

Health Impact Assessment

South Lincoln Homes, Denver CO



Author

EnviroHealth Consulting: Karen Roof

Any comments or questions, please contact
EnviroHealth Consulting at Karen.Roof@UCDenver.edu

Contributors

Mithun: Erin Christensen, Laura Curry, Robert Matthews,
Tammie Schacher, Critter Thompson, Cristina Bump

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South Lincoln Redevelopment Steering Committee

Tom Reed
Matt Brady
Juanita Virgil
Kathy Ewing
Julie Moore
Dave Stauffer
Victor Jackson
Peg Vinyard
Kelly Lovato
Dennis Weber
Blake Pendergrass
Molly Gallegos
Meritt Smith
David Griggs
Jason Torrez
Larry Martinez
Rick Cisneros
Kristin Krasnove
Karen Good
Teresa St. Peter
Councilwoman Judy Montero
William Kralovec
Terry Ware
Michael Miera
Bill Sirois
Mark Jacobson

EXECUTIVE SUMMARY

The South Lincoln Health Impact Assessment (HIA) focuses on the redevelopment master plan for the Denver Housing Authority's South Lincoln Homes community in downtown Denver. The rapid HIA and masterplan was a four-month process that began in April 2009. The HIA identifies potential health impacts and recommends changes to optimize positive and minimize negative health consequences for the South Lincoln neighborhood. This assessment includes community demographic and socioeconomic information, identified potential health issues, interviews available surveys, and limited body measurement data along with supportive evidence-based research and recommendations that informed the HIA and masterplan design.

The South Lincoln Homes neighborhoods are over 50 years old and community wide revitalization is needed. With the construction of the adjacent 10th and Osage light rail stop, the South Lincoln neighborhood is now developing into a transit oriented community.

Within the South Lincoln neighborhood there are 270 public housing units (referred to as South Lincoln homes) on 15.1 acres, and within these homes and the broader neighborhood (referred to as South Lincoln neighborhood), nearly 30% of the area's approximately 6,000 residents are children under the age of 18. Approximately 38% live in poverty, but more than half of all children are poor. Slightly more than half of residents are Latino/Hispanic.

One of the goals of the redevelopment is to improve the overall health of the community. This effort includes access to health care and public transit as well as to develop a resource efficient, healthy, desirable, and safe neighborhood. The design also seeks to achieve multiple health related objectives some of which include reducing noise, increasing physical activity, and reinforce a social support network.

HIA is a process to assess the impacts of policies, redevelopment projects and programs on population health. It is recognized that most influences on and solutions to public health are not within the traditional health sector. Improvements in health care can have limited impact if policy makers in other sectors fail to take into account the health impacts of their work (CDC, 2009).

Health is determined not only by genetics, socioeconomic status and personal choices, but also by policies and environmental factors (Collins, 2009). With a housing redevelopment, improvements can be made to the home design, urban form, in the layout and architecture of the buildings and the provision of amenities, services and economic opportunities that support healthy and more sustainable living.

Health Factors

The primary health determinants of the South Lincoln HIA that were identified are described in the following sections:

1. Social and Mental Wellbeing (social capital, mental health; cultural identity and equity). Equity falls across all determinants but is described in this section;
2. Natural Environment;
3. Built Environment and Transportation (physical activity and healthy eating); and
4. Access (in recommendations but no separate description except some is addressed in social and mental wellbeing section);
5. Safety (personal and traffic).

Recommendations

Recommendations identified (located at end of HIA document) focus on positive and potentially negative health impacts and improvements that can be influenced by the redevelopment of the South Lincoln neighborhood. The recommendations in this report respond to the draft proposed master plan design and include specific comments addressing community-wide best practices.

The recommendations are supported with related research, a health study of South Lincoln neighborhood, a survey of South Lincoln Homes residents, some comparative data, and citywide data from various city departments. Some recommendations stem from the Healthy Development Measurement Tool (HDMT) indicators, other HIAs, interviews with community members, South Lincoln steering committee members, other design team members, community organizers, and governmental and non-governmental support agencies.

Initial Outcomes, Perceived Changes, and Follow-Up

The South Lincoln master plan includes many proven and progressive sustainable design concepts which focus on health and well-being of the residents. Those concepts intend to foster a safer, more accessible, well-connected neighborhood that supports physical activity and healthy lifestyles for all residents of South Lincoln.

In addition to the masterplanning effort, a second short phase to be completed in October 2009 focuses on customizing the Healthy Development Measurement tool (HDMT) to improve its utility and to better address Denver and specifically South Lincoln. This phase includes further data collection and may offer additional and/or specific recommendations.

A key future step in the HIA process is to evaluate the impact the assessment has had on the implementation of the redevelopment. Tracking of decisions made in the project is needed to determine whether and which HIA recommendations were adopted, the reason for implementing or not implementing these recommendations, and finally, whether the recommendations that were implemented made a difference. For example, 81% of surveyed residents stated that they were completely or partially satisfied with their current residence. The hope is that after redevelopment has occurred, the percentage of residents who previously said they were very satisfied with their residence (26%) will have at least doubled.

The process of conducting this health impact assessment has already had positive immediate outcomes. For example, since hearing an earlier presentation to the South Lincoln Steering Committee, the City Council member for District 9 has expressed strong support for the use of HIAs. She has been engaged in promoting health throughout city departments, and met jointly with Denver planners, state and city health staff, and the health consultant about incorporating HIAs into neighborhood and station area plans throughout Denver.

Additionally, from discussions with the other planners about potentially including public health as a component within their request for proposals (RFP), public health considerations are now required. Other positive outcomes

are harder to tie directly to HIA, but at the same health presentation mentioned above, a portion of the discussion focused on reducing bike accidents and traffic speeds by narrowing Mariposa Avenue and including bike lanes. Approximately a month later, funding was allocated to construct bike lanes on Mariposa Avenue.

Broader Health Objectives for South Lincoln Homes and Existing Health Data (adults only)

- Increase physical activity: Overweight/obesity high among residents (55%)
- Improve pedestrian & bike opportunities and safety: Very few residents exercise enough (28% exercise aerobically 3 or more times a week)
- Increase opportunity for healthy eating: Very few eat recommended daily allowances for fruits, vegetables and other fiber (only 13% have 5 or more servings of high fiber food)
- Better access to health care: High percentage of residents have above normal blood pressure; 41% are not Denver Health patients and 30% don't have a medical home
- Reduce crime and fear of crime: About 50% of residents agree the community has shootings and violence; 51% feel safe about being alone at night in neighborhood
- Some social cohesion: Some neighbors feel neighbors are willing to help if needed, and feel the neighborhood is close knit but 48% strongly or somewhat disagree that the neighborhood is good place to raise children and 66% do not attend neighborhood association meetings
- Improve traffic safety: 65% do not have any type of motor vehicle; 54% take bus



Councilwoman Judy Montero at initial stakeholder interviews

INTRODUCTION

Connection between the Built Environment, Natural Environment and Health

Nationwide, evidence shows that decisions about how we use land and build our environment have significant impacts on individual and population health, safety, and well-being, as well as impacts on community networks, economic growth, environmental sustainability and social equity. The built environment influences injury in the form of pedestrian and vehicular accidents as well as exercise and healthy lifestyles. In addition, certain land use patterns and zoning have contributed to the growing epidemic of obesity and associated increased rates of cardiovascular diseases and diabetes and other diseases (Frumkin, 2004).

Public health is not only about the physical health but should be thought of as multi-faceted and incorporates emotional well-being and social cohesion (Stokols, 1992). The Institute of Medicine stated that health includes not only health care and public health institutions, but also actors working in many other sectors that impact health, such as housing, transportation, food production, urban and rural planning and environmental protection (Jackson, 2007).

Planners, transportation engineers, architects and other disciplines are experiencing many pressures to shift from the sprawling and unhealthy types of development to more compact, connected, mix use/mixed income developments that support walking, biking and transit. These disciplines can also improve energy efficiency in municipal buildings to achieve cost-effective reductions in local greenhouse gas emissions. By creating pedestrian and bike friendly travel routes, cities and neighborhoods can often decrease the number of vehicles on the road, leading to less congestion, obesity and air pollution.

Health Impact Assessment

The Healthy Development Measurement Tool (HDMT) checklist was used as the framework for this Health Impact Assessment. The HDMT was developed by the San Francisco Department of Public Health, and is a comprehensive evaluation metric to consider health needs in urban development plans and projects. HDMT represents a specific methodology, generated and validated to use for multiple types of HIAs. The details within each HIA phase whether scoping or assessment

will be discussed below along with the identified health risks, current health status, supportive research and proposed recommendations. Based on the health data from the community, specific types of interventions will be discussed and examples of how changes in the built environment can improve these health issues. Research has documented that all else being equal, residents of walkable communities drive less, are more physically active and are less likely to be obese with reduced traffic collision risk and less air pollutants (Frank, 2006).

The South Lincoln HIA is an expansive analysis which includes not only the South Lincoln homes but the broader South Lincoln neighborhood. This is considered a rapid HIA because it was completed, along with the masterplan design, in approximately four months. Since this HIA is focused on an assessment of current conditions and future potential impacts from the redevelopment, the evidence-based research and recommendations are centered on potential changes to the built environment and less on policy considerations.

The goals of the HIA are to:

- Identify potential impacts the redevelopment may have on health and wellbeing of the South Lincoln neighborhood;
- Suggest ways to improve overall health through evidence based health data and to assess potential human health risks; and
- Provide specific recommendations for the South Lincoln neighborhood through the redevelopment process.

South Lincoln Neighborhood Redevelopment

The South Lincoln neighborhood (also referred to more broadly as La Alma-Lincoln Park) is an area just southwest of downtown Denver and is one of the oldest neighborhoods in Denver. Aside from many single family detached houses that date back from 1900, South Lincoln has two-story Victorians, brick bungalows, and row houses. Additionally, there are two major housing developments which include the Parkway Center with 1,050 units of apartments and condominiums, and the South Lincoln Homes with 270 public housing units owned and managed by the Denver Housing Authority (DHA).

The design team for the redevelopment includes a multi-disciplinary team of architects, a health professional, landscape architects, engineers, financial advisors, developers, energy specialists and land use planners collaborating on the design of a mixed-use, mixed-income community. The master plan is an integrated design effort which includes the design team, the DHA, and the community. The objective is to triple the number of units overall while maintaining a 1:1 ratio of replacement of the current 270 public housing units and to create an environmentally conscious, sustainable, mixed-income community.

Key Demographics of Auraria/ Lincoln Park Neighborhood

The data below is from a larger area than just the South Lincoln neighborhood referred to throughout this document. The data is collected regularly by the Piton Foundation for the Auraria/ Lincoln Park area and can be used for comparison in future.

Age

Percentage of population age 1-34 is decreasing slightly and slightly increasing of those ages 35-65 and over (2002) but still overall younger than Denver.

Labor and Employment

Over half of the community (55%) have service type jobs compared to Denver (36%) (2002 data).

AURARIA/ LINCOLN PARK DEMOGRAPHICS		
Indicator	2000 Data	2007 Data
Total Population	6,554	6,315
Total Births *	149	93
% Births Non-Latino White *	11.41%	23.66%
% Births African-American *	6.71%	11.83%
% Births Latino *	77.18%	60.22%
% Birth Asian/Pacific Islander *	0%	4.3%

FAMILIES AND HOUSEHOLDS			
Indicator	Auraria-Lincoln Park	Denver	Data Year
Persons per Household	2.51	2.24	2006
% Children Living with Single Parents	52.09%	28.01%	2000
% Births to Unwed Mothers *	53.76%	33.24%	2007



Children at Denver Intercity Parish

POVERTY AND INCOME			
Indicator	Auraria-Lincoln Park	Denver	Data Year
Average Household Income	\$38,480	\$55,129	2000
% Persons in poverty	37.73%	14.29%	2000
% Children (under 18) in Poverty	51.04%	20.82%	2000
% Families in Poverty	37.05%	10.63%	2000
% Single Mothers with Children in Poverty	63.99%	32.58%	2000
% Households with Income less than 100% of Denver's Median Income	65.4%	49.9%	2000
% Non-Latino Whites in Poverty	26.42%	7.8%	2000
% African-Americans in Poverty	35.82%	19.37%	2000
% Latinos in Poverty	45.71%	22.47%	2000
% Asian and Pacific Islanders in Poverty	21.03%	16.83%	2000



South Lincoln Homes at the 1000 block of Navajo, looking north to the La Alma Recreation center

ADULT EDUCATION			
Indicator	Auraria-Lincoln Park	Denver	Data Year
% Persons age 25+ with less than 12th grade education	38.57%	21.11%	2000
% Persons age 25+ with high school only education	17.75%	20.01%	2000
% Persons age 25+ with some college but no degree	14.24%	19.52%	2000
% Persons Age 25+ with college degree (Associates or Better)	29.44%	39.37%	2000

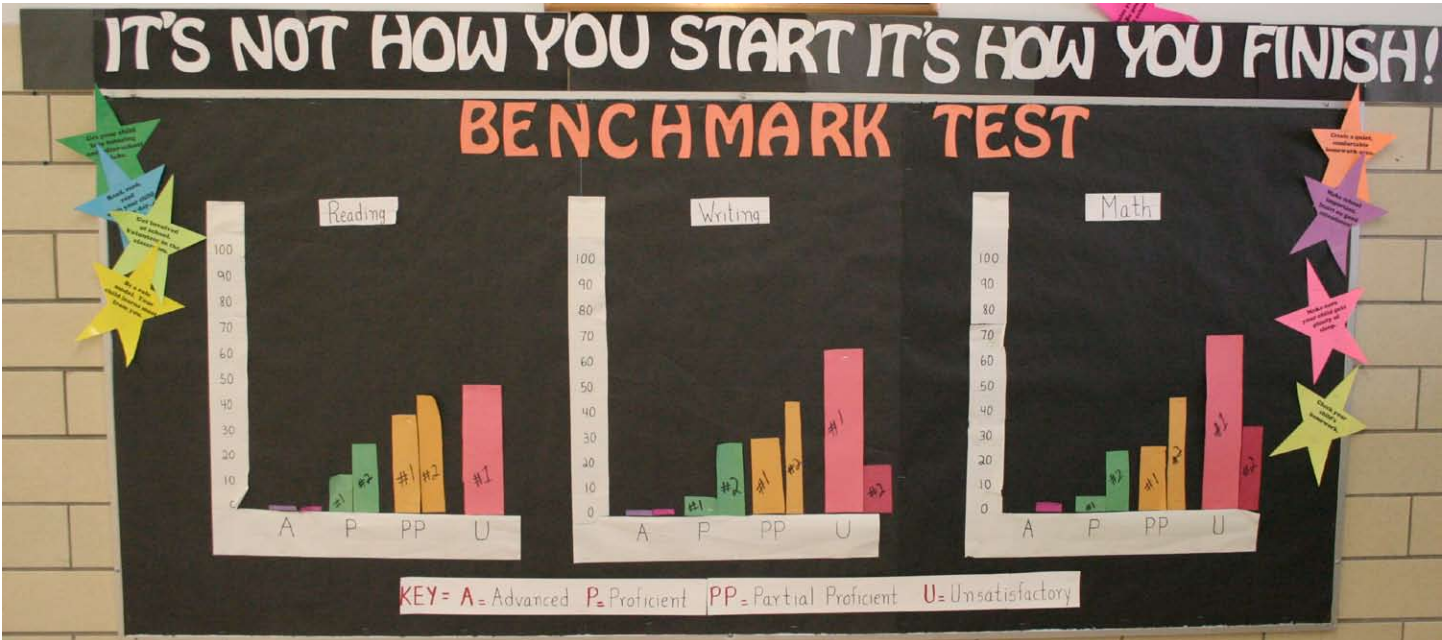
Key Socioeconomic Data Lincoln Park Schools

Schools in this area continue to struggle to serve the needs of the children. For example,

- Graduation rate is about 12%.
- About 95% of students received free and/or reduced cost lunches, compared to 64% citywide.
- In 7th grade, the majority of students are unsatisfactory or only partially proficient in math and reading at K-8 level.



Drawing after school



Greenlee Elementary School

HOMEOWNERSHIP			
Indicator	Auraria-Lincoln Park	Denver	Data Year
# Housing Units	3,009	274,735	2007
% Housing Owner-Occupied	19.86%	52.48%	2000
% non-Latino White Homeowners	17.06%	62.62%	2000
% African-American Homeowners	4.84%	48.37%	2000
% Latino Homeowners	30%	49.11%	2000
% Asian/Pacific Islander Homeowners	8.18%	44.87%	2000
Median Income for Home Purchasers	\$59,950	\$65,400	2003
Average Loan Amount for Home Purchasers	\$179,064	\$203,763	2003
% Approved Loan Applications - White	72.18%	65.23%	2003
% Approved Loan Applications - Non-White	51.43%	54.78%	2003



Homes in the Lincoln Park neighborhood

PHASES IN CONDUCTING HEALTH IMPACT ASSESSMENT AT SOUTH LINCOLN

Below are the HIA process steps developed early in the project.

Phase I – Scoping

- Characterize built environment
- Collect demographic and socioeconomic data
- Obtain environmental, public health, built environment and other data already available
- Conduct initial literature review
- Identify list of initial health impacts to be assessed in next phase
 - o Physical activity
 - o Obesity, cardiovascular disease, diabetes
 - o Air quality, asthma
 - o Water quality
 - o Nutrition, food access and quality
 - o Traffic safety
 - o Accessibility
 - o Noise
 - o Mental health
 - o Social capital
 - o Social equity
 - o Hazardous waste (this has been removed from description below because both the radium site and a leaking underground storage tank have been remediated as of 2007.)
 - o Personal safety
- Assess impacts of Relocation (focus in future design phases)

Phase II – Assessment

- Conduct more detailed health literature review on evidence-based research
- Identify related indicators/benchmarks
- Conduct key informant interviews with community and officials
- Conduct food audit of most used grocery stores (added later)
- Develop draft recommendations

Phase III – Analysis and Reporting

- Analyze data and identify evidence-based published data
- Report final recommendation
- Potentially write grants and secure other funding for potentially data collection, evaluation or relocation plan

Types of Data used at South Lincoln

Whether a few months or year long process, HIAs generally consist of different levels and types of data (blood pressure, crime, air pollution or community interviews) to come up with appropriate and effective recommendations, and in this case, a healthier South Lincoln neighborhood. This data also provides a baseline for potential improvements that can be measured and allows for benchmarks to be established.

The main health issues identified include transportation, healthy food access, physical activity, social and mental wellbeing, natural environment, personal and traffic safety, and accessibility. During the four month work period, some data was collected through evidence-based documented research, resident and community organizer interviews and focus groups, different City-wide department data, data and discussions with Denver Health, a community health profile, and local community surveys.

Multiple organizations and agencies contributed data and comments that informed the HIA such as the Piton Foundation (data), Denver Health and Hospital Authority (data), Denver Department of Environmental Health (data and consultation), the Denver Housing Authority (data and consultation), local schools (nurses interviewed), Denver Planning Department (consultation), Denver Urban Gardens (data and consultation), Learning Landscapes (consultation), Denver Public Works (data and consultation), and Denver Police (data and consultation).

Some data for the HIA was collected qualitatively through numerous interviews and focus groups conducted with students, school nurses, community leaders/activists, residents and agency officials. The qualitative information assisted with determining likely positive and negative health impacts. Example question of qualitative data is, why do some residents not like to walk to Kings Soopers?

Also some types of quantitative data were collected such as from surveys and body measurements. This type of data answers such questions as, how many bike accidents are there on Mariposa Avenue?

SURVEYS

Below are the summaries of two different surveys. In preparation for seeking HOPE VI funding through HUD, DHA conducted a survey of current South Lincoln residents to shape a Community and Supportive Services (CSS) needs assessment. This survey, conducted in spring 2009, included one direct health question and many other health related questions. The second survey was conducted by Denver Health in 2007, and along with a summary of the data includes responses and body measurements taken. These surveys provide a range of direct and indirect health data. In addition, as part of this HIA, data was collected about related food access issues. This data can be found in the Healthy Eating section.

DHA South Lincoln Homes Resident Survey

Highlights of a 2009 survey conducted by the Denver Housing Authority are below. The survey includes a multitude of health related data and assisted in informing the masterplan design and other decision making. The survey conducted by DHA, had responses from 224 households out of 270 South Lincoln housing units.

Health conditions:

- 38% or 84 people responded “yes” they had health conditions that prevent them from working. Some

responses included the health conditions such as: asthma, diabetic, high blood pressure, mental disorders, heart problems, and cancer.

- 63%, or 140 respondents, stated that they do not have any health conditions that would prevent them from working.

Crime related:

- 58% strongly or somewhat agree that the neighborhood has people using drugs.
- 51% strongly or somewhat agree that they feel safe about being alone at night in the neighborhood.

Social capital related:

- 66% do not attend neighborhood council or association meetings.
- 62% do not attend South Lincoln Local Resident Council meetings.
- 48% strongly or somewhat disagree that the neighborhood is good place to raise children.

Transportation related questions:

- 54% of residents take the bus to get to appointments.
- 65% stated that no one in their home have a car, motorcycle or other vehicle.



South Lincoln residents



Pedestrians on Santa Fe Drive

Denver Health South Lincoln Neighborhood Survey

Denver Health conducted door to door health surveys with residents in five neighborhoods, including South Lincoln, in 2007. The goal of the project was to help residents improve their health. These five neighborhoods were determined from a list of priority areas in most need of revitalization. The project was funded by the Denver Office of Economic Development and the Colorado Department of Public Health and Environment, Office of Health Disparities. No questions specific to children were asked.

In the South Lincoln neighborhood, 343 households participated in the door to door health survey, which included a collection of actual measurements for body mass index (BMI) and blood pressures. Areas with the highest levels of poverty within the South Lincoln community were targeted for the survey.

Some of the highlights of the South Lincoln adult 2007 health study results (averaged percentages) include:

- Only 20% had normal blood pressure; 77% had above normal blood pressure (pre hypertension, stage 1 HTN, stage 2 HTN);
- 55% of population was either obese or overweight;
- 40% smoked;
- Only 30% had a “medical home”;

- Only 13% had 5 or more servings of high fiber food on a daily basis;
- Only 62% had some type of health care coverage (including private health insurance, HMOs or Medicare);
- 40% described their overall health as poor or fair;
- Only 28% exercised aerobically 3 or more times a week;
- 13% had been told they have asthma;
- 9% described their level of depression as mild or moderate;
- 20% responded that in the past 12 months they couldn’t afford to see a doctor when they needed to; and
- Similarly, 20% could not afford a prescription when medicine was needed in the past 12 months.

Comparative data and details of these highlighted results are described below. Some referenced data uses the Behavior Risk Factor Surveillance System (BRFSS), which is a nationally standardized telephone survey regularly used to monitor lifestyles and behaviors that contribute to disease.

76.96% had above normal blood pressure. Uncontrolled high blood pressure can lead to stroke, heart attack, heart failure or kidney failure. People with lower education and income levels tend to have higher levels of blood pressure. In the US, 2005 death rates from high blood pressure were 15.8 for white males, 15.1 for white females, 52.1 for black males and 40.3 for black females. High blood pressure is particularly prevalent in African Americans, middle-aged and elderly people, obese people, and heavy drinkers (American Heart Association, 2009). Above normal blood pressure levels could fall into either of these categories defined by American Heart Association (2009), as pre hypertension (just above normal blood pressure), stage 1 HTN and stage 2 HTN (stages of high blood pressure).

55.4% of community is obese or overweight and don't exercise enough.

23.91% are obese and 31.49% are overweight. South Lincoln does not meet the National Healthy People 2010 target that no more than 15% of adults will be obese. Obesity in Colorado is 18.2% (2006 BRFSS survey). Only 28% of adults exercise aerobically 3 or more times a week, and only 17% exercise aerobically 1 or 2 times a week.

Only 12.54% have 5 or more servings of high fiber food on a daily basis. Statewide, 24.5% have more than 5 servings of fruits and vegetables on a daily basis.

Only 62% have some type of health care coverage (including private health insurance, HMOs or

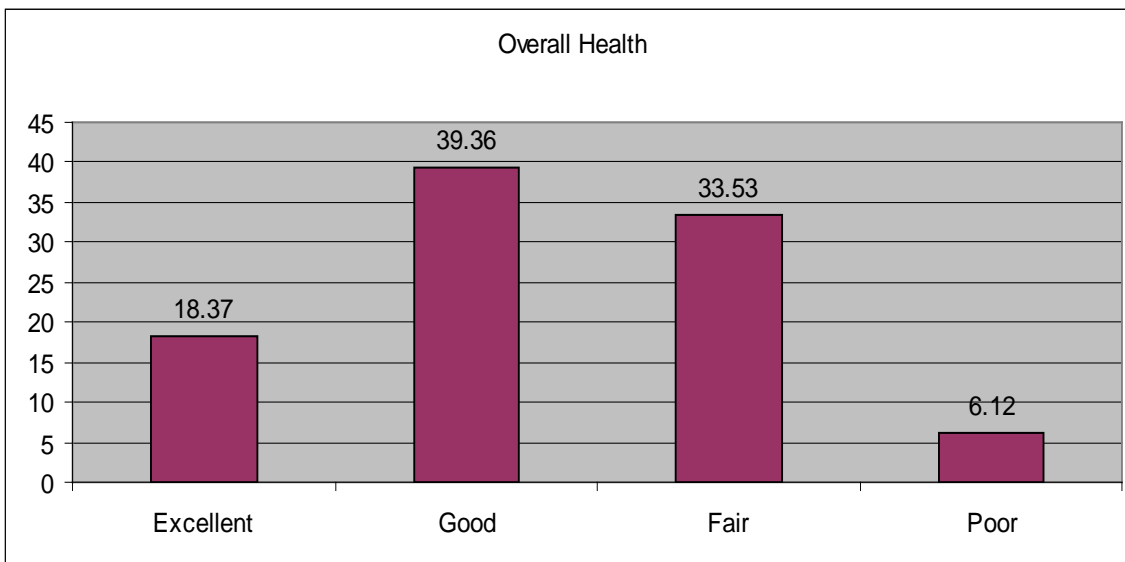
Medicare). Statewide, 83% have some type of health care coverage. In Commerce City, CO, which has similar demographics to South Lincoln and a population of ~27,000, 72% have some type of health care coverage (Tri-County Health Department, 2007).

13% adults have been told they have asthma in South Lincoln. Colorado BRFSS 2005 adult rates of asthma are 7.9%. In 2001, 14.7% of Denver adults had asthma.

39.65% described their overall health as poor or fair. Statewide, the percentage of those who reported fair or poor health status is 11.6% in comparison to good or excellent. In Commerce City, CO, 19.7% reported fair or poor health status (Tri-County Health Department, 2007). This question is very powerful self assessment and highly valid in predicting a person's quality of health.

20% of adults who said they needed to see a doctor within past 12 months but could not because of cost. Statewide, 12.9% adults said they could not see a doctor within the past 12 months because of cost (2005 BRFSS survey), and 10.3% in Commerce City, CO (Tri-County Health Department, 2007).

Many questions asked the residents whether they have ever been told they have a disease such as high blood pressure, high cholesterol, diabetes, etc. There were a low percentage of yes's for these questions. But 50% of the residents responded that they have not been tested for cholesterol in the past 10 years.



Therefore, it is likely that many residents have not had a physical, seen a doctor, or have been tested for these diseases in many years. As in many low income communities, preventive care is needed in the South Lincoln community. More residents need to be enrolled in some publicly funded insurance.

As part of the redevelopment planning and community outreach, some of this survey data was shared with the South Lincoln Steering Committee and residents in two different presentations.

Identifiers such as names and addresses were collected during surveying and are being confidentially held by Denver Health so a follow up study/evaluation could occur with future potential funding. Additionally, this was only an adult study. A study on children and adolescents is needed.

Short term recommendations:

Health Care Access can be improved by considering the following:

- La Mariposa Clinic is not currently operational. The clinic building is not compliant (no elevator) with American Disabilities Act, and would be very costly to bring up to code. It is important to consider reopening La Mariposa Clinic or having some other type of clinic in the neighborhood. Based on a meeting with the health consultant, Perry Rose staff (who are identifying resources for South Lincoln) and the Director of La Clinica Tepevac in June 2009, they have an interest in expanding into the South Lincoln neighborhood.
- A free shuttle to the hospital is provided weekdays with a volunteer driver from 7:30am-1:30pm for South Lincoln residents and other nearby communities who can access this shuttle by calling Pat from Community Voices at 303-436-4070 to set up pickup . This information should be posted on site and printed on materials such as on the information sheets dispersed in the neighborhood.



Mural at La Alma Recreation Center in Lincoln Park



Skateboarding in Lincoln Park neighborhood



Residents at the senior center

BUILT ENVIRONMENT AND TRANSPORTATION (NON-MOTORIZED)

Nationally, statewide, and within the South Lincoln neighborhood, improvements are needed to the physical environment to provide more opportunities for people to eat healthy foods and to be safe and physically active on a daily basis. The overall walkability of a community has multiple impacts including physical activity levels, equity, access to healthy food, and social cohesion.

Zoning regulations that accommodate mixed land uses can increase physical activity by encouraging walking and bicycling for commuting purposes. Walking is a basic form of transportation to work, school or play, and can be an important source of daily physical activity. Walking to and from public transportation (i.e. light rail, buses) can also help individuals attain recommended levels of daily physical activity.

However, walking can be difficult for residents in communities such as South Lincoln lacking well-maintained sidewalks (flagstones) and safe pedestrian

street crossings and lighting.

Benchmarks: South Lincoln Homes are within ½ mile of a bus stop and a light rail stop (CDC 2009). Improved bus access is encouraged through the Masterplan recommendations, such as near 10th and Osage and Mariposa.

Walkability

- Pedestrian access (sidewalks, trails, etc.)
- Pedestrian amenities (seating, shade, etc.)
- Parking availability
- Connectivity, direct routes
- Variety of destinations
- Proximity of destinations
- Parks/public recreation spaces
- Aesthetics (public art, landscaping, window displays, etc.)
- Convenient transit



Biking along Osage Street near the 10th & Osage LRT station



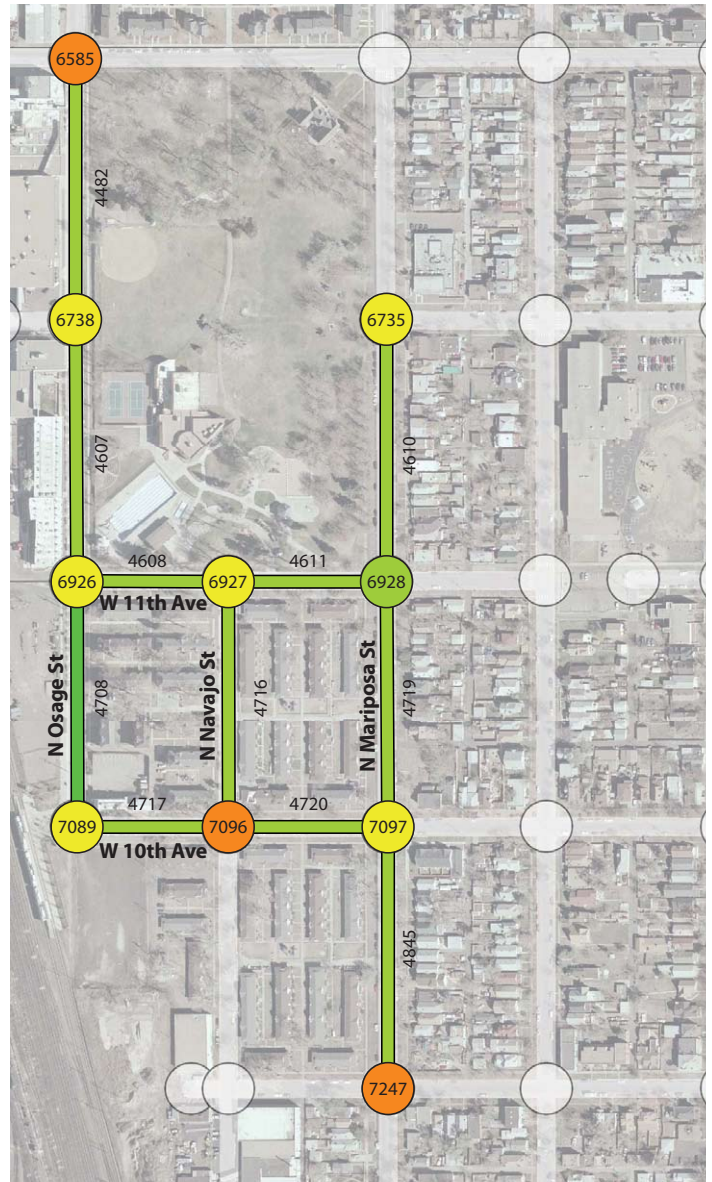
Pedestrian at La Alma Recreation Center in Lincoln Park

Pedestrian Environmental Quality Index (PEQI)

The PEQI is a tool, developed by the San Francisco Department of Public Health, used to measure the pedestrian environment. During the summer of 2009, several teenagers from the La Alma Boys and Girls Club conducted a walking audit of selected street segments and intersections in the South Lincoln neighborhood. The audit is an analysis which draws on published research and work from numerous cities to assess how the physical environment impacts whether people walk in a neighborhood. It is an observational survey, based on the perspective of the user, which quantifies various factors empirically known to affect people's travel behaviors. The survey considers intersection safety, traffic, street design, perceived safety, and land use. Each category contains indicators, which can be found in Appendix A.



Flagstone sidewalks in the Lincoln Park neighborhood



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

Within the study area, 11 street segments (the length of one block) and 10 intersections were surveyed. The analysis determined that the street segments have reasonable or better pedestrian conditions, meaning that residents will be likely to walk; however, many of the intersections scored poor or unsuitable for pedestrians. The masterplan includes traffic calming recommendations aimed at improving the safety of these conditions.

PHYSICAL ACTIVITY AND INACTIVITY

Two-thirds of adults and nearly one-fifth of children in the United States are overweight, placing them at greater risk for chronic diseases (CDC, 2009). This increases the number of health risks for:

- Heart Disease: Diabetes; Stroke; High Blood Pressure; Respiratory problems; Arthritis; Depression and Anxiety;
- Increase the risk of colon (~50%) and breast cancer (~25%); and
- Dying prematurely.

Because the majority (approximately 60%) of the residents from the South Lincoln neighborhood are Hispanic/Latino, they are at higher risk for being physically inactive.

Physical Activity

- Helps build and maintain healthy bones, muscles and joints,
- Helps weight control,
- Promotes mental health, reduces depression and anxiety,
- Improves agility and balance, and reduces risk of injuries from falls.

Regular physical activity is defined as, at least 20 minutes of vigorous activity 3 or more days per week (e.g. running, swimming), or at least 30 minutes of moderate activity 5 or more days per week (e.g. brisk walking, bicycling). This measure of physical activity includes all the activities a person may participate in during his or her daily routine (CDC, 2009).

As documented earlier from the Denver Health survey, only 28% of residents within the South Lincoln neighborhood exercise aerobically 3 or more times a week and 17% 1 or 2 times a week. One of the ways to increase opportunities for physical activity is to ensure resident access to existing recreational facilities, such as school gyms and playgrounds.

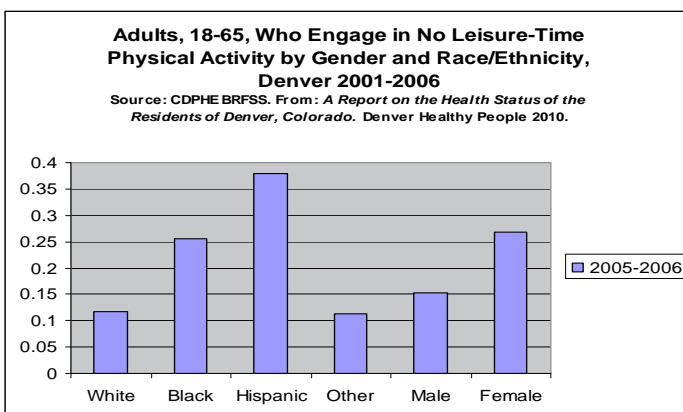
Lincoln Park, located directly north of South Lincoln Homes, is a 15-acre amenity with abundant opportunities for the community to engage in physical activity, which can also enhance mental health. Lincoln Park includes La Alma Recreation facility, outdoor sports fields, a public pool, picnic tables and a community playground.

Benchmark: Recreational facilities are within a ½ mile distance of the surrounding community. South Lincoln meets this benchmark. There are other issues contributing to physical inactivity and higher obesity levels such as, safety and nutrition factors which will be discussed in later sections.

In addition to recreation facilities, bicycling can also provide a regular source of physical activity. Research shows a strong and significant association between bicycling infrastructure and frequency of bicycling for both recreational and commuting purposes. Infrastructure that supports bicycling includes bike lanes, shared-use paths (sharrows), bike routes on roads, and bike racks in the vicinity of retail and other public spaces (CDC, 2009). This type of infrastructure is lacking in South Lincoln, but bike lanes are proposed to be installed along Mariposa Avenue in fall 2010. The Masterplan also contains recommendations to add bike lanes and facilities in the redevelopment.

Physical Inactivity

White 12%, Black 26%, Hispanic 38%



Physical Inactivity Rates



Soccer game at Lincoln Park

HEALTHY EATING - FOOD ACCESS AND QUALITY

Good nutrition can help lower the risk of many chronic diseases, but many people consume high calorie, low nutrition foods. Research shows that the average American now consumes almost one thousand more calories per day than in the 1950s. Several studies report that racial minorities tend to eat a diet higher in fat and sugar, exercise less, are more overweight than white Americans (USDA, 2002). Healthier foods are generally more expensive than less healthy foods, posing an economic barrier, particularly among low-income populations. Also, a lack of access to healthy foods and easy access to unhealthy foods are contributing factors to a poor diet. The result is a public health crisis that falls disproportionately on those unable to access healthy, affordable food, which can lead to diet-related illnesses such as obesity, type 2 diabetes, heart disease, and other illnesses (CDC, 2009).

The benefits of good nutrition are numerous. Good nutrition maintains good health for the entire body, enables all body systems to function optimally, provides energy, promotes good sleep, promotes mental health, and promotes healthy aging. The current Surgeon General guidelines recommend at least 2 servings of fruit and at least 3 servings of vegetables per day, for a total of 5 or more daily servings of fruits and vegetables.

Generally, supermarkets have a larger selection of healthy food at lower prices compared to convenience stores. Other healthy food sources include farmers markets, farm stands and farm-to-school initiatives, and purchasing food more directly from farms through programs such as Community Supported Agriculture. Increasing the availability of such mechanisms may reduce costs of fresh foods and potentially increase the availability through direct sales. Direct sales also decrease packaging and shipping time, as a result, improve the nutritional value

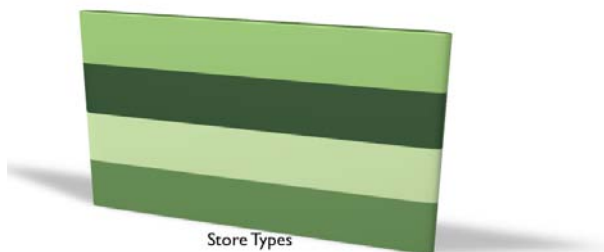
and taste of fresh foods by harvesting produce at ripeness rather than when it was shipped (CDC, 2009).

As part of the masterplanning and HIA effort, two food surveys were conducted in the La Alma/ South Lincoln neighborhood. The first was done to determine food choices and availability at a variety of retail locations in the neighborhood. The second was done to examine food pricing and routes to stores within the neighborhood. During community meetings, residents have indicated the most common grocery stores they shop are the Walmart Super Center (Walmart), Albertsons Sav-On (Albertsons), and King Soopers Grocery Store (King Soopers). King Soopers is the closest grocery store 0.7 miles walking distance away from the site. Some community members believe that prices are lower at Walmart and Albertsons; therefore they take public transportations (light rail and/or bus) or taxis to shop at these stores. The walk to the King's Soopers is perceived as dangerous by some and precludes a number of residents with disabilities from walking, so instead they take a taxi or drive a car if possible (65% don't have a motor vehicle).

There are also two corner stores in the vicinity of South Lincoln, the American Way Market, Rio Grande, a gas station store, and a 7-11 within a half of a mile. The presence of fast food restaurants was not significant in the vicinity of South Lincoln Homes, so this was not identified as a health issue to be addressed for this neighborhood.

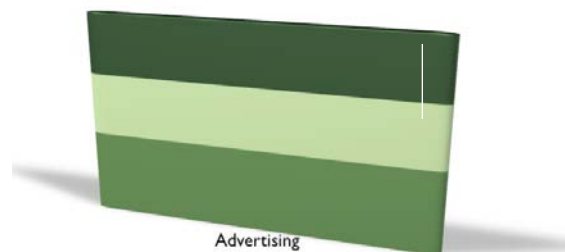
The below data is from the first food survey, which was focused on retail food availability and choices (conducted by Laura Curry). The four stores were selected based on proximity to South Lincoln Homes, and included one supermarket (King Soopers), one corner market, one liquor store, and one gas station. The goal was to determine what food choices are available to residents.

■ 1 Super Market ■ 1 Corner Market ■ 1 Liquor Store
 ■ 1 Gas Station



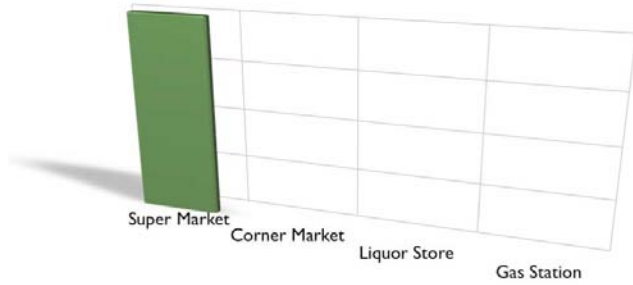
There is only one supermarket in proximity to South Lincoln

■ Unhealthy Foods - 4 ■ Cigarettes - 3 ■ Alcohol - 3



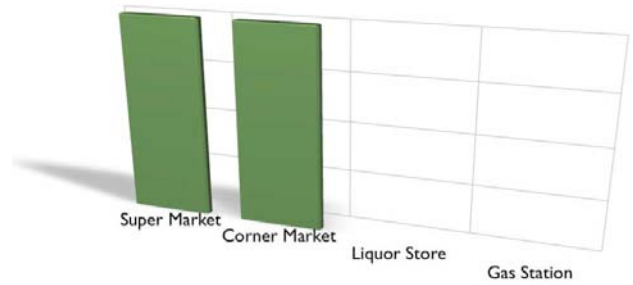
All four stores advertised unhealthy foods

■ Fresh Fruits



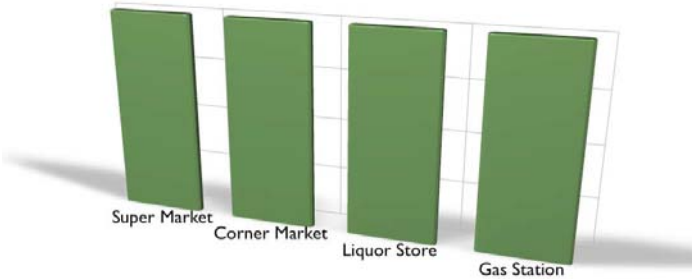
The supermarket is the only retail source of fresh fruits.

■ Fresh Vegetables



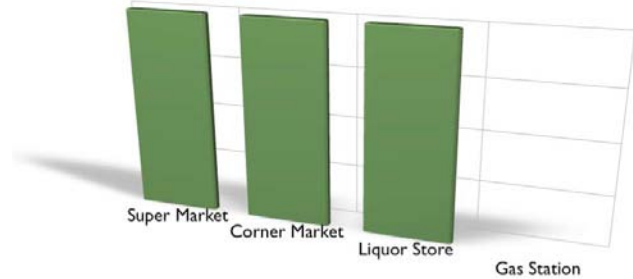
Fresh vegetables are available at the supermarket and corner market.

■ Dairy



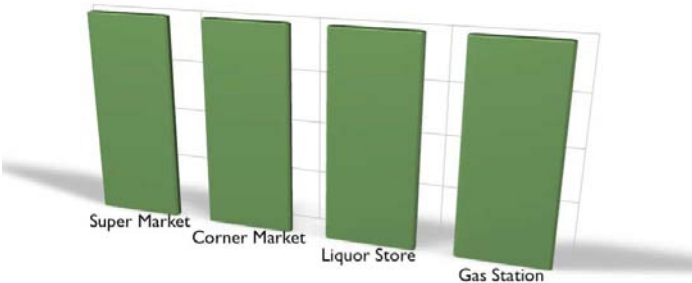
Dairy products are available at all store types.

■ Grains



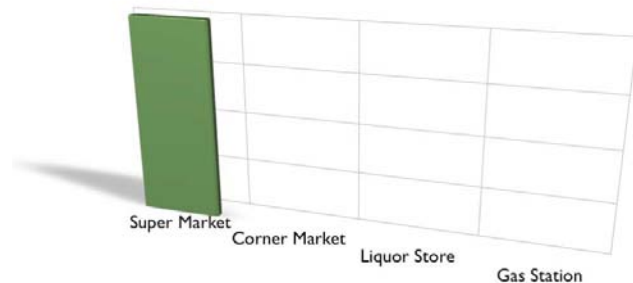
Grains can be found in most retail stores.

■ Unhealthy Products



All retail store types are a source for unhealthy products such as candy, soda, chips, alcohol, and tobacco.

■ Whole Grains



The supermarket is the only source of whole grains.

In addition to the retail food availability survey, a food audit was conducted of three local grocery stores and corner stores in the vicinity of the South Lincoln neighborhood (data collected by graduate student, Shun-Ping Chau). This portion of the report and below data is focused on the grocery stores. This food audit also addresses the routes to stores, discrepancies between the stores, and recommendations.

The food audit survey was done on prices of common foods which incorporated elements from the Store Inventory Tool from the D.C. Healthy Corner Store

Program, and HDMT food audit. It also considered the built environment en-route to the stores and food disparities within the grocery stores (survey data, Appendix B).

For the walking audit portion, the starting point was set at the intersection between 10th Avenue and Navajo Street, a location considered as the center of the South Lincoln community.

- Walmart: A trip begins with walking one block to the 10th and Osage light rail station, a short train ride to Auraria Station (less than five minutes), and a bus ride of approximately eleven minutes. A round trip is

approximately an hour and cost \$4.00, or \$2.00 for seniors (65+), students, and people with a disability. There is no need to cross any streets from the bus station to Walmart. On the return trip, one must cross a major street (Wadsworth Blvd.) which has pedestrian crossing lights. There is shelter at the bus stops in the form of a partially enclosed kiosk.

- Albertsons: It takes a two-minute train ride from the 10th and Osage light rail station to Alameda station, followed by at least a five-minute walk to cross a large parking lot to arrive at Albertsons. A round trip takes approximately fifteen to twenty minutes and costs the same as Walmart.
- King Soppers: There is no scheduled public transportation to the King Soppers. Regional Transportation District (RTD) offers some limited services for disabled persons at the normal fare of \$4.00 one-way. Some community members mentioned that RTD would provide rides for at least 10 people but this has been difficult for the residents to organize.
- A walk to King Soppers involves crossing multiple streets, some without crosswalks and/or pedestrian lights. Most of the streets have curb cuts but about half the sidewalk is paved with flagstones, resulting in a rather uneven surface. Lighting is adequate only in certain areas.

The food audit determined that, overall, Walmart had the lowest prices (this included using store discount cards).

- For fruits and 100% fruit juices, Walmart had the lowest prices for 10 out of 12 items, King Soppers had the lowest price for 1 item, and tied with Walmart for 1 item.
- For vegetables, Walmart had the lowest prices for 8 out of 15 items, King Soppers had the lowest prices for 4 items, and Albertsons had the lowest price for 3 items.
- For dairy products and eggs, Walmart had the lowest prices for 7 out of 11 items, Albertsons had the lowest prices for 3 items, and King Soppers had the lowest prices for 1 item.
- For cereals, grains, bread, and legumes, Walmart had the lowest prices for 14 out of 21 items, King Soppers had the lowest prices for 5 items, and Albertsons 2 items.

- For meat and fish, Walmart had the lowest prices for 5 out of 11 items, Albertsons had the lowest prices for 3 items, and King Soppers had the lowest prices for 3 items.
- For snacks, Walmart had the lowest prices for 7 out of 13 items, King Soppers had the lowest prices for 4 items, and Albertsons had the lowest prices for 3 items.

Price Disparity

An interesting and unexpected observation during the survey was the difference in prices within the same store, among certain similar and identical products as a result of the products' location and grouping. At Walmart, a 15-ounce can of sardines in tomato sauce costs \$1.48 among other canned meats and fish, but costs \$1.56 at the "Mexican foods" aisle.

This occurrence is most noticeable at King Soppers and a more detailed survey was conducted (See Appendix B) where many items were 3-5 times more expensive in the "Mexican section". For example, canned black beans is \$2.19/15 oz. (Goya) compared to \$0.84/15 oz. (Kroger); or sugar at \$5.19 (Zuika) for 4 lbs. compared to \$1.98 generic version in the non-Mexican section. Sharing this type of information is important for residents to make good decisions about how their money on food is spent.



Entrance to King Sooper grocery store

Access to Healthy Food, Farmers Markets, and Community Gardens

“Community gardens enhance nutrition and physical activity and promote the role of public health in improving quality of life. Opportunities to organize around other issues and build social capital also emerge through community gardens. Additionally, community gardens appeal to newly arrived immigrants, who use them to help maintain cultural traditions” (Twiss, 2003).

Currently, there are two very small gardens in South Lincoln. The first is located at Greenlee school, in the playground area. The second is on the South Lincoln property, near 10th Avenue and Navajo Street. A third larger garden is located on Elati Street, near West High School.

In South Lincoln, a new community garden of approximately 25 plots (at least) is recommended. There will be a need to work with Denver Urban Gardens (DUG) and the residents to coordinate the maintenance and use of the garden. Space for a community garden and

potential farmers market is located in the South Lincoln master plan. Farmers markets help to facilitate direct sales between the residents and local farmers and gardeners. These markets do not require fixed infrastructure and will be optimal for the future 10th street promenade where the street could be closed off for such activities.



South Lincoln garden plots



Mural in the La Alma/ Lincoln Park neighborhood

SOCIAL AND MENTAL WELLBEING

The interaction between the individual and their community is vital for mental and social wellbeing. This section briefly discusses social cohesion, social capital, equity, cultural identity and mental health. Many social community health determinants such as social cohesion and capital, equity, cultural identity and mental health are interrelated. A high degree of each of these concepts can contribute to population health in several ways. Some studies indicate that friendly interactions improve health directly by reducing illnesses. Increased community cohesion can improve personal security, which encourages people, particularly vulnerable residents such as seniors, to walk and participate in social activities. Community cohesion can also contribute to a reduced crime rate because neighbors watch out for one another (Frank, 2006).

Social Cohesion and Capital

The term social cohesion is often used to describe this interaction of strong connections and support among members of a community that can lead to better adjusted, happier, and in some ways physically healthier individuals (Frumkin, 2004). Social capital is more about the degree to which people know and trust their neighbors, level of social involvement, and participation in community activities. Social cohesion and capital can be compromised by linguistic or racial isolation, and socioeconomic inequalities.

Community planning best practices rely on the existing social cohesion and social capital to support and expand community development. Building community capacity through job training, schooling, and crime mitigation, can address social ills and create a sense of unity and cohesion.

Social and mental wellbeing could be improved by making South Lincoln a more safe, aesthetically pleasing, culturally appropriate (such as through art and architecture) and safer neighborhood with greater opportunities for physical activity and interaction. This can be accomplished through the incorporation of local art, walking paths, gathering spaces, benches and gardens.

Community engagement is an important component of social cohesion and capital and has been a central element of the master plan design at the South Lincoln

neighborhood. Numerous community interviews and meetings were held which not only provided helpful feedback and direction on the design of their neighborhood but also provided opportunity for residents to know their neighbors better, increasing social cohesion and capital. An on site office was created for availability of design documents about the proposed redevelopment project, proposed timeline, draft plans, notes from meetings, and financial documents, so that neighbors could access these documents when it is convenient and provide feedback anonymously.



Talking with residents at the first Community Meeting



Talking with residents at the first Community Meeting

Health Equity and Socioeconomic Status

Poor people continue to experience higher rates of illness and die younger than their richer counterparts (CDC, 2009). In addition, public health data indicates that the burden of illness is higher among minorities and low income communities. One of the strongest and most consistent predictors of a person's morbidity and mortality is a person's socioeconomic status (SES). This phenomenon persists across most diseases throughout the span of a person's life and extends across numerous risk factors for disease. SES is usually measured by determining education, income, occupation or a combination of these factors (Winkleby, 1992).

Whether assessed by income or education, SES is linked to a wide range of health problems, including low birthweight, cardiovascular disease, hypertension, arthritis, respiratory illness, diabetes and cancer (Adler, 2002). Lower SES communities are known to have lesser quality housing, lack opportunities for outdoor activities or healthy food options (Scinivasan, 2003). More support is needed for those people with lower SES and demonstrated by numerous studies, can then improve health status and overall quality of life.

Lower income children suffer more traffic injuries and fatalities than those from higher income families. Nationwide, pedestrian injuries and fatality rates for Hispanic and Black people are several times higher than those among White people. Researchers believe these rates may stem from a higher probability of being a pedestrian, road design in areas where minority persons walk, and cultural factors like not being accustomed to high-speed traffic. People with disabilities may have fewer options for physical activity because of barriers in the built environment. They are also more at risk of a collision in difficult traffic situations and may recover more slowly if injured (Tri-County Health Department, 2007).

Mental Health

Employment of the residents of South Lincoln is crucial to good mental health and maintaining a healthy lifestyle. As part of the redevelopment planning, DHA is working with consultants and the design team to address services and job opportunities. Because childcare issues can be a barrier for employment, assuring affordable and high

quality childcare is important for South Lincoln. This issue has been raised on numerous occasions by residents and community organizers and considered by many as one of the top priorities.

Additionally, within South Lincoln, we know that 75% stated in the DHA survey that they are currently unemployed and 70% are not actively looking for a job or another job. Because of this economic status, we can anticipate that the South Lincoln residents will have a higher need to improve health determinants, such as access and opportunities for physical activity, jobs, and healthier food options. The redevelopment of South Lincoln Homes will include a significant low income and moderate income population, ranging from 0 – 60% of the average median incomes. Providing job opportunities is a goal of the redevelopment, specifically ensuring residents in the neighborhood have access to jobs related to the redevelopment that include not only demolition and construction but in other stages such as landscaping.



Mural in the La Alma/ Lincoln Park neighborhood

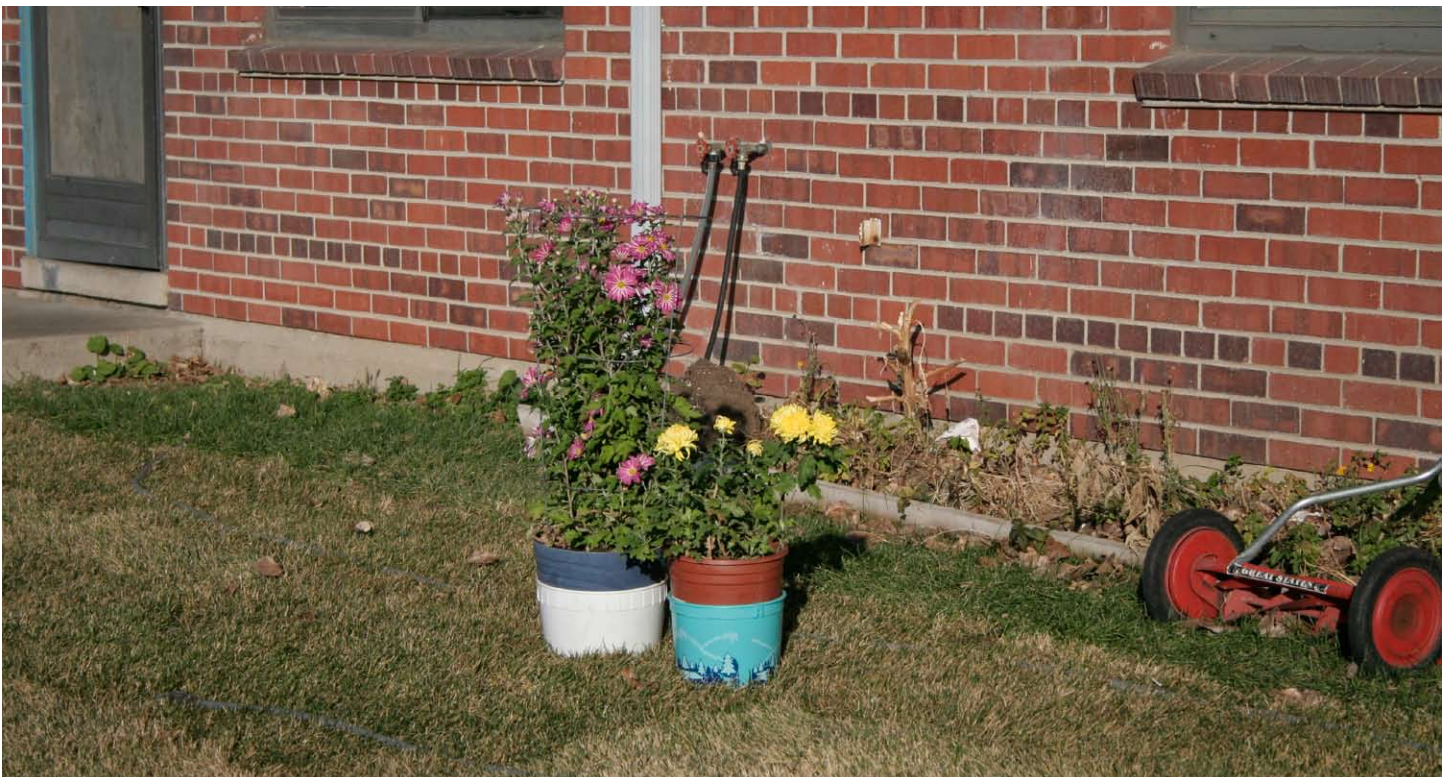
As part of the Section 3 housing program for low income, DHA provides these job opportunities to the South Lincoln residents first. The redevelopment project provides space for a new, locally serving business such as an auto repair, beauty salon/barber, and/or video store, and opportunities for job training programs. This project demonstrates a good model for increasing employment opportunities.

A connected and supportive community can both prevent and mitigate the impact of mental health disorders. The burden of mental disease can be reduced with built form that enhances the sense of community, and provides areas of solace and opportunities for safe physical activity (Frank, 2006). Established Smart Growth policies and programs support mental health by encouraging physical activity which decreases stress along with improving independence for non-drivers. Transportation provides opportunities to those without motor vehicles to access health services, jobs, and other necessities. A lack of these options can further increase a sense of isolation and day-to-day stress.

Some experts have found that access to nature contributes to mental health. Studies show that even just

views of nature can decrease infirmity visits, and speed up recovery from surgery (Frank, 2006). One way to introduce the natural environment to an urban landscape is to incorporate community gardens. Apart from all the potential physical and nutritional benefits of gardening, it can also provide a powerful element of mental rejuvenation and stress reduction through the direct contact with nature.

A European study found that residents in areas with high levels of greenery had three times the likelihood of being more physically active, and a 40% lower occurrence of being overweight and obese than in similar areas with low levels of greenery. It should be noted that the study also found in areas with high levels of social incivilities (anti-social activities such as crime), the likelihood of being more physically active was less and the likelihood of being overweight or obese was greater. Green space is defined as vegetated land or water within or adjoining an urban area, including: natural and semi-natural habitats, paths, rivers and canals, parks, gardens playing fields and children's play areas (Greenspace Scotland, 2008). The study used a measure of green space that included the level of vegetation and greenery visible on houses and the streets immediately surrounding them.



Container gardening at South Lincoln Homes

SAFETY (PERSONAL AND TRAFFIC)

Personal Safety

People may be less inclined to walk, bike or play outdoors in neighborhoods that are perceived to be or are unsafe due to crime and violence. Similarly, safety considerations have been shown to affect parents' decisions to allow their children to play outside and walk to school (CDC, 2009). Local governments can implement efforts to improve neighborhood safety such as increasing police presence, increasing eyes on the street and parks, improving street lighting and property conditions (graffiti, trash, weeds, etc.) (CDC, 2009). Below are data on the number of crimes in 2007, 2008 and beginning of 2009. The second graph are the percentages of crime of the broader Auraria-Lincoln Park (includes North Lincoln) compared to Denver (Piton Foundation data).

SOUTH LINCOLN NEIGHBORHOOD CRIMES			
(area of data: 6th Ave. to Speer, to Colfax, and just west of railroad, Source: Denver Police Department)			
Crimes	2007	2008	Jan.-Apr. 2009
Homicides	2	1	0
Sexual Assault	4	7	6
Robbery	21	34	5
Burglary	74	116	32
Larceny (theft from motor vehicle)	118	158	59

Crime, whether burglary or violent crime, is significantly higher in South Lincoln than in Denver and other communities. Established guidelines, such as Crime Prevention Through Environmental Design (CPTED) should be incorporated throughout the design as described below.

The master plan should create a series of opportunities to provide for eyes on the streets, buildings, parking areas and parks for better safety. This can be accomplished by

CRIME			
Indicator	Auraria-Lincoln Park	Denver	Data Year
% Property Crimes	61.84%	57.74%	2007
% Violent Crimes	7.73%	8.27%	2007
% Other Crimes	30.43%	33.99%	2007
Crime Rate per 1,000 Persons	196.67	68.62	2007
Burglary Crime Rate per 1,000 Households	37.08	22.48	2007
Violent crime rate per 1,000 Persons	15.2	5.68	2007

designing buildings with porches, balconies, and residential space above street-level retail space (Carter, 2003).

Principles of territorial reinforcement such as considering the use of pavement treatments, landscaping, art, signage, screening, and fences to define and outline ownership of property provide a feeling of safety and a network of boundaries within a community. For example, at South Lincoln very low black metal fencing defines the public and private spaces within the community. Unfortunately, these short fences are located on some blocks but not on others at South Lincoln. Another principle to consider is the placement and design of physical features that maximize visibility. This includes the orientation of windows, entrances and exits within a building, parking lots, walkways, guard gates, and landscape materials, fences or walls, signage, and any other physical obstructions within the site (Carter, 2003). Additionally, support is needed for community policing programs such as neighborhood watch, walk and watch groups and blight/graffiti elimination programs.

Traffic Safety

Traffic safety is the security of pedestrians and bicyclists from motorized traffic. Enhancing traffic safety has been shown to be effective in increasing levels of physical activity in adults and children (CDC, 2009). Traffic safety can be enhanced by engineering streets for lower speeds or by altering existing streets with traffic calming measures or by improving street crossings for pedestrians.

For example, historically, a higher number of bicycle accidents occur along 13th street, 9th and Mariposa (data below is from 2000-2005). Mariposa is greater than 50 feet in width which is considered wide for a community street. Narrowing the street by introducing bicycle lanes is one option which creates an environment that not only encourages physical activity, but slows traffic down. Evidence shows that the difference between 40 and 20 mph is clearly the difference between life and death. Additionally, we know from the DHA survey that 65% of households do not own a motor vehicle so the environment

for non-motorized modes of transportation must be safe.

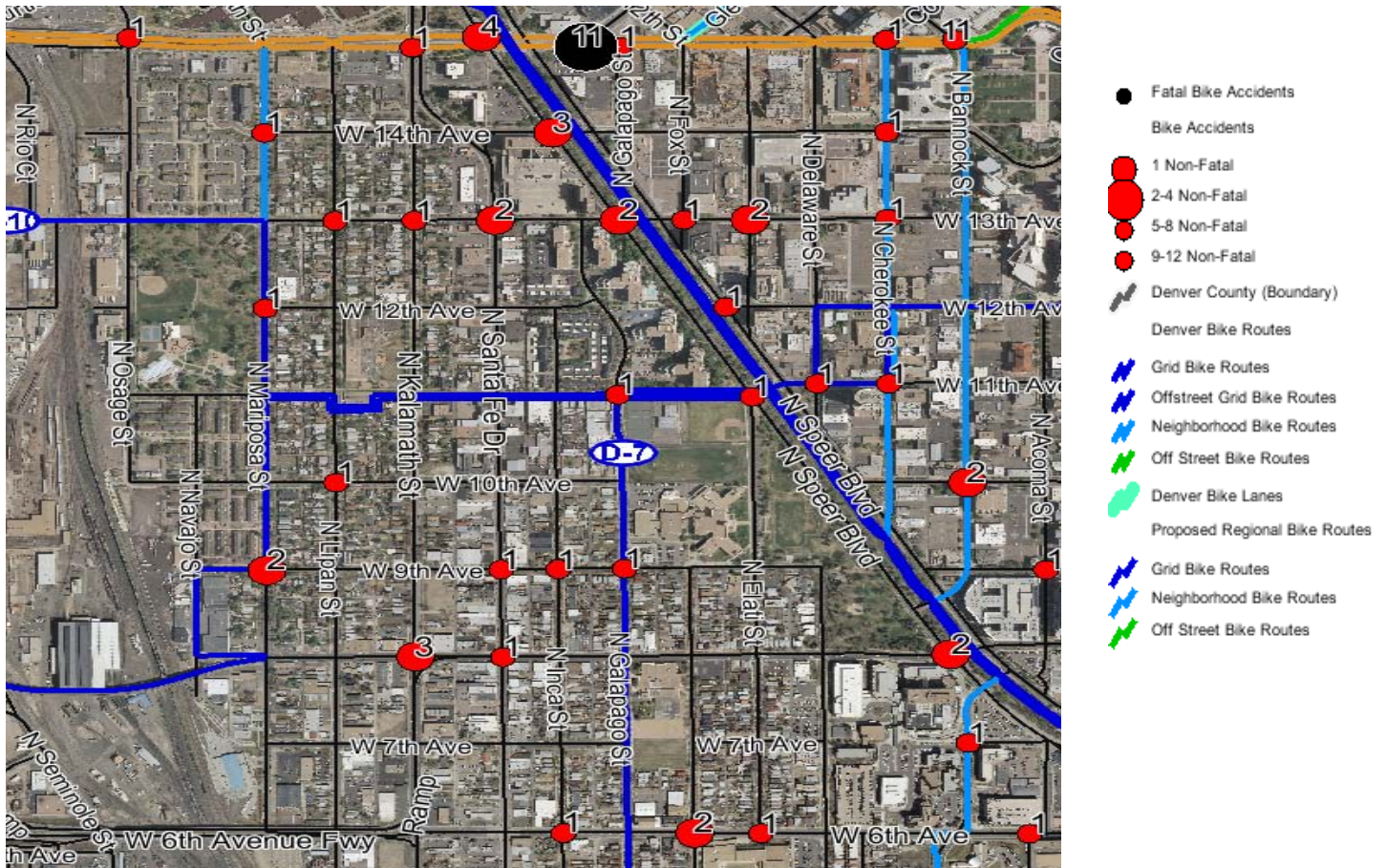
We also know from the Longmont study, discussed below, that generally the wider the road the less safe it is. Bike lanes along with parked cars along a wide road such as Mariposa are effective ways to narrow the perceived width of the street, slowing traffic which creates a safer environment for all users. Narrower streets are slower and have been shown to be safer.

As found in the Longmont, CO study of 20,000 accidents, the street width had the greatest relationship to injury accidents.

The study found that accidents per mile per year (a/m/y) were higher on wider street:

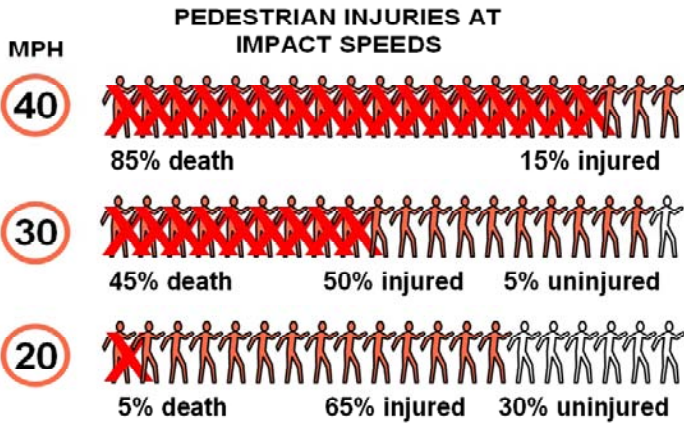
- 40-foot wide street 2.23 a/m/y
- 36-foot wide street 1.21 a/m/y
- 24-foot wide street 0.32 a/m/y

Source: Residential Street Typology and injury accident



frequency, Swift and Associates, Longmont, CO, 1997.
 Source: UK Department of Transportation

Krus and colleagues reported that 69% of child pedestrian injuries occur mid-block, when children dart into the street. Young children have difficulty judging vehicle distance and velocity and lack cognitive skills required to make valid and consistent crossing judgment. Considering that a high percentage of the South Lincoln community is younger compared to other communities, these considerations are particularly important (Retting, 2006).



Considering the limited resources of the redevelopment, research states the following priorities have the greatest potential for collision prevention.

- Single-lane modern roundabouts,
- sidewalks (for south Lincoln its flagstone improvement),
- exclusive pedestrian signal phasing,
- pedestrian refuge islands (similar to one on Mariposa but with needed design improvements), and
- increased intensity of roadway lighting (Retting, 2006).

Safety improvements for non-motorized forms of transportation can be classified into 3 broad categories.

1. Separate pedestrians from vehicles by time or space,
2. increase the visibility of pedestrians by motorist, and
3. reduce vehicle speeds.

Installation of traffic circles (modern roundabouts) at intersections is the most effective speed control intervention identified in research. European studies indicate that, on average, converting conventional intersections to traffic circles can reduce the rate of

pedestrian crashes by about 75% compared to stop-controlled intersections (Retting, 2006). Significant benefits can be realized by converting stop-controlled and signalized intersections into traffic circles. Benefits include, improved safety, speed reduction, aesthetics and operational functionality and capacity. Single lane roundabouts can accommodate up to 20,000 entering vehicles per day (ITE, 2006). Traffic circles had the most favorable impacts on safety with chicanes being number two. Circles not only slow traffic on the approaches but reduce the number of potential conflict points within the intersection (Ewing, 2006). Currently at South Lincoln, vehicle-to-vehicle and vehicle-to-pedestrian accident data has not been analyzed so recommendations specific to traffic circle locations cannot be offered. Additionally, city regulations do not allow for neighborhood scale traffic circles.

Management of traffic signals at intersections is a strategy to reduce conflicts between pedestrians and vehicles. Exclusive traffic signal phasing which stop all vehicle traffic for part or all of the pedestrian crossing signals have been shown to significantly reduce conflicts. Another analysis of intersections, with or without exclusive pedestrian signal phasing, reported that the risk of pedestrian-vehicle crashes at intersections with exclusive timing was approximately half that at intersections than with standard pedestrian signals. Automatic pedestrian detection instead of push buttons at traffic signals has also been shown to improve safety (Retting, 2006).

The additional strategies below can improve safety and the



Street and sidewalk conditions along Mariposa Street

pedestrian environment (HDMT, 2008).

- Improved crosswalks (contrasting pavement texture, style, or color, i.e. zebra stripping, raised)
- Street closures
- Street trees
- Traffic circles
- Truck restrictions

To improve visibility of pedestrians, increased intensity of roadway lighting can increase pedestrians' visibility at night, when more than half of all fatal pedestrian crashes occur.

A bike lane width of 5' is recommended by AASHTO Guide for the Development of Bicycle Facilities, and is the most widely accepted standard. Widths of 6' are recommended with the presence of considerable truck traffic, and when speeds exceed 40 mph. Widths greater than 6' are generally not recommended, to discourage drivers from using lanes as turning lanes (Kueper, 2009).

"General principles and considerations regarding on-street parking that can better protect cyclist and drivers include the following:

- On-street parking should be primarily parallel parking on urban arterial boulevards and avenues. Angled parking may be used on low-speed and low-volume commercially-oriented collector avenues and streets, primarily those serving as main streets.... On-street parking should be prohibited on major streets with speeds greater than 35 mph due to potential conflicts associated with maneuvering in and out of spaces..." (ITE, 2006)

Back-in angle parking provides several benefits as compared with conventional "pull-in" angle parking. Key benefits include:

- Better sight lines when exiting the parking stall.
- Fewer accidents, back-in angle parking is safer. A study conducted in Pottstown, Pennsylvania found a 25% reduction in the number of accidents because of back-in angle parking.
- Pedestrian safety because when children are exiting a vehicle, they are channeled naturally toward the sidewalk and open doors block access to the street.
- Bicycle friendly, no "dooring" of cyclist as can occur in

parallel parking (Taipalus, 2008).

Back-in angle parking provide safety benefits for lower speed roads such as 10th street promenade and 11th in front of the recreation center but currently city regulations do not allow for this type of parking.

Speed management measures include traffic calming and multi-way stop sign control. Traffic calming techniques include (Retting, 2006):

- Lane narrowing;
- Adjustments in roadway curvature;
- Pedestrian refuge islands;
- Speed humps;
- Bike lanes or paths can narrow lanes and reduce bicycle collisions;
- Chicanes;
- Curb extensions; and
- Pavement treatments.

The redevelopment Masterplan includes street design consistent with National Best Practices to improve pedestrian safety, including the following strategies:

- All streets within the proposed South Lincoln redevelopment have corner bulb-outs with pedestrian-friendly curb radii (tighter than public works current 25' minimum);
- Mariposa Street Corridor between Colfax and 6th Avenue has been identified as the highest priority pedestrian safety area: Allow traffic calming measures which may modify the existing right-of-way from 9th



The 10th and Osage LRT light rail station plaza

Avenue to 13th Avenue, including a planted center median, bike lanes, and on-street parking. Safety measures will be designed such that existing vehicular traffic patterns/ levels of service are not negatively impacted;

- At the intersections of Osage, Mariposa, 10th, and 11th: vertical traffic calming devices (e.g. raised crosswalks or intersections, speed tables, or speed humps);
- On the north side of 11th Avenue between Osage and Mariposa: back-in angled parking adjacent to Lincoln Park;
- At mid-blocks of Mariposa, Navajo, & Osage between 9th Avenue and 11th Avenue: vertical traffic calming (e.g. raised mid-block crosswalks/speed tables) to increase pedestrian safety; and
- Other adjacent residential streets may be traffic calmed as needed to enhance pedestrian safety.

ENVIRONMENT

Urban areas typically have higher surface air temperatures than suburban and rural areas, resulting in a hotter environment, higher energy demands, and accelerated smog formation. This effect, known as heat islands, is created by components of the built environment such as dark roofs, asphalt lots and roads, which absorb sunlight and re-radiate energy as heat. In addition, urban streets typically have fewer trees and vegetation to shade buildings and cool the air. Air quality and urban heat are health issues because they can lead to respiratory diseases. Public health researchers have estimated that there are presently over 300 heat-related excess deaths in New York City alone during an average summer. Air pollution and heat stress are two important current public health stressors in many urban areas across the U.S. (Rosenthal, 2007).

Air quality, asthma, other respiratory diseases

- Denver: From 1993-2001, hospital discharge rate for asthma was 20.3 in 100,000
- In 2001, an estimated 14.7% of the adult population in Denver had asthma, which is significantly more than the state and national averages of 10.9% and 11.0%
- In Colorado, 2004, 12.5% children ages 1-14 were diagnosed at some time with asthma
- Source: Colorado Asthma Program, Colorado Asthma Surveillance report: 2004

South Lincoln's proximity to the rail yards, as well as the higher rates of asthma reported in Denver; make air quality a potential issue. Improvements can be made through transportation and housing design. Some factors to consider are: level of density and size; urban design factors, such as the orientation and form of buildings and roads; and the creation of anthropogenic heat (Rosenthal, 2007). The Masterplan includes components such as additional street tree plantings and reduction of energy consumption to offset heat island effects.

Noise

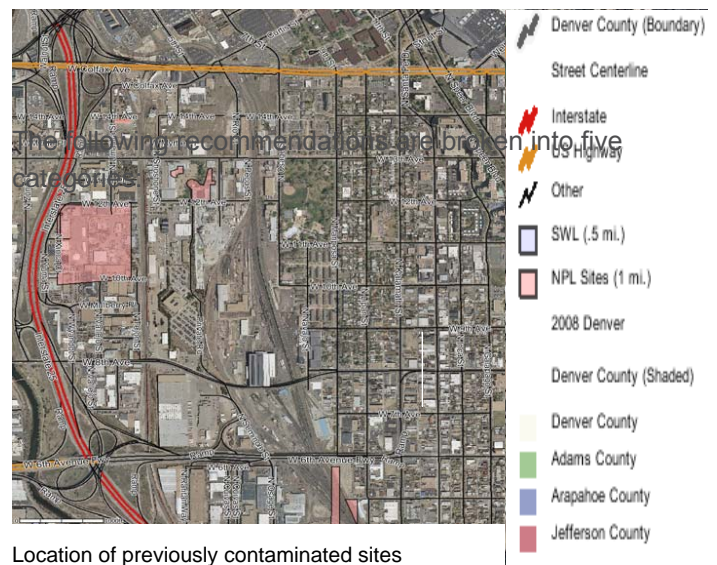
Noise pollution can negatively impact health by noise-induced hearing impairment and loss (<70 dBA is considered safe ; also >65 documented in HDMT, 2006); interference with speech communication; disturbance of rest and sleep; physiological, mental-health, and performance effects; effects on residential behavior and annoyance; and interference with intended activities (WHO, 1999).

South Lincoln Homes are located directly adjacent to heavy rail yards, and residents have made numerous complaints. For South Lincoln residents and many others, the trains produce disruptive noise (i.e. blowing of horns) throughout the night. The federal Noise Control Act of 1972 (NCA) was established "to promote an environment for all Americans free from noise that jeopardizes their public health and welfare". The States, regions and local jurisdictions have the responsibility to control the use of noise sources and the levels of noise to be permitted in their environment. Exceptions include transportation noise sources including aircraft and railroad operations and motor vehicle traffic involved in interstate transport (U.S EPA, 2007).

As part of redevelopment, noise barriers should be incorporated near the rail yard (e.g. berms, landscaping with trees), while maintaining the mountain views. Consider the use of acoustic/noise reducing materials in buildings facing the railroad. In addition, the Housing Authority should consider advocating for a "quiet zone" through work with the rail company.

Hazardous Waste

At the beginning of the Master planning effort, the site area was reviewed for hazardous waste health issues. A nearby radium hazardous waste site was remediated in 2007, and a leaking underground storage tank (LUST site) near 10th and Osage was also remediated. Therefore there are no identified hazardous waste health threats to the South Lincoln homes.



HEALTH IMPACT ASSESSMENT RECOMMENDATIONS

1. Social and Mental Wellbeing
2. Natural Environment
3. Built Environment and Transportation
4. Access
5. Safety

Please note that recommendations for certain factors such as socioeconomic, social services, and energy efficiency, are mainly addressed by other team members with this expertise and have been incorporated into the redevelopment Masterplan. This HIA also touches on some of the potential funding resources to improve socioeconomic factors.

An over arching economic, environmental, and health goal is to make South Lincoln a more walkable community. Even as long ago as 1999, the Urban Land Institute's study of four new pedestrian communities determined that

home buyers were willing to pay \$20,000 more for homes in walkable areas. Research has documented that all else being equal, residents of walkable communities drive less and are physically active, less obese, lower risk for traffic accidents and less air pollutants (Frank, 2006).

In addition to the recommendations, their inclusion in the masterplan document is noted, as well as any further actions that need to be taken during detailed design and land use approvals, implementation and construction of the redevelopment, or in Community and Supportive Services (CSS) planning that is anticipated to occur in conjunction with the physical redevelopment. The CSS plan includes 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.



The final redevelopment masterplan for South Lincoln Homes

1. HEALTH FACTORS: SOCIAL AND MENTAL WELLBEING

Health Impacts: Mental health (depression, social isolation, stress), cultural identity, equity, social capital i.e., social interaction/involvement

RECOMMENDATIONS	INCORPORATION IN MASTERPLAN
<p>a) Incorporate attractive and safe streetscape amenities such as benches, game tables, decorative pedestrian level lighting.</p>	<p>All new streetscapes in the redevelopment will include amenities such as pedestrian lighting. Additional amenities will be focused on the 10th Avenue 'Promenade', which serves as the primary neighborhood pedestrian street.</p>
<p>b) Design and display a colorful, way-finding map at the 10th and Osage LRT station that clearly shows community assets and amenities such as the park, as well as the art district and bus routes.</p>	<p>Work with RTD and include during detailed design.</p>
<p>c) Childcare: Establish a relationship with a non-profit to provide a child care facility. Consider incenting licensed child care providers by providing below market rate rent, or subsidizing other operating costs such as utilities or security. If a new or retrofitted child care facility is included in the redevelopment, it should be designed to meet best practice standards for childcare environmental design. http://www.bridgehousing.com/Childcare_Services</p>	<p>Work with partners during CSS planning and implementation.</p>
<p>d) Consider that schools should be used and advertised for multiple functions for students and the community; for example, adult classes or community meeting facilities, pre- and after-school, community recreational facility, and neighborhood park. Greenlee is a landscape learning school but not advertised as an open community school.</p>	<p>Schools are not located on the project site. Work with partners during CSS planning and implementation.</p>
<p>e) Water fountains can be a wonderful place for naturally assembling people but must be designed and managed carefully so there is no stagnant water for mosquito breeding; filtering of water for designs where water shoots up and kids can stand over it (spray pads), and design considers water conservation measures.</p>	<p>If fountains are included in plaza during detailed design, incorporate recommendations.</p>
<p>f) Provide barbeque pits within South Lincoln and smaller parks.</p>	<p>Include during detailed design of pocket parks.</p>

1. HEALTH FACTORS: SOCIAL AND MENTAL WELLBEING

Health Impacts: Mental health (depression, social isolation, stress), cultural identity, equity, social capital i.e., social interaction/involvement

<p>g) Consider hiring local artists to create culturally appropriate, functional art and/or architectural opportunities for the display of artwork. Incorporate art into the streetscape that also ties into the Santa Fe Arts District. Consider benches and other public realm elements as an expression of art (e.g. students of Greenlee and/or seniors develop design).</p>	<p>The redevelopment Masterplan includes art in the streetscape along the 10th Avenue “promenade” and near the 10th and Osage LRT station.</p>
<p>h) Provide kiosk or community bulletin board to publicize arts and community meetings or events, etc.</p>	<p>Include during detailed design of community and amenity spaces.</p>
<p>i) To promote physical activity within buildings, use art and lighting to highlight stairs and draw more people to use the stairs (instead of elevators). Consider a security camera in stairwells in the senior building and other multi-level buildings.</p>	<p>Include in detailed design of buildings.</p>
<p>j) Create and support ongoing community organization or associations, i.e. South Lincoln resident council.</p>	<p>The Masterplan outreach process has started this effort. Work with partners during CSS planning and implementation.</p>

2. HEALTH FACTORS: NATURAL ENVIRONMENT

Health Impacts: Water quality and air pollution (i.e. asthma), noise, waste

RECOMMENDATIONS	INCORPORATION IN MASTERPLAN
<p>a) Incorporate low impact development stormwater management techniques (e.g., grass swales, rain gardens, wetlands, designing parking lots to naturally drain into perimeter and island landscaping, permeable pavers, etc.) to improve water quality while providing an attractive natural amenity.</p>	<p>The Masterplan incorporates LID stormwater approach as a guiding principle.</p>
<p>b) Increase residential and commercial/school recycling: curbside is free for residents but residents need to call to get bin and recycling pick up. Consider truck access in alleys and streets (some trouble at Stapleton redevelopment). City has instructors for free who will come out and teach about recycling and sign residents up.</p>	<p>The Masterplan incorporates city standards for access. During implementation, coordinate with recycling programs.</p>

2. HEALTH FACTORS: NATURAL ENVIRONMENT

Health Impacts: Water quality and air pollution (i.e. asthma), noise, waste

RECOMMENDATIONS	INCORPORATION IN MASTERPLAN
<p>c) Air quality will be one of the biggest future challenges; seek to reduce automobile use and VMT in the new development.</p> <p>Reduce parking demand through unbundled parking (charging for parking costs separate from residential/commercial property/rental costs), making parking costs transparent and optional.</p> <p>Reduce parking footprint through shared parking (which is included in the design of the site plan to meet the conceptual program).</p>	<p>The Masterplan is focused on improving walking, bike, and transit access. During detailed design, implement strategies including:</p> <ul style="list-style-type: none"> • Incorporating corner and mid-block curb bulb-outs to narrow crossing distances and increase pedestrian visibility. • Implementing tighter turn radii at intersections (less than the current City standard of 25') to slow turning vehicles as they cross the pedestrian realm would be a non-site specific strategy. • Installing raised crosswalks and or raised intersections to slow vehicles and reduce conflicts with crossing pedestrians. • Establishing back-in angled parking on the north side of Osage Street adjacent to Lincoln Park and other bike priority streets to improve pedestrian safety of motorists existing parked cars and entering the pedestrian realm.
<p>d) Constructing noise barriers is an important consideration (e.g. wall, berm, buildings, landscaping with trees). A balance is needed about a type of barrier to block noise from rail yard and not block the mountain views. Use acoustic/noise reducing materials in buildings facing the railroad. Potentially work toward creating "quiet zone". Additionally, it is a concern with idling freight trains that expel smoke.</p>	<p>The Masterplan includes a green buffer and parking garage along the rail to act as noise barriers. Detailed design of buildings on Block A should include acoustic considerations.</p>
<p>e) Replace dead or dying trees and allow for additional (drought and disease-resistant) trees that will shade pedestrians and enhance air quality. Denver has initiatives that provide free trees.</p>	<p>The Masterplan identified existing trees to be preserved as well as new tree plantings in the streetscapes.</p>
<p>f) Ensure mitigation measures that reduce greenhouse gas emissions, i.e. vehicle miles traveled.</p>	<p>The Masterplan document has a description of the mitigation techniques.</p>
<p>g) City has free graffiti removal for private and commercial property. They also have instructors who will come to schools, etc. to teach children/teens about graffiti.</p>	<p>The Masterplan includes a graffiti art wall. During implementation and CSS planning, work with schools and art programs to facilitate education.</p>

3. HEALTH FACTORS: BUILT ENVIRONMENT AND TRANSPORTATION - OPPORTUNITIES FOR PHYSICAL ACTIVITY AND HEALTHY EATING (FOOD ACCESS AND QUALITY)

Health Issues: inactivity, obesity, cardiovascular disease, stroke, diabetes, cancer

RECOMMENDATIONS	INCORPORATION IN MASTERPLAN
Opportunities for Physical Activity	
<p>a) Add 5' wide striped connected bike lanes. Bicycle lanes provide an environment that not only encourages physical activity but is safer. Bike lanes narrow streets to slow traffic such as Mariposa. For those streets not wide enough for separate bike lanes, sharrows can work within existing widths.</p>	<p>The Masterplan includes recommendations for enhancing the bike network.</p>
<p>b) Identify walking route(s) (1/2 and 1 mile) and collaborate with Santa Fe Artist and nearby students to develop signage markers to mark the routes and denote number of walking steps or mileage between certain destinations (transit to arts district, park to King Soopers).</p>	<p>The Masterplan includes a walking loop. Implement during detailed design and potentially partner with the City's Office of Cultural Affairs.</p>
<p>c) Improve biking facilities (potentially reduce availability of parking if needed), such as bicycle racks and/or secure bike lockers at housing, retail and recreational destinations.</p>	<p>Incorporate during detailed design.</p>
<p>d) Partner with Denver City B-Cycle program to explore a bike sharing station at the South Lincoln housing, park or other.</p>	<p>Incorporate during detailed design and CSS planning.</p>
<p>e) In the proposed design plan having a bus route included at light rail stop is very beneficial along with working with RTD to integrate more bus stops within the South Lincoln community. Routing new or existing fixed-route service to provide direct access to the 10th/Osage light rail station via 9th and 11th. Coordinating existing or new private-sector shuttles to supplement fixed-route service (e.g., shared stops, marketing)</p>	<p>Continue to work with RTD and the City on enhanced transit service.</p>

3. HEALTH FACTORS: BUILT ENVIRONMENT AND TRANSPORTATION - OPPORTUNITIES FOR PHYSICAL ACTIVITY AND HEALTHY EATING (FOOD ACCESS AND QUALITY)

Health Issues: inactivity, obesity, cardiovascular disease, stroke, diabetes, cancer

RECOMMENDATIONS	INCORPORATION IN MASTERPLAN
f) Need to work with Parks & Rec. to provide more activities for people at the north end of the South Lincoln Park and to potentially conduct usage study to gain understanding and baseline data.	During implementation and Community and Support Services (CSS) planning, work with Parks and Recreation.
g) Place “Share the Road” signs in key locations such as on Mariposa.	During implementation, work with the City.
h) In high pedestrian activity areas, such as 10th ave, use wider sidewalks.	The Masterplan includes enhanced pedestrian realm design on 10th Avenue.
Opportunities for Healthy Eating	
a) Improve opportunities for access to more fruits and vegetables at grocery stores (improve lighting, better crossings, etc. for clear and safe routes to the King Soopers grocery store), community gardens, and farmers markets.	The Masterplan includes a community garden and space to accommodate a farmers market at the 10th Avenue promenade. Continue to work with The Food Trust and others to advocate for healthy food options at grocery stores.
b) Create one large public space for community gardens, specifically, at least 25 plot community garden. Provide amenities for the garden, including a greenhouse to extend the growing season, a compost area, and watering facilities. Currently the City has instructors to come teach the community about composting for free.	Please see the Masterplan for the location of the proposed community garden. During detailed design and implementation, work with Denver Urban Gardens (DUG).
c) Potentially encourage with incentives or space, etc. to assist neighborhood small grocer to expand fruit and vegetable offerings. Participate in Healthy Corner Stores Initiative that promotes efforts to bring healthier foods into corner stores in low-income and underserved communities.	During implementation and CSS planning, work with partners.
d) Provide information kiosk particularly in front of community garden with instructions of gardening and nutrition.	Incorporate during detailed design and implementation.

3. HEALTH FACTORS: BUILT ENVIRONMENT AND TRANSPORTATION - OPPORTUNITIES FOR PHYSICAL ACTIVITY AND HEALTHY EATING (FOOD ACCESS AND QUALITY)

Health Issues: inactivity, obesity, cardiovascular disease, stroke, diabetes, cancer

RECOMMENDATIONS	INCORPORATION IN MASTERPLAN
Opportunities for All Users	
a) New or redeveloped construction properties incorporate features consistent with LEED or similar standards, as well as meet or exceed the Americans with Disabilities Act (ADA) standards and consider “visitability” construction standards.	The Masterplan recommendations include meetings Green Communities and Energy Star standards, as well as LEED for multi-family and non-residential buildings.

4. HEALTH FACTORS: ACCESS TO AMENITIES, SERVICES AND HEALTH CARE, PROGRAMS, EDUCATION

Health Impacts: poorer overall health, early mortality and more extensive sickness, self esteem, lack of resources

RECOMMENDATIONS	INCORPORATION IN MASTERPLAN
a) Focus on closed La Mariposa clinic as potentially being a clinic again or at least use building for other social services. Work with Denver Health, about potentially bringing building into ADA compliance, etc. or selling. Other option is Clinica Tepeyac, David Lack, a clinic for the uninsured in Globeville and interested in opening a clinic in South Lincoln.	During CSS planning and implementation, work with partners.
b) Extend Denver Health FREE shuttle past 9am-3pm everyday for nearby south Lincoln residents to be picked up and taken to the hospital (by volunteer driver). This information should be posted at community kiosk, at the onsite office location and printed on community materials.	During CSS planning and implementation, work with partners.

4. HEALTH FACTORS: ACCESS TO AMENITIES, SERVICES AND HEALTH CARE, PROGRAMS, EDUCATION

Health Impacts: poorer overall health, early mortality and more extensive sickness, self esteem, lack of resources

RECOMMENDATIONS	INCORPORATION IN MASTERPLAN
<p>c) WIC (Women, infant and children) discount healthy food vouchers are able to be used at the three closest grocery stores. WIC information needs to be advertised throughout community about signing up for program (bus stops) and use at local groceries. WIC participants are given vouchers for foods that contain selected nutrients. Typical foods are milk, cereal, eggs, cheese and infant formula. Women need to call (303) 692-2400.</p>	<p>During CSS planning and implementation, work with partners.</p>
<p>d) Continue to partner with the Byers Library to develop and implement an awareness and education campaign that includes skills such as nutritious shopping and cooking, healthy eating out, importance of trees, environment and other determinants that impact health. Include groups such as, Operation Frontline to conduct shopping education and nutrition classes. Cooperative Extension also has great education for low-income, diverse populations and is funded through the City.</p>	<p>Continue to work with the City on a potential Library branch relocation to South Lincoln. During CSS planning and implementation, work with partners.</p>
<p>e) Apply for LiveWell Colorado grant to modify and enhance healthy lifestyles to achieve maximum health status and well being.</p>	<p>Consider seeking funds.</p>
<p>f) Partner with Colorado Health Foundation, Healthy Living program to better understand and encourage healthy food outlets and discourage unhealthy food (e.g. The Food Trust).</p>	<p>Potential partnership.</p>
<p>g) Obtain grants for local schools to collect student health data for all age groups, including Head Start, such as body mass index.</p>	<p>Consider seeking funds.</p>
<p>h) Write grant for Colorado Safe Routes to School funds for either education or infrastructure. Funds can also be used for obtaining Bicycle Colorado who has an education curriculum for schools. They implement and teach school staff and students about being crossing guards, curriculum, etc.</p>	<p>Consider seeking funds.</p>

4. HEALTH FACTORS: ACCESS TO AMENITIES, SERVICES AND HEALTH CARE, PROGRAMS, EDUCATION

Health Impacts: poorer overall health, early mortality and more extensive sickness, self esteem, lack of resources

RECOMMENDATIONS	INCORPORATION IN MASTERPLAN
i) Encourage the development of Wellness Committees at local schools and support their actions for health promotion with their students and families, including implementation of policies and programs that support Safe Routes to School, healthy eating, active living, violence prevention, etc.	During CSS planning and implementation, work with partners.

5. HEALTH FACTORS: SAFETY (PERSONAL AND TRAFFIC)

Health Impacts: Crime, mortality, injury

RECOMMENDATIONS	INCORPORATION IN MASTERPLAN
a) Allow for future traffic flows with single-lane traffic circles.	The Masterplan does not include circles because they are not allowed per current City regulations. Consider working with City to promote use of circles in other future developments.
b) Separate pedestrians from vehicles by time/space, i.e. improved crosswalks, street closures, street trees.	The Masterplan includes these in proposed street design.
c) Institute measures that increase the visibility of pedestrians such as exclusive pedestrian signal phasing, pedestrian refuge islands (and need to improve current island on mariposa); and increase the intensity of roadway lighting.	Incorporate in detailed design.
d) Work closely with Public Works to remove policy restrictions on traffic calming measures such as, speed humps, and speed tables.	Initial conversations have been held with Public Works. Continue throughout detailed design and entitlements.

5. HEALTH FACTORS: SAFETY (PERSONAL AND TRAFFIC)

Health Impacts: Crime, mortality, injury

RECOMMENDATIONS	INCORPORATION IN MASTERPLAN
e) Consider truck restrictions along roads which are more used or will be more used by pedestrians and specifically children (for example 10th st.)	Work with Public Works during detailed design and entitlements.
f) Bike lanes along a wide road such as Mariposa are important to slow vehicle speeds so it can be safe for all users whether in a wheel chair, bicycling or taking a jog.	The Masterplan includes bike lane recommendations.
g) In the draft plan there are a good amount of “eyes” on parks, streets, schools, etc. with the design of buildings with porches, balconies, and residential space above street-level retail space.	The Masterplan includes open space design to maximize visibility from buildings and the street.
h) Work with the Police Department to enforce current vehicle speeds. Use mobile speed trailers (driver feedback speed signs) for periods in areas where children are likely to cross major roads to go to school and near major pedestrian crossings.	During CSS planning and implementation, work with the Police Department.
i) Territorial safety reinforcement such as considering the use of pavement treatments, landscaping, art, signage, screening, and fences to define ownership of property.	The Masterplan includes these recommendations.
j) Other principles for safety are to consider the placement and design of physical features to maximize visibility. This includes, building orientation, window, entrances and exits, parking lots, walkways, guard gates, and landscape trees and shrubs, fences or walls, signage, and any other physical obstructions	The Masterplan includes these recommendations.
k) Need for improved energy efficient lighting of current and future bus stops and space to sit at all bus stops.	Incorporate during detailed design, and work with RTD and the City.
l) Use security cameras in higher crime and less safe areas such as the future parking structure.	Incorporate during detailed design.
m) Provide small “store front” space for a couple police to come and go throughout day and have computer, desks, and phone available.	During implementation and CSS planning, work with partners.

5. HEALTH FACTORS: SAFETY (PERSONAL AND TRAFFIC)

Health Impacts: Crime, mortality, injury

RECOMMENDATIONS	INCORPORATION IN MASTERPLAN
n) Increase lighting on streets, parking lots, routes to King Soopers, Denver Health and Greenlee and West High and install more lighting in the park.	Work with the City to advocate for these changes.
o) Collaborate with and support community policing programs such as neighborhood watch, walk and watch groups and blight/graffiti elimination programs.	During implementation and CSS planning, work with partners.
p) Work with the City to improve crosswalks and safer routes, bike lanes, etc. for routes to Greenlee and other schools, King Soopers, Santa Fe and Auraria campus.	Work with the City to advocate for these changes.
q) Use zebra striping and countdown meters at pedestrian crossings located at all future planned retail nodes (10th), major intersections as on Santa Fe and near schools.	Include during detailed design of South Lincoln.

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APPENDIX A: PEQI (PEDESTRIAN ENVIRONMENTAL QUALITY INDEX)

Pedestrian Environmental Quality Index (PEQI) Survey:

Neighborhood:		Surveyed By:		Survey Date:	
Project:		Date Entered into Database:			
INTERSECTIONS					
Intersection CNN #:			Primary Street:		
			Secondary Street:		
	1. Crosswalk	2. Ladder Crosswalk	3. Pedestrian Signal		7. No Turn on Red Sign(s)
			WITH count-down	NO count-down	
4 Directions					
3 Directions					
2 Directions					
1 Direction					
None					
			8. Intersection Traffic Calming Features (TCFs):*		0 TCFs
					1-2 TCFs
					3-4 TCFs
					5 or more TCFs
Check all that apply:*					
* See PEQI manual for illustrations/definitions.					
4. Signal at Intersection:			Yes		
			No		
If Yes - Crossing Time: (seconds)					
Intersection Length:			(Feet, walking along Primary Street)		
5. Crossing Speed:			Faster than 3.5 ft/sec		
(Length, feet / Crossing Time, seconds)			Slower than 3.5 ft/sec		
6. Crosswalk Scramble:			Yes		
			No		
			9. Additional Signs for Pedestrians:		Yes
					No

STREETS						
Street:			CNN #:			
Cross Street #1:			Cross Street #2:			
Domain:	Indicator:	Indicator Values:		Comments:		
 Vehicle Traffic:	10. Number of Lanes: (not including turning only lanes)	4 + Lanes				
		3 Lanes				
		2 Lanes				
		1 Lane				
		No Lanes				
	11. Two Way Traffic:	Yes				
		No				
	12. Vehicle Speed - Is there a posted speed limit?	Yes			Note: San Francisco default street speed limit is 25 mph.	
		No				
	Speed Limit:	10 mph	35 mph			
		15 mph	40 mph			
		20 mph	45 mph			
		25 mph	50 mph			
		30 mph	55 mph			
	>55 mph					
	13. Street Traffic Calming Features:	Yes			Note: See PEQI manual for illustrations and definitions.	
		No				
Check all that apply:						
Chicanes		Rumble Strips		Speed Tables		
		Speed Humps		Street Medians		
Pavement Treatments		Speed Limit Enforcements				



















 : should be able to observe while standing in one place

 : best assessed while walking along the street


APPENDIX A: PEQI (PEDESTRIAN ENVIRONMENTAL QUALITY INDEX)

NOTE: From this point on, street conditions on each side of the street are recorded separately.

Northern or Eastern side = N/E; Southern or Western side = S/W.

Domain:	Indicator:	Indicator Values:	N/E	S/W	Comments:
Sidewalks:	 14. Width of Sidewalk:	No Sidewalk			Note: Measure at approximately mid-block (but not at a bulbout/curb extension).
		Less than 5 ft.			
		5-7 ft. 11 in.			
		8-12 ft.			
		Greater than 12 ft.			
 15. Impediments in Sidewalk Surface		Significant			Note: 1 large impediment on segment is significant. Should be able to push a stroller without a problem.
		Few			
		None			
		No Sidewalk			
 16. Large Sidewalk Obstructions:		Yes, Permanent			Note: 2 people should be able to walk side-by-side along the entire sidewalk.
		Yes, Temporary			
		No			
		No Sidewalk			
 17. Presence of Curb:		Curb			
		No Curb			
 18. Driveway Cuts: (Please enter count <u>and</u> check a category)		Enter Count (#):			Note: Parking garages count as 2 (i.e., vehicle entry and exit in same driveway = 2 cuts)
		5 or more			
		Few (less than 5)			
		None			
 19. Trees:		Continuously Lined			
		Sporadically Lined			
		None			
 20. Planters/ Gardens:		Yes			
		No			
 21. Public Seating:		Yes			
		No			
 22. Presence of Buffer:		Bike Lane (BL)			Note: Street cleaning restrictions do not count as time-restricted parallel parking.
		Parallel Parking - not time restricted (PP)			
		Time-restricted Parallel Parking (TPP)			
		BL and PP			
		BL and TPP			
		None			
Land Use:	 23. Storefront/ Retail Use:	3 or more			Note: This should reflect <u>businesses only</u> . Include <u>ground floor</u> businesses with window treatments, displays and open shades.
		1 or 2			
		0			
 24. Public Art / Historical Sites:		Yes			
		No			
Safety/ Other:	 25. Illegal Graffiti:	Yes			
		Little to None			
 26. Litter:		Yes			
		Little to None			
 27. Ped Scale Street Lighting Present:		Yes, Street Lighting			
		Yes, Private (business or residential)			
		No			
 28. Construction Sites:		Yes			
		No			
 29. Abandoned Buildings:		Yes			
		No			

 : should be able to observe while standing in one place

 best assessed while walking along the street

APPENDIX B: DATA FROM FOOD AUDIT

PRODUCT	PRICE AT "MEXICAN AISLE"	BRAND IN "MEXICAN AISLE"	PRICE ELSEWHERE IN THE STORE	BRAND ELSEWHERE
sweetened condensed milk	\$1.99/14 oz.	Nestle	\$1.89/14 oz.	Kroger (store brand)
wheat cereal for babies > 12 mos.	\$5.99/17.6 oz	Nestle	\$1.81/8 oz.	Gerber
dried black beans	\$1.79/lb.	La Preferida	\$1.79/lb.	Kroger
dried black-eye peas	\$2.69/lb	La Preferida	\$1.49/lb.	Kroger
canned black beans	\$2.19/15 oz.	Goya	\$0.84/15 oz.	Kroger
	\$1.19/15 oz.	La Preferida	\$1.25/15 oz.	Organics*
canned pinto beans	\$2.39/15 oz.	Goya	\$0.84/15 oz.	Kroger
	\$1.09/15 oz.	La Preferida	\$1.25/15 oz.	Organics*
canned tuna in water	\$2.69/6 oz.	Dolores	\$1.50/5 oz.	Kroger
canned tuna in vegetable oil	\$2.69/6 oz.	Dolores	\$0.73/5 oz.	Kroger
canned sardines in tomato sauce	\$2.49/15 oz.	Calmex	\$1.99/15 oz.	Bumble Bee
vegetable oil	\$3.69/33.81 oz.	"1.2.3"	\$2.72/48 oz.	Kroger
pasta/noodles	\$0.59/7 oz.	La Moderna	\$0.78/lb.	generic
sugar	\$5.19/4 lbs.	Zuika	\$1.98/4 lbs.	generic
	\$2.39/2 lbs.	Zuika	\$2.29/ 24 oz.	Kroger*
baking powder	\$2.79/10 oz	Royal	\$1.89/10 oz.	Kroger

Table 1 Price Disparity within King Soopers

*Organic products

APPENDIX B: DATA FROM FOOD AUDIT

For certain products, such as tuna or sardines, there may be some difference in taste since Dolores brand tuna, Calmex brand sardines, and La Preferida pasta are produced in Mexico. The dried and canned beans, however, regardless of the brand, are all US products.

The packaging and advertisement on some products are different between the mainstream brands and the Nestle sweetened condensed milk for the Spanish-speaking market. In the “Mexican” aisle, some sweetened condensed milk is sold in squeeze bottles for \$3.99 per 15.8 oz., almost twice as expensive as regular canned sweetened condensed milk.

In addition, the sweetened condensed milk products in the “Mexican” aisle all have a line advertising them as “a good source of calcium” in both Spanish and English. While each serving provides 10% of the RDA, there are also 22g of sugar per serving. While this kind of advertising is within FDA guidelines, it is not seen on regular products for the English-speaking market.

