkin AJ, Wonderling D, Wilkinson P, Dowler EA. A minimum income for healthy living. *J Epidemiol Community Health*. 2000; 54(12):885-9.

Mariposa Healthy Living Tool Indicators of

	INDICATOR
HEALTHY HOUSING	PERCENT OF POPULATION LIVING BELOW POVERTY LEVEL
	PERCENT OF HOUSEHOLD INCOME SPENT ON HOUSING
	HOUSING INDOOR ENVIRONMENT (AIR QUALITY, TEMPERATURE, HUMIDITY)
SUSTAINABLE, SAFE TRANSPORTATION	AVERAGE TRANSIT COMMUTE TIME IN MINUTES
	COST OF TRANSPORTATION AND HOUSING AS % OF AVERAGE INCOME
	NUMBER OF TRAFFIC INJURIES/ COLLISIONS/ FATALITIES
ENVIRONMENTAL STEWARDSHIP	PERCENT OF RESIDENTS WITH ACCESS TO OPEN SPACE/ NATURE WITHIN NEIGHBORHOOD
	AIR QUALITY - PARTICULATE MATTER
	VMT PER CAPITA PER DAY
SOCIAL COHESION	PROPORTION OF POPULATION WITHIN 1/2 MILE TO COMMUNITY GATHERING SPACES
	TOTAL CRIME RATE PER 1,000 PEOPLE
	PERCENTAGE OF ELIGIBLE ADULTS WHO VOTED
	PERCENTAGE OF POPULATION WHO FEEL SAFE ALONE AT NIGHT IN NEIGHBORHOOD
PUBLIC INFRASTRUCTURE	PROPORTION OF POPULATION WITHIN 1/2 MILE KEY RETAIL
	NEIGHBORHOOD SCHOOL PERFORMANCE
	# OF HEALTHY FOOD OUTLETS WITHIN 1/2 MILE OF NEIGHBORHOOD
HEALTHY ECONOMY	UNEMPLOYMENT RATE
	AVERAGE ANNUAL INCOME COMPARED TO THE SELF-SUFFICIENCY WAGE
	NUMBER OF BUSINESSES AND NUMBER OF JOBS IN NEIGHBORHOOD

Community Health

RATIONALE

	Poverty limits access to important health-enabling resources, including proper nutrition, good medical care, stable health insurance, and favorable housing ⁵¹ .
	This item can make be the largest expenditures in a household budget, effecting the amount of money available for health related costs ⁵² .
	Homes that have inadequate heating or ventilation, can lead to the growth of mold, and dust mites, leading to asthma and respiratory allergies ⁵³ .
	Reducing time spent on public transit can help incentivize transit as an alternative to driving. Residents dependent on transit that live in areas that experience higher than average commute times have less time available for physical and leisure activities that promote health and social well-being ⁵⁴ .
	These two items make up the largest expenditures in a household budget; including transpo costs is more reflective of actual cost of living than just housing costs ⁵⁵ .
	This is an indicator of the safety risk of the street network for road users, including pedestrians, cyclists, drivers and passengers. Traffic collisions involving motor vehicles are one of the leading causes of preventable injury in the nation ⁵⁶ .
	Parks and natural open space areas promote physical activity and social interaction. Areas with natural vegetation also have direct effects on physical and mental health ⁵⁷ .
	Increased exposure to PM2.5 is associated with detrimental cardiovascular outcomes, including higher blood pressure and heart disease ⁵⁸ .
	Traffic related noise and air pollution is associated with cardiovascular and respiratory diseases, including asthma. Traffic also increases chances of injury and fatalities from collisions ⁵⁹ .
	Social networks and social integration are beneficial to health, including buffering from negative impacts of stress and providing better access to health services and programs ⁶⁰ .
	Concerns about crime strongly influence walking rates and outdoor physical activity participation. Witnessing crime also increases stress, emotional, and behavioral problems ⁶¹ .
	Public participation in policy and political process can have diverse impacts on the social and environmental conditions that affect health ⁶² .
	Residents' feelings about safety can be a disincentive to engage in physical activity outdoors and to engage in social interaction, and a source of chronic stress ⁶³ .
	Being within walking distance of neighborhood goods and services promotes physical activity, reduces vehicle trips and miles traveled, and increases neighborhood cohesion and safety ⁶⁴ .
	Academic performance is related to educational achievement, which both predicts positive health outcomes directly as well as the effects of education on lifetime earnings ⁶⁵ .
	Access to healthy food choices is directly correlated to obesity and diabetes rates, which occur in higher rates among people living in low-income communities with worse food environments ⁶⁶ .
	Unemployment has been consistently linked to poor health,a and has been associated with higher mortality rates, especially from heart disease and suicide ⁶⁷ .
	The relationship between income and health is mediated though nutrition, employment conditions, parenting resources, leisure and recreation, housing adequacy, and neighborhood environmental quality, community violence, and stress ⁶⁸ .
	For working age adults, employment is a fundamental resource for good health. Active commutes, via walking or bicycling, help meet requirements for physical activity, and reduce the environmental consequences of driving ⁶⁹ .

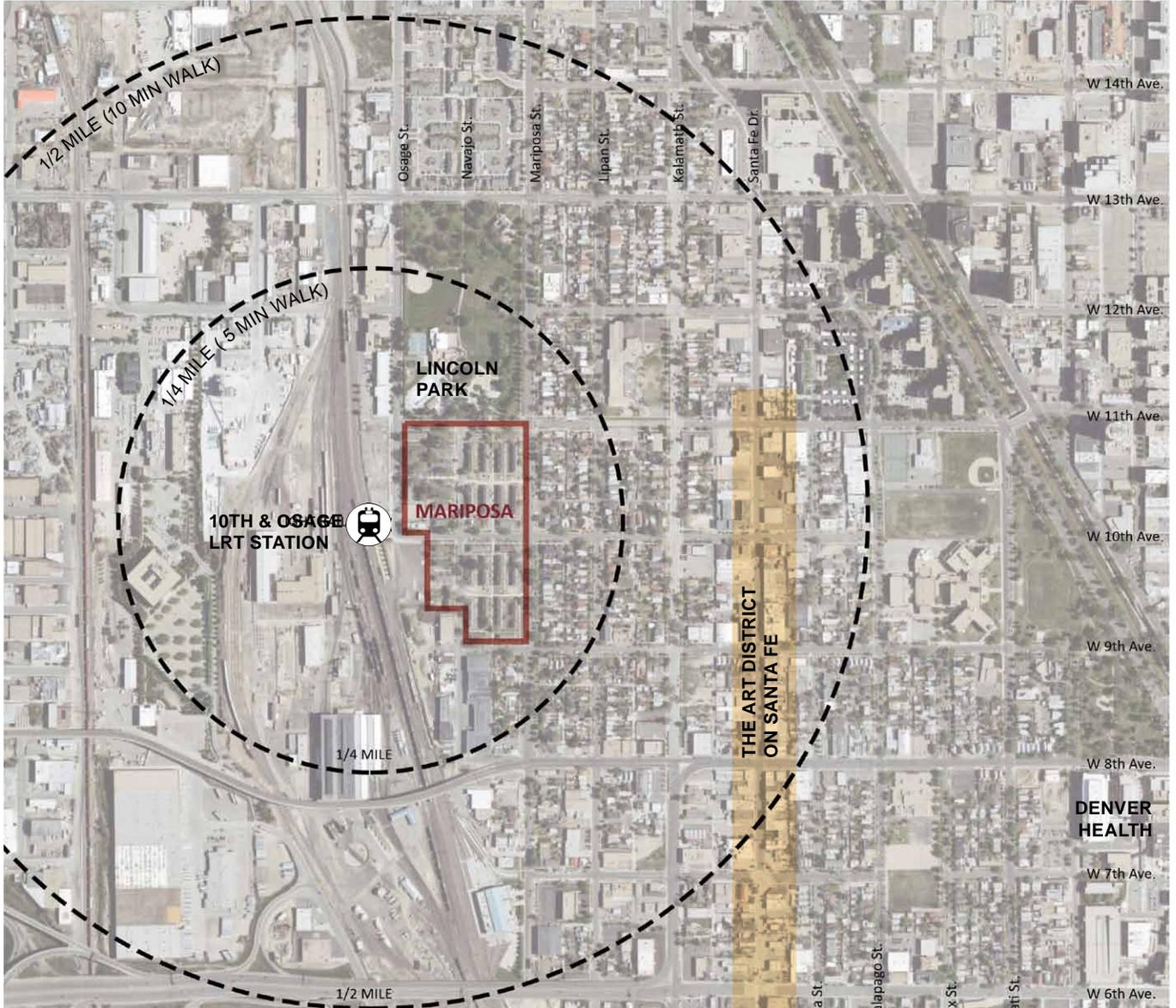


Fig. 3 Neighborhood Context Map

Community Snapshot

Before Redevelopment

The redevelopment of South Lincoln Homes in the historic La Alma/Lincoln Park neighborhood in Denver presents an opportunity for redesign into a mixed-income, mixed-use community that will enhance overall resident health. Built in 1953 and owned by the Denver Housing Authority (DHA), South Lincoln Homes epitomized the “old thinking” of housing the poor: deeply concentrated in obscure locations that are generally isolated from social and economic opportunities. Time has revealed the consequences of these outdated practices.

When the South Lincoln Redevelopment Master Plan was drafted in 2009, it was done so to help alter some startling statistics: 700 individuals, the majority of which lived in poverty, had few options for upward mobility. Ninety-four percent had incomes of 0-30% of the Area Median Income (AMI)³⁶. Only 1% of the population had a college degree, and 40% has less than a high school diploma³⁷.

While stagnant economically, South Lincoln Homes also portrayed a disturbing health portrait:

- Over 55% of the residents were overweight or obese³⁸.
- More than 38% indicated a health condition (such as asthma, diabetes and heart problems) that kept them from working³⁹.

The detriments of South Lincoln Homes had also spilled into the neighborhood – La Alma had about 6,400 14% for the City of Denver)⁴⁰. There were 51% of children living below the poverty line (compared to 21% in Denver)⁴¹. Greater than 96% of students were receiving free and reduced lunch, compared to 66% for Denver overall ⁴².

36 2000, U.S. Census Bureau and DRCOG

37 2000, U.S. Census Bureau

38 Denver Health South Lincoln Neighborhood Survey. “Denver Health South Lincoln Neighborhood Survey”.

39 “Resident Community Services Survey”. HOPE VI Assessment of South Lincoln Residents. Denver Housing Authority. May 8, 2009

40 2000, U.S. Census Bureau

41 2000, U.S. Census Bureau

42 Denver Public Schools, Piton Foundation for Auraria/Lincoln Park



Mariposa Redevelopment Goals

GOAL A

Base the redevelopment plan on the current and long term physical, social, economic and environmental NEEDS of South Lincoln residents.

[GOAL B -"later combined with Goal E"]

GOAL C

Use and implement an approach that promotes a sustainable and holistic site design and promote economic self sufficiency. A holistic site looks at integrated sustainable solutions on a site wide basis.

GOAL D

Increase access to the outdoors by providing varied opportunities for open space and 'green' design solutions and materials.

GOAL E

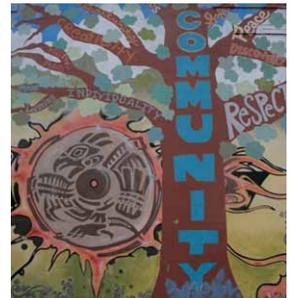
Provide mixed-income redevelopment. Replace public housing, expand affordable housing and attract market rate housing.

GOAL F

Provide opportunities to increase jobs and job training, particularly in emerging sectors of the economy.

GOAL G

Improve safety and security of homes, site amenities, public places and streets.



GOAL H

Provide opportunities for non-residential uses that serve the neighborhood in specific locations within and surrounding South Lincoln Park.

GOAL I

Provide amenities and site features that meet the needs of families and residents of different ages and cultures. Promote community interaction and active participation.

GOAL J

Create a redevelopment consistent with the positive physical qualities of the surrounding neighborhood, increases interconnections between South Lincoln and the neighborhood and include non-residential uses that benefit the La Alma / Lincoln Park residents.

GOAL K

Expand the visibility and opportunities for art and creative ways to channel graffiti.

GOAL L

Incorporate and expand opportunities for education on the site, in the physical plan, in programming and in the community services that will be a part of redevelopment at South Lincoln. Promote hands-on experiences, community learning, and historical education.

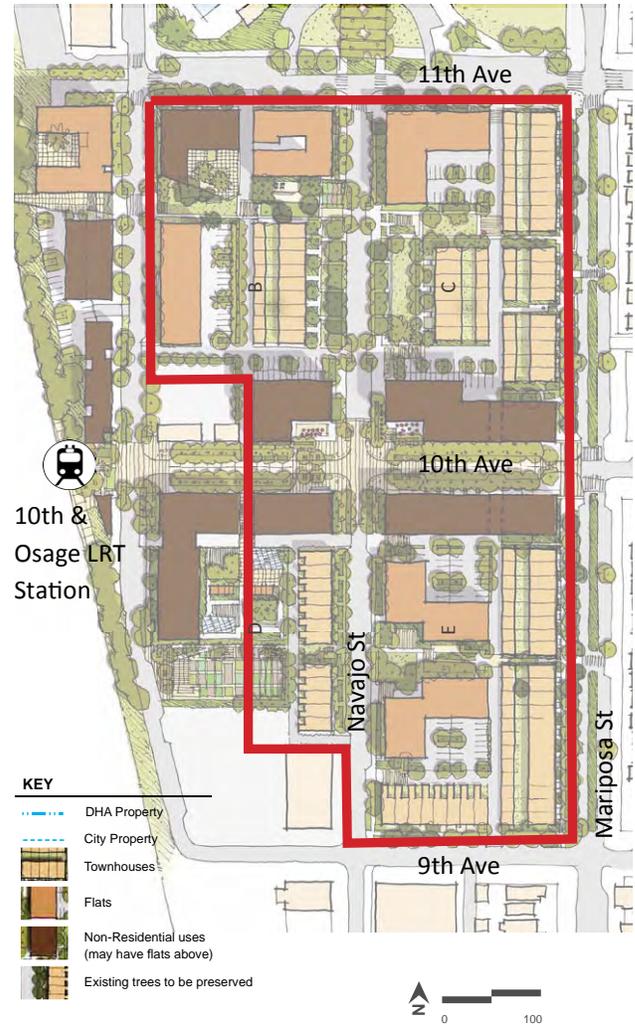


Fig. 4 South Lincoln Redevelopment Plan

The redevelopment of South Lincoln Homes into the Mariposa community will contain 800-900 units with approximately 1,300 residents at build out. A variety of construction types will include senior housing, townhomes, multi-family buildings, community serving facilities and commercial spaces. The eight-phase redevelopment will create the new Mariposa community, and has attracted more than \$30 million in federal funds, including ARRA/Stimulus and HOPE VI, which is leveraging more than \$100m in total project investments. Phase I construction, Tapiz at Mariposa, was recently completed and includes 100 units of senior/disabled housing, all affordable to 30% of a resident's income and 7,000 sf of ground floor related office and community facility space. Phase II construction began in March 2012, Phase III began in September 2012 and Phase IV design is currently underway.

The development is already seen as a holistically sustainable national model for a mixed-income, mixed-use, transit oriented community. The Mariposa Healthy Living Initiative will demonstrate how resident health can be improved through the built environment at Mariposa.



Mariposa Redevelopment Master Plan, Credit: Mithun

Mariposa Priority Health Issues

Based on a Health Impact Assessment conducted in 2009, and feedback from the community, these issues were identified as priorities for the South Lincoln Homes residents who will return to the Mariposa community. More information on health indicators baseline and progress is available in Chapter 3, *Get the Facts*.

2009 Baseline data: South Lincoln Homes and La Alma/ Lincoln Park Neighborhood

- 1. Increase physical activity:** 55% of community is obese or overweight; 78% had above normal blood pressure⁴³.
- 2. Improve pedestrian & bike opportunities:** Only 28% exercise aerobically 3 or more times a week⁴⁴.
- 3. Improve access to health care:** 41% are not Denver Health patients and 30% don't have a "medical home" 38% of residents do not have any type of health insurance (including government)⁴⁵.
- 4. Improve mobility and traffic safety:** 65% do not have any type of motor vehicle; 54% take the bus.⁴⁶
- 5. Improve access to education and jobs and reduce health conditions that keep residents from working:** More than 38% indicated a health condition kept them from working (such as asthma, diabetes, and heart problems)⁴⁷.
- 6. Increase safety and security:** 51% don't feel safe

43 Denver Health South Lincoln Neighborhood Survey. 2007.

44 Denver Health South Lincoln Neighborhood Survey. 2007.

45 Denver Health South Lincoln Neighborhood Survey. 2007.

46 "Resident Community Services Survey". HOPE VI Assessment of South Lincoln Residents. Denver Housing Authority.

47 "Resident Community Services Survey". HOPE VI Assessment of South Lincoln Residents. Denver Housing Authority.

about being alone at night in the neighborhood⁴⁸, and residents do not feel safe in Lincoln Park in the daytime and evening hours.

- 7. Increase opportunity for healthy eating:** only 13% have 5 or more servings of high fiber food⁴⁹.

Since the 2009 baseline, we are also learning new information about residents. In Tapiz, the first phase of construction, a 100-unit building, 35% of residents are elderly and 65% are disabled. This population needs a different and targeted approach to increase activity, improve access, and enhance opportunities.

City & Statewide Health Initiatives

In context, the Mariposa redevelopment is a significant opportunity to make progress on citywide, state and national health initiatives and established goals. Some relevant initiatives are described below through excerpt in abbreviated summary.

2011 Health of Denver Report⁵⁰ priority issues:

- Access to health care, disparities: Hispanics and Native Americans/American Indians and lower income persons
- Obesity, disparities: Hispanics and blacks, lower income persons
- Mental Health, disparities: white males/suicide and lower income persons/depression

48 "Resident Community Services Survey". HOPE VI Assessment of South Lincoln Residents. Denver Housing Authority.

49 Denver Health South Lincoln Neighborhood Survey. " 2007.

50 [http://www.denvergov.org/deh/Department of Environmental Health/2011HealthStatusReport/tabid/443019/Default.aspx](http://www.denvergov.org/deh/Department%20of%20Environmental%20Health/2011HealthStatusReport/tabid/443019/Default.aspx)

- Substance abuse, disparities: Native Americans/ American Indians and whites and Hispanics
- Tobacco use, disparities: lower income persons, youth, men who have sex with men

Colorado Health Foundation key outcomes and funding strategies⁵¹:

- Healthy Living
 - Develop healthy schools
 - Promote healthy communities
- Health Coverage
 - Optimize coverage in public programs
 - Ensure adequate and affordable coverage
- Health Care
 - Improve health care delivery
 - Build health care professionals workforce
 - Accelerate the adoption of health information technology

Denver Healthy People 2020 initiatives⁵², based on national Healthy People 2020

- Denver Healthy Food Access
- Health and the Built Environment

51 <http://www.coloradohealth.org/yellow.aspx?id=4794&linkidentifier=id&itemid=4794>

52 <http://www.denvergov.org/hp2010/Initiatives/tabid/437502/Default.aspx>





2 CAMPAIGNS FOR ACTION



Campaigns for Action

Overview

Based on the Mariposa priority health issues and progress made to date, the following campaigns have been prioritized. These campaigns include “bundles” of strategies that are organized around a theme for the Denver Housing Authority, organizations, residents, and agencies to take action.

The strategies in the campaigns were specially targeted because they are intended to improve multiple health determinants. For example, a strategy of ensuring that 90% of windows in housing have views to nature improves both the Healthy Housing and Environmental Stewardship determinants of a healthy community.

Each campaign includes a “Campaign Checklist”, which is a guideline and tracking chart to identify next steps, responsible leads and team members, and set a time frame for action. The Campaign Checklists also serve a way to monitor progress over time. Each Campaign should have a designated lead and party responsible for implementation.

For more information about strategies, refer to the Mariposa Healthy Living Toolkit in Chapter 5.

1. Get Connected

Create healthy, safe, vibrant places; encourage physical activity; increase security and safety and social cohesion; provide living environments that support well-being.

2. Healthy Places

Create healthy, safe, vibrant places; encourage physical activity; increase security and safety and social cohesion; provide living environments that support well-being.

3. Healthy Eating

Improve access to healthy foods, promote healthy eating habits, celebrate cultural diversity and improve social cohesion.

4. Health Care & Wellness

Improve access to health care and services; support activities and programs to enhance wellbeing.

5. Lifelong Learning

Improve access to educational programs for all life stages; improve access to job training and career pathways; improve financial literacy.

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1. GET CONNECTED

MISSION

- Improve neighborhood physical, economic, and social connectivity.
- Increase access to services, education, jobs, arts, culture, and health care.
- Promote community engagement.
- Celebrate cultural diversity and improve social cohesion.



STRATEGIES



- Improve access to and provide safe pedestrian routes to health care, providers, and counselors.
- Improve access and provide safe pedestrian routes to educational facilities.
- Encourage key retail and neighborhood amenities within walking distance of Mariposa.
- Enhance and build safe, appealing bicycle and pedestrian networks and connect with neighborhood and city-wide networks and destinations.
- Enhance street network, increase multi-modal connectivity, and transit access.
- Connect with the arts, cultural programs, and other community resources.
- Provide a dedicated central community location for information sharing.
- Reduce disruption and number of moves for residents returning to Mariposa, and provide a variety of housing options and affordability levels to support in-neighborhood aging.
- Support community engagement and leadership development of residents.

Responsible Co-Leads: DHA Real Estate Department and Resident Community Services.

CAMPAIGN CHECKLIST 1. Get Connected

STRATEGY	ACTIONS	PARTNERS	GOAL	STATUS
a. Improve access to and provide safe pedestrian routes to health care, providers, and counselors. 	i. Improve access, safe pedestrian routes, and transportation to Denver Health. Coordinate a free shuttle to Denver Health.	DHA Resident Community Services (RCS); Denver Health	2014	✓ See "Success Stories," pages 62-63.
	ii. Provide information about transit connections to health clinics and facilities, including the existing #9 bus to the West Side Clinic.	DHA RCS		
b. Improve access and provide safe pedestrian routes to educational facilities. 	i. Create walking groups or coordinate a "Walking Bus" for children and parents to go to school together.	DHA RCS; Greenlee Elementary School; West High School; Auraria; Safe Routes to School; Let's Move Denver; Healthy Living Program Coordinator funded through CHF	2013	
	ii. Improve pedestrian crossings of Colfax Avenue and encourage transit access to Auraria.	DHA Real Estate Dept; Public Works; Auraria; Metropolitan State University; Community College of Denver	2014	
	iii. Improve pedestrian crossings of Kalamath and 10th for access to Manny Martinez Elementary School and West High School.	DHA Real Estate Dept; Manny Martinez Elementary School; West High School; Safe Routes to School; Let's Move Denver; Healthy Living Program coordinator funded through CHF	2014	
c. Encourage key retail and neighborhood amenities within walking distance of Mariposa. 	i. Seek and encourage community supporting tenants for new ground level spaces and in the Art District on Santa Fe	DHA Real Estate Dept; Entrepreneurship and microfinance business support entities	2012-2015	✓ Osage Café Computer Lab, ArtStreet, MicroFinance Institute.
	ii. Support existing retail and amenities in the neighborhood	DHA RCS; Denver Office of Economic Development (OED); the Art District on Santa Fe	2012-2015	
d. Enhance and build safe, appealing bicycle and pedestrian networks and connect with neighborhood and city-wide networks and destinations. 	i. Focus improvements on 10th Avenue as a primary connection to the La Alma/ Lincoln Park neighborhood.	DHA Real Estate Dept; Public Works; the Art District on Santa Fe; LaAlma Task Force	2012-2014	
	ii. Work with the City to improve traffic safety through traffic calming, traffic safety enforcement, intersection, roadway and sidewalk design. Support measures at 10th and Kalamath and periodically conduct pedestrian audits to identify problem areas.	DHA Real Estate Dept; City of Denver Public Works; Bike Denver; B-Cycle; UC Denver School of Public Health	2012->	
	iii. Support neighborhood walking groups to destinations (schools, arts district First Friday) and for leisure	Let's Move Denver; Flobots; Jolt; Denver Environmental Health		

CAMPAIGN CHECKLIST 1. Get Connected

STRATEGY	ACTIONS	PARTNERS	GOAL	STATUS
<p><i>Enhance and build safe, appealing bicycle and pedestrian networks and connect with neighborhood and city-wide networks and destinations.</i></p> <p>CON'T</p>	iv. Support trails and trail connections - support a walking trail at the planned playing fields at Auraria Campus and a connection to those as well as to the Cherry Creek and South Platte Trails.	DHA Real Estate Dept; City of Denver Public Works; Bike Denver, B-Cycle	2013	
	v. Install pedestrian and bicycle pathways where streets are disconnected and enhance existing pedestrian and bicycle network.	City of Denver Public Works, Bike Denver, B-Cycle		✓ See "Success Stories," pages 62-63.
	vi. Incorporate wayfinding along established bike routes and paths.	DHA Real Estate Dept	2014	
	vii. Provide safe, convenient bicycle parking on streets, in parking garages, and in housing units.	DHA Real Estate Dept	2012-2015	
<p>e. Enhance street network, increase multi-modal connectivity, and transit access.</p> 	i. In new construction, comply with Denver's complete streets policy, http://www.smart-growthamerica.org/documents/cs/policy/cs-co-denver.policy.pdf	DHA Real Estate Dep	ongoing	
	ii. Provide/promote carsharing in the neighborhood; provide carsharing spaces in new buildings.	DHA Real Estate Dept; eGo CarShare or similar; DHA Property Management	2014	
	iii. Work with RTD, the City, and employers to provide subsidized transit passes.	DHA Real Estate Dept; eGo CarShare or similar; DHA Property Management	2015	
	iv. Support bikesharing, and provide bike tool library/bike depot in the redevelopment; provide interior bicycle storage in units; provide secure bike storage and changing rooms in workplaces.	DHA RCS; DHA Real Estate Dept; DHA Property Management; B-Cycle; Bike Denver	2013-2015	✓ DHA partnership with Denver BCycle, see pages 62-63.
<p>f. Connect with the arts, cultural programs, and other community resources.</p> 	i. Use local artists to incorporate art in Mariposa redevelopment.	DHA Real Estate Dept; the Art District on Santa Fe; Denver Office of Arts & Venues; Arts Street	2012-2015	✓ Mural on Tapiz, See "Success Stories," pages 62-63.
	ii. Provide volunteer opportunities at cultural institutions for residents.	DHA RCS; Arts Street; the Art District on Santa Fe	2013	✓ See "Success Stories," pages 62-63.
	iii. Provide information and connections to First Friday art events.	DHA RCS; the Art District on Santa Fe	2013	
	iv. Provide wayfinding from Mariposa to the Art District on Santa Fe.	DHA Real Estate Dept; City of Denver, Art District on Santa Fe; Lincoln Park Neighborhood Association	2013	

CAMPAIGN CHECKLIST 1. Get Connected

STRATEGY	ACTIONS	PARTNERS	GOAL	STATUS
	v. Support multi-generational access to cultural programs and music.	DHA RCS; Flobots.org; New Center Active Design; Healthy Living Program Coordinator	2012-2015	
g. Provide a dedicated central community location for information sharing. 	i. Provide interactive kiosk for real time transit information, transportation options, bike maps, and community event information at the 10th & Osage LRT or the new plaza.	DHA Real Estate Dept; DHA RCS; the Art District on Santa Fe; RTD; Transit Alliance Group; Bike Denver	2014	
	ii. Consider community ambassador to serve as a conduit for community information.	DHA RCS	2013	
	iii. Provide a community forum on the internet, or work with community partners to support a forum.	DHA RCS; Denver Office of Economic Development (OED); Lincoln Park Neighborhood Association	2014	
h. Reduce disruption and number of moves for residents returning to Mariposa, and provide a variety of housing options and affordability levels to support in-neighborhood aging. 	i. Structure the relocation and phasing plans to reduce the number of moves for residents.	DHA Real Estate Dept	ongoing	✓ See "Success Stories," pages 62-63.
	ii. Provide a variety of unit types, sizes, and affordability levels in the Mariposa redevelopment to support a balance of housing types within the La Alama/ Lincoln Park neighborhood.	DHA Real Estate Dept	2012-2015	
i. Support community engagement and leadership development of residents. 	i. Actively engage with community groups and organizations to assure equitable participation in all planning processes, and provide translation services when gathering input to encourage diverse participation.	DHA Real Estate Dept; DHA RCS; Lincoln Park Neighborhood Association; Local Resident Councils	ongoing	✓ See "Success Stories," pages 62-63.
	ii. Support programs that incorporate leadership development.	DHA RCS	2012-2015	✓ Local Resident Councils.
	iii. Provide community space that could be used for meetings.	DHA Real Estate Dept; DHA RCS	2012-2015	✓ See "Success Stories," pages 62-63.

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2. HEALTHY PLACES

MISSION

- Create healthy, safe, vibrant places
- Encourage physical activity.
- Increase security, safety and social cohesion.
- Provide living environments that support well-being.



STRATEGIES



- Improve safety and security of streets, common areas, and parks.
- Provide community spaces for social and cultural programs and encourage gathering places.
- Incorporate casual, everyday opportunities for physical activity in indoor spaces as well as in the functionality of commercial workplaces and residential buildings.
- Encourage physical activity in programming of public open spaces.
- Improve design of buildings at street level and design of public spaces to promote cultural vitality and aesthetics.
- Provide and improve outdoor open space, natural ecosystems, and urban forest.
- Provide comfortable, healthy indoor environments with good air quality, access to daylight, views to nature, and energy efficiency.

Responsible Lead: DHA Real Estate Department.

CAMPAIGN CHECKLIST 2. Healthy Places

STRATEGY	ACTIONS	PARTNERS	GOAL	STATUS
a. Improve safety and security of streets, common areas, and parks. 	i. Convene stakeholders to develop a strategy to improve security and safety of Lincoln Park. Consider park “ambassadors” who assist with wayfinding, security, and social services.	DHA RCS; DHA Real Estate Dept; Denver Parks Dept; Denver Police Dept; the Art District on Santa Fe; Healthy Living Program Coordinator funded through CHF	2012-2013	
	ii. Support community policing, neighborhood watch groups, community organizing.	DHA RCS; City Council, Lincoln Park Neighborhood Association; Prevention Institute		✓ Local Resident Councils in S. Lincoln and Tapiz.
	iii. Require use of Crime Prevention through Environmental Design (CPTED) principles in design and implementation.	DHA Real Estate Dept; DHA Property Management	2012-2015	✓ See “Success Stories,” Page 47.
	iv. Support new lighting and seating along primary routes and at transit stops.	DHA Real Estate Dept; Denver Public Works; RTD	2013	
	v. Track crime rate, graffiti, and other crime data and make information accessible to community.	DHA RCS; DHA Property Management; Denver Police Department; UC Denver School of Public Health	ongoing	
b. Provide community spaces for social and cultural programs and encourage gathering places. 	i. Provide affordable space for nonprofit providers within community, and provide new community spaces.	DHA Real Estate Dept; Mariposa; the Art District on Santa Fe	2012-2015	✓ See “Success Stories,” Page 42.
	ii. Consider shared spaces and joint use of community facilities for neighborhood programs.	DHA RCS; City of Denver; Lincoln Park Neighborhood Association; La Alma Recreation Center; the Art District on Santa Fe	2014	
c. Incorporate casual, everyday opportunities for physical activity in indoor spaces as well as in the functionality of commercial workplaces and residential buildings.. 	i. Provide one or all stairs in new buildings for everyday use and primary means of travel.	DHA Real Estate Dept; Mariposa redevelopment architects and redevelopment team	2012-2015	
	ii. Locate building functions to encourage brief bouts of walking or travel to commonly used amenities within buildings, and provide visually appealing environments.	DHA Real Estate Dept	2012-2015	
d. Encourage physical activity in programming of public open spaces 	i. Support installation of adult recreation equipment (also known as Fitness Zones) in existing parks and open spaces.	DHA Real Estate Dept; DHA RCS; Denver Parks Dept, Trust for Public Land; Colorado Health Foundation	2013	

CAMPAIGN CHECKLIST 2. Healthy Places

STRATEGY	ACTIONS	PARTNERS	GOAL	STATUS
<i>Encourage physical activity in programming of public open spaces CON'T</i>	ii. Coordinate with Parks Dept to support programming in open spaces, plazas, and Lincoln Park, such as zumba.	HA Real Estate Dept; DHA RCS; Denver Parks Dept; La Alma Recreation Center; Flobots.org (music)	2013-2015	
	iii. Provide walking maps and map out 1-, 2-, or 5-mile walking loops in the neighborhood.	DHA RCS; Denver Parks Dept; Let's Move Denver	2013	
e. Improve design of buildings at street level and design of public spaces to promote cultural vitality and aesthetics. 	i. Contribute a percentage of total construction costs to creation of public art, or public arts fund.	DHA Real Estate Dept; City, State and Federal grant programs	2012-2015	✓ Mural at Tapiz, See "Success Stories," Page 48.
	ii. Review design of buildings for use of Crime Prevention through Design principles.	DHA Real Estate Dept; DHA Property Management; Mariposa architects and the Department of Development and Planning	2012-2015	
	iii. Public realm and ground level design should promote interaction and celebrate neighborhood history and culture.	DHA Real Estate Dept	2012-2015	
f. Provide and improve outdoor open space, natural ecosystems, and urban forest. 	i. Use only plants that are non-invasive and appropriate for site conditions, climate, and design intent to improve landscape performance and reduce resource use.	Colorado Native Plant Society; Native Plant Information Network's Native Plant Database	2012-2015	✓ See "Success Stories," Page 48.
	ii. Provide and improve tree canopy with climate appropriate species to reduce urban heat island, improve air quality. Select plant species that can provide additional benefits to the site, such as food and habitat for wildlife or visual barriers from tracks.	Denver Parks Dept; Public Works; USDA Forest Service; Center for Urban Forest Research	2012-2015	
g. Provide comfortable, healthy indoor environments with good air quality, access to daylight, views to nature, and energy efficiency. 	i. Provide interior day lighting in 90% of common areas and 75% of all areas and units.	DHA Real Estate Dept	2012-2015	
	ii. Provide access to views of nature in 90% of common areas and 75% of all areas and units.	DHA Real Estate Dept	2012-2015	✓ See "Success Stories," Pages 42,48,49.
	iii. Design and install energy efficient systems in new construction.	DHA Real Estate Dept; DHA Property Management	2012-2015	✓ See "Success Stories," Page 42.
	iv. Include measures to improve air quality in units during demolition and construction, and ongoing in units.	DHA Real Estate Dept; DHA Property Management	2012-2015	✓ See "Success Stories," Page 47.
	v. Include noise mitigation in new construction as needed to maintain healthy levels of noise.	DHA Real Estate Dept; DHA Property Management	2012-2015	✓ See "Success Stories," Page 42.



3. HEALTHY EATING

MISSION

- Improve access to healthy foods.
- Promote healthy eating habits.
- Celebrate cultural diversity and improve community cohesion.



STRATEGIES



- a. Improve access to healthy and locally grown foods.
- b. Provide and support classes, volunteer opportunities, and programs around healthy eating and nutrition.
- c. Provide space for community gardens. Maintain the new community garden and offer programming and education.
- d. Provide space in the redevelopment for a Community Supported Agriculture (CSA) drop off location.

Responsible Lead: DHA Real Estate Department.

CAMPAIGN CHECKLIST 3. Healthy Eating

STRATEGY	ACTIONS	PARTNERS	GOAL	STATUS
a. Support increased fresh produce offerings in the neighborhood. 	i. Work with nearby grocery stores and convenience stores to include more fresh produce and healthy foods.	DHA RCS; Denver Seeds; American Way Market	2013-2015	
	ii. Support interest of a new market or healthy restaurant to locate in Mariposa or near the site.	DHA Real Estate Dept; Lincoln Park Neighborhood Association; the Art District on Santa Fe	ongoing	✓ Osage Cafe opens 11/12.
	iii. Require food vendors to accept food stamps/ Electronic Benefits Transfer (EBT) and Women, Infants, and Children (WIC) vouchers.	DHA RCS	2014	
b. Provide and support classes, volunteer opportunities, and programs around healthy eating and nutrition. 	i. Host cooking and nutritional classes at Mariposa and leverage the Youth Culinary Academy classes to a broad audience. Create awareness on nutritional facts with fast food, other restaurants, and convenience stores.	DHA RCS; Youth Culinary Academy; LiveWell; Metropolitan State University Hospitality, Tourism and Events Department; Let's Move Denver; Kitchencue	2012-2015	
c. Provide space for community gardens. Maintain the new community garden and offer programming and education. 	i. Provide community gardens in each phase of redevelopment at Mariposa.	DHA Real Estate Dept; DHA RCS; Denver Urban Gardens; Colorado Health Foundation	2012-2015	✓ Tapiz Gardens, See "Success Stories," Page 49.
	ii. Provide a greenhouse to allow year-round food production - identify location in Phase 3 or 4 and develop a program for utilization.	DHA Real Estate Dept; DHA RCS; Colorado Health Foundation	2012-2015	
d. Provide space in the redevelopment for a Community Supported Agriculture (CSA) drop off location. 	i. Work with DHA staff and redevelopment team to identify CSA drop off locations.	DHA Real Estate Dept; DHA RCS; Colorado Health Foundation	2012-2015	

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4. HEALTH CARE & WELLNESS

MISSION

- Improve access to health care and services.
- Support activities and programs to enhance wellbeing.
- Improve access to recreation facilities.



STRATEGIES



- Improve access to health care and services.
- Provide and support education about healthy habits and behaviors.
- Support on-site health providers and services.
- Improve access to recreation facilities.
- Provide a Healthy Living Program Coordinator to provide information and programming for residents.
- Continue to monitor health determinants and health status of residents.

Responsible Lead: DHA Resident Community Services.

CAMPAIGN CHECKLIST 4. Health Care & Wellness

STRATEGY	ACTIONS	PARTNERS	GOAL	STATUS
<p>a. Improve access to health care and services.</p> 	<p>i. Improve access to health care and service providers.</p> <p>ii. Improve access to counseling and mental health resources.</p> <p>iii. Explore availability of onsite health care delivery including hiring a “Health Navigator” for seniors and disabled residents. The Health Navigator will help residents review their health care records, make appointments, obtain medications and assist with enrollment in medical care programs, as needed. Also, the Health Navigator would provide information about available services to residents.</p>	<p>DHA RCS; Denver Health; Denver Inner City Parish; Head Start/ Catholic Charities Child Care Services</p> <p>DHA RCS; Denver Health</p> <p>DHA RCS; Denver Health; Colorado Health Foundation</p>	<p>2012-2015</p> <p>2012-2015</p> <p>2013</p>	<p>✓ See “Success Stories,” Page 48.</p>
<p>b. Provide and support education about healthy habits and behaviors.</p> 	<p>i. Support programs and education on healthy behaviors for residents, including diet, exercise, childhood development, nutrition and preventive health care.</p> <p>ii. “With Every Heart Beat is Life Initiative” curriculum to be offered to residents.</p> <p>iii. Train key members of the Mariposa community at the Prevention Training Center.</p>	<p>DHHA; National Heart, Lung, and Blood Institute’s (NHLBI) Education Resources to Address Health Disparities “With Every Heart Beat is Life Initiative”</p> <p>DHA RCS; National Heart, Lung, and Blood Institute’s (NHLBI) Education Resources to Address Health Disparities</p> <p>DHA RCS; Denver Health - Prevention Training Center; Colorado Health Foundation</p>	<p>2012-2015</p> <p>2012-2015</p> <p>2014</p>	<p>✓ Two cohorts of WEBIL curriculum held by DHA to date.</p>
<p>c. Support on-site health providers and services.</p> 	<p>i. Encourage health providers and health care tenants in commercial spaces at Mariposa redevelopment.</p>	<p>DHA Real Estate Dept; DHA RCS</p>	<p>2012-2015</p>	

CAMPAIGN CHECKLIST 4. Health Care & Wellness

STRATEGY	ACTIONS	PARTNERS	GOAL	STATUS
<p>d. Improve access to recreation facilities.</p> 	<p>i. Support the La Alma Recreation Center and consider providing free or reduced rate access to residents.</p>	<p>DHA RCS; Denver Parks Dept; La Alma Recreation Center</p>	<p>2013-ongoing</p>	
<p>e. Provide a Healthy Living Program Coordinator to provide information and programming for residents.</p> 	<p>i. Hire a Healthy Living Program Coordinator, who would be an on-site healthy living expert and activity coordinator and offer programs on diet and exercise to residents. Programs will also include teaching parents about childhood development, nutrition and preventive health care.</p>	<p>DHA RCS; Denver Health; Colorado Health Foundation</p>	<p>2013</p>	
	<p>ii. Offer programs about healthy living in the home. This includes sessions to discuss non-toxic cleaning products, saving water and energy, recycling, composting, and buying locally grown produce.</p>	<p>DHA RCS; Northwest Earth Institute's Eco-Parties</p>	<p>2013-2015</p>	
	<p>iii. Offer programs on health and wellness.</p>	<p>DHA RCS</p>	<p>2013-2015</p>	
<p>f. Continue to monitor health determinants and health status of residents.</p> 	<p>i. Initial Health Assessment: An initial survey of residents should be conducted as they move into the new buildings at Mariposa by DHA. This is critical for establishing the baseline of health conditions, behaviors, and determinants for future evaluation purposes.</p>	<p>DHA RCS; DHA Property Management; Denver Health, Colorado Health Foundation; Colorado School of Public Health</p>	<p>2012-ongoing</p>	
	<p>ii. Ongoing Assessment: Residents will be re-surveyed on an established periodic basis. The surveys may be conducted by a third party.</p>	<p>DHA RCS; DHA Property Management; Denver Health, Colorado Health Foundation; Colorado School of Public Health</p>	<p>2012-ongoing</p>	<p>✓ Completed for Tapiz Building.</p>
	<p>iii. Data Management and Analysis: The information from residents, indicators, and survey results will be analyzed and tracked.</p>	<p>DHA; Denver Health; Colorado Health Foundation; Colorado School of Public Health</p>	<p>2012-ongoing</p>	



5. LIFELONG LEARNING

MISSION

- Improve access to educational programs for all life stages.
- Improve access to job training and career pathways.
- Improve financial literacy.



STRATEGIES

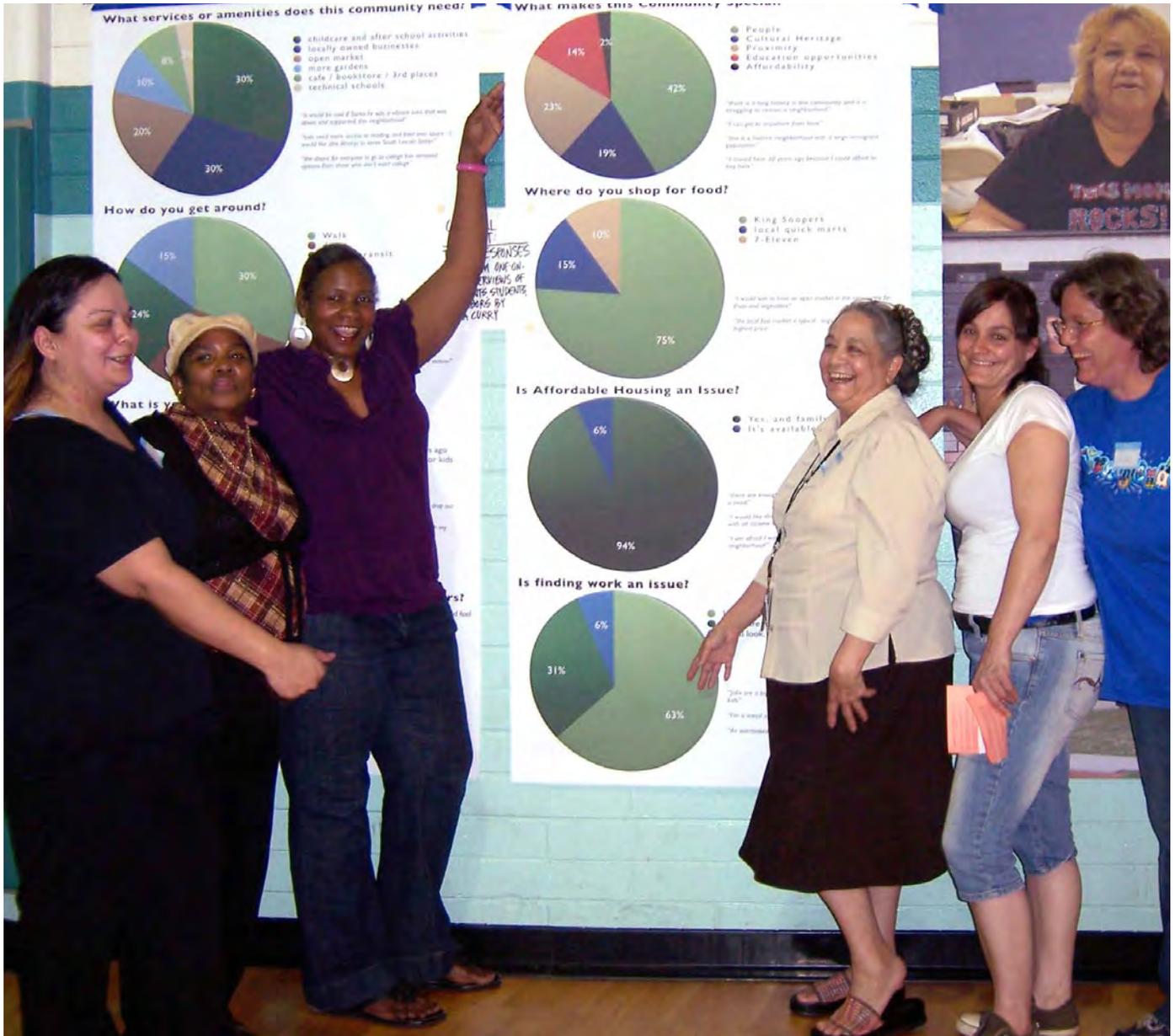


- Coordinate with local school districts, parks, recreation facilities, and non-profits to maximize youth programs and parent and family involvement.
- Provide and/or support job training, entrepreneurship, and micro-finance programs, especially in sectors that provide self-sufficiency wages and good benefits.
- Provide opportunities for affordable early childhood education facilities are high quality day care facilities to exist within the neighborhood.
- Provide financial literacy education and training (e.g. credit repair, first time home buyer training).
- Work with educational institutions to improve enrollment.

Responsible Lead: DHA Resident Community Services.

CAMPAIGN CHECKLIST 5. Lifelong Learning

STRATEGY	ACTIONS	PARTNERS	GOAL	STATUS
<p>a. Coordinate with local school districts, parks, recreation facilities, and non-profits to maximize youth programs and parent and family involvement.</p> 	<p>i. Work with local groups for more programming in the area.</p>	<p>DHA RCS; Boys and Girls Club; Trust for Public Land; Greenlee Elementary School; Manny Martinez Middle School; University of Denver Bridge Project; Colorado I Have a Dream Foundation; Arts Street; Flobots.org</p>	<p>2012-2015</p>	<p>✓ See "Success Stories," Page 47.</p>
<p>b. Provide and/or support job training, entrepreneurship, and micro-finance programs, especially in sectors that provide self-sufficiency wages and good benefits.</p> 	<p>i. Work with groups and educational institutions to support access to adult education and career pathways.</p>	<p>DHA RCS; Mi Casa; OED's Division of Workforce Development; The Auraria Campus; Emily Griffith; Metro State University; Community College of Denver; Rocky Mountain MicroFinance Institute; West High School Generations Program Center for Work; Education and Employment ("CWEE")</p>	<p>2012-2015</p>	<p>✓ See "Success Stories," Page 47.</p>
	<p>i. Provide on-site classroom space for education and entrepreneurship providers.</p>	<p>DHA Real Estate Dept</p>		
<p>c. Provide opportunities for affordable early childhood education facilities are high quality day care facilities to exist within the neighborhood.</p> 	<p>i. Provide on-site day care facilities.</p>	<p>DHA Real Estate Dept; DHA RCS; The Colorado Child Care Assistance Program (CDHS); Catholic Charities Child Care Services; Metro State University - Family Literacy Program</p>	<p>2014</p>	<p>✓ See "Success Stories," Page 48.</p>
<p>d. Provide financial literacy education and training (e.g. credit repair, first time homebuyer training).</p> 	<p>i. Host classes for residents at Mariposa.</p>	<p>DHA RCS; OED's Division of Workforce Development; Rocky Mountain MicroFinance Institute; Metro State University; Community College Denver; University Colorado Denver</p>	<p>2012-2015</p>	<p>✓ Classes held at Connections @ Mariposa.</p>
<p>e. Work with educational institutions to improve enrollment.</p> 	<p>ii. Partner with educational institutions to understand the impact of relocation on enrollment, and coordinate to remove barriers.</p>	<p>DHA RCS; Greenlee Elementary School; Manny Martinez Middle School; West High School</p>	<p>2012-2015</p>	<p>✓ Partnered with Greenlee Elem.</p>



South Lincoln Redevelopment Master Plan community workshop, 2009. Credit: Mithun.

3 GET THE FACTS

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Mariposa 2012 Indicator Report Card

Health and Health Determinant Indicators

Using indicators is essential to understand our communities, identify areas of concern, and measure progress toward our goals. It is important to establish indicators that are both meaningful and practical.

The Mariposa Healthy Living Tool recommends a set of indicators that are most relevant to health determinants (conditions we can change), that have data availability, and that in many cases are quantifiable. As much as possible, existing data should be leveraged to inform design and development decisions. Many organizations, such as the Colorado Health Department and Denver Health and Hospital Authority, do collect health data on a regular basis.

Data can range in geographic scale (parcel, neighborhood, citywide), in demographic scale (affected population segments – public housing residents, neighborhood residents, or employees), and in quality (from qualitative to empirical data to modeled data).

Even if the data is not currently available, it may be identified as important. “Aspirational” data for future collection and use in indicators should still be sought if it will help to better understand health conditions and inform actions. For example, air quality and particulate matter data for the vicinity of the site may not be currently available, but collecting this information will raise awareness of potential issues that could be mitigated through built environment improvements.

The Mariposa 2012 Indicator Report Card includes a series of indicators across health determinant areas of Healthy Housing, Environmental Stewardship, Sustainable and Safe Transportation, Social Cohesion, Public Infrastructure, and Healthy Economy. Many of these indicators are consistent with the Healthy Development Measurement Tool assessment completed in 2010.

The Report Card provides the baseline condition for indicators, describing the conditions before redevelopment, and also provides a status update completed in 2012 with new data when available.

Mariposa 2012 Indicator Report Card



INDICATOR

HEALTHY HOUSING

- PERCENT OF POPULATION LIVING BELOW POVERTY LEVEL
- PERCENT OF HOUSEHOLD INCOME SPENT ON HOUSING
- HOUSING INDOOR ENVIRONMENT (AIR QUALITY, TEMPERATURE, HUMIDITY)

SUSTAINABLE, SAFE TRANSPORTATION

- AVERAGE TRANSIT COMMUTE TIME IN MINUTES
- COST OF TRANSPORTATION AND HOUSING AS % OF AVERAGE INCOME
- NUMBER OF TRAFFIC INJURIES/ COLLISIONS/ FATALITIES

ENVIRONMENTAL STEWARDSHIP

- PERCENT OF RESIDENTS WITH ACCESS TO OPEN SPACE/ NATURE WITHIN NEIGHBORHOOD
- AIR QUALITY - PARTICULATE MATTER
- VMT PER CAPITA PER DAY

SOCIAL COHESION

- PROPORTION OF POPULATION WITHIN 1/2 MILE TO COMMUNITY GATHERING SPACES
- TOTAL CRIME RATE PER 1,000 PEOPLE
- PERCENTAGE OF POPULATION WHO FEEL SAFE ALONE AT NIGHT IN NEIGHBORHOOD

PUBLIC INFRASTRUCTURE

- PROPORTION OF POPULATION WITHIN 1/2 MILE KEY RETAIL
- NEIGHBORHOOD SCHOOL PERFORMANCE
- % PERSONS AGE 25+ WITH LESS THAN 12TH GRADE EDUCATION
- # OF HEALTHY FOOD OUTLETS WITHIN 1/2 MILE OF NEIGHBORHOOD

HEALTHY ECONOMY

- UNEMPLOYMENT RATE
- AVERAGE ANNUAL INCOME COMPARED TO THE SELF-SUFFICIENCY WAGE
- NUMBER OF BUSINESSES AND NUMBER OF JOBS/SQ MI. IN NEIGHBORHOOD

Blue text represents an indicator that was newly established in 2012.

	CITY OF DENVER BASELINE	MARIPOSA PRE- REDEVELOPMENT BASELINE	MARIPOSA STATUS UPDATE	MARIPOSA TREND
	14.29%	37.05%	45.05%	▲
	28.1%	12.75%	13.44%	▲
	n/a	n/a	Monitoring recommended	
	27	24.60	20.05	▼
	47.4%	26.18%	29.83%	▼
	n/a	Data Collection in Progress	Data Collection in Progress	
	n/a	26%	32%	▲
	n/a	n/a	<2.5 mm	
	33.6	24.4	14.7	▼
	n/a	100%	100%	—
	68.62	247.9	157	▼
	n/a	49%	Recommended survey	
	60 Walkscore (Update 2012)	100%	87 Walkscore	—
	n/a	n/a	30.8 Greenlee Elementary 38 Martinez Middle School	
	21.11%	38.57%	n/a	
	n/a	0	1	▲
	n/a	10.63%	15.2%	▲
	1.49 / 1.0	1.04 / 1.0	1.06 / 1.0	▲
	n/a	Data Collection in Progress	551/ 308,205	

Mariposa 2012 Indicator Report Card



INDICATOR

HEALTHY HOUSING	PERCENT OF POPULATION LIVING BELOW POVERTY LEVEL
	PERCENT OF HOUSEHOLD INCOME SPENT ON HOUSING
	HOUSING INDOOR ENVIRONMENT (AIR QUALITY, TEMPERATURE, HUMIDITY)
SUSTAINABLE, SAFE TRANSPORTATION	AVERAGE TRANSIT COMMUTE TIME IN MINUTES
	COST OF TRANSPORTATION AND HOUSING AS % OF AVERAGE INCOME
	NUMBER OF TRAFFIC INJURIES/ COLLISIONS/ FATALITIES
ENVIRONMENTAL STEWARDSHIP	PERCENT OF RESIDENTS WITH ACCESS TO OPEN SPACE/ NATURE WITHIN NEIGHBORHOOD
	AIR QUALITY - PARTICULATE MATTER
	VMT PER CAPITA PER DAY
SOCIAL COHESION	PROPORTION OF POPULATION WITHIN 1/2 MILE TO COMMUNITY GATHERING SPACES
	TOTAL CRIME RATE PER 1,000 PEOPLE
	PERCENTAGE OF POPULATION WHO FEEL SAFE ALONE AT NIGHT IN NEIGHBORHOOD
PUBLIC INFRASTRUCTURE	PROPORTION OF POPULATION WITHIN 1/2 MILE KEY RETAIL
	NEIGHBORHOOD SCHOOL PERFORMANCE
	% PERSONS AGE 25+ WITH LESS THAN 12TH GRADE EDUCATION
	# OF HEALTHY FOOD OUTLETS WITHIN 1/2 MILE OF NEIGHBORHOOD
HEALTHY ECONOMY	UNEMPLOYMENT RATE
	AVERAGE ANNUAL INCOME COMPARED TO THE SELF-SUFFICIENCY WAGE
	NUMBER OF BUSINESSES AND NUMBER OF JOBS/SQ MI. IN NEIGHBORHOOD

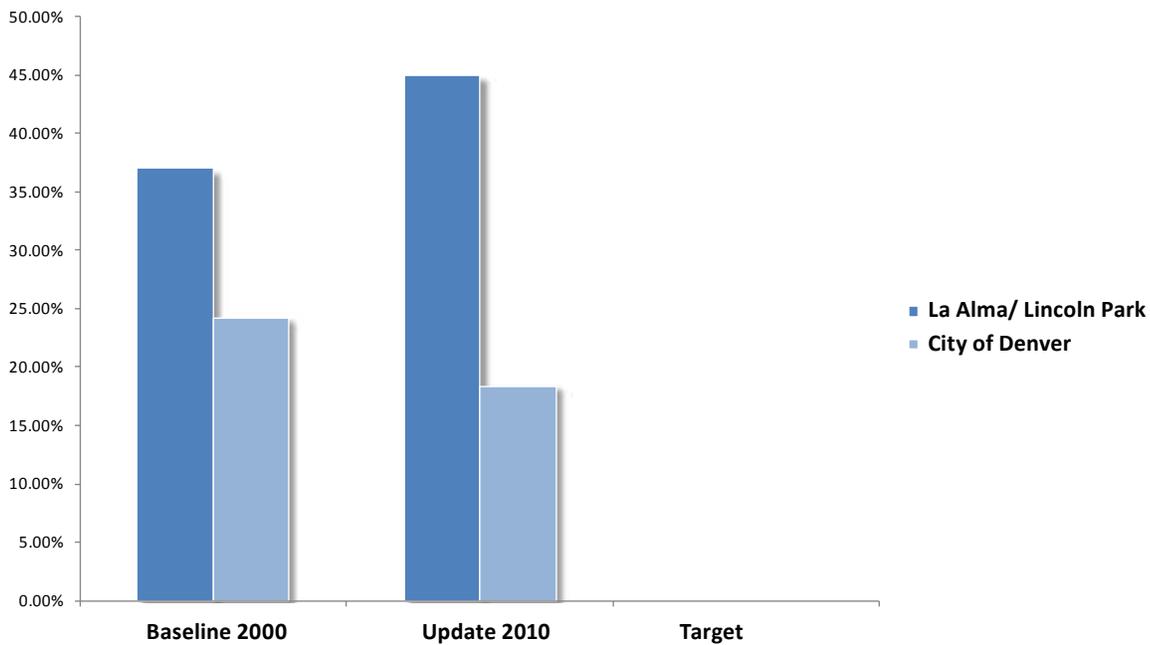
Blue text represents an indicator that was newly established in 2012.

Data Sources & Geographic Scope

	DATA SOURCE/BASELINE	DATA SOURCE/STATUS UPDATE	GEOGRAPHIC SCOPE
	Census 2000	ACS 2006-2010	Auraria - Lincoln Park statistical area
	H+T Index 2010	H+T Index 2012	Census block group 19.01.2
	n/a	n/a	Site/Building monitoring
	Census 2000	ACS 2006-2010	Auraria Lincoln Park statistical area
	H+T Index 2010	H+T Index 2012	Census block group 19.01.2
	Denver Police 2009	Denver Police 2012	Auraria - Lincoln Park statistical area
	Mithun Map Analysis 2009 (based on SITES)	Mithun Map Analysis 2012 (based on SITES)	1/2 mile radius from Mariposa site
	n/a	http://http://apcd.state.co.us	Monitoring stations located at 2105 Broadway and 14th at Albion St., Denver
	Census 2000	H+T Index 2012 (vmt per household/avg household size)	Auraria-Lincoln Park statistical area/ baseline and Census block group 19.01.2
	Neighborhood Survey 2009	Neighborhood Survey 2012	1/2 mile radius from Mariposa site
	Denver Police Dept 2005	Denver Police Dept 2012	Auraria - Lincoln Park statistical area
	DHA Resident Survey 2009	tbd	Neighborhood Surveys
	neighborhood completeness indicator 2010	Walkscore 2012	1/2 mile radius from Mariposa site/ baseline; Walkscore: Lincoln Park Neighborhood
	n/a	Colorado Department of Ed 2012	n/a
	Piton 2000	n/a	Auraria - Lincoln Park statistical area
	Food Availability Survey 2009	Urban Ventures Survey 2012	1/2 mile radius from Mariposa site
	Piton 2002	ACS 2006-2010	Auraria - Lincoln Park statistical area
	Piton 2002/City of Denver	Census 2012/City of Denver	Auraria - Lincoln Park statistical area
	tbd	Census via ESRI 2012/H+T	Lincoln Park statistical area/ H+T used Census block group 19.01.2

Featured Facts

1. Percent of population living below poverty level

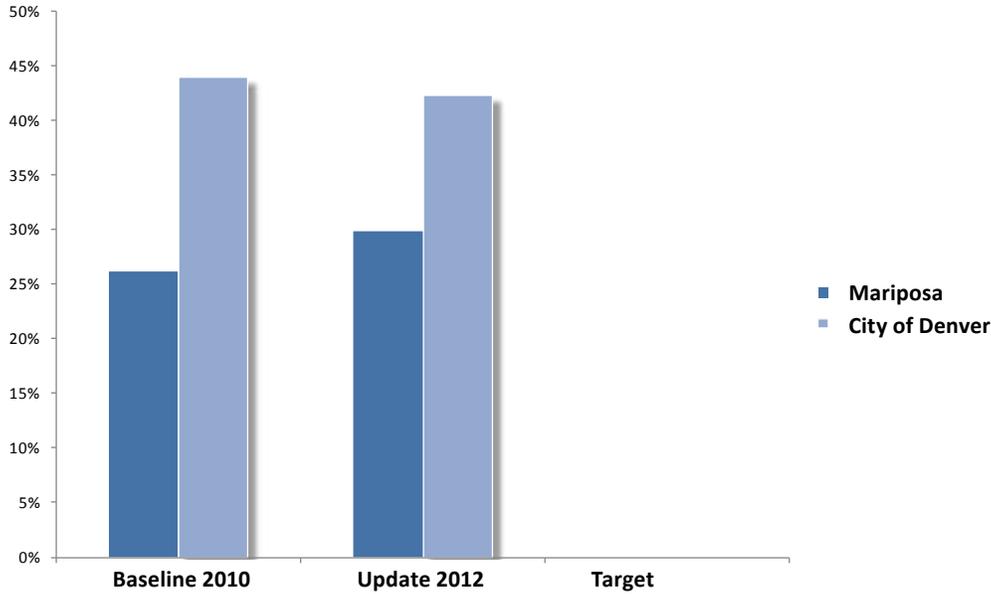


Source

Baseline 2000: US Census, tract 18, 19.01 (Auraria-Lincoln Park); city-data.com, Denver CO

Update 2010: American Community Survey 2006-2010 estimate, tract 18, 19.01 (Auraria-Lincoln Park); Denver CO; city-data.com

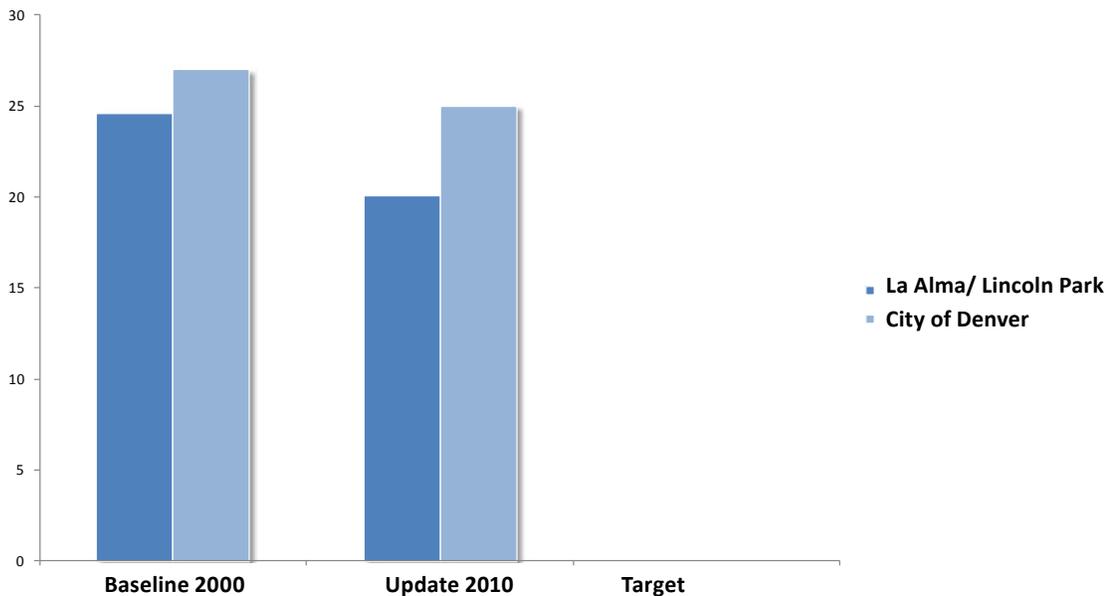
2. Cost of transportation and housing as percentage of income



Source

Baseline 2010, Update 2012: Census block group 19.01.2, <http://htaindex.cnt.org>

3. Average Transit Commute time (minutes)

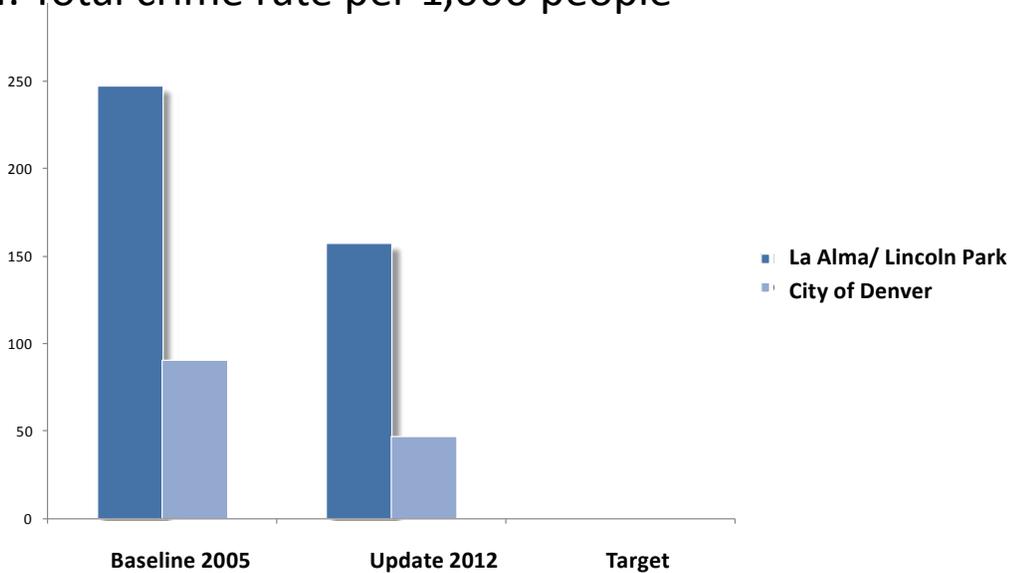


Source

Baseline 2000: US Census, tract 18, 19.01 (Auraria-Lincoln Park); city-data.com, Denver CO

Update 2010: American Community Survey 2006-2010 estimate, tract 18, 19.01 (Auraria-Lincoln Park); Denver, CO; city-data.com

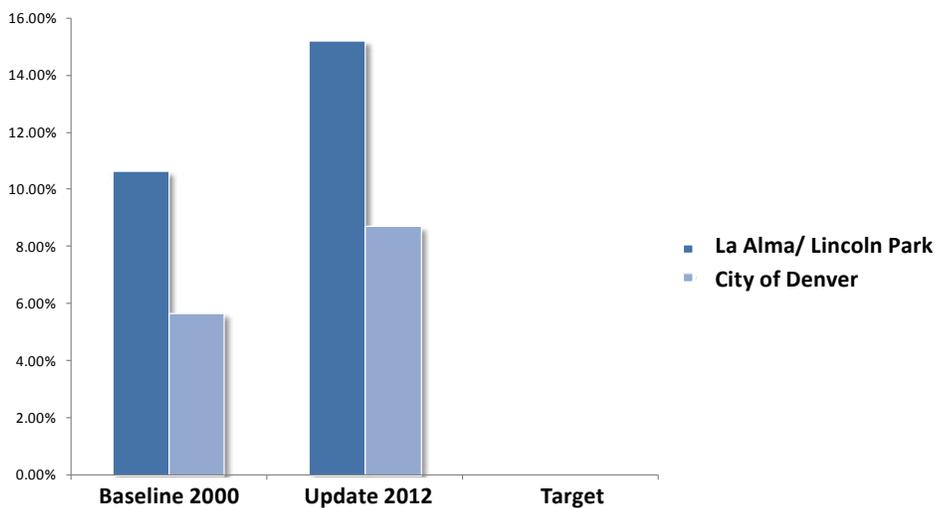
4. Total crime rate per 1,000 people



Source

Baseline 2005: City of Denver Police Department- Auraria-Lincoln Park, Denver Colorado
 Update 2012: City of Denver Police Department- Auraria-Lincoln Park, Denver Colorado

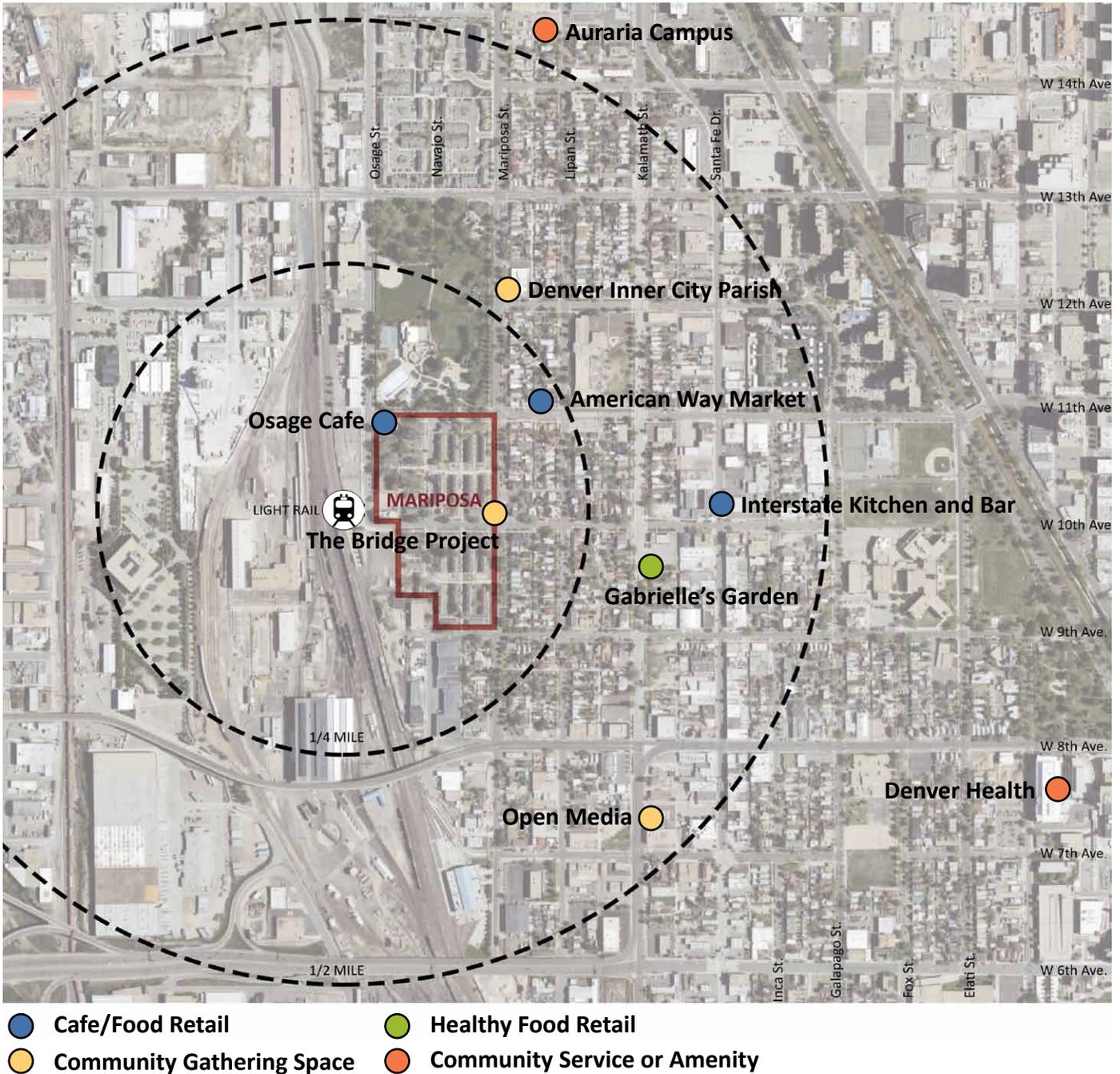
5. Unemployment rate



Source

Baseline 2000: Piton Foundation (US Census), tract 18, 19.01 (Auraria-Lincoln Park); US Bureau of Labor Statistics, Denver CO
 Update 2012: American Community Survey 2006-2010 est., tract 18, 19.01. (Auraria-Lincoln Park); US Bureau of Labor Statistics, Denver CO

6. Proportion of neighborhood population living within 1/2 mile of community gathering spaces



How are we doing?

Since the 2010 HDMT recommendations, the Denver Housing Authority has been making progress in a number of areas with the Mariposa Redevelopment.

Campaigns

Implementation to date shows progress across a number of dimensions of the community. The Campaigns establish thirty-one strategies, and all Campaigns have some strategies and actions underway currently. At the time this report was written, twenty-three strategies are either in-progress or completed. For more information, reference the Campaign Checklists in the previous section, and the highlighted success stories below.

Indicator Trends

The indicators in the Report Card are initially showing positive trends since pre-redevelopment conditions. While there is a limited amount of current data that directly correlates these positive trends and the redevelopment, they are none the less encouraging in reduced transit commute time, improved access to open space, and improved income compared to the self-sufficiency wage. Importantly, data still needs to be collected for several key indicators including: Number of Businesses and Number of Jobs/Sq Mi. in the Neighborhood, Number of Traffic Injuries, and Housing Indoor Environmental Air Quality. Collection of these types of data is more challenging as it typically requires on-site surveys or measurement. Additional information on the status of these indicators can be found in the Mariposa Report Card.

Collaboration and Partnerships

The goals of improving resident health in the Campaigns are often aligned with the organizational mission of many

community organizations and service providers. The early implementation of Campaigns has resulted in partnerships in the first few years of redevelopment at Mariposa. Below are some examples.

Denver Urban Gardens (DUG) was established in 1985 to support Denver residents in creating sustainable, food-producing neighborhood community gardens. DHA is collaborating with DUG on the community gardens at Tapiz.

Denver B-Cycle is a non-profit in Denver whose mission is to offer shared bicycle stations at a low cost for members to have the option to travel via bike instead of using a car. A B-Cycle station is located at the 10th and Osage light rail station, and DHA is collaborating with B-Cycle to improve access to memberships for residents.

University of Denver Bridge Project's mission is to provide educational opportunities for children living in Denver's public housing neighborhoods so they graduate from high school and attend college or learn a trade. DHA is collaborating with the Bridge Project to provide afterschool opportunities for youth.

Arts Street is a local non-profit that cultivates low-income and under-served youth into a creative and culturally competent workforce by using the power of the arts and arts professionals to nurture leadership and engage youth in learning. DHA collaborated with Arts Street to complete the mosaic mural on Tapiz with DHA Youth Employment Academy youth involved in a work internship.

Catholic Charities Child Care and Head Start Services' mission is to promote family and child development through a partnership that involves staff, families, children and the community. The organization strives to provide quality Child Care and early childhood education programs by using development appropriate

practices in a safe and nurturing environment. DHA is collaborating with Catholic Charities Child Care and Head Start Services to provide a new child care space at Mariposa.

Lessons Learned

In the past three years, the team has learned valuable lessons about planning for and implementing strategies to advance health. Some important takeaways that may be helpful to others within the La Alma/ Lincoln Park or Denver community, or to other designers, developers, and practitioners interested in similar goals.

- Get partners involved early to identify gaps in services and/or to link the services that exist to the residents.



South Lincoln Redevelopment Master Plan stakeholder interviews, 2009.

Having a comprehensive assessment of services was very helpful to confirm with stakeholders and ensure we weren't missing or overstating anything.

- Ask residents what they need - they know best.
- Set the tone for redevelopment to use a filter of health. This is critical to ensuring that health is considered every step of the way.
- Set the standard that everyone deserves the right to a high quality and healthy environment which includes all of our determinants - regardless of age, income, household size, race, and other considerations.
- Once health is used as a framework for the redevelopment, it guides decisions.
- Gather baseline data before redevelopment starts. Having this baseline was a very smart move - one that we appreciate more now that we have begun redevelopment so we are able to make comparisons and track progress.
- Find like minded partners who can help fund actions like HIAs, grants for programming/physical improvements for health in the built environment, and lend technical expertise. Many strategies can be implemented without significant funding, if relationships are forged with organizations that have aligned missions. As developers, we are not public health professionals.

Highlighted Success Stories

A few examples of how health is being advanced through redevelopment are highlighted below, and reference the health determinants in the Tool.

Healthy Housing and Environmental Stewardship

Healthy Buildings

Tapiz at Mariposa is tracking LEED Platinum (certification is imminent). Phases II and III of the project will reach LEED Gold or higher, and all phases follow Enterprise Green Communities Criteria. These standards align with improved indoor air quality, and with improved energy and water efficiency. These will reduce utility bills, ensure a more comfortable and healthy indoor environment, and can contribute in the long term to reduced green house gas emissions, and therefore better air quality.

Community Gardening

The Tapiz Garden, consisting of seven raised planters, is blossoming with tomatoes, peppers, squash, collard greens, and more. All of the beds were turned, planted and tended to by South Lincoln and/or Tapiz residents. Several students from the University of Denver students School of Social Work and International Affairs worked with these families in educating them about what vegetables and plants grow well in this climate and helped them to plant food that they would want to harvest and prepare in their homes. A garden leader was appointed by Denver Urban Gardens (DUG), who volunteered their time to help get the gardens started. Basic garden tools were donated by DUG to the residents, funds from DHA's HOPE VI grant provided more tools, seeds, and plants, and a local non-profit, Shalom, donated a garden shed. One of the plots is tended to by staff from the Osage Café, DHA's non-profit restaurant run by the DHA Youth Culinary Academy.

Reducing Noise Impacts

A noise study was completed, and the glazing and wall assembly at Tapiz at Mariposa accomplished mitigation to reduce noise levels below unhealthy levels inside of all units

Sustainable and Safe Transportation

Bike Share

DHA has partnered with Denver B-Cycle to offer access to B-Cycle stations throughout Denver – and two were installed near Mariposa: at the 10th and Osage light rail station and at 9th and Santa Fe. Both stations enhance connectivity to neighborhood and city amenities for Mariposa residents and employees. Scholarships are offered to DHA low-income residents who are interested.

Safe Neighborhood Bike Routes

11th Avenue has become a designated bike route by the City of Denver. To help improve the connectivity of the transit station, the City installed sharrows directly linking to established bike routes in town. The city re-opened 11th Ave at Kalamath, featuring more pedestrian friendly bulb outs, to promote easier access along bike routes.



Social Cohesion

Youth Education Project

SOAR was developed by Metropolitan State University and Shades of Blue, a non-profit that provides young people with the educational opportunities, to provide training and employment assistance needed to pursue careers in the aviation and aerospace industries for middle school youth living in the La Alma/ Lincoln Park neighborhood. In the summer of 2011, eight middle and high school youth took part in the Aviation & Aerospace program provided by Project SOAR.

After school Programs

DHA has partnered with the DU Bridge Program to provide after school opportunities for youth in the Mariposa community. The Bridge Project's mission is to provide educational opportunities for children living in Denver's public housing neighborhoods so they graduate from high school and attend college or learn a trade. DHA has also partnered with the La Alma Recreation Center to offer scholarships to families and with the Denver Boys & Girls Club.

Health and Wellness Education

DHA has partnered with various service providers and educational partners to provide classes on wellbeing to Mariposa residents. Adelente Counseling has been present at neighborhood events and resource fairs to provide information on available counseling services. Smoking cessation classes have been taught on-site at Tapiz. In addition, space has been made available on an intermittent basis to community organizations Innovage (health wellness checks) and CHARLAR (diabetes and heart healthy) to provide services to residents.

Public Infrastructure

Art and Cultural Opportunities

DHA has partnered with Arts Street to help facilitate art in the Mariposa redevelopment, including a mosaic mural that was designed and installed on Tapiz through paid workforce training, a large sculpture currently being designed for the 10th and Navajo plaza, and additional commissioning opportunities for Phases III and IV. Arts Street also is located on-site on the first floor of Tapiz and currently offers art classes in various mediums and creative industries job training.



Arts Street Mural at Tapiz, credit: Katie Kerwin McCrimmon



4 MARIPOSA HEALTHY LIVING TOOLKIT



MARIPOSA HEALTHY LIVING TOOLKIT



Positive Health Outcomes in Community Redevelopment

Introduction

What is it?

The Mariposa Healthy Living Tool (Tool) is a guide to assess the health conditions of residents and identify opportunities for improvement through the built environment in urban redevelopment projects. This process is similar to a review process called a Health Impact Assessment (HIA), which is typically performed by public health government agencies, community organizations and academic institutions. The Tool was created for practitioners, developers and urban designers to improve health outcomes. The Tool affects health outcomes by advancing evidence-based and effective strategies that improve social and environmental determinants of health - specifically by targeting design, implementation, and construction in redevelopment projects.

It is based on a similar tool originally developed by the San Francisco Department of Public Health called the Healthy Development Measurement Tool (HDMT). In 2009, the Denver Housing Authority sponsored the customization of the HDMT, creating the Denver HDMT for use to identify priority health issues and guide the Mariposa redevelopment. The Mariposa Healthy Living Tool represents an evolution of the Denver HDMT.

Why?

The Mariposa Healthy Living Tool uses a new approach, providing a comprehensive evaluation tool and implementation guide for practitioners to incorporate health into design, redevelopment, and construction. The Tool considers comprehensive health needs in urban development with the ultimate goals of achieving higher quality social and physical environments that advance resident health, and draws on health evidence and standards. The Mariposa Healthy Living Tool focuses on health determinants related to projects and programs that can be shaped by designers and developers. The Mariposa Healthy Living Tool organizes determinants into the following dimensions, or sectors, of a healthy community:

- **Healthy Housing**
- **Sustainable and Safe Transportation**
- **Environmental Stewardship**
- **Social Cohesion**
- **Public Infrastructure (services and amenities)**
- **Healthy Economy**

User Guide

The Mariposa Healthy Living Tool was created to be used by developers, urban designers, architects, design professionals in all disciplines, practitioners, service providers, government organizations, and community groups to guide planning and redevelopment decisions and actions to improve health and health determinants. The Tool is intended to promote cross-sector partnerships, to use a participatory approach that values resident and stakeholder experience, and to provide the best available evidence to decision-makers. The Tool should be used in a timely manner with the best evidence available to effectively inform redevelopment decisions.

The Tool was created to be used for Mariposa redevelopment, and includes objectives, indicators, and strategies relevant to this target community. The

Tool should not be considered an exhaustive resource; however it was created to be used as a template that could be customized for use in other redevelopment efforts. If considered for use elsewhere, it should be customized before application to reflect the influences and characteristics of the particular community*.

The Mariposa Healthy Living Tool can be used in five steps to inform redevelopment decisions. This process is designed to be rigorous and evidence-based, to ensure strategies are responsive to identified needs, and to be tuned to the pace and decision-making process inherent in redevelopment and neighborhood revitalization. The Tool draws from the health impact assessment framework as described by the Center for Disease Control (CDC) and World Health Organization (WHO) and recent practice

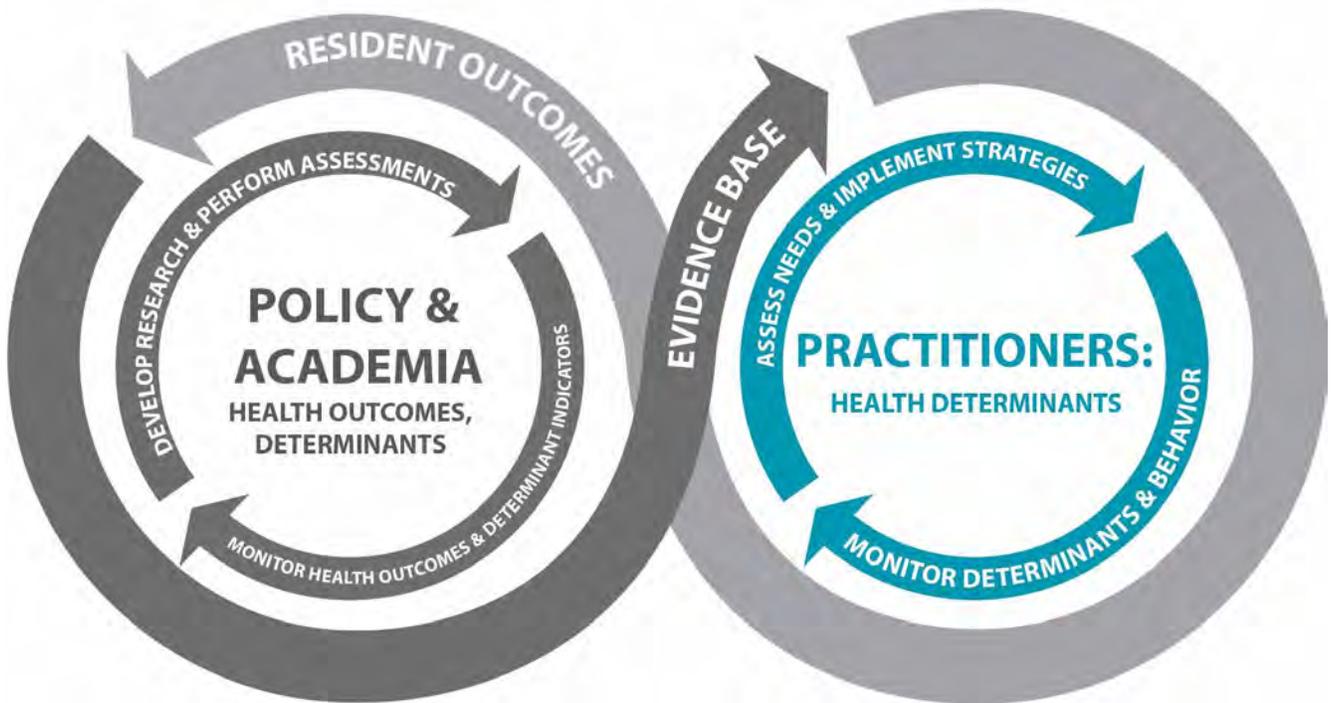


Fig. 5 Cross sector partnerships, review, and monitoring.

standards,⁵³ as well as the methodology described by The Roadmaps to Health Action Center, which is geared towards community activism and engagement⁵⁴. Using the Mariposa Healthy Living Tool, however, does not constitute completing a Health Impact Assessment.

⁵³ The Minimum Elements and Practice Standards for Health Impact Assessment, Version 2

⁵⁴ Based at the University of Wisconsin Population Health Institute, and available through the Healthy County program.

*MARIPOSA HEALTHY LIVING TOOL CUSTOMIZATION

The Denver Housing Authority respectfully requests that if you are planning on applying the Mariposa Healthy Living Tool to a development plan or project, that you notify us of your intention to do so. As we share the Mariposa Healthy Living Tool with a range of interested parties, we would like to track how it is being used.



“Application” of the Mariposa Healthy Living Tool means the evaluation of population health and a particular development project against our development targets and making a general assessment of the “healthfulness” of a plan/project. We do not consider the use of the indicator data, research citations, standards, or development targets as reference material in your work or in developing evaluation materials to be an “application.”

If you do plan to apply the tool, we would like to be notified. In addition, we would also appreciate receiving materials related to your application – e.g., a description of the project you are evaluating or a completed application. Please note that receipt of any such documents is not the equivalent of an endorsement of your evaluation.

Endorsement Disclaimer: The Mariposa Healthy Living Tool represents a vision for healthy redevelopment at Mariposa that will positively influence the La Alma / Lincoln Park neighborhood. It provides a framework for practitioners to understand positive and negative health impacts of redevelopment, with the goal of recommending strategies to improve health determinants. While the Tool is intended to be useful for other practitioners, use of the Mariposa Healthy Living Tool alone does not constitute an endorsement of that particular redevelopment project.

Using the Mariposa Healthy Living Tool

1. Assess Needs and Resources:

Define the resident population or community of focus. Identify the decision-makers, an assessment team, technical resources, and a community engagement strategy. Using indicators from the Tool, conduct a baseline assessment of needs and resources. Consider conducting a Health Impact Assessment if there is a specific plan/ policy target.

Use the indicators as a guide to determine the status of health determinants in the community and to map existing assets and resources. Seek this information from residents and community stakeholders as well. *Use the Report Card Template to create your baseline, and customize it for your community.*

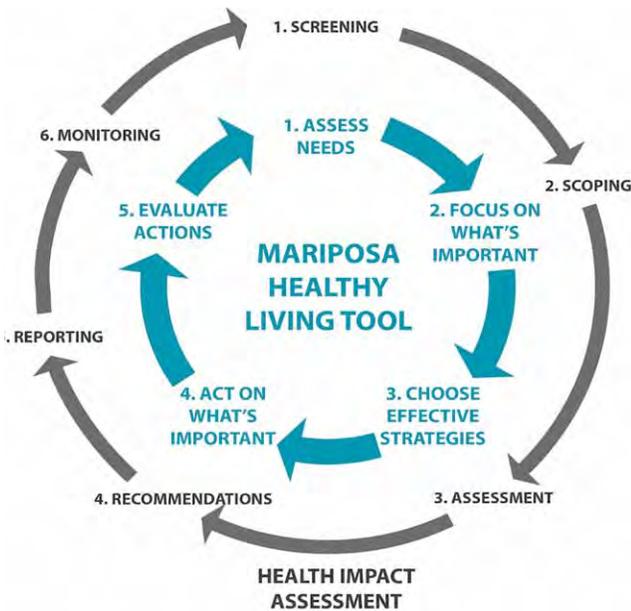


Fig. 6 Relationship between Mariposa Healthy Living Tool and Health Impact Assessment

2. Focus on What’s Important:

Based on indicator data, status of health determinants, and map of assets and resources, identify priority issues for the community of focus. Determine areas of concern not yet addressed, and gather qualitative data on the lived experience of residents and community stakeholders through outreach and engagement. Consider which health determinants and characteristics are controlled by decision-makers and can be influenced by the redevelopment project.

Using the baseline indicator data, develop and set targets for how you want those indicators to evolve over time (e.g. decrease, increase) to reflect the desired future of the community. Customize the targets to the specific community if appropriate. Assess areas of concern not yet addressed, and gather feedback from advisory groups, community members and residents, and stakeholders to help inform priorities. Focusing on a single “message” or priority at a time leads to higher levels of success rather than spreading resources across a range of action items.

3. Choose Effective Strategies:

In order to influence the baseline indicators and improve health and health determinants, use the Tool to choose strategies that are relevant to the priority issues and targets. Refer to the evidence base and standards to learn more about whether the particular strategy will be applicable or appropriate to the redevelopment project. To be successful, prioritize a very limited number of strategies.

Report and recommend strategies to promote positive health effects or reduce adverse effects to the decision-makers and stakeholders for consideration.

4. Act on What's Important:

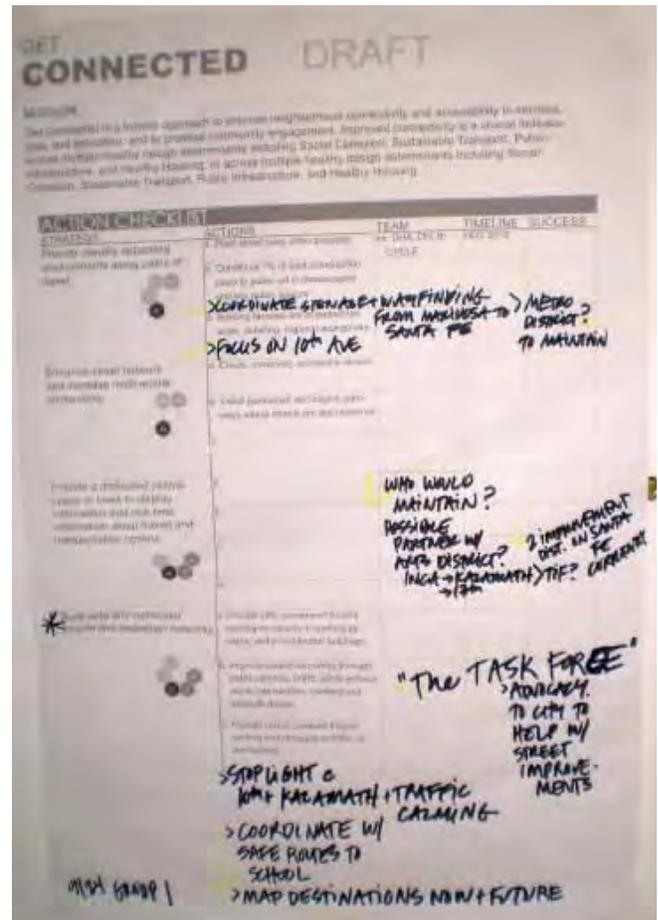
With buy-in from decision-makers and end-users, use the priority strategies to influence change in the redevelopment. Related strategies can be bundled together into campaigns. To create a road map for action, structure the campaigns in a series of steps to build measurable success, improve participation, and foster interest. Use a layers of engagement framework to be clear about who can be involved and how. *Use the Campaign Checklist template from the Mariposa Healthy Living Toolkit to document your campaigns, responsible parties, and timeframes for action.*



5. Evaluate Actions:

Monitor the progress of the redevelopment over time, tracking which recommendations and strategies are implemented. See “Measuring Progress” below for more information and guidance on monitoring. Evaluate the effect of the Tool on redevelopment decisions, and track resident health determinants using the indicators identified in step one to measure progress. Progress on these indicators can also be measured through the use of surveys or validation studies to understand the impact of strategies on resident behavior.

Guidance for indicator tracking and validation studies is available in the Mariposa Healthy Living Toolkit. Periodically, the strategies should be reassessed to identify whether adjustments in implementation or design are needed to better respond to resident experiences and any changing needs. Priority issues can then be readjusted as needed with this process. *Use the Report Card Template to track progress and indicators.*



September 2012 Mariposa Healthy Living Tool Advisory Panel Workshops, Credit: Perspective-3



MARIPOSA HEALTHY LIVING TOOLKIT

HEALTHY HOUSING

SUSTAINABLE, SAFE TRANSPORTATION

ENVIRONMENTAL STEWARDSHIP

SOCIAL COHESION

PUBLIC INFRASTRUCTURE

HEALTHY ECONOMY



INDICATORS



STRATEGIES



RESOURCES

The Toolkit includes six sections, or dimensions of a healthy community. Each contains objectives and rationale related to health outcomes, recommended indicators and strategies, and referenced resources for additional information. The Toolkit also includes a template Report Card for tracking indicators, a template Campaign Checklist, to organize action and track progress, and a list of relevant organizations and potential partners.

CAMPAIGN CHECKLIST

CAMPAIGN CHECKLIST TEMPLATE

STRATEGY	ACTIONS	PARTNERS	GOAL	STATUS
Improve access to and provide safe pedestrian routes to health care, providers, and counselors.	a. Improve access, safe pedestrian routes, and transportation to Denver Health. Coordinate a free shuttle to Denver Health.	DHA Resident Community Services (RCS); Denver Health	2014	✓ See "Success Stories," page 49
	b.			

REPORT CARD TEMPLATE

	INDICATOR	RATIONALE	DATA SOURCE (2009/2012)	GEOGRAPHIC SCOPE	CAVEATS & LIMITATIONS
HOUSING	PERCENT OF POPULATION LIVING BELOW POVERTY LEVEL	Poverty limits access to important health-enabling resources, including proper nutrition, good medical care, stable health insurance, and favorable housing ¹¹ .	Census 2000/ ACS 2006-2010	Auraria - Lincoln Park statistical area	The data sourced utilized aggregate the poverty rate for the Auraria and Lincoln Park neighborhoods. Because it is an institutional campus, Auraria has a very low number of residents which may alter the indicator results.
	PERCENT OF HOUSEHOLD INCOME SPENT ON HOUSING	This item can make be the largest expenditures in a household budget, effecting the amount of money available for health related costs ¹² .	Census 2000/ Census 2012	Census block group 19.01.2	
	HOUSING INDOOR ENVIRONMENT (AIR QUALITY, TEMPERATURE, HUMIDITY)	Homes that have inadequate heating or ventilation, can lead to the growth of mold, and dust mites, leading to asthma and respiratory allergies ¹³ .		Site/Building monitoring	Currently, baseline and monitoring data is not available for this indicator. The indicator relies on building evaluation.
TRANSPORTATION	AVERAGE TRANSIT COMMUTE TIME IN MINUTES	Reducing time spent on public transit can help incentivize transit as an alternative to driving. Residents dependent on transit that live in areas that experience higher than average commute times have less time available for physical and leisure activities that promote health and social well-being ¹⁴ .	n/a/ACS estimate	Auraria Lincoln Park statistical area	As is the case with all surveys, statistics from sample surveys are subject to sampling and non-sampling error.
	COST OF TRANSPORTATION AND HOUSING AS % OF AVERAGE INCOME	These two items make up the largest expenditures in a household budget; including transpo costs is more reflective of actual cost of living than just housing costs ¹⁵ .	H-T INDEX 2010/2012, derived from ACS and other datasets	Census block group 19.01.2	H-T Affordability Index methodology uses a model to estimate three dependant variables from independent variables. For the ACS housing cost data, renters paying with vouchers may be excluded.
	NUMBER OF TRAFFIC INJURIES/ COLLISIONS/ FATALITIES	This is an indicator of the safety risk of the street network for road users, including pedestrians, cyclists, drivers and passengers. Traffic collisions involving motor vehicles are one of the leading causes of preventable injury in the nation ¹⁶ .	Denver Police 2009/2012	Auraria - Lincoln Park statistical area	This data is currently being collected from the Denver Police Department.



Why is this a health determinant? Adverse housing environments can be substandard, overcrowded, or undesirably located; high costs may leave fewer resources for food, transportation, health care ¹⁻⁴. Homeownership positively impacts social cohesion and civic participation ⁵.

Desired objectives: Provide a range of housing options: size, tenure, affordability; protect from involuntary displacement; decrease concentrated poverty; ensure access to healthy, quality housing and home environment.



HEALTHY HOUSING INDICATORS

-  Percent of population living below poverty level
-  Housing supply and options Index and match of need
-  Percent of household income spent on housing and transportation
-  Housing health & safety



HEALTHY HOUSING STRATEGIES

-  Support a housing “ladder” in the neighborhood through educational and support programs and by increasing the available range of housing types and affordability levels. Support residents moving from deeply subsidized to middle income housing to homeownership ^a.
-  Install a ventilation system for the dwelling unit capable of providing fresh air per ASHRAE requirements to ensure indoor air quality ^b.
-  Construct energy efficient housing to reduce utility costs and to improve outdoor air quality ^c.
-  Include casual, everyday opportunities for physical activity in indoor spaces as well as in the functionality of commercial workplaces and residential buildings ^{6-7, d}.
-  Implement and enforce a no smoking policy within buildings and 25 feet around all residential buildings ^e.
-  Provide interior daylighting in 90% of common areas and 75% of all areas ^f.
-  Provide access to views of nature in 90% of common areas and 75% of all areas ^f.
-  Within multi-family and mixed-use buildings, provide visually appealing environments along hallways and paths of travel ^g.
-  Design a minimum of 15% of the dwelling units (no fewer than one) in accordance with ICC /ANSI A117.1, Type A, Fully Accessible guidelines ^h.

(#) - See page 108 for reference
 (x) - See resources opposing page

 Indicates strategies linked to health evidence and academic research.



HEALTHY HOUSING RESOURCES

- a. **LEED ND - NPDC4 - Mixed Income Diverse Communities:** To promote socially equitable and engaging communities by enabling residents from a wide range of economic levels, household sizes, and age groups to live in a community.
- b. **LEED ND- GIBc2: Building Energy Efficiency** - To encourage the design and construction of energy-efficient buildings that reduce air, water, land pollution and adverse environmental effects from energy production and consumption.
- c. **Enterprise Green Communities Criteria 5.1 -5.8 Energy Efficiency:** Improvements in building energy performance result in utility cost savings from more efficient heating, cooling, hot water, lights and appliances, which improves residents' comfort and lowers operating costs.
- d. **NYC Active Design Guidelines - 2.1 Land Use Mix** - When planning urban-scale developments, provide for a mix of uses—for example, residences, offices, schools, retail stores, cultural and community spaces, and recreational facilities.
- e. **Enterprise Green Communities - Criteria 7.16 Smoke Free Building:** Implement and enforce a no-smoking policy in all common and individual living areas, and with a 25-foot perimeter around the exterior of all residential projects. The lease language must prohibit smoking in these locations and specify that it is a violation of the lease to smoke and the restriction applies to all owners, tenants, guests, and service-persons.
- f. **LEED NC- EQc8.1-8.2: Daylight and Views** - To provide building occupants with a connection between indoor spaces and the outdoors through the introduction of daylight and views into the regularly occupied areas of the building.
- g. **NYC Active Design Guidelines 2.9 - Designing Pedestrian Pathways:** Create or orient paths and sidewalks toward interesting views. Research indicates that the provision of attractive open views from a path encourages increased walking.
- h. **Enterprise Green Communities - Criteria 1.2 Universal Design:** Design a minimum of 15% of the dwelling units (no fewer than one) in accordance with ICC /ANSI A117.1, Type A, Fully Accessible guidelines, **LEED ND NPDC11 - Visibility and Universal Design.**



Why is this a health determinant? Quality, safe pedestrian and bicycle environments support an increase in physical activity with benefits including the prevention of obesity, diabetes, and heart disease as well as stress reduction and mental health improvement ¹⁸⁻²¹.

Desired objectives: Reduce VMT; provide accessible, affordable public transportation; create safe, quality environments for walking and biking.



SUSTAINABLE, SAFE TRANSPORTATION INDICATORS

-  Transportation mode split
-  Average transit commute time
-  Cost of transportation and housing as a percentage of average income
-  Number of (pedestrian, bicycle) traffic injuries/ collisions/ fatalities



SUSTAINABLE, SAFE TRANSPORTATION STRATEGIES

-  Improve the pedestrian infrastructure and environment, for all ages and abilities ^{22-25, a}.
-  Implement traffic calming measures as part of street design to address areas of conflict ^{26, b}.
-  Consider ongoing tracking of pedestrian and bicycle counts and accident reporting (Use the Pedestrian Environmental Quality Index (PEQI) or other pedestrian audit tools) ^c.
-  Enhance the bicycle network and infrastructure and improve cyclist safety, and promote bicycle sharing within the neighborhood ^{27-28, d}.
-  Prioritize new development and housing close to high quality public transportation options and in locations with walkable amenities and services ^{29, e}.
-  Enhance the street network and increase multi-modal street connectivity ^{30, a, f}.
-  Provide transit facilities that are safe and close to housing and services, amenities, and destinations ^g.
-  Provide “last mile” options to get from transit to destinations ^h.
-  Provide no-cost or reduced cost shuttles between worksites, homes, health care facilities, and regional public transit ⁱ.
-  Promote carshare/carpooling within neighborhoods ^{h, j}.
-  Implement a Transportation Demand Management (TDM) program. Consider funding a transit pass program, and subsidizing free or discounted passes for income-qualified households ^{h, j}.

(#) - See page 108 for reference
 (x) - See resources opposing page

 Indicates strategies linked to health evidence and academic research.



SUSTAINABLE, SAFE TRANSPORTATION RESOURCES

- a. **Enterprise Green Communities Criteria 5.1 -5.8 Energy Efficiency:** Improvements in building energy performance result in utility cost savings from more efficient heating, cooling, hot water, lights and appliances, which improves residents' comfort and lowers operating costs.
- b. **NYC Active Design Guidelines - 2.8 Traffic Calming** -Promote walking and improve the overall pedestrian experience through traffic calming measures. Slowing traffic helps to maintain the human scale—and pace—of city streets.
- c. **Pedestrian Environmental Quality Index** draws on published research and work from numerous cities to assess how the physical environment impacts whether people walk in a neighborhood. <http://www.sfphes.org/elements/24-elements/tools/106-pedestrian-environmental-quality-index>
- d. **LEED ND- SSLc4 Bicycle Network and Storage Requirements:** To promote bicycling and transportation efficiency, including reduced vehicle miles traveled (VMT). To support public health by encouraging utilitarian and recreational physical activity.
- e. **LEED ND- SSLc3 - Locations with Reduced Automobile Dependence:** To encourage development in locations shown to have multimodal transportation choices or otherwise reduced motor vehicle use, thereby reducing greenhouse gas emissions, air pollution, and other adverse environmental and public health effects associated with motor vehicle use.
- f. **LEED ND- NPDc1 - Walkable Streets:** To promote transportation efficiency, including reduced VMT. To promote walking by providing safe, appealing, and comfortable street environments that support public health by reducing pedestrian injuries and encouraging physical activity.
- g. **LEED ND- NPDc7 - Transit Facilities:** To encourage transit use and reduce driving by providing safe, convenient, and comfortable transit waiting areas and safe and secure bicycle storage facilities for transit users.
- h. **LEED ND- NPDc5 - Reduced Parking Footprint:** To design parking to increase the pedestrian orientation of projects and minimize the adverse environmental effects of parking facilities.
- i. **LEED ND- NPDc8 - Transportation Demand Management:** To reduce energy consumption, pollution from motor vehicles, and adverse health effects by encouraging multi modal travel.
- j. **Victoria Transport Policy Institute. 2011. Online TDM Encyclopedia.** Available at: <http://www.vtpi.org/tdm/>.



Why is this a health determinant? Access to open space and natural areas with outreach and education can increase the frequency of physical activity by 48%⁸. Exposure to fine particulate air pollution is associated with cardiovascular risk and increased risk of death⁹⁻¹⁰. Long term exposure to noise can adversely affect sleep, school and work performance¹¹.

Desired objectives: Restore, preserve, and enhance natural areas and open space; preserve clean air quality and water quality; maintain safe levels of community noise.



ENVIRONMENTAL STEWARDSHIP INDICATORS

-  Open space/ nearby nature within neighborhood
-  Air quality - particulate matter
-  Vehicle Miles Traveled (VMT) per capita per day
-  Average daytime and nighttime outdoor noise levels



ENVIRONMENTAL STEWARDSHIP STRATEGIES

-  Provide publicly accessible outdoor open space and coordinate maintenance and programming^{12,a}.
-  Provide, improve, and if possible maintain natural areas, vegetation, and tree canopy to improve air quality issues and mitigate crime^{13-15, b}.
-  Re-designate truck routes away from residential and sensitive areas.
-  Use dust control measures and emissions technologies for construction equipment to improve air quality during demolition and construction^c.
-  Mitigate or remediate any contaminated sites or pollution point sources^d.
-  Design units and buildings exposed to high noise levels to mitigate noise using sound attenuation in the building, and with interior courtyards and patios that open into acoustically protected and shielded areas^{16,e}.
-  Provide comfortable, healthy indoor environments with good air quality, access to daylight, and views to nature^{17, f}.
-  Reduce vehicle miles traveled (VMT) to improve air quality^{17, g}.
-  Design and build the project to a density of at least 15 dwelling units per acre to support mass transit^h.

(#) - See page 108 for reference
 (x) - See resources opposing page

 Indicates strategies linked to health evidence and academic research.



ENVIRONMENTAL STEWARDSHIP RESOURCES

- a. **Enterprise Green Communities-Criteria 2.6-7 Preservation of and Access to Open Space:** Access to open space and natural resources improves quality of life and provides the opportunity to better understand the importance of the natural environment.
- b. **SITES: Credit 4.7** - Provide outdoor spaces for mental restoration and **SITES Credit 4.8** -Provide outdoor spaces for social interaction.
- c. **SITES: Credit 4.4 - Minimize Soil Disturbance in Design and Construction:** Limit disturbance of healthy soil to protect soil horizons and maintain soil structure, existing hydrology, organic matter, and nutrients stored in soils.
- d. **SITES: Credit 7.3 Restore Soils Disturbed by Previous Development:** Restore soil function in areas of previously disturbed topsoils and subsoils to rebuild the site's ability to support healthy plants, biological communities, water storage, and infiltration.
- e. **SITES: Credit 6.7 - Provide Views of Vegetation and Quiet Outdoor Spaces for Mental Restoration:** Develop and implement a plan to provide views of vegetation and access to quiet outdoor space(s) on site to optimize mental health benefits of site users.
- f. **Enterprise Green Communities: Criteria #7 - Healthy Living Environment** - Optimal ventilation improves indoor air quality and the flow of fresh air throughout the home, contributing to a healthier living environment.
- g. **Enterprise Green Communities: Criteria #2 Location and Neighborhood Fabric** - Locating a project within an existing neighborhood and in close proximity to infrastructure encourages more resource-efficient development of land, reduces development costs, conserves energy, and adds to the vitality of the overall community.
- h. **Enterprise Green Communities-Criteria 2.4 Compact Development:** Design and build the project to the density required for the location type.



Why is this a health determinant? Neighborhood crime strongly influences a willingness to allow children to actively commute (e.g. walk or bike)³¹⁻³³. Group membership and political participation is associated with improved health outcomes³⁴⁻³⁵.

Desired objectives: Promote a socially cohesive community; support a diverse population; promote a safe and secure community; support community gathering and spaces for interaction; support mental health.

SOCIAL COHESION INDICATORS

- Proportion of population within 1/2 mile to community gathering spaces
- Residential mobility (% residents living at their current residence for less than 1 year)
- Voting Power: Percentage of population of eligible adults who voted
- Perceived safety
- Violent and property crime rate per 1,000 people

SOCIAL COHESION STRATEGIES

- Provide affordable space for nonprofit providers within community^a.
- Provide translation services at meetings intended for community input to encourage diverse participation^b.
- Actively engage with community groups and organizations to assure equitable participation in all planning processes^c.
- Provide meeting areas and community spaces for voting, community meetings, after school programming, mentoring, or other social programs^{36, d}.
- Apply Crime Prevention through Environmental Design (CPTED) principles in public realm and infrastructure design and construction, building design and construction, and infrastructure design and construction^{37-38, e}.
- Support programs and organizations supporting voter registration and civic engagement^f.
- Address barriers to eligibility, provide information about, and address affordability of services and resources related to housing, food, and employment services^{39, g}.
- Encourage the development of neighborhood groups that are involved and active in community issues^h.
- Track and share crime rate and statistics to make information accessible to communityⁱ.

(#) - See page 108 for reference
(x) - See resources opposing page

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SOCIAL COHESION RESOURCES

- a. **Social Support Measurement and Intervention.** Cohen S, Underwood LG, Gottlieb BH. 2000. Oxford University Press. New York.
- b. **The Evidence Base for Cultural and Linguistic Competency in Health Care,** T. D. Goode, M. C. Dunne, and S. M. Bronheim, The Commonwealth Fund, October 2006
- c. **LEED ND- NPDc12: Community Outreach and Involvement:** To encourage responsiveness to community needs by involving the people who live or work in the community in project design and planning and in decisions about how it should be improved or how it should change over time.
- d. **Social Support Measurement and Intervention.** Cohen S, Underwood LG, Gottlieb BH. 2000. Oxford University Press. New York.
- e. **Effectiveness of crime prevention through environmental design (CPTED) in reducing robberies.** Casteel C, Peek-Asa C. 2000. Am J Prev Med 18:99-115.
- f. **A multilevel analysis of key forms of community- and individual- level social capital as predictors of self-rated health in the United States.** Kim D, Kawachi I. 2006. Journal of Urban Health 83(5):813-826.
- g. **Case Management Society of America. (2010).** (CMSA) Standards of Practice for Case Management. Retrieved April 18, 2010, <http://www.cmsa.org/portals/0/pdf/memberonly/StandardsOfPractice.pdf>
- h. **Crime Prevention Research Review No. 3: Does Neighborhood Watch Reduce Crime?** Holloway, Katy, Trevor Bennett, and David P. Farrington. Washington, D.C.: U.S. Department of Justice Office of Community Oriented Policing Services, 2008
- i. **The Piton Foundation - Community Facts:** a tool developed to make data about the health and well-being of Denver-area families and communities widely accessible. Community Facts provides detailed information about geographical areas related to demographics, education, housing, economics, health, safety, and more. <http://www.piton.org/CommunityFacts>



Why is this a health determinant? Academic performance is related to educational achievement, predicting health outcomes and the effects of education on lifetime earnings⁴⁰. Access to healthy food choices and neighborhood amenities is directly correlated to obesity and diabetes rates⁴¹⁻⁴³.

Desired objectives: Promote access to, and affordability of quality public infrastructure: education, child care, public health and recreation facilities, daily goods and services; promote affordable and high-quality food access.



PUBLIC INFRASTRUCTURE INDICATORS

-  Neighborhood Completeness Indicator for public services and retail
-  School performance within neighborhood (include graduation rate as a complementary indicator)
-  % of population within 1/2 mile of retail food, a full service supermarket or grocery store, farmers market, or Community Supported Agriculture drop-off site
-  Public health facility and recreation facility access within 1/2 mile and by transit



PUBLIC INFRASTRUCTURE STRATEGIES

-  Contribute a percentage of total construction costs to creation of public art, public performance on site, or contribute to public arts fund.
-  Improve the pedestrian-level design of buildings to promote and reinforce cultural vitality^a.
-  Improve access to healthcare facilities and sources. Address access with a Transportation Management Plan and by encouraging transit density near hospitals and health facilities^b.
-  Encourage grocery stores and corner stores within walking distance to provide a minimum of 10% shelf space to fresh produce⁴⁴.
-  Promote small scale, distributed healthy food choices, including new fresh foods markets and healthy restaurants^{44, c}.
-  Require food vendors to accept food stamps/Electronic Benefits Transfer (EBT) and WIC vouchers (Women, Infants and Children)^d.
-  Promote transit density near hospitals and other health facilities, to minimize public parking and use of cars^e.
-  Coordinate with local school districts, parks and recreation facilities, and non-profits to maximize youth programming opportunities during non-school hours^f.
-  Provide child care and early education facilities in the new development or support development of facilities in the neighborhood^{h, i}.
-  Support community partnerships that promote continuing education, high quality education and life-long learning^{a, g}.
-  Improve access to and provide safe pedestrian routes to educational facilities and institutions, including neighborhood schools^{a, h}.

(#) - See page 108 for reference
 (x) - See resources opposing page

 Indicates strategies linked to health evidence and academic research.



SOCIAL COHESION RESOURCES

- a. LEED ND- NPDC1 - Walkable Streets:** To promote transportation efficiency, including reduced VMT. To promote walking by providing safe, appealing, and comfortable street environments that support public health by reducing pedestrian injuries and encouraging physical activity.
- b. Enterprise Green Communities Criteria 2.5 Proximity to Services:** Locate the project within designated distances from community support facilities.
- c. LEED ND NPDC13 - Local Food Production:** To promote community-based food production, improve nutrition through increased access to fresh produce, and support local economic development that increases the economic value and production of farmlands and community gardens.
- d. Enterprise Green Communities Criteria 2.12 Access to Fresh, Local Foods:** Access to fresh produce offers healthy food options for residents.
- e. LEED ND - SSLc3 - Locations with Reduced Automobile Dependence:** To encourage development in locations shown to have multimodal transportation choices or otherwise reduced motor vehicle use, thereby reducing greenhouse gas emissions, air pollution, and other adverse environmental and public health effects associated with motor vehicle use.
- f. LEED ND NPDC10 - Access to Recreation Facilities:** To improve physical and mental health and social capital by providing a variety of recreational facilities close to work and home to facilitate physical activity and social networking.
- g. Center on School, Family, and Community Partnerships.** John Hopkins University. <http://www.csos.jhu.edu/P2000/center.htm>
- h. LEED ND NPDC15 - Neighborhood Schools:** To promote community interaction and engagement by integrating schools into the neighborhood. To support students' health by encouraging walking and bicycling to school.
- i. Including Child Care in Local Planning.** Child Care Law Center. 2005. <http://www.ccc-oc.org/Resource/Regulations/Including%20Child%20Care%20in%20Local%20Planning.pdf>



Why is this a health determinant? Income is one of the strongest and most consistent predictors of health and disease in the public health research literature.

Desired objectives: Increase quality, healthy employment opportunities and access for residents; increase equity in income and wealth; promote entrepreneurship, locally and resident owned businesses.



HEALTHY ECONOMY INDICATORS

-  Unemployment, including by race
-  Percent of jobs paying wages equal to or greater than self sufficiency
-  Proportion of jobs available by transit, walking, or bicycle
-  Number of new businesses in area
-  Access to banks and credit unions
-  Percent of population aged 25 and above without a high school education or GED



HEALTHY ECONOMY STRATEGIES

-  Provide Green jobs training and access to Green jobs.
-  Provide and/or support job training programs, especially in sectors that provide self-sufficiency wages and good benefits ^{45-46, a}.
-  Promote the expansion/retention of neighborhood-serving, full-service financial institutions in the neighborhood ^{47, b}.
-  Provide financial literacy education and training (e.g. credit repair, first time homebuyer training) ^{48, c}.
-  Encourage financial institutions to offer Individual Development Accounts which match the savings of debt-free, income-qualified personal accounts with both federal dollars and private donations ^{49, d}.
-  Provide space under favorable terms (e.g. % of sales rent) in the project for new and relocated locally-owned or Section 3 businesses.
-  Increase the quantity and quality of start-up spaces.
-  Provide business management training programs or business support programs ^{50, e}.

(#) - See page 108 for reference
 (x) - See resources opposing page

 Indicates strategies linked to health evidence and academic research.



HEALTHY ECONOMY RESOURCES

- a. **WOW Congressional Testimony on WIA: Recommendations to Improve the Effectiveness of Job Training.** Hearing on “Workforce Investment Act: Recommendations to Improve the Effectiveness of Job Training” July 26, 2007.
- b. **National Housing Institute “When Your Bank Leaves Town: How Communities Can Fight Back”.** <http://www.nhi.org/online/issues/126/bankclosings.html>
- c. **A. Lusardi, “Household Saving Behavior: The Role of Financial Literacy, Information, and Financial Education Programs,”.** NBER Working Paper No. 13824, February 2008, and forthcoming in “Implications of Behavioral Economics for Economic Policy.”
- d. **CFED Assets and Opportunities Scorecard: Reviewing Individual Development Accounts Benefits and Costs.** http://scorecard2009.cfed.org/financial.php?page=support_ida_programs
- e. **“Local Capitalism, Civic Engagement, and Socioeconomic Well-Being.”** Tolbert, Charles M., Thomas A. Lyson, and Michael D. Irwin. 1998. *Social Forces* 77(2):401–428.



RELEVANT ORGANIZATIONS

Healthy Housing

- **The Denver Housing Authority** is a quasi-municipal corporation with a portfolio of more than 11,000 units and housing choice vouchers, providing affordable housing to more than 26,000 very low, low and middle income individuals representing more than 10,000 families. DHA has transformed public housing in Denver creating vibrant, revitalized, sustainable, transit-oriented, and mixed-income community of choice. www.denverhousing.org
- **The Denver Office of Economic Development (OED)** is committed to the preservation, rehabilitation and development of affordable housing. OED offers programs in quality affordable housing, an enhanced living environment, energy saving options, and expanded economic opportunities to benefit those with low and moderate incomes, tenants with special needs and the low-income elderly. For more information, go to www.denvergov.org/

Sustainable, Safe Transportation

- **Regional Transportation District (RTD)** offers bus, light rail, and "skyride" services within the Metro Denver area. RTD has more than 140 Local, Express, and Regional bus routes serving 10,000 bus stops, five light rail lines (and growing) providing more than 35 miles of light rail service. Go to rtd-denver.com for schedules and information.
- **Denver B-cycle** is a citywide public bike sharing system made for people taking short trips around the city. A member of Denver B-cycle can pick up a bike at any B-station and return it to that station or any other B-station when they are done riding. Memberships

can be purchased at any kiosk or online. Go to denver.bicycle.com for more information.

- **eGo CarShare** is a local non-profit car sharing organization that serves the Denver-Boulder Metro area. Their mission is to provide and promote alternatives to individual car ownership, thereby reducing the environmental and social impacts associated with motor vehicle use. Anyone can become a member and rent a car, go to carshare.org for more information.
- **Bike Denver** is Denver's bicycle advocacy organization and the leading non-profit to promote and encourage bicycling as an energy efficient, non-polluting, healthy and enjoyable transportation alternative in and around Denver. Go to bikedenver.org for more information.
- **Institute of Transportation Engineers** is an international educational and scientific association of transportation professionals who are responsible for meeting mobility and safety needs. ITE facilitates the application of technology and scientific principles to research, planning, functional design, implementation, operation, policy development and management for any mode of ground transportation. Through its products and services, ITE promotes professional development of its members, supports and encourages education, stimulates research, develops public awareness programs and serves as a conduit for the exchange of professional information. Go to <http://www.ite.org/> for more information.

Environmental Stewardship

- **The Trust for Public Land** is a national nonprofit that conserves land for people to enjoy as parks, gardens, historic sites, rural lands and other natural places. The organization works from the inner city

to the wilderness, ensuring livable communities for generations to come. For more information, go to www.tpl.org/

- **The Northwest Earth Institute** helps lead the curious and the motivated to take responsibility for Earth. NEWI offers remote learning in a variety of topics, including the following: Choices for Sustainable Living, A World of Health, Hungry for Change, Reconnecting With Earth, and many more. For more information, go to www.nwei.org
- **The City of Denver's Parks and Recreation** provides more than 200 city and mountain parks for people to enjoy year round. Denver Parks and Recreation's Parks maintains parks, greenhouses, fountains, river and trails, and more. The organization also has a focus on sustainability, especially with water conservation. For more information, go to denvergov.org/parks

Social Cohesion

- **The Denver Police Department**, in partnership with the community, the Denver Police Department endeavors to deliver high quality public safety services so all people may share a safe and healthy environment. For non-emergency help call, 720-913-2000 or go to denvergov.org/police
- **Lincoln Park Neighborhood Association (LPNA):** Denver's Registered Neighborhood Organizations (RNOs) are organizations registered with the City of Denver that are formed by residents and property owners within a neighborhood (or other defined set of boundaries) that meet regularly. The RNO for La Alma/ Lincoln Park is called Lincoln Park Neighborhood Association. RNOs receive notification of proposed zoning amendments, landmark designation applications, planning board and board of adjustment

hearings, liquor and cabaret licenses and other activities occurring in the neighborhood as stipulated in the Revised Municipal Code. For more information, go to <http://www.lincolnparkneighborhood.org/>

- **Denver Health and Hospital Authority** is a comprehensive, integrated organization providing level one care for all, regardless of ability to pay. Twenty-five percent of all Denver residents, or approximately 150,000 individuals, receive their health care at Denver Health. As Colorado's primary safety net institution, Denver Health has provided billions of dollars in uncompensated care. Denver Health is an integrated, efficient, high-quality health care system serving as a model for other safety net institutions across the nation. For more information, go to <http://denverhealth.org>

Public Infrastructure

- **The Auraria Campus** is an educational facility located in Downtown Denver. The campus houses three universities and colleges: (1) The University of Colorado Denver (UCD), (2) Metropolitan State University of Denver, (3) Community College of Denver. For more information, go to <http://www.ahec.edu/>
- **Center for Work, Education and Employment** ("CWE") assists single parents (mostly single mothers) in reaching self sufficiency. Located across Osage from Lincoln Park, the program is a three month program that participants attend five days per week, from 9AM to 4PM. For more information, go to www.cwee.org/
- **Catholic Charities Child Care Services and Head Start Services'** mission is to promote family and child development through a partnership which involves staff, families, children and the community. Their vision is to provide quality Child Care and



RELEVANT ORGANIZATIONS

early childhood programs by using developmentally appropriate practices in a safe and nurturing environment. By honoring and supporting children and their families, we wish to help them reach their highest potential. For more information, go to www.ccdenver.org

- **The Colorado Child Care Assistance Program (CDHS)**, a Division of Child Care, is the lead agency on the Colorado Child Care Assistance Program (CCCAP). The program provides child care assistance to low-income families that are working, searching for employment or are in training, and families that are enrolled in the Colorado Works Program and need child care services to support their efforts toward self-sufficiency. For more information, go to www.colorado.gov/cs
- **Emily Griffith**, which is a DPS school, is an accredited technical college founded in 1916. It is similar to community college, but offers only career and technical (not general) education. Emily Griffith uses the same course numbering system as the Colorado community colleges and all credits are transferable to community colleges. Courses are offered under nine tracks: the Apprentice Training Division; Business and Technology; Design Industries; Health Sciences, Trades and Industry, the Language Learning Center (ESL), Corporate Training, Emily Griffith High School (for those under 21), and Extended Learning (adult education/GED). EG was founded to educate and care for non-traditional students. For more information, go to www.egos-school.com
- **The Bridge Project's** mission is to provide educational opportunities for children living in Denver's public housing neighborhoods so they graduate from high school and attend college or learn a trade. For more information, go to <http://www.du.edu/bridgeproject/>
- **Boys and Girls Clubs** are places where young people come to learn, do homework, develop social skills, express themselves creatively, and participate in sports. Boys & Girls Clubs of Metro Denver also owns and operates a residential summer camp near Ward, Colorado called Gates Camp. The Clubs are staffed by full-time professionals and located in neighborhoods where they are needed most. For more information, go to <http://www.bgcmd.org/>
- **Childcare Law Center The Child Care Law Center** uses legal expertise to secure good, affordable child care for low-income families and communities. Every day, we break down barriers to child care for working parents because without it they cannot support their families. Every day, we stand up for child care providers because children need good early care and education to thrive. For more information, go to <http://www.childcarelaw.org/>
- **The Center on School, Family, and Community Partnerships's** mission is to conduct and disseminate research, programs, and policy analyses that produce new and useful knowledge and practices that help parents, educators, and members of communities work together to improve schools, strengthen families, and enhance student learning and development. For more information, go to <http://www.csos.jhu.edu/p2000/center.htm>
- **The Healthy Corner Stores Network** supports efforts to increase the availability and sales of healthy, affordable foods through small-scale stores in underserved communities. Because together, we can create better meal alternatives in our communities than just chips and soda. For more information, go to <http://www.healthycornerstores.org/about-us>

Healthy Economy

- **The Rocky Mountain MicroFinance Institute** (RMMFI) is a non-profit organization that provides learning, lending and coaching to grow Community Entrepreneurs who build businesses to advance along the pathway to self-sufficiency and self-worth. RMMFI's brand of microfinance combines affordable and approachable business support services and flexible microloans to help individuals turn a good idea into an income-generating business. For more information, go to www.rmmfi.org/
- **Mi Casa** is a leading career and business development center dedicated to advancing the success of Latino Families in Denver. Mi Casa's Career Development track focuses on high growth industries, short term job training programs that enable people to work as quickly as possible, career paths that offer strong earning potential and jobs that favor bilingual individuals. Focus industries are business and financial operations, healthcare support and construction. Within this tract, Mi Casa offers a pre-apprentice program, with a green energy focus for those interested in construction. The program, offered four times per year, trains 20 people in each class. The financial services program, offered four times per year, trains 15 people in each class. The healthcare program is still under development. CITC and Emily Griffith are training partners for Mi Casa. The Business Development tract helps Latinos start a new business or expand/sustain an existing one, specifically by helping participants develop a business plan, address specific needs, connect with funding sources, and network with other businesses. The Youth and Family Development tract empowers students to succeed and stay in school, while learning about advocacy, college,

career paths and entrepreneurial skills. The Removing Barriers to Success tract offers case management, job placement assistance, ESL, Spanish, GED, Adult Basic Education, Financial Literacy, life skills and seminars. For more information, go to micasadenver.org/

- **Denver Public Schools** For more information, go to <http://www.dpsk12.org/>
- **OED's Division of Workforce Development** runs five Work Force Centers throughout the City. The centers assist those seeking jobs in developing career goals, assessing skills, identifying resources (education and training opportunities, and funding assistance) to close knowledge gaps, identifying job opportunities, and applying for job opportunities. Workforce Center Services are free to the public. The main offering for adults is a two week job readiness program that covers basic computer skills, resume writing, interviewing, networking, professional goal setting etc. The Workforce Centers also offer job placement programs for youth ages 14 through 21, including Youth training Academies run in partnership with DHA. Mariposa lies between two work force centers (the Westside Center at 13th and Federal in the Denver Human Services building, and the Speer Workforce Center on 14th and Speer above King Soopers. The Westside Center serves approximately 22,000 people per month, and the Speer Center serves about 11,000 people per month. The Culinary Youth Trades Academy is at South Lincoln (at 1401 Mariposa). Workforce has a TAG Program that focuses on refugees. Certain youth and adult programs have income and other restrictions tied to funding sources. For more information, go to www.denvergov.org/

REPORT CARD TEMPLATE

	INDICATOR	RATIONALE
HEALTHY HOUSING	PERCENT OF POPULATION LIVING BELOW POVERTY LEVEL	Poverty limits access to important health-enabling resources, including proper nutrition, good medical care, stable health insurance, and favorable housing ⁵¹ .
	PERCENT OF HOUSEHOLD INCOME SPENT ON HOUSING	This item can make be the largest expenditures in a household budget, effecting the amount of money available for health related costs ⁵² .
	HOUSING INDOOR ENVIRONMENT (AIR QUALITY, TEMPERATURE, HUMIDITY)	Homes that have inadequate heating or ventilation, can lead to the growth of mold, and dust mites, leading to asthma and respiratory allergies ⁵³ .
SUSTAINABLE, SAFE TRANSPORTATION	AVERAGE TRANSIT COMMUTE TIME IN MINUTES	Reducing time spent on public transit can help incentivize transit as an alternative to driving. Residents dependent on transit that live in areas that experience higher than average commute times have less time available for physical and leisure activities that promote health and social well-being ⁵⁴ .
	COST OF TRANSPORTATION AND HOUSING AS % OF AVERAGE INCOME	These two items make up the largest expenditures in a household budget; including transpo costs is more reflective of actual cost of living than just housing costs ⁵⁵ .
	NUMBER OF TRAFFIC INJURIES/ COLLISIONS/ FATALITIES	This is an indicator of the safety risk of the street network for road users, including pedestrians, cyclists, drivers and passengers. Traffic collisions involving motor vehicles are one of the leading causes of preventable injury in the nation ⁵⁶ .
ENVIRONMENTAL STEWARDSHIP	PERCENT OF RESIDENTS WITH ACCESS TO OPEN SPACE/ NATURE WITHIN NEIGHBORHOOD	Parks and natural open space areas promote physical activity and social interaction. Areas with natural vegetation also have direct effects on physical and mental health ⁵⁷ .
	AIR QUALITY - PARTICULATE MATTER	Increased exposure to PM2.5 is associated with detrimental cardiovascular outcomes, including higher blood pressure and heart disease ⁵⁸ .
	VMT PER CAPITA PER DAY	Traffic related noise and air pollution is associated with cardiovascular and respiratory diseases, including asthma. Traffic also increases chances of injury and fatalities from collisions ⁵⁹ .

DATA SOURCE (2009/2012)	GEOGRAPHIC SCOPE	MONITORING PERIOD	CAVEATS & LIMITATIONS
Census 2000/ ACS 2006-2010	Auraria - Lincoln Park statistical area	3 years	The data sourced utilized aggregate the poverty rate for the Auraria and Lincoln Park neighborhoods. Because it is an institutional campus, Auraria has a very low number of residents which may alter the indicator results.
Census 2000/ Census 2012	Census block group 19.01.2	1 year	
	Site/Building monitoring	Post-construction and 1 year after occupancy	Currently, baseline and monitoring data is not available for this indicator. The indicator relies on building evaluation.
n/a/ACS estimate	Auraria Lincoln Park statistical area	3 years	As is the case with all surveys, statistics from sample surveys are subject to sampling and non-sampling error.
H+T INDEX 2010/2012, derived from ACS and other datasets	Census block group 19.01.2	1 year	H+T Affordability Index methodology uses a model to estimate three dependant variables from independent variables. For the ACS housing cost data, renters paying with vouchers may be excluded.
Denver Police 2009/2012	Auraria - Lincoln Park statistical area		This data is currently being collected from the Denver Police Department.
Mithun Map Analysis 2009 /2012 (based on SITES)	1/2 mile radius from Mariposa site	1 year	The quality and utility of recreational spaces is influenced by many other factors beyond land area, including the range of facilities, like playgrounds, sports fields/courts, swimming pools, bathrooms, etc., and the safety and cleanliness of the space.
http://http://apcd.state.co.us	Monitoring station located at 2105 Broadway and 14th at Albion St., Denver	1 year	
Census 2000 / n/a	Auraria-Lincoln Park statistical area/baseline and Census block group 19.01.2	1 year	This indicator does not currently capture socio-demographic differences in daily distance travelled in autos for residents. While DRCOG provides modeled VMT estimates, this data was not used for the indicator because data has not been validated.

REPORT CARD TEMPLATE

	INDICATOR	RATIONALE
SOCIAL COHESION	PROPORTION OF POPULATION WITHIN 1/2 MILE TO COMMUNITY GATHERING SPACES	Social networks and social integration are beneficial to health, including buffering from negative impacts of stress and providing better access to health services and programs ⁶⁰ .
	TOTAL CRIME RATE PER 1,000 PEOPLE	Concerns about crime strongly influence walking rates and outdoor physical activity participation. Witnessing crime also increases stress, emotional, and behavioral problems ⁶¹ .
	PERCENTAGE OF ELIGIBLE ADULTS WHO VOTED	Public participation in policy and political process can have diverse impacts on the social and environmental conditions that affect health ⁶² .
	PERCENTAGE OF POPULATION WHO FEEL SAFE ALONE AT NIGHT IN NEIGHBORHOOD	Residents' feelings about safety can be a disincentive to engage in physical activity outdoors and to engage in social interaction, and a source of chronic stress ⁶³ .
PUBLIC INFRASTRUCTURE	PROPORTION OF POPULATION WITHIN 1/2 MILE KEY RETAIL	Being within walking distance of neighborhood goods and services promotes physical activity, reduces vehicle trips and miles traveled, and increases neighborhood cohesion and safety ⁶⁴ .
	NEIGHBORHOOD SCHOOL PERFORMANCE	Academic performance is related to educational achievement, which both predicts positive health outcomes directly as well as the effects of education on lifetime earnings ⁶⁵ .
	# OF HEALTHY FOOD OUTLETS WITHIN 1/2 MILE OF NEIGHBORHOOD	Access to healthy food choices is directly correlated to obesity and diabetes rates, which occur in higher rates among people living in low-income communities with worse food environments ⁶⁶ .
HEALTHY ECONOMY	UNEMPLOYMENT RATE	Unemployment has been consistently linked to poor health, and has been associated with higher mortality rates, especially from heart disease and suicide ⁶⁷ .
	AVERAGE ANNUAL INCOME COMPARED TO THE SELF-SUFFICIENCY WAGE	The relationship between income and health is mediated through nutrition, employment conditions, parenting resources, leisure and recreation, housing adequacy, and neighborhood environmental quality, community violence, and stress ⁶⁸ .
	NUMBER OF BUSINESSES AND NUMBER OF JOBS IN NEIGHBORHOOD	For working age adults, employment is a fundamental resource for good health. Active commutes, via walking or bicycling, help meet requirements for physical activity, and reduce the environmental consequences of driving ⁶⁹ .

DATA SOURCE (2009/2012)	GEOGRAPHIC SCOPE	MONITORING PERIOD	CAVEATS & LIMITATIONS
Neighborhood Survey 2009/2012	1/2 mile radius from Mariposa site	1 year	The number of community centers is one among many possible indicators of social cohesion within a neighborhood. Taken alone, the existence of community centers does not necessarily mean that a neighborhood is socially cohesive, and vice versa.
Denver Police Dept 2005/2012	Auraria - Lincoln Park statistical area	1 year	This indicator data includes crimes reported to the Denver Police Department. Reports are dynamic and numbers may vary. Excludes runaways, traffic offenses, unfounded reports and non-criminal activity.
	Neighborhood Surveys	4 years	A voting rate data source was not available for this report. Many interrelated factors impact whether individuals register to vote and participate in elections.
DHA Resident Survey 2009 / tbd	1/2 mile radius from Mariposa site/ baseline; Walkscore used Lincoln Park Neighborhood	3 years	As is the case with all surveys, statistics from sample surveys are subject to sampling and non sampling error.
n/a / Walkscore 2012	n/a	1 year	While this indicator demonstrates the geographic distribution of key retail services, two residents may have very different access to any service, due to the cost, hours of operation, and language and cultural accessibility. Walk Score uses a variety of data sources including Google, Education.com, Open Street Map, and Localeze; however not all data has been verified. Due to the frequent turnover, the actual businesses can change quickly.
n/a / Colorado Department of Ed 2012	Auraria - Lincoln Park statistical area	3 years	Many other factors affect school quality such as: availability of books and resources; actual and perceived safety at the schools; proximity to green space; training and experience of teachers and staff; and involvement of parents in children's education. Performance must be considered within the broader context of neighborhood, social and economic conditions.
Neighborhood Survey 2009/2012	1/2 mile radius from Mariposa site	1 year	Due to the frequent turnover, the actual businesses in the neighborhood can change quickly. Many factors affect access to retail food sources, including cost, hours of operation, the presence of physical barriers, perceived and actual safety, cultural preferences, etc.
Piton 2002/ City Data	Auraria - Lincoln Park statistical area	3 years	Unemployment figures indicate how many are not working for pay but seeking employment for pay. The impacts of the recession upon household incomes today may not be accurately reflected in the data.
Piton 2002, City of Denver / Census 2012, City of Denver	Auraria - Lincoln Park statistical area	3 years	Although the self-sufficiency standard accounts for variation in the costs of living by county and by family type, it does not address differential access to public or private assistance.
tbd, Census via ESRI 2012	Lincoln Park statistical area/ H+T used Census block group 19.01.2	3 years	Jobs are reported by the employer's address, which may not necessarily be where the employee works. Certain types of jobs may be more likely to be accurately represented than others in this dataset.



REFERENCED STANDARDS

- **LEED for Neighborhood Development (LEED-ND) v 2.0**, available at <https://new.usgbc.org/leed/rating-systems>
- **LEED for New Construction (LEED-NC) v 2.0**, available at <https://new.usgbc.org/leed/rating-systems>
- **Enterprise Green Communities Criteria 2012**, available at <http://www.enterprisecommunity.com/solutions-and-innovation/enterprise-green-communities>
- **NYC Active Design Guidelines 2010**, available at http://www.nyc.gov/html/ddc/html/design/active_design.shtml
- **Sustainable Sites Initiative (SITES) 2009**, available at <http://www.sustainablesites.org>

CAMPAIGN CHECKLIST TEMPLATE

CAMPAIGN CHECKLIST TEMPLATE

STRATEGY	ACTIONS	PARTNERS	GOAL	STATUS
<p><i>Improve access to and provide safe pedestrian routes to health care, providers, and counselors.</i></p> 	<p>a. <i>Improve access, safe pedestrian routes, and transportation to Denver Health. Coordinate a free shuttle to Denver Health.</i></p>	<p><i>DHA Resident Community Services (RCS); Denver Health</i></p>	<p>2014</p>	<p>✓ See "Success Stories," page 49</p>
	<p>b.</p>			
	<p>a.</p>			
	<p>b.</p>			
	<p>c.</p>			
	<p>a.</p>			
	<p>b.</p>			
	<p>a.</p>			
	<p>b.</p>			
	<p>c.</p>			

Measuring Progress

The fifth step in using the Mariposa Healthy Living Tool is to “Evaluate Actions”. Measuring progress is important to align actions with goals, yet it can be challenging.

The approach and initial guidance for a monitoring plan described here is based on the Health Impact Assessment approach for monitoring⁵⁵, and has been revised to reflect real estate development influences, timing, and data availability factors.

Goals for Monitoring

The objective of the Mariposa Healthy Living Tool is to change the way we practice design, development, and provide housing and services to residents to focus on improving health outcomes. As practitioners, our role is to serve these needs and implement projects and programs, which are determinants of resident health. The goals for monitoring of the Mariposa Healthy Living Tool are to understand how use of the Tool influenced decision-making, which recommendations were implemented, and whether residents’ behaviors have changed as a result.

The ultimate goal of monitoring is to provide feedback on whether the strategies that were implemented were successful in improving opportunities for healthy living, and to help inform management or other actions that may be needed to effectively change behavior and improve opportunity for resident health. The role of monitoring for DHA and their partners at Mariposa is distinct from the role of public health agencies, organizations, academic institutions, and governments, who monitor and report population health outcomes, such as obesity rates or asthma rates, and will continue to report that information for not only the La Alma/ Lincoln Park neighborhood, but also the populations of other neighborhoods, as well as the City and County of Denver.

⁵⁵ A Health Impact Assessment Toolkit A Handbook to Conducting HIA, 3rd Edition, Oakland, CA: Human Impact Partners. February 2011.

Resident Health and Health Determinant Indicators

The Report Card Template developed for the Mariposa Healthy Living Tool includes a range of indicators.

The recommended or possible data sources for each indicator have been noted in Chapter 3 of this report.

The recommended geographic scope of indicators is also noted. The health determinant indicators in the Report Card should be tracked every three to five years. As monitoring is conducted, any changes in the determinants and the direction of change should be recorded. If available through regularly collected data, indicators can be included annually or more frequently in the Report Card.

Some indicators can more directly inform decision-making and implementation. These have been noted and should be prioritized, if possible, in monitoring to provide an early warning for issues that remain to be addressed. The Report Card Template can be used for monitoring and includes recommendation of update frequency, taking into account data sources and collection methods. The results should be shared with the Campaign team, residents, stakeholders, and the public. Monitoring indicators will provide valuable data on health determinants within the community, and the results should be used as a needs assessment to identify how priority issues may have changed over time and any new actions that could be needed.

Current Indicator Reporting and Data Collection at Mariposa

As part of the 2012 status update and data collection, most indicators were updated. Some new indicators have been added because they are particularly meaningful to goals at Mariposa and to inform actions. Data collection was not

possible to complete for every indicator for this update. As a result, there are a few recommendations for data collection for these new and ‘in progress’ indicators.

- Housing Indoor Air Quality:** Baseline data is not available on the indoor air quality of housing units at South Lincoln prior to redevelopment. The new units at Mariposa are being designed for healthy indoor air quality. Consider integrating health goals and outcomes in the building commissioning scope for new construction, which can be fairly simple to accomplish if planned for ahead of time. To align with health goals, testing could include factors such as: temperature and humidity, total volatile organic compounds (TVOC), energy and water usage and costs, formaldehyde, CO, and CO₂. After the post-construction commissioning, the indoor environment of units should be monitored periodically, potentially one year after occupancy. Ideally, the indoor environment would be measured pre-construction, post-construction, and after occupancy. For more information about indoor environmental quality testing and methodologies, refer to the National Center for Healthy Housing⁵⁶ at <http://www.nchh.org/>, and to ASHRAE standards at <http://www.ashrae.org/>.
- Particulate Matter and Outdoor Air Quality:** Data is available on a regional basis; however the most relevant way to measure this information is through on-site monitoring. On-site ozone monitors can be installed for a relatively low cost, and result including temperature, wind speed and direction, and other data can be logged and compared to data from the regional monitoring network. The data available from this type of monitor does not comply

with air quality regulations, however, is suitable for informing status on site and identifying any issues that should be mitigated. Other benefits of this type of on-site monitoring include potential for coordination with resident education programs. A non-profit organization called GO3 is currently providing this type of monitoring equipment to schools and community groups. For more info, go to: <http://www.go3project.com/>

- Collision Data:** The number of traffic collisions, including vehicular collisions and number of pedestrian and bicyclist injuries and fatalities as a baseline and current data is being collected from the Denver Police Department but not available at the writing of this report.
- Number of Businesses and Jobs in the Neighborhood:** Baseline data is not currently available for the number of businesses and for job density in the neighborhood prior to redevelopment. This data is likely available through the Denver Office of Economic Development, and is recommended for collection. New business data that is used for the status update was obtained through ESRI which synthesized data from the U.S. Census and the American Community Survey. Data for current job density was obtained through the Center for Urban Sustainability.
- Perceived Safety:** No new data is currently available, but a neighborhood level survey is recommended as a funding priority or to be coordinated with other surveys such as the Behavior Risk Factor Surveillance System (BRFSS).

⁵⁶ National Center for Healthy Housing (2011). Green Housing = Improved Health: A Winning Combination. http://www.nchh.org/Portals/0/Contents/green_build_symposium_r3.pdf

Campaigns and Implementation

The Campaign Checklists set up a structure for monitoring the implementation of campaigns, strategies, and recommendations. The Campaign Checklist can be used to track progress on these factors, which can be done quarterly or biannually. The Checklist should identify who will be accountable for monitoring, who will be responsible for implementation, who has been consulted in the decision, and who was informed of the decision.

The results of Campaign monitoring should be shared amongst the Campaign team on a biannual basis, and an approach should be determined on how to respond if recommendations are not being met. In addition, the Campaign results should be shared annually with residents, stakeholders, and the public, online if possible.

Resident Behavior and Health Status

Ideally, resident behavior should be monitored to understand whether the actions and strategies implemented to address priorities are effective at actually moving indicators among the target population. For example, did a new playground result in more daily exercise for children in Mariposa? If not, why? Furthermore, are there specific issues that can be addressed via tweaks to strategy implementation?

As each phase of development and new buildings are opened at Mariposa, an initial survey of residents should be conducted to establish a baseline of health conditions, behaviors, and determinants for future evaluation purposes. The baseline surveys may also help to identify previously unknown needs that could be addressed through Campaigns. For ongoing assessment, resident behavior and responses to implemented strategies can be tracked by using short surveys conducted annually, or on an established periodic basis, with Mariposa residents.

Survey questions regarding health behaviors should be developed using validated survey instruments, such as those used in the Behavior Risk Factor Surveillance System (BRFSS) and others, as a way to: 1) reduce the resources necessary to develop the surveys, and 2) compare survey responses to those of the general population. If possible, the surveys should be coordinated with other points of contact with residents, such as annual inspections, other surveys (such as post occupancy evaluation or energy behaviors), or community health ambassador visits. DHA should work with partners to assess whether Institutional Review Board (IRB) approval is necessary, particularly if biological measures are being collected. If personal information is being collected in surveys, DHA should work with partners to determine whether an informed consent process is needed and review privacy issues related to sharing information. Survey results may require analysis.

The results of these surveys should be reported to the Campaign teams and to residents, to help inform any adjustments or management responses that may be necessary. Consider the possibility of partnering with public health agencies or organizations and academic institutions to develop and potentially conduct these surveys. Additional guidance on surveys and resources are available from the World Health Organization⁵⁷ and the National Association of County and City Health Officials⁵⁸.

57 World Health Organization. 1995. Measuring Health, A Step in the Development of City Health Profiles. P. Garcia, M. McCarthy. http://www.euro.who.int/__data/assets/pdf_file/0017/101645/WA95096GA.pdf

58 National Association of City and County Health Officials. Community Health Survey Template and Survey Examples. 2007-2010. <http://www.naccho.org/toolbox/veritysearch/search.cfm?keywords=survey&x=55&y=11&p=MAPP+Related+Toolkit%7C16&st=ALL&jurisdiction=ALL>



PEQI Intersection and Street Scores

- 0 - 20 Environment not suitable for pedestrians
- 21 - 40 Poor pedestrian conditions
- 41 - 60 Basic pedestrian conditions
- 61 - 80 Reasonable pedestrian conditions
- 81 - 100 Ideal pedestrian conditions



Pedestrian Environmental Quality Index observational survey analysis results, 2009. Conducted by Boys and Girls Club teens and analysis performed by Mithun.

Decision-Making

In addition to monitoring Campaigns and behavior, tracking how health is being integrated into the decision-making and implementation process is required. Use a chart to annually track:

- To what extent did residents and stakeholders use the Mariposa Healthy Living Tool?
- To what extent did DHA and decision-makers use the Mariposa Healthy Living Tool?
- Did the Tool inform discussions of trade-offs involved in the project?
- Are there any recommendations that are not being implemented, and if not, is there further action that is required?
- Were discussions of connections between the project and health evident in media, outreach, or policy statements?
- Is the Tool helping to build consensus and buy-in for implementation?
- Did the Tool lead to interest from previously uninvolved groups?

- Did the Tool encourage new partners to participate, or existing partners to participate in new ways in implementation?
- What are lessons learned during implementation that should be shared with stakeholders, the community, and other practitioners? What are the successes that should be celebrated?

Monitoring Schedule and Communicating Progress

Below is a summary of each element that should be monitored and frequency of data collection and reporting. The Campaign leads and team members should be convened biannually to review progress, discuss actions and implementation, and lessons learned. At this time, Campaign leads can determine any decisions or authorizations needed by various organizations, or new actions that require partnerships or funding. The Campaign team can also discuss any recommendations that were not implemented, and whether any follow up action is

MONITORING AND COMMUNICATION SCHEDULE

ELEMENT	DATA COLLECTION FREQUENCY	REPORT TO CAMPAIGN TEAM AND DECISION-MAKERS	REPORT TO RESIDENTS AND PUBLIC
Report Card Indicators	Three to five years	Three to five years	Three to five years, coordinate with annual report
Campaigns and Implementation	Quarterly or bi-annually	Bi-annually	Annually
Resident Behavior and Health Status: Baseline Assessment	Upon move-in	Coordinate with Campaign report bi-annually	Coordinate with annual report
Resident Behavior and Health Status: Ongoing Assessment	Annually or established basis	Annually	Annually
Decision-Making	Annually	Annually	Annually

required. The Campaign leads should coordinate with DHA leadership, and report to the DHA Board and Local Resident Councils (LRC) on a biannual or annual basis. Annually, the progress, successes, and lessons learned should also be reported broadly to residents and the general public, and made available online if possible.

The Mariposa Healthy Living Initiative should consider public and creative ways to communicate progress to the Mariposa residents, La Alma/ Lincoln Park neighborhood, and visitors to the community. Some examples include sharing Report Card Indicators and Campaigns online on a community website, on a community kiosk, or even through art and murals in public gathering spaces such as the 10th and Navajo plaza currently under construction. The Mariposa Healthy Living Initiative information should be available to residents and others through a potential Community Health Navigator, by hard copy, as well as electronically.

Data Management

To successfully learn from and use the data, indicators, and survey information that is collected through monitoring, a system to maintain and manage this information is critical. DHA should consider how this data tracking and management might coordinate with current and ongoing reporting and data management within Resident Community Services, the Real Estate Department, or Housing Management. Alternately, DHA could work with a third party to manage the data on an ongoing basis. DHA should seek to have a data management system in place by the end of the first quarter of 2013. The management system should easily integrate into current reporting mechanisms, and be accessible to those who will be managing the Campaigns and other decision-makers within DHA to ensure that the data is being used to the maximum extent possible.

Monitoring Resources

Peer-reviewed studies connecting land use decisions to health are available in Human Impact Partners' Evidence Base: Connections between Health and Place: Review of the Evidence Base for Health Impacts of Planning Projects. Available at: <http://www.humanimpact.org/evidencebase>. A database of evidence-based recommendations and findings on interventions and policies that improve health and prevent disease in communities is available on the Center for Disease Control website at: <http://www.thecommunityguide.org/index.html#topics>

Searchable databases for epidemiological literature include:

- PUBMED (maintained by the National Institutes of Health): www.ncbi.nlm.nih.gov/pubmed.
- Guide to Community Preventive Services (maintained by the Centers for Disease Control and Prevention (CDC): www.thecommunityguide.org.
- Campbell Collaboration provides systematic reviews of social interventions in education, crime and justice and social welfare: www.campbellcollaboration.org/.
- United States Census Bureau, American Fact Finder: population data on demographics, social and economic characteristics, at state, county, city, zip code, census tract and block level.
- Centers for Disease Control, Behavioral Risk Factor Surveillance System: the largest, ongoing telephone health survey, tracking health conditions and risk behaviors in the U.S.; data are collected monthly.
- Public Agencies: Public health, planning, environmental, and transportation agencies.

Data and indicator resources for the Denver area include:

- City of Denver Department of Environmental Health: <http://www.denvergov.org/deh/DepartmentofEnvironmentalHealth/2011HealthStatusReport/tabid/443019/Default.aspx>
- Be Healthy Denver: <http://www.denvergov.org/behealthydenver>
- Denver Health and Hospital Authority: <http://denverhealth.org/Services/PublicHealth/2011CommunityHealthAssessment.aspx>
- Colorado Department of Public Health and Environment (CDPHE), including Behavioral Risk Factor Surveillance Surveys at the County level: http://www.chd.dphe.state.co.us/topics.aspx?q=Adult_Health_Data, <http://www.colorado.gov/airquality/>
- The Piton Foundation is a foundation whose mission is to provide opportunities for children and their families to move from poverty and dependence to self reliance. The Piton Foundation aggregates and provides indicator data on their website at piton.org/
- Denver Region Council of Governments (DRCOG): <http://gis.drcog.org/datacatalog/>
- Regional Air Quality Council: <http://www.raqc.org/>
- Denver Fastracks Quality of Life Program: <http://asap.fehrandpeers.com/projects/denver-fastracks-quality-of-life-program/>
- The Health Indicators Warehouse: <http://healthindicators.gov/>

Data Collection tips:

Whether just beginning a baseline assessment or updating indicators and monitoring, these considerations may be helpful.

- Data collection can be accomplished in a variety of ways: through regularly updated sources such

as census or American Community Survey data, by interviewing residents and stakeholders to incorporate lived experiences, or by working with community members to collect observational survey data.

Methods for collecting new data include: modeling (air quality, noise), surveys, forecasting tools, and studies.

- Some indicators may require analysis – we have provided guidance in the following section. Use qualitative analysis for issues that don't lend themselves to quantitative forecasting.
- Don't start from scratch - work with partners and other organizations to leverage data that is already being collected and/or reported for other purposes. These might include reports on a project, accounts from meetings or public agencies, or interviews with decision-makers and stakeholders. Use tools and methods that already exist.
- Consider how you are interacting with residents for other purposes and look for opportunities to integrate health data collection. For example, if you are doing a new resident interview or unit inspection, can surveys be incorporated? Can community service providers that interact with residents on a regular basis keep tabs on important indicators?
- Keep track of aspirational data, and advocate for ways to track this data in the future.
- Expect that there will be data gaps, and note the gaps when they exist. Acknowledge assumptions, strengths, and limitations of data and methods. The goal is to inform decision-making on a timely basis with the best information available at that time.
- Use indicators to both inform need and recommend action, as well as to report progress and measure success. Indicators can act as an "early warning" system to identify unexpected consequences and create a structure for addressing them.

Methodology

The Mariposa Healthy Living Tool draws from a variety of data sources to measure progress, identify priorities and make recommendations. Spatial data sources vary in geographic scope, and data can also vary in quality depending on collection methods, level of accuracy, and other factors. Therefore, various indicators cannot always be used in direct comparison. Where spatial data has been used, it was collected at the lowest geography possible. The Auraria-Lincoln Park statistical area is referenced in many of the data used for indicators. This statistical area is a City of Denver planning area, also utilized by the Piton Foundation, and includes: Auraria (block group/tract – 1902) and Lincoln Park (block group/tracts 19011, 19012, 18002, and 18001). Figure 7 provides additional information on geographic scope.

Data sources used for this document include:

- US Census- Data was used from the 2000 census, as well as the 2010 census when available.
- American Community Survey – The ACS was used when complete census data was not available for a particular indicator. In several cases, ACS data projections were used in lieu of actual data summaries for 2012. ACS data are typically estimates.
- The Piton Foundation was responsible for the collection and synthesis of census data specifically for Lincoln Park neighborhood which is comprised of two tracts.
- Denver Police Department can provide data on crime, and pedestrian/traffic accidents. This information is typically not available online; therefore a direct data request is required.
- DHA Neighborhood Surveys 2009/2012- The Denver Housing Authority completed a resident survey in 2009 for the original HDMT report, which was funded by the Denver Office of Economic Development and

the Colorado Department of Public Health. Another survey was completed by the Environment, Office of Health Disparities in 2007. An additional on-the-ground survey will be needed for the 2012 update, and periodically needed in the future.

- ESRI modeling- Data was also collected from ESRI GIS maps that were generated from projected census figures.
- Colorado Department of Education publishes data on school performance, including an overall performance score, for each school in the state of Colorado.
- In order to calculate VMT per capita per day, we obtained VMT per household from the Center for Neighborhood Sustainability's (CNT) "Housing and Transportation Index" and divided that by average household size, also obtained from CNT. These data was obtained from <http://htaindex.cnt.org>
- Two sources were used to measure "Proportion of population within 1/2 mile of key retail." The 2010 baseline used the Neighborhood Completeness Indicator, per the San Francisco Department of Public Health method. <http://www.sfphes.org/elements/24-elements/tools/104-neighborhood-completeness-indicator>. For the 2012 status update, Walkscore was used. <http://www.walkscore.com/>
- To calculate "Total Crime Rate per 1,000 people" total crimes reported to the Denver Police Department in Lincoln Park neighborhood were divided by the population of that neighborhood. The neighborhood population data was obtained from the Piton Foundation.

While not ideal, projected or modeled data may be the best placeholder until more complete and accurate data is released from the 2010 census.

Data analysis used for indicators includes:

- Map Analysis- The distance from all major building entrances to open space was measured using aerial

maps. The minimum size of public open space was derived from SITES and LEED for Neighborhood Development, which states that they should provide seating for five percent of possible users, and be at least 1/6 of an acre. This analysis was used for the indicator: "Percent of residents with access to open space/nature with neighborhood."

- Visual verification: Neighborhood gathering spaces and healthy food retail were mapped through an on-the-ground visual verification of the neighborhood on 10-4-12, conducted by Urban Ventures staff, for indicators: "Number of Healthy Food Outlets within a Half Mile of the Neighborhood" and "Proportion of

Population within a Half Mile of Community Gathering Spaces." Healthy food outlets were defined per criteria used in the HDMT, as retail outlets with at least 10% of shelf space devoted to fresh produce.

Recommended for further study:

- Indoor air quality baseline data is not available, however consider post-construction commissioning and monitoring.
- The most relevant way to measure outdoor air quality, such as particulate matter concentration, is by on-site measurement.
- Voting patterns are typically not analyzed in the census at the neighborhood scale. Therefore, neighborhood



Fig. 7 La Alma/Lincoln Park Study Area & Geographic Data Sources

surveys will be required to establish and baseline and then effectively monitor change.

- The “Percentage of people who feel safe alone at night” is a key indicator of a healthy neighborhood and is best measured by a neighborhood scale survey. This survey is recommended as a funding priority, and could be coordinated with other future neighborhood surveys or with BRFSS.

Wherever possible, references were integrated into the report and the Mariposa Healthy Living Tool. In the Mariposa Healthy Living Tool, references can be found in the Why is this a health determinant? section, as well as the Strategies section. Each strategy has both an endnote and a reference to practical information that can support the implementation of the strategy. In the Mariposa Healthy Living Tool Report Card Template, baseline and current data sources are listed for all the indicators included in the tool.

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Mariposa Healthy Living Tool History & Adaptation

The Mariposa Healthy Living Tool is a road map to consider the human health impacts of urban redevelopment plans, projects, programs and implementation. It acts as a framework to assess baseline health data (through the use of as the Mariposa Healthy Living indicators or a full Health Impact Assessment (HIA) and to improve the social and physical determinants of health outcomes that are often a part of redevelopment, including economic and social factors, as well as built environment factors. The Mariposa Healthy Living Tool is an adaptation of the Healthy Development Measurement Tool (HDMT)⁵⁹, which was developed by the San Francisco Department of Public Health.

In 2009 and 2010, the Denver Housing Authority sponsored an effort to customize the HDMT to be used as a development metric to incorporate a health-based planning process in a mixed-income redevelopment effort in Denver, Colorado – the South Lincoln Redevelopment – to document the existing health of the community and determine how the proposed redevelopment might impact the health of the community. The result of this work was two-fold: the customized Denver HDMT, and application of this Denver HDMT to the South Lincoln Redevelopment to inform the redevelopment Master Plan that was currently being developed. Additional information about the Denver HDMT customization methodology, the tool itself, and the South Lincoln Redevelopment Master Plan recommendations can be found in the report, “Use

⁵⁹ The HDMT was developed by the San Francisco Department of Public Health, and is a comprehensive evaluation metric to consider health in urban development plans, projects, and programs. The HDMT explicitly connects public health to urban development planning in efforts to achieve a higher quality social and physical environment that advances health. The HDMT is composed of 6 Elements: Environmental Stewardship, Sustainable and Safe Transportation, Social Cohesion, Public Infrastructure, Adequate and Healthy Housing, and Healthy Economy. The HDMT was developed for use in neighborhood planning in San Francisco.

of the Healthy Development Measurement Tool (HDMT) in Denver: Cross-Sector Partnerships for Development and Public Health South Lincoln Homes, Denver CO.”⁶⁰ The 2010 Denver HDMT application to South Lincoln was used to provide specific development targets to guide the evolution of the master plan, as well as to inform the development of the potential Community and Supportive Services (CSS) planning that would be conducted if DHA was successful in receiving a HOPE VI grant.

⁶⁰ <http://www.denverhousing.org/development/SouthLincoln/Documents/Healthy%20Development%20Measurement%20Tool%20Report.pdf>

Use of the Healthy Development Measurement Tool (HDMT) in Denver
Cross-Sector Partnerships for Development and Public Health
South Lincoln Homes, Denver CO

SOCIAL COHESION			
PRIMARY OBJECTIVES AND INDICATORS	BENCHMARKS AND DEVELOPMENT TARGETS*	RECOMMENDATIONS	TIMING FOR INCORPORATION IN PLANNING PROCESS
<p>SC 1 Promote socially sensitive neighborhood development</p> <p>Indicators: • SC 1.1 Promote socially sensitive neighborhood development • SC 1.2 Promote socially sensitive neighborhood development</p>	<p>Residential mobility (living at address for less than 1 year) in Aurora Lincoln Park was 38.9% in 2005, compared to 28.8% in Denver (Polar Foundation). It is within walking distance of the La Alma rec center, the senior center, and the proposed redevelopment may include community space.</p>	<p>In design of open space, meet SD-Civil 4.8 to provide social interaction, and promote educational, after-school, and other outdoor opportunities for youth. Consider partnering with other agencies for these opportunities.</p>	<p>Detailed design, CSS planning, and implementation</p>
<p>SC 2 Promote personal safety</p> <p>Indicators: • SC 2.1 Number of violent crimes • SC 2.2 Number of property crimes</p>	<p>The design promotes natural surveillance and eyes on the street through CPTED principles.</p>	<p>Track the number of violent and property crimes to monitor progress. Consider working with the Police Department or other service providers to support community policing, neighborhood watch groups, and community organizing.</p>	<p>Maintain CPTED principles through design and implementation.</p>
<p>SC 3 Increase participation in social decision-making process</p> <p>Indicators: • SC 3.1 Use of social decision-making process</p>	<p>The design includes community space which could be used for after-school programming, tutoring/mentoring, senior center or other social programs.</p>	<p>Work with service providers and agencies to coordinate use of public community spaces in the redevelopment.</p>	<p>CSS planning and implementation.</p>

*For a detailed listing of every development target, please refer to the customized Denver HDMT

Denver HDMT
MITHUN
SOUTH LINCOLN REDEVELOPMENT

2010 HDMT application and recommendations

DHA successfully received funding to support the South Lincoln redevelopment, including ARRA/stimulus funds awarded in 2010 which supported the Phase 1 development of Tapiz at Mariposa, a 100-unit affordable housing apartment building, and a FY 2010 HOPE VI grant, to support five additional phases of redevelopment as well as Community and Supportive Services (CSS) programming. The 2010 Denver HDMT application and recommendations have served as a guide to incorporate health considerations into the implementation of the redevelopment through design, construction, management and resident programming. In addition to Technical Assistance grants for study and modeling by the Office of Sustainable Communities in 2010, a 2011 grant by the Colorado Health Foundation further supported health programming at the redevelopment site.

In 2012, with the first phase of construction complete, two phases under construction and design of the fourth phase underway, DHA sponsored the Mariposa Healthy Living Initiative to further adapt the Denver HDMT into a tool that could act as a road map for the implementation currently underway. Further phases of redevelopment at the site will be seeking funding in 2013/2014 and interactions to connect Mariposa to the La Alma/ Lincoln Park neighborhood will benefit from this road map in the Mariposa Healthy Living Initiative.

For the 2012 Mariposa Healthy Living Tool adaptation, indicators from the Denver HDMT were first assessed for alignment with priority health outcome goals for the Mariposa redevelopment and health outcomes goals for City and Statewide initiatives. The remaining indicators were evaluated based on whether they were strongly supported by empirical evidence and whether this evidence could be easily obtained at a relevant scale and a three to five year timeframe. The final list of prioritized indicators included in the Mariposa Report Card were selected based on the criteria above and vetted with a peer

review team and Advisory Panels including residents and community stakeholders. This list of priority objectives and indicators were reviewed in order to include updated referenced standards such as LEED-ND, SITES, and Enterprise Green Communities.

In addition to indicators, the Mariposa Healthy Living Tool also further developed the Denver HDMT in several areas. Information was added to describe the relationship between the indicators or strategies and health outcomes, drawing from scientific evidence and academic studies. Strategies were refined to include those that have been proven to be effective through health evidence. Best practices and referenced standards were added to strategies to ease implementation, and citations were added. Finally, a user guide and guidance on a monitoring plan were added.

To adapt the recommended strategies and actions from the Denver HDMT into a new format of Campaigns for Action in the Mariposa Healthy Living Initiative, the team conducted an assessment of which recommendations had been completed to date, as well as an updating indicator data based on newly available information. With an understanding of current needs and progress, the team held work sessions with a series of Advisory Panels consisting of residents, community stakeholders, leaders, and service providers, to review proposed Campaigns and provide feedback. After gathering feedback from the Advisory Panels, peer review team, and DHA staff, the Campaigns for Action and next steps were finalized.

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Appendices

Glossary

Authorship and Sponsor

2012 Advisory Panels Workshop Minutes

Housing and Transportation Affordability Index Methods

Glossary

CPTED. Crime Prevention Through Environmental Design is an approach to deterring criminal behavior through environmental design. The three most common built environment strategies are natural surveillance, natural access control and natural territorial reinforcement.

CSA. Community Supported Agriculture consists of a community of individuals who pledge support to a farm operation, with the growers and consumers providing mutual support and sharing the risks and benefits of food production. Typically, members or “share-holders” pledge in advance to cover the anticipated costs. In return, they receive shares in the farm’s bounty throughout the growing season. By direct sales to community members, who have provided the farmer with working capital in advance, growers receive better prices for their crops, gain some financial security, and are relieved of much of the burden of marketing.

CSS. Community and Supportive Services are required by the HUD HOPE VI program in conjunction with the physical redevelopment of a public housing project. Each HOPE VI grantee must submit and implement a CSS Plan, with the key principles of: services to help residents make progress toward self-sufficiency, services designed to address the needs of individual families, linkage to relocation with informed choice, community building in which residents work together to provide mutual support, achieve common ends, and build joint capacity, and management monitoring and evaluation.

ECE. Early Childhood Education regards education in one of the most vulnerable stages in life, from birth to age eight. In July 2009, HUD announced that they are encouraging public housing authorities (PHA) to incorporate early childhood education components into the HOPE VI planning process.

Green Communities. A certification developed collaboratively by Enterprise and a number of leading national organizations and experts for the purpose of providing a clear, cost-effective framework for affordable housing. The Green Communities criteria are aligned with the LEED® (Leadership in Energy and Environmental Design) Green Building Rating System, and are linked to potential funding and grants through the Enterprise Foundation.

GHG. Greenhouse Gas includes gases that trap heat in the earth’s atmosphere. The principal greenhouse gases due to human activity include Carbon Dioxide (CO₂), Methane (CH₄), Nitrous Oxide (N₂O), and Fluorinated Gases. GHG emissions are commonly quantified in million metric tons carbon dioxide equivalent (MMTCO₂e).

HDMT. The Healthy Development Measurement Tool (HDMT) is a comprehensive evaluation metric that supports the inclusion and consideration of health needs in urban land use plans and projects. The HDMT is comprised of a “community health indicator system” to evaluate community health objectives and baseline neighborhood conditions, a “healthy development checklist” that is used to evaluate land use plans and projects, and a “menu of policy and design strategies.”

HIA. Health impact assessment (HIA) is commonly defined as “a combination of procedures, methods, and tools by which a policy, program, or project may be judged as to its potential effects on the health of a population, and the distribution of those effects within the population.”

HOPE VI. HOPE VI is a major HUD plan meant to revitalize the worst public housing projects into mixed-income developments. The program began in 1992, with formal recognition in law in 1998. As of 2005, the program had distributed \$5.8 billion through 446 federal block grants to cities for the developments, with the highest individual grant being \$50 million.

LEED-ND. The LEED for Neighborhood Development Rating System integrates the principles of smart growth, urbanism and green building into the first national system for neighborhood design, developed in collaboration among USGBC, Congress for the New Urbanism, and the Natural Resources Defense Council.

Neighborhood Completeness Factor. The Neighborhood Completeness Factor is referenced in the HDMT and measures the proximity of residents to daily goods and services in their neighborhoods. Included are 11 key public and 12 key retail services necessary to meet the daily needs of neighborhood residents and to promote increased social interaction, walking and biking. Neighborhood public services include: childcare/daycare, community garden, hospital and public health clinic, library, open spaces, neighborhood or regional parks of 1/2 acre or more, performance/cultural space, post office, public art, recreational facility, and public school. Neighborhood serving retail includes: auto repair, banks/credit unions, beauty salon/barber shop, bike repair, dry cleaner, eating establishments, gym/fitness center, hardware store, laundromat, pharmacy, retail food market (including supermarket, produce store, and other retail food stores), entertainment (i.e. video store or movie theater).

PEQI. Pedestrian Environmental Quality Index. The Pedestrian Environmental Quality Index (PEQI) is an observational survey which quantifies street and intersection environmental factors empirically known to affect people’s travel behaviors. PEQI includes five main pedestrian categories which embody important physical environmental factors: traffic, sidewalks, land use, intersections and safety.

PTC The Prevention Training Center is a partnership with the public health department of Denver Health to provide training for key members of the Mariposa community at the Prevention Training Center.

Section 3. The Section 3 program requires that recipients of certain HUD financial assistance, to the greatest extent possible, provide job training, employment, and contract opportunities for low- or very-low income residents in connection with projects and activities in their neighborhoods.

Self-sufficiency standard. The Self-Sufficiency Standard defines the amount of income necessary to meet basic needs (including taxes) without public subsidies (e.g., public housing, food stamps, Medicaid or child care) and without private/informal assistance (e.g., free babysitting by a relative or friend, food provided by churches or local food banks, or shared housing). The family types for which a Standard is calculated range from one adult with no children, to one adult with one infant, one adult with one preschooler, and so forth, up to two-adult families with three teenagers. In Denver in 2008, the Self

Sufficiency Standard was \$40,892, and in 2011, the Self Sufficiency Standard was \$42,245 for one adult and one preschool child.

SES. Socio-economic status. SES is usually measured by determining education, income, occupation or a combination of these factors (Winkleby, 1992).

Simpson Diversity Index. is a mathematical measure that characterizes diversity in a community. It is used in LEED-ND to determine diversity of housing types.

Social cohesion. A term used in social policy, sociology and political science to describe the bonds or “glue” that bring people together in society, particularly in the context of cultural diversity.

SITES. The Sustainable Sites Initiative was created to promote sustainable land development and management practices that can apply to sites with and without buildings. SITES will provide tools for those who influence land development and management practices and can address increasingly urgent global concerns such as climate change, loss of biodiversity, and resource depletion. They can be used by those who design, construct, operate and maintain landscapes, including but not limited to planners, landscape architects, engineers, developers, builders, maintenance crews, horticulturists, governments, land stewards and organizations offering building standards.

Tenure. In housing, tenure refers to the financial arrangements under which someone has the right to live in a house or apartment. The most frequent forms are tenancy, in which rent is paid to a landlord, and owner occupancy.

TDM. Transportation Demand Management is the application of strategies and policies to reduce automobile travel demand.

VMT. Vehicle Miles Traveled, a measure that is commonly used to describe automobile use on a daily or annual basis. It incorporates both the number of vehicle trips and the length of those trips. Factors affecting the number of vehicle trips made each day include age, income, population and household size, workers per household, auto ownership, and access to transit. VMT is typically modeled, rather than directly observed.

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Sponsor

This report was sponsored by the Denver Housing Authority in September 2012. Building on the success of the 2009 Denver HDMT customization and cross-sector partnerships effort that was published in 2010, “Use of the Healthy Development Measurement Tool (HDMT) in Denver, Cross-Sector Partnerships for Development and Public Health, South Lincoln Homes, Denver CO”, the Denver Housing Authority has sponsored the Denver Healthy Living Initiative to expand on the use of the HDMT. The purpose of the Mariposa Healthy Living Initiative is to take the HDMT from its status as a written report of recommendations and baseline data trends to a working tool that implements Health into the Built Environment at Mariposa, addressing priority health issues for the affected residents. The Denver Healthy Living Initiative also leverages lessons learned from the first phase of development, Tapiz at Mariposa, and other pre-development activities, including Resident Community Services, which have been completed since the publication of recommendations in 2010. The scope of this effort focuses on the Mariposa redevelopment and Denver Housing Authority residents at this site, but also is relevant to the broader La Alma/ Lincoln Park neighborhood. The assessment of actions completed to date and indicator update was completed by project team members other than the Denver Housing Authority staff; and by team members who have not been actively involved in the redevelopment efforts since the completion of the South Lincoln Redevelopment Master Plan. The project team did collect and gather information on status from DHA staff and redevelopment team members. This was done in an effort to minimize conflict of interest wherever possible.



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Memorandum

To:	Mariposa Healthy Living Initiative/HDMT Advisory Panels	Date:	October 1, 2012
From:	Kimball Crangle, Denver Housing Authority; Erin Christensen, Mithun; Lisa Langer, Perspective3	Project #:	12253.00
Re:	09/24/12 Mariposa Healthy Living Initiative/HDMT Advisory Panel Workshops		

Mariposa Healthy Living Initiative/HDMT



Workshop Meeting Notes

Session 1: Social Cohesion/ Public Infrastructure

Group 1 Team: KC, EC/ Jan McIntosh(Catholic Charities), Laurie Grosselfinger (Greenlee Elem.), Elva Chavez (Tapiz Resident), Mark Raeburn (Art District at Santa Fe), Katie McCrimmon (HealthPolicySolutions.org)



Erin Christensen of Mithun gives an overview of the Mariposa Healthy Living Initiative.

Mariposa Healthy Living/HDMT Initiative
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Education

- Education of parents is important; need adult ed. classes – Laurie Grosselfinger
 - vocabulary improvement
 - track to community college flowing GED
 - Moms need a path to continue education
 - **Valued by Moms = valued by kids
 - Cultural assimilation: do some cultures not see the value of 4yr. degree?
 - Microfinance opportunities- education leads to jobs to self-sufficiency. They want to help their families through extra money. This supports the diverse population that exists in Alma and people want to buy diverse products.
 - Can be informal classes too-doesn't have to be GED or Comm.College, but classes and opportunity are very important.
 - Greenlee is like a mini-United Nations – native translator available for Somali moms
 - Parent volunteers could be more helpful
 - Parents- learning how to help their kids AND how they relate to their peers. “Parent and Teacher Teams” (P-A-T)
 - “tons” of services available for the kids in this neighborhood
- Head Start – Jan McIntosh
 - We see people who come with the family members to ask for access to other services that their extended families need.
 - Are there opportunities to volunteer in the community?
 - Bring elders to help with services
 - Is there a need to help elders in age in place?
 - Microfinance opportunities?
- Education for residents – Elva
 - Nutrition class- in it and loves it, learning a lot
 - Market – vegetables are needed to be touted and available
 - Latino healthy eating
 - Interview and appt. help – clothes, etc.

Getting Connected – worksheet notes

- Strategy: Provide visually appealing environments along paths of travel
 - Coordinate signage and way finding from Mariposa to Santa Fe – Metro District to maintain?
 - Focus on 10th Avenue
 - Beautify 10th and Osage LTR to be more appealing
- Strategy: Provide a dedicated central space or kiosk...
 - Who would maintain? Possible partner with art district? Inca > Kalamath >13th, TIF?
 - 2 improvement districts on Santa Fe currently

- Strategy: Build safe and connected bicycle and pedestrian networks
 - Stoplight at 10th and Kalamath and traffic calming
 - Coordinate with Safe Routes to school
 - Map destinations, now and future
 - Security at school not an issue, but walking to and from through La Alma Park feels unsafe
 - **La Alma Park** –is sketchy- homeless and drunk people; needs more security, more eyes on it; doesn't feel safe
 - Neighborhood watch in the park? **Need more safety in the park!**
 - **"The TASK Force"** advocacy to city to help w. street improvements
 - **Connectivity to Santa Fe is critical** – people who live at Mariposa don't go to Santa Fe for any of their entertainment; Business owners don't interact with Mariposa and don't use the LTR station now; Need to encourage flyers, education, information exchange, so residents know what is going on
- Strategy: Provide community spaces for social and cultural programs
 - **Info. About Santa Fe** First Friday – organize a 3rd Friday group?
- Strategy: Design buildings and neighborhoods with mitigation to reduce excessive noise
 - Windows in Tapiz keep all noise at bay. Noise in the park not of concern.
 - New construction: handling it pretty well
- Strategy: Ensure safe Streets and common areas
 - **La Alma Park** –is sketchy- homeless and drunk people; needs more security, more eyes on it; doesn't feel safe
 - Neighborhood watch in the park? Need more safety in the park!
 - Pool opening

Session 1: Social Cohesion/ Public Infrastructure

Group 2 Team: RMS, DF, LL, Lynne / Erin Brown(Denver parks and Rec.), Narada Golden (YRG), Macy Dorf(Art District at Santa Fe), Ronald Fields (Tapiz Resident) , Adam Anderson (UC Denver), Jami Duffy (flobots.org),

What are your impressions of Health at Mariposa?

Mental health connections

- Macy- The community sessions make a personal impact; **feels good to be a part of the process**; this has been good for the health of those displaced
- Ronald- first time living at 1099 and in this type of atmosphere; concerned that there is **too much isolation**; smoking is a big issue; it isolates residents but need education that 2nd hand smoke is bad
- Lynne- 1099 Tapiz= 20% residents from the neighborhood, 35% elderly, 65% disabled; needs for disabled and seniors are very different

Mariposa Healthy Living/HDMT Initiative
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- Erin – when resident’s needs are so different the connection is not there, it is a tough challenge; initial steps toward health focus are in place
- Narada- this framework that is being developed in the HDMT will be critical

Getting people out-Are Arts and Culture the answer?

- Jami – **arts and culture are critical**, and have been successful already; the kids programs have a lot of involvement, create places where they don’t even know they are participating- ex. Benches made in a way that if hit in different places make different “music”; **they get activity and knowledge without knowing it** (computer music programs=music + computer literacy)
- Can programs be expanded to be **multi-generational?** (flobots is only for up to age 20)
- Need to generate motivation to get out of their units and participate
- Erin Brown- parks and getting to **exercise resources requires a comfort level (going to the rec ctr. Or park)**; City working with youth to bring fitness models home can help the parents be more comfortable; develop a family fitness model?
- Is there a conflict with having only facilities in the rec. center? It makes the residents get out and go there – but it is not comfortable to do that for most? (New buildings are not supposed to provide duplicate services like this)
- **Santa Fe** needs to feel connected – set up a group that goes over for a gallery walking tour together – comfort in numbers?
- **Information helps comfort level** – provide focal points/kiosk at Tapiz, 10th plaza; kiosks should be in old and new technologies –touch screen info, and paper flyers
- **Tours, events, connecting people-** outreach/education; social events; coffee clutch groups; engaging the resident
- **Eliminate isolation** - connect people to one another, to their community, to activities
- Motivational tool needed to get people to rec. ctr
- Flobots and Jolt doing walking tours now
- Flobots partnering with DPS/Kaiser for Healthy living study going on now**- **healthy knowledge, decisions and patterns**
- Erin Brown-the La Alma community comes together in times of struggle – i.e. to save the Recreation Center- then melts down. **How do we keep that passion for permanent change?**
- 2 health classes now at Tapiz- Health and Nutrition- high blood pressure

Key thoughts:

- Expand “Get connected” to **socially connected, and people connected to people** (this addresses the isolation and need to engage residents in their community)
- Connect people to information
- Utilize social arts and cultural events to connect people to one another...i.e. an outdoor dance gets people out, they dance, they meet, they engage in art, they enjoy their community

- **Health education** leads to address healthy knowledge, decisions, habits, patterns. This could be leveraged to specific grant funds and programs
- Senior housing options to **help isolation** problem: daytime talks, book group, events to fill the day = engage
- **Central place:** what's happening in the community? A place where multi-generations come together. ...Activities such as coffee clutches, sharing of expertise, special topic exploration
- **Information kiosk or hub-** at LTR? Keep info updated- who does that?
- Senior communities elsewhere may have ideas that can be borrowed to get people out of their units and into activities

Session 2: Health Policy/ Environment/ Transportation

Group 1 Team: KC, EC- Peip van Heuven (Bike Denver), Monica Buhlig (Kaiser), Gretchen Armijo (CO Health), Jaclyn King (DHHA), Adam Anderson (UC Denver)

Transportation:

- **Access to bike** and equipment – Piep
 - Need U-locks, lights, where to park it- basic equipment, derailier
 - Interior secure parking is key
 - **Education-** how to lock your bike, how to fix your bike, where can I take my bike to?, where is bike friendly? Why do I need a helmet?
 - What is in it for me?- cheaper, easy, healthy, fun
 - Storage- bike room? Bike depot?
 - City bike map posted in buildings, at kiosks
 - Make it easier to bike than drive
 - **Signage,** signage, signage!
 - **Bike routes-** bike routes are a system- connect the signage and routes
 - **Garden tour on trikes- get to know the hood**
 - **Bike library- check out bikes; check out equip.; information**
 - **A ride along program with bike cops?**
- **If people can bike or walk safely they will be healthier ;** it needs to be easy and safe- Monica/Jaclyn
 - **Walking School Bus** – plan a route as if you are a bus, pick up kids along the way, it will be safer and community building
 - Denver Enviro. Health has all of these date points
 - **Lighting for safety** to destination
 - **Graffiti** and perception of graffiti- feeling safe vs. being safe
 - Transit stops- **lighting, seating, safety**
 - **Transit Alliance Group** – trend now is people moving to Denver to be healthy

- **Millennial shift** to sexy, healthy, neighbor- desire to be healthy too

Environment:

- **Air quality** – Tim
 - Bikes improve air quality in the summertime
 - Environment is critical to this-biking is healthier and requires less energy etc.
 - Air quality is critical- have on-site air monitoring is a great idea- ozone and particulate monitoring-(show the good results and educate)
 - Community gardens should be in all phases of development
- **Data-** Gretchen
 - **Assessment and connectivity** to destinations- conditions of sidewalks; audit tools are available; schools have students available to do this
 - **School planning project?** –GIS mapping, graffiti to DPD grid
 - Transit stops/ comfort, access, and use

Policy:

- **DATA collection: don't recreate- use what is there**
 - **Data:** minutes of physical activity per day- goes to neighborhood level or census tract level-how many trips are you taking?
Updated yearly
 - Tracked by **CO health dept.**, Behavioral Risk Factor Health Assessment- can submit your questions to them, done every year
 - Bicycle tracks- date for trips, calories, gas savings
 - Measure car-sharing
 - Study done on utilization of bicycle
 - Over sampling- 3-5 years assess population
 - **Bundling approach for source of data...air quality + transport**
 - **Community Health Assessment –DHHA; Be Healthy Reports**
 - **Bundle indicators too**
- **Safety/Transportation**
 - **Safety/ Violence-** prevention institute different funding
 - **Community Activism-**
 - To bring resources for traffic calming, etc.



- City council use as advocacy
- Transportation subcommittee

Session 2: Health Policy/ Environment/ Transportation

Group 2 Team: RMS, DF, LL- Otto van Geet (NREL), Julie George (Live Well), Max Gibson(UC Denver), Narada Golden (YRG) , Mark Raeburn(Art District at Santa Fe)

What is keeping Mariposa from being healthy?

Policy/Environment:

- **Live Well** – policy needed to keep vending machine choices healthy
- Help small groups find **sense of community**, then bring those groups together
- **Partnerships**, New Center Active Design and City
- **Park safety**- La Alma is not safe now= not healthy, possible opportunity to **partner** with Trust for Public lands for funding for lighting etc.?
 - **Park safety** will bring community functions or vice versa? Markets, music
 - Need for community to **take back the park**, and have sense of ownership to keep eyes on the park
 - Have **community plantings**- garden beds, shrubs, Arbor Day, to give sense of nurture, pride, ownership
- **Urban Ag education**- garden to table events? Small business ed. Grow and sell food
- **Access** to healthy food- work with 7-elevn, convenience store on choices of products
 - but need to foster a market for healthy food in the community through education and outreach (Live well type programs)
- **Worksite wellness programs**- track incentives for healthy behavior, Live Well at work, Dallas company is applying this
- Youth sports teams- build community- teams offered through rec. ctr. for reduced rate
- Rec. center access- free to residents?
 - **Incentive Programs could be made to be informative and fun with the existing utility monitoring system**- show residents what they are using/saving. Have incentive awards. Post the information to be accessed easily
 - Real time building utilities reports
 - LEED education for community
- Kids are important to the Health and Sustainability ongoing education
- University buys in-be active in this community, metro-more community involvement
- **Live Well communities**- look at Westwood, Park Hill
- **UC Denver Students**- Health and planning students are **BRIDGE to future healthy living** and planning

- **Does Rec. Center effectively serve all residents?** Partner with City to change that
- **Why is the park a barrier and not an amenity? Safety is the issue**

Key thoughts:

- Team addressed Health deterrents that will be present: people not feeling that they belong (inclusion), access to healthy food, smoking, low income is often paired with low empowerment, not a lot of community members feeling confident enough to share ideas
- Exercise knowledge and opportunities should be introduced to residents so they can meet one another and carry on those habits (walking teams, yoga etc).
- Senior communities elsewhere may have ideas that can be borrowed to get people out of their units and into activities
- Mariposa's proximity to Auraria campus provides the University's/Colleges a chance to have some ownership and community service in the neighborhood
- A healthy and affordable restaurant would be a great addition to the neighborhood

Session 3: Healthy Economy

Group 1 Team: KC, EC, DF- Councilwoman Judy Montero, Annie Dowding, Ledy Garcia-Eckstein, Amanda Gonzalez

Healthy Economy:

- **Youth Programs- Ledy**
 - **Expand Health Industry Academy**
 - More people and further progress, to take them **further along their path to self-sufficiency?**
 - **Health care = middle income job opportunities**, 800,000 in CO people will get health care because of new law
 - Classroom space for Community College would be great **pre-requisite**
 - **Shared resources and shared space**
- **Youth Programs – Annie**
 - **Café and Kitchen- Educate** the community on healthy eating habits that are **feasible** and within reach
 - Baby steps, using fresh ingredients from garden as resources, bake vs. fry, etc.
 - Within budget, easy, accessible are critical
 - Eat healthy within their means

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- Educate youth to educate families
- An overall learning tool
- Ex. 6 week class, 13 youth/class, 10 adult/class- healthy eating class/web discovery, building social cohesion as well
- **Cultural Competence is important – Amanda**
 - **Social cohesion in the classes-** kids come from all over the city, meet for first time at class and know each other by the end of the class
 - **Zumba classes –** promote social cohesion + exercise +cultural (multi lingual, \$1, offer daycare)
 - **Historic barriers in cooking –** lard in Latino cooking, make change to olive oil, etc.
- **Community Activism – Councilwoman Judy Montero**
 - **La Alma used to be ground zero for activism in 60’s and 70’s** which lead to assets like the rec. center, park, pool
 - Locals needed to be **threaded together by community relevancy / sense of community**
 - Affinity for what it means for the community
 - Keep **adding amenities and bolstering** what is here
 - Allow the community to push the envelope and **identify aspirations of the people**
 - **Strong community attracts people**
 - **Name of neighborhoods is important –La Alma/ Lincoln Park Neighborhood – “the soul”- important to past, present, and future**
 - **LEADERSHIP** is plentiful in la Alma – very passionate. Setting goals and following through on them. Commitment to the course being charted.
 - **Follow lead** of people that live here
- **Jobs/Generational Community/ Education - group**
 - **Senior housing + college + ECE**
 - **Job readiness-** more than high school diploma, stackable credentials allow people to go at their own pace and walk away with credential
 - **Career pathways-** (ex. State of Washington) Build up > Pace 1 yr. tech classes/Comm. college to move from poverty level
 - **Really low paying jobs are what we have –** don’t have manufacturing in Denver to support middle income jobs
 - **Apprentice opportunities are great –** make \$ while learning
 - **West High School** now has **4 schools** on one campus: **1) West HS, 2) Vocational, 3) Leadership Academy, 4) West Generation**
 - **West HS-** doing assessments with students to identify “what they want to be” and finding their path and job
 - **Placement starting in 9th grade!**
 - **Skill trades –**being on track/ taught/identified in high school so there is a certificate at graduation
 - **Aurora Lights Program –** concurrent credit

- **Connecting to Auraria Campus**
 - **Colfax crossing**- residents still feel “unwelcome” attending Auraria. This connection needs to be bolstered. Auraria need to do **more outreach and career pathways**
 - **Community College of Denver** – Latino serving institution, can there be even more connection and outreach?
 - **Metro Sate**- targeting local population- goal to reach 25% Latino student population, CCD already there
 - **CVA** opening on Santa Fe, helping bridge gaps/ art camps
 - **Auraria ball fields**- put bike lane on 13th to connect fields to Auraria/ Sun Valley
 - **Running trail** around fields so the residents can use the space as well
 - **YCA/ Metro** connection
 - When Auraria was built, demo, not for us (sp?)
 - **Light Rail**- merits – show the community!
 - **Metro Hotel Mgmt.** – possible connections to Café and Annie
- **Strategy – Enhance street network...**
 - **Denver Complete Streets Policy**

Session 3: Healthy Economy

Group 2 Team: RMS, LL – Narada, Bill Sadler, Rob smith, Amanda Sandaval

Healthy Economy: What are the lessons learned?

- **Community Gardens/schools - Amanda**
 - **Gardens educate**, they provide a place for participation and social cohesion, health is the final product
 - Important for residents to know what to do with fresh veggies, how to clean prepare, cook
 - We need to teach this next generation, they can’t learn it at home- parents don’t know
 - Schools- need to partner with for sense of ownership and pride in healthy eating habits programs
 - Talk about healthy options
 - “ Opt Out” programs, everyone participates, take this reverse approach then student don’t have to return a form from home to “opt-in”
 - Jefferson County Schools –weekend free food program, student get weekend bag of 14 items, they come back on Monday ready to learn having eaten over the weekend
- **Barriers – Bill**
 - Food access is barrier
 - Connections to jobs is barrier
 - Access to jobs = elevated income = health

- **Other projects to look at – Rob /group**
 - **21-1, St. Louis** –community became their own advocates
 - **Justine Peterson Program** –focuses on personal needs, ex. If your refrigerator breaks down, there some available to loan so the resident doesn't start the habit of buying fast food
 - **Healthy Food Initiative** –incentive, but still a business, part time subsidy in the meant time while trying to build the market; ex. Getting small store to sell fresh fruit- they won't stock it of there is not a market, therefore you need to build the market first before they buy into it.
 - **Equitable access** – there is still a floor and bottom line that has to be met in microfinance opportunities
 - **Other TOD projects to look at:** Bay Area-Fruitvale; Seattle –SE Line; Twin Cities –Central Corridor, did studies with a focus on economics and HIA from an economic standpoint, Pennsylvania –Reading Terminal
 - **Evaluate and learn from**, what are the reasons a business fails?
 - **Mentorship**
 - **Celebrating the cultural heritage**, sometimes businesses get “gentrified” out
 - **What are the needs and what is the market? DHA has data on needs?**
 - **Better Block** project in Denver?
 - **West HS – Generations Program** – entrepreneurship

Key thoughts:

- **Important for Residents to have a part of the Opportunities created by Mariposa Development**
 - **TOD's need to allow residents the opportunity for small business so the see that “redevelopment is for me”** –provide places for shared business space, office share, etc.
 - Provide incubator sites in redevelopment – Green Spaces, plus education and childcare
 - **Rocky Mountain Microfinance Institute** serves low income residents, people have great ideas that can be feasible, **they provide a market place incubator to launch** multiple businesses which allows for testing the business plan; if one fails there are still the others at the market place, don't let one failure take the “message” down
 - **Business development education** will be important b/c businesses will fail and will have to adapt to market demand
- DHA knows their community and knows the needs: can they help to identify business opportunities...i.e. the need for certain spices, goods that are in demand (that residents travel far to)
- **To bring together the Mariposa with Art and Business community on Santa Fe:**
 - Invite Mariposa residents (personally); help them to know how the First Friday's work, create a role

- Maybe set up a temporary art exhibit for a 'mini First Friday' to familiarize the community with an art walk
- Include healthy food
- Resident art?
- Invite artists/businesses from Santa Fe

H+T INDEX

The Center for Neighborhood Technology's Housing + Transportation (H+T[®]) Affordability Index is an innovative tool that measures the true affordability of housing by calculating the transportation costs associated with a home's location. Planners, lenders, and most consumers traditionally measure housing affordability as 30 percent or less of income. The H+T Index proposes expanding the definition of housing affordability to include transportation costs to better reflect the true cost of households' location choices. Based on research in metro areas ranging from large cities with extensive transit to small metro areas with extremely limited transit options, CNT has found 15 percent of income to be an attainable goal for transportation affordability. By combining this 15 percent level with the 30 percent housing affordability standard, the H+T Index recommends a new view of affordability, one defined as combined housing and transportation costs consuming no more than 45 percent of household income.

The H+T Index was constructed to estimate three dependent variables (auto ownership, auto use, and transit use) as functions of 11 independent variables (median income, per capita income, average household size, average commuters per household, residential density, gross density, average block size, intersection density, transit connectivity, transit access shed, and employment access). To hone in on the built environment's influence on transportation costs, the independent household variables (income, household size, and commuters per household) are set at fixed values to control for any variation they might cause. By establishing and running the model for a "typical household," (one defined as earning the regional area median income, having the regional average household size, and having the regional average number of commuters per household) any variation observed in transportation costs is due to place and location, not household characteristics.

See below for detailed information on the H+T Index methods.

GEOGRAPHIC LEVEL AND DATA AVAILABILITY

The H+T Index was constructed at the Census block group level. The H+T Index currently covers the Metropolitan and Micropolitan Areas in the United States, or the Core Based Statistical Areas (CBSAs), as defined by the Office of Management and Budget (OMB). The 2009 American Community Survey 5-year estimates serve as the primary dataset, thereby dictating the use of the 953 CBSAs as defined in 2008.

However, due to data limitations, multiple CBSAs were excluded from the Index. Due to incompatible and insufficient data, all regions in Puerto Rico (13) were excluded. Also, in 19 counties in eight states, the Census identified geographic code and definition problems, making block groups within these counties unusable

(http://www.census.gov/acs/www/data_documentation/2009_geography_release_notes/). This resulted in the exclusion of four CBSAs where no usable data were available.

Data availability due to data suppression also presented difficulties. Regions where necessary variables were available for less than 80 percent of the regional households were also excluded. This resulted in the exclusion of 59 CBSAs.



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In total, 76 regions were excluded due to data limitations, bringing the total Index coverage from 953 to 877 regions.

HOUSING COSTS

To calculate the H in the H+T Index, housing costs are derived directly from nationally available datasets. Median Selected Monthly Owner Costs and Median Gross Rent, both from the 2000 American Community Survey 5-year Estimates (ACS), are averaged and weighted by the ratio of owner- to renter-occupied housing units from the Tenure variable for every block group in the 100 CBSAs.

TRANSPORTATION COST MODEL

While housing costs are derived directly from ACS data, transportation costs, the T in the H+T Index, are modeled as three components of transportation behavior—auto ownership, auto use, and transit use—which are combined to estimate the cost of transportation.

BASIC STRUCTURE

The household transportation model is based on a multidimensional regression analysis, in which the formulae describe the relationships between three dependent variables (auto ownership, auto use, and transit use) and independent household and local environment variables. Neighborhood (Census block group) data on household income (both median and per capita), household size, household commuters per household, household density (both residential and gross), street connectivity (measured using average block size and intersection density), transit access, and employment were utilized as the independent or predictor variables.

To construct the regression equations, each predictor variable was tested separately; first to determine the distribution of the sample and second to test the strength of the relationship to the criterion variables. For this research, the regression analysis was conducted in a comprehensive manner, thus ignoring the distinction between the local environment variables and the household variables in order to obtain the best fit possible from all of the independent variables. The predicted results from each model was multiplied by the appropriate price for each unit—autos, miles, and transit use—to obtain the cost of that aspect of transportation. Total transportation costs were calculated as the sum of the three cost components as follows:

$$\text{Household T Costs} = [C_{AO} * F_{AO}(X)] + [C_{AU} * F_{AU}(X)] + [C_{TU} * F_{TU}(X)]$$

Where

C = cost factor (i.e. dollars per mile)

F = function of the independent variables (F_{AO} is auto ownership, F_{AU} is auto use, and F_{TU} is transit use)



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INDEPENDENT VARIABLES: NEIGHBORHOOD CHARACTERISTICS

The 2009 American Community Survey 5-year estimates (ACS) at the block group level serve as the primary data source for the independent variables.

Household Density

Household density has been found to be one of the largest factors in explaining the variation in all three dependent variables. Various definitions of density have been constructed and tested, and the following two are utilized in the final transportation models.

Residential Density:

Residential Density represents household density of residential areas, in contrast to population density on land area. Total households are obtained at the block level from the 2010 US Census, and TIGER/Line files are used to define blocks. Blocks are selected on the criteria that gross density (households per land acre) must be greater than one. From these selected blocks, land acres are aggregated to calculate the total acres of residential blocks at the block group level. The count of households from the ACS is then scaled by the ratio of households in residential blocks to total households, and is then divided by the residential land area to calculate the block group level residential density.

Gross Density:

Gross Density is calculated as total households (from the ACS) divided by total land acres (as calculated using TIGER/Line files).

Street Connectivity and Walkability

Measures of street connectivity have been found to be good proxies for pedestrian friendliness and walkability. Greater connectivity created from numerous streets and intersections creates smaller blocks and tends to lead to more frequent walking and biking trips, as well as shorter average trips. While other factors clearly have an impact on the pedestrian environment (e.g., crime), two measures of street connectivity have been found to be important drivers of auto ownership, auto use, and transit use.

Average Block Size:

Census TIGER/Line files are used to calculate average block size (in acres) as the total block group land area divided by the number of blocks within the block group.

Intersection Density:

To determine intersection density, Census TIGER/Line files are used to identify every street intersection. All streets in the TIGER/Line files are included (e.g., alleys, interstates, etc.). For each block group, the sum of all intersections (including those on the borders) is calculated and divided by the total land area of the block group.



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Transit Access

Transit access is measured through General Transit Feed Specification (GTFS) data collected and created by CNT. In addition to the publicly available GTFS data provided by a small number of transit agencies, CNT has created GTFS structured datasets utilizing online transit maps and schedules. In many cases, CNT has directly contacted transit agencies to obtain more specific information on stop locations and schedules. All GTFS data is merged into a proprietary dataset known as AllTransit™. AllTransit is an online tool that facilitates the collection, normalization, aggregation, and analysis of GTFS data to determine fixed-route transit service. To date, CNT has compiled station and stop data for bus, rail, and ferry service for more than 75 percent of all metropolitan and micropolitan areas in the country.

Transit Connectivity Index:

The Transit Connectivity Index (TCI) is a measure of transit access that CNT has developed specifically for use in this household transportation cost model.

To calculate this measure, a buffer was constructed around each transit access point (¼ mile radius for bus stops and ½ mile radius for rail stations and all other access points). Next, five concentric annuluses were constructed, each with the width of the initial buffer. These six access areas were then assigned a service frequency value (total trips per week) for the transit access point they surround.

Next, at the block group level, six access values were calculated. These were calculated as:

$$\frac{\text{land area of the access area intersecting the block group} * \text{service frequency value} * \text{weighting multiplier}}{\text{total block group land area}}$$

The weighting multiplier identified in the above equation is calculated using regression analysis. Measured values of autos per household and percent journey to work by transit were each regressed against the six access values as defined above to obtain the optimal weighting multiplier for each. Therefore, two weighting multipliers are identified for each access area (one from the autos per household regression and one from the percent journey to work by transit regression). The rounded average of the two is used, and the six access values are summed for each block group in the final TCI calculation.

Transit Access Shed:

The Transit Access Shed is defined as the optimal accessible area from any block group within 30 minutes by public transportation scaled by the frequency of service. This measure was derived from the GTFS schedules discussed above. For each transit stop, all stops that can be reached within 30 minutes were identified. One transfer within 600 meters of a stop was allowed, and all transfers were padded with 10 minutes of walking and/or waiting. The stops reachable within 30 minutes were all based on the minimum travel time between the two stops, allowing the inclusion of more distant stops that are reachable within 30 minutes via express service. For each origination stop, a quarter mile buffer was created around the destination stops. Based on the location of the originating stop, the access shed was then aggregated for each stop to the block group and multiplied by the frequency of service (trips per week). Finally, the accessible area was derived and called the Transit Access Shed.



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Employment Access Index

Employment numbers are calculated using OnTheMap Version 5 which provides Local Employment Dynamics (LED) data at the Census block level. These data are currently unavailable in New Hampshire, Massachusetts, and the District of Columbia. CNT created an alternative dataset for these areas using 2000 Census tract level data from the Census Transportation Planning Package (CTPP), scaled to 2007 using county level employment estimates from the Bureau of Labor Statistics (BLS). Utilizing a constant share method, the tract level variation from the 2000 CTPP data is preserved, while the 2007 county level BLS data enables updating to the appropriate time period. The estimates for New Hampshire, Massachusetts, and the District of Columbia are then combined with the more comprehensive LED data available for all other states.

The Employment Access Index was determined using a gravity model, which considered both the quantity of and distance to all employment destinations, relative to any given block group. Using an inverse-square law, an employment index was calculated by summing the total number of jobs divided by the square of the distance to those jobs. This quantity allows us to examine both the existence of jobs and the accessibility of these jobs for a given census block group. Because a gravity model enables consideration of jobs both directly and not directly in a given block group, the employment access index gives a better measure of job opportunity, and thus a better understanding of job access than a simple employment density measure.

The Employment Access Index is calculated as:

$$E \equiv \sum_{i=1}^n \frac{p_i}{r_i^2}$$

Where E is the Employment Access for a given Census block group, n is the total number of Census blocks, p_i is the number of jobs in the i^{th} Census block, and r_i is the distance (in miles) from the center of the given Census block group to the center of the i^{th} Census block.

Because it was not feasible to include *all* jobs nationally in the calculation of employment access, jobs within 63 mile radius of a given block group were included. This cutoff was used as it represents the 90th percentile of commute distances nationally in the LED data.



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INDEPENDENT VARIABLES: HOUSEHOLD CHARACTERISTICS

The 2009 American Community Survey 5-year estimates (ACS) at the block group level serve as the primary data source for the independent variables pertaining to household characteristics.

Household Income

Median Income:

Median household income is obtained directly from the ACS.

Per Capita Income:

Per capita income was calculated as median household income divided by average household size.

Average Household Size

Average household size was calculated using Total Population in Occupied Housing Units by Tenure and Tenure to define the universe of Occupied Housing Units.

Average Commuters per Household

Average commuters per household was calculated using the total workers 16 years and over who do not work at home from Means of Transportation to Work and Tenure to define Occupied Housing Units. Because Means of Transportation to Work includes workers not living in occupied housing units (i.e. those living in group quarters), the ratio of Total Population in Occupied Housing Units to Total Population was used to scale the count of commuters to better represent those living in households.

DEPENDENT VARIABLES*Auto Ownership*

For the dependent variable of auto ownership, the regression analysis was fit using measured data on auto ownership obtained from the ACS. Aggregate Number of Vehicles Available by Tenure defined the total number of vehicles, and Tenure defined the universe of Occupied Housing Units. Average vehicles per occupied housing unit were calculated at the block group level.

Auto Use

For the dependent variable of auto use, the regression analysis was fit using measured data representing the total amount that households drive their autos, or vehicle miles traveled (VMT) per automobile. In order to determine the amount that households drive their autos, odometer readings were used. Odometer readings for 2005 through 2007 were obtained from the Massachusetts Department of Transportation for the entire state at a 250 meter grid cell level. A similar dataset for the greater Chicago area was analyzed at the zip code level and compared with the Massachusetts dataset, resulting in similar findings. Due to the finer geographic scale of the Massachusetts dataset, the regression analysis is fit using these data.

Transit Use

Because no direct measure of transit use was available at the block group level, a proxy was utilized for the measured data representing the dependent variable of transit use. From the ACS, Means of Transportation to Work was used to calculate a percent of commuters utilizing public transit.



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REGRESSION ANALYSIS

A rational function, a ratio of third order polynomials, was utilized as the functional form to regress each dependent variable:

$$R(x) \equiv \frac{a_1 \times x + a_3 \times x^2 + a_5 \times x^3}{1 + a_2 \times x + a_4 \times x^2 + a_6 \times x^3}$$

Because the GTFS data used to calculate the independent variables of transit access were not available in all regions, two regressions were fit and two models constructed for each dependent variable: one for regions with transit data (669 regions) and one for all regions excluding transit data to be used in regions without data available (208 regions).

Due to small samples sizes in the ACS, many block groups have missing data for various variables. The regressions were fit only where all independent and the given dependent variable were available. The models were ultimately run everywhere all independent variables were available.

For the vehicle miles traveled regressions, due to limitations in measured data, the analyses were only conducted for the state of Massachusetts. The resulting coefficients or models were then run for all regions in the country.

TRANSPORTATION COST CALCULATION

As discussed, the transportation model in the H+T[®] Affordability Index estimates three components of travel behavior: auto ownership, auto use, and transit use. To calculate total transportation costs, each of these modeled outputs is multiplied by a cost per unit (e.g., cost per mile) and then summed to provide average values for each block group.

Auto Ownership Costs

The 2007 edition of the America Automobile Association's (AAA) Your Driving Costs report serves as the basis for the auto ownership cost component. AAA reports an average ownership cost per year composed of full-coverage insurance, license, registration and taxes, depreciation, and finance charges.

Auto Use Costs

The 2007 Your Driving Costs report also serves as the basis for the auto use cost component. AAA reports an average operating cost per mile (composed of gas, maintenance, and tires). The gas component of AAA's operating costs is subtracted and replaced with regional fuel costs from the Energy Information Administration (EIA) to account for regional variation in gas prices.

Transit Use Costs

The 2007 National Transit Database (NTD) served as the source for transit cost data. Specifically, directly operated and purchased transportation revenue were used (demand response revenue was not factored into this analysis). The transit revenue was assigned to each of the transit agencies where GTFS data were collected. The allocation of transit revenue to the metropolitan level was then based on the percentage of each transit agencies' bus and rail stations within the primary versus surrounding metropolitan areas. For example, if a transit agency had a total of 500 bus stops and



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425 of those stops were located in the primary metropolitan area and 75 stops extended into a neighboring metropolitan area, the primary metropolitan area received 85 percent of the transit revenue and the neighboring metropolitan area received 15 percent. The allocation of the transit revenue was then applied to the block group level based on the percentage of transit commutes and household commuter counts within each block group from the ACS, to estimate the average household transit costs.

There were a number of metropolitan areas for which GTFS data were not available and/or there was no revenue listed in the NTD. In these cases, the national transit cost average from the allocation calculation described in the previous paragraph was used for these metropolitan areas. The average transit costs were then allocated to the block group level based on the percentage of transit commutes and household commuter counts. The end result was an average household transit cost at the block group level.

CONSTRUCTING AN INDEX

Because the H+T Index was constructed to estimate the three dependent variables (auto ownership, auto use, and transit use) as functions of independent variables, any set of independent variables can be altered to see how the outputs are affected. As a way to focus on the built environment, the independent household variables (income, household size, and commuters per household) were set at fixed values. This controls for any variation in the dependent variables that is a function of household characteristics, leaving the remaining variation a sole function of the built environment. In other words, by establishing and running the model for a “typical household,” (one defined as earning the regional area median income, having the regional average household size, and having the regional average number of commuters per household) any variation observed in transportation costs is due to place and location, not household characteristics.

MODEL FINDINGS

As discussed above, a rational function, a ratio of third order polynomials, was utilized as the functional form to regress each dependent variable:

$$R(x) \equiv \frac{a_1 \times x + a_3 \times x^2 + a_5 \times x^3}{1 + a_2 \times x + a_4 \times x^2 + a_6 \times x^3}$$

Each independent variable was normalized by a factor of 10 to eliminate very large and small values, and Table 1 below shows the coefficients, normalization values, and resulting R-squared values from each of the six regression analyses.



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