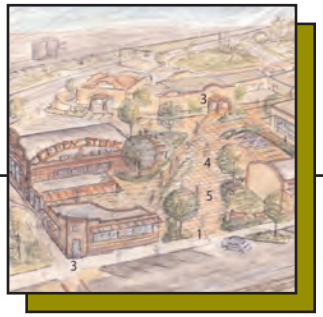
Health Impact Assessment

DERBY REDEVELOPMENT

HISTORIC COMMERCE CITY, COLORADO



Tri-County Health Department

LiveWell COMMERCE CITY

September 2007

TABLE OF CONTENTS

Executive Summary

BACKGROUND

In 2006 Kaiser Permanente awarded Tri-County Health Department (TCHD) a multi-year grant (LiveWell Commerce City, previously known as Thriving Communities Commerce City) to promote healthy eating and active living in historic Commerce City through a combination of programs, policies and changes to the built environment. Since the initiative to restore Derby District (hereinafter, Derby), historic Commerce City's commercial core, began concurrently with the LiveWell grant, TCHD and the City agreed that Derby should be the LiveWell program's initial focus for changes to the environment. As part of this work, TCHD decided to conduct a Health Impact Assessment (HIA) to evaluate the potential impact of Derby's redevelopment on physical activity and nutrition behaviors of the population of historic Commerce City. Currently, there are only six residences in Derby. People living in historic Commerce City are most likely to be affected by Derby's restoration.

An ideal HIA is prospective, so that decision makers can incorporate health considerations into a proposed initiative as it evolves. TCHD was able to follow this model on the Derby project because the City invited the health department's full participation in the redevelopment team.

The HIA analyzed traffic safety, personal safety and walkability in Derby as key factors influencing physical activity. With regard to nutrition-related behaviors, access to healthy food was analyzed.

As part of the LiveWell grant, TCHD contracted with the Colorado Department of Public Health and Environment to conduct a nationally standardized telephone survey to assess the health conditions and health-related behaviors of Commerce City residents. Appendix A explains the survey methodology. Survey data could not be analyzed separately for the population of historic Commerce City. Results from the Commerce City Health Survey are included in the HIA since they provide timely and accurate health data specific to residents of Commerce City (hereinafter, the City). Prior to this survey, such data were only available at the county level.

CONCLUSIONS

The HIA concludes that the documents guiding the redevelopment of Derby – the Derby Sub-Area Master Plan, Planned Unit Development (PUD) zoning ordinance and Design Guidelines - will create physical conditions in Derby that foster physical activity within historic Commerce City. It also concludes that the zoning provisions of the redevelopment effort will promote increased access to healthy foods in historic Commerce City.

RECOMMENDATIONS

City Council unanimously adopted the Derby Sub-Area Master Plan in April, 2007. The PUD zoning ordinance and the Design Guidelines are the tools that will realize the vision and policies embodied in the Master Plan. With the adoption of these documents for Derby's redevelopment, TCHD recommends that the City adopt a phased implementation plan. This report includes a list of suggested implementation action items.

Sources of Information for the Health Impact Assessment (HIA)

HIAs rely on quantitative scientific evidence where it exists but also recognize the importance of qualitative information that may include opinions and expectations of a variety of stakeholders ranging from elected officials to community members whose lives will be most affected by development decisions. In conducting this HIA, TCHD utilized scientific literature and best professional practices, but also incorporated input from consultants with expertise in transportation planning and public health policy, and from many community outreach activities, as summarized below.

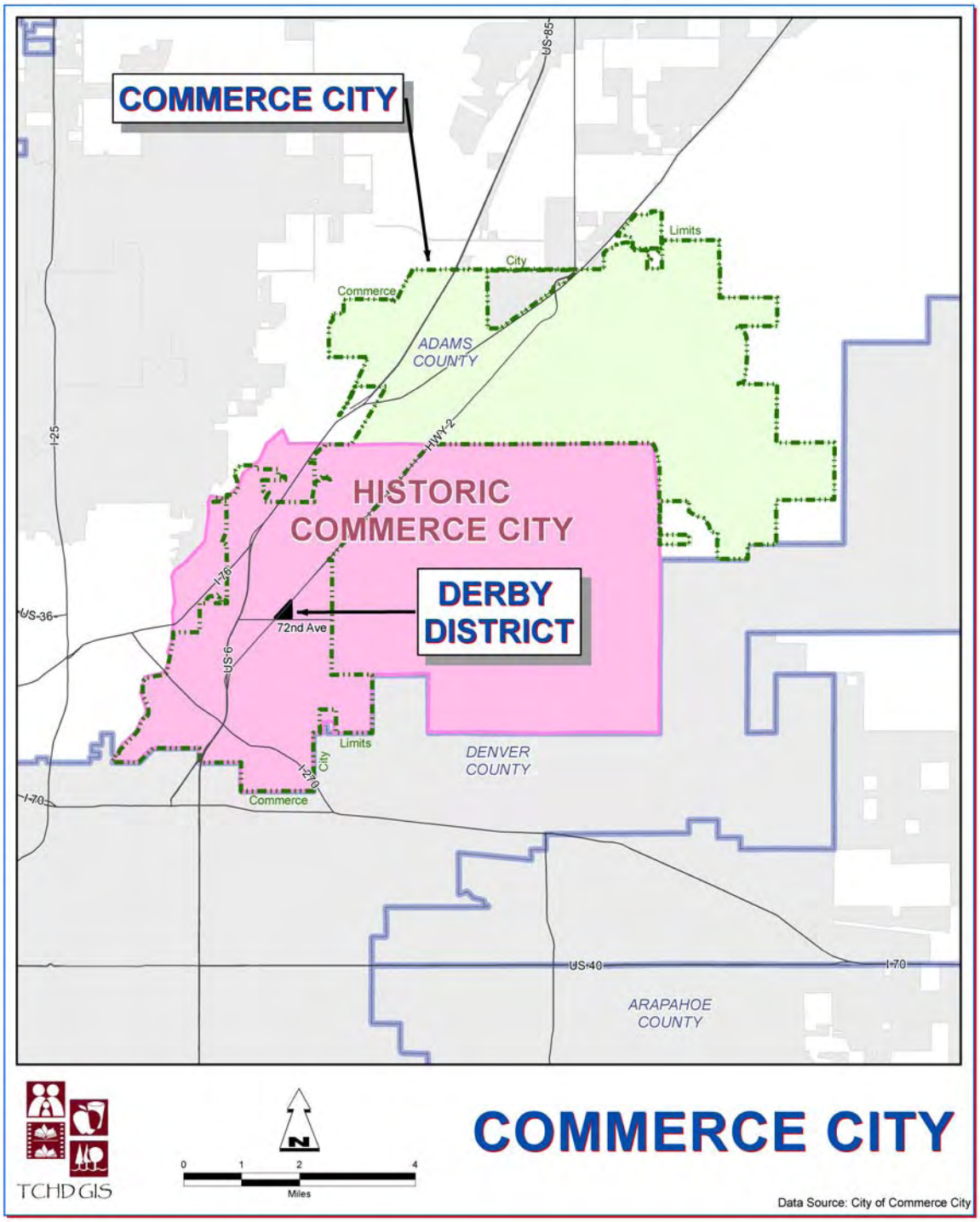
CONSULTANTS

- Dan Burden, (Director, Walkable Communities, Inc., Principal, Glatting, Jackson, Kercher and Anglin).
  - April 12-14, 2006 consultation.
  - Supported jointly by LiveWell Commerce City and the City.
  - Held working sessions on walkability concepts and issues with City policy makers and staff, teens and parents, and monolingual Spanish-speaking families. Gave presentation and conducted a visual preference survey at a City Council meeting.
- Dan Burden
  - July 24-26, 2006 consultation.
  - Supported by the City.
  - Prepared a Conceptual Master Plan map for Derby.
- Lisa Feldstein (Senior Policy Director, Public Health Law Program, Public Health Institute, San Francisco, CA)
  - July 24-25, 2006 consultation
  - Supported by the City.
  - Conducted meetings/exercises with staff, gave presentation to City Council on the role of public policy in promoting public health.
- Glatting, Jackson, Kercher and Anglin, transportation consulting firm.
  - April 25-27, 2007 consultation
  - Supported by LiveWell Commerce City.
  - Met with staff, City management, Fire Department. Conducted a transportation assessment for 72nd Avenue corridor between Highway 2 and Quebec Street. Prepared preliminary traffic calming and other streetscape recommendations.

COMMUNITY OUTREACH ACTIVITIES

- Kaiser Permanente Educational Theater Program – As part of two trimester-long classes facilitated by Kaiser Permanente educators from March-June, 2006, Adams City High School teens prepared a video (Appendix C) on their walk to school. Teens discussed walkability and safety issues at a 4/06 community meeting with their parents, consultants and City and TCHD staff.
- Derby walkability assessment (7/06), in which 51 residents of historic Commerce City completed a written evaluation of the Derby District while walking along its streets. See Appendix B.
- Photovoice project (9/06-11/06), in which 7 residents and 6 staff from local agencies and non-profit organizations took photos to express their issues and desires about local conditions affecting physical activity and nutrition.
- Various community forums throughout the redevelopment planning process. These were conducted by City staff/consultants and TCHD, sometimes jointly.

Figure 1. Commerce City



Data Summary by Geographic Area

The figures and the table in this report drew on data for three different geographic areas of the City: the City as a whole, historic Commerce City (including Derby District) and the Derby District. Following is a summary, by geographic area, of the data that are represented in the report's figures and table.

COMMERCE CITY (hereinafter, the City)

Health Survey (Behavior Risk Factor Surveillance System)

HISTORIC COMMERCE CITY (including Derby District)

Population
Demographic characteristics
Property conditions
Sidewalk conditions
Bike routes, parks and existing and future trails
Bus routes
Location of large grocery stores

DERBY DISTRICT (hereinafter, Derby)

Pedestrian and bicycle traffic accidents
Lighting and the location of crime and graffiti

Acknowledgements

TCHD wishes to express its appreciation to the following Commerce City departments and staff for sharing data that was used in this report:

GIS	Scott Tometich
Police Department	Dianna German
Neighborhood Services	Sherry Chavez
Parks	Traci Ferguson
Public Works	Venessa Sanchez, Glenn Ellis
Economic Development	Pam Downs

Special thanks to Scott Tometich and Dianna German for their additional assistance in preparing and interpreting data sets.

We wish to thank Commerce City for its consistent partnership and support on the LiveWell Commerce City project, and Derby Redevelopment Team members Jessica Osborne, Dana Crawford, Kemp Will and Nigel Staton for embracing public health as a cornerstone of the effort and for creating a model collaboration.

We also want to recognize Community Enterprise staff Cristie Jophlin, Andrea Romero and Margarita Ceballos-Gomez for organizing and conducting the walkability assessment, promoting many of the community outreach efforts, and providing translation services throughout the redevelopment process. We also thank Jaime Di Paulo for providing translation services and equipment for community meetings.

Dan Burden, of Walkable Communities, Inc., graciously allowed us to use several photos in this document.

Finally, our thanks go to the many Commerce City residents, businesses, agency representatives and property owners who contributed to this study by giving their own time, often on evenings and weekends, to share their insights, concerns and hopes for the future of Derby and historic Commerce City.

Funding for this project was supplemented by a grant from the Centers for Disease Control and Prevention (CDC) through the National Association of County and City Health Officials (NACCHO). Tri-County Health Department wishes to thank CDC and NACCHO for supporting this effort and for advancing the practice of Health Impact Assessment in the United States.

Introduction—The Effect of Land Use On Health

The effect of land use on health has been acknowledged in the U.S. for almost a century. In 1926 the Supreme Court ruled that zoning could be used for the purpose of "public health, safety and welfare". Since then land use planning has played an important role in protecting people from industrial pollutants and unsanitary conditions that present serious health risks.

Today, though environmental hazards remain a critical issue, chronic diseases such as heart disease, stroke and type 2 diabetes pose a far greater health risk to the population as a whole. Physical inactivity and poor diet, major risk factors for these diseases, are fueling the chronic disease epidemic. Together they are responsible for more than 200,000 U.S. preventable deaths annually.[1]

Treating these conditions is very expensive. In 2000 the nation spent an estimated $76 billion in direct medical costs related to physical inactivity alone[2]. Such enormous health care expenditures can take away resources from other areas of need, such as education and economic development.

The good news is that local decision makers can exercise some control over the chronic disease problem. A growing body of research from the transportation, planning and health fields tells us that the way we design and build our communities can encourage healthy behaviors such as exercise and good eating habits.

There is much more to learn, but science is beginning to paint a picture of how community design can promote healthy lifestyles which might help reduce the chronic disease burden. The purpose of this report is to assess how one community planning effort—the redevelopment of Derby—can help create a health-supportive environment in historic Commerce City.

An active lifestyle is not just a matter of choice. The built environment can influence how much physical activity people get during their daily routines.

What is A Health Impact Assessment (HIA)?

Ideally, public health should not only prevent disease but also create the conditions for wellness. Health Impact Assessment (HIA) is a relatively new tool designed to help accomplish both these goals. HIA is a process for evaluating the potential effects of a proposed plan, project or policy on the health of a population. In the land use arena, public health agencies often conduct HIAs before a project is approved or built, giving elected officials information that can help promote health and minimize negative health impacts.

An HIA can take a comprehensive look at all possible health impacts, or limit its scope to a few targeted issues. Where possible, HIAs attempt to quantify a projected impact; e.g., if this trail is built, 50 people from the adjoining neighborhood will walk 2 miles on it every week. They also make qualitative projections where evidence suggests a particular outcome; e.g., based on community input, building this trail will likely increase both walking and bicycling by neighbors. HIAs tend to be multidisciplinary and participatory. They also focus on creating equal opportunities for health. This means they pay particular attention to the effects of a proposed project on demographic groups who face the greatest health risks.

DERBY HEALTH IMPACT ASSESSMENT BACKGROUND

In January 2006, TCHD received a multi-year grant from Kaiser Permanente to promote healthy eating and active living in historic Commerce City. The grant, named LiveWell Commerce City, called for a combination of interventions including programs, policies and physical changes to the environment. At about the same time of the grant award, City Council began an initiative to renovate Derby, the City's historic commercial core. This made Derby the logical place to focus the environmental change resources of the grant.

TCHD decided to conduct an HIA on Derby's redevelopment consistent with the LiveWell initiative. Thus, the assessment was limited to findings related to physical activity and nutrition behaviors.

Currently, Derby is predominantly commercial uses; it contains only six residences. Thus, the scope of the evaluation was limited to potential impacts of the redevelopment on the physical activity and nutrition behaviors of the population of historic Commerce City, the people who live around Derby.

TCHD provided guidance on the targeted health issues by working with the City's redevelopment team throughout the planning process. The effort was synergistic. The team found that elements that responded to community needs and that supported the economic and aesthetic goals for Derby were often the same elements that would promote health and healthy behaviors.

Physical Activity and Nutrition: Agents of Wellness

BENEFITS OF PHYSICAL ACTIVITY

- Reduces risk of dying prematurely
- Reduces risk of chronic diseases; i.e., heart disease, diabetes and stroke
- Helps build and maintain healthy bones, muscles and joints
- Weight control
- Promotes mental health, reduces depression and anxiety
- Improves agility and balance, reduces risk of injuries from falls

BENEFITS OF NUTRITION

- Maintains good health for the entire body
- Enables all body systems to function optimally
- Provides energy
- Promotes good sleep
- Promotes mental health
- Promotes healthy aging

How the Built Environment Can Affect Physical Activity

Healthy People 2010, the federal government's initiative to improve the nation's health, ranks physical activity as one of 10 leading health indicators. The Surgeon General recommends adults 18 and over accumulate a minimum of 30 minutes of moderate intensity physical activity five or more days a week[3]. The most common moderate activity is brisk walking, which people can do at any age. Benefits accrue whether the activity occurs all at once or in multiple 10-minute sessions.

"Physical activity is not an all or nothing proposition. We want every American to understand that small steps toward a more physically active life yield significant health benefits."

- Health and Human Services Secretary Tommy G. Thompson, 2003

Recreational activity is performed during one's leisure time, often specifically to get exercise.

Utilitarian activity is performed during one's daily routine, usually for a practical purpose.

The type of neighborhoods we live and work in can make it easier for us to accumulate the recommended levels of physical activity. **Active community environments** are places that make it easy for people of all ages and abilities to choose to be physically active through recreational or utilitarian activity.

How the Built Environment Can Affect Nutrition

Good nutrition can help lower the risk of many chronic diseases. Lack of access to healthy foods and easy access to unhealthy foods are contributing factors to poor diet. Some research has demonstrated that the more supermarkets a neighborhood has, the more fruits and vegetables its residents eat[4]. In addition, fast food restaurants have been implicated in our nation's obesity epidemic. If a community is full of fast food outlets but lacks other types of affordable restaurants, residents have no choice but always to dine at fast food chains whenever they eat out.

Land use planning is a tool that can be used to help improve a community's food environment. Through zoning, a municipality can permit grocery stores and farmers' markets in all commercial zones and it can permit community gardens on vacant land. Zoning can also expressly prohibit certain uses. In recent years, some jurisdictions have chosen to regulate fast food restaurants by directly or indirectly banning them in residential areas or by restricting their number or density in certain geographic areas.

Zoning can be used to permit community gardens, such as the Bridges of Silence youth-run community garden in historic Commerce City.

Health Impact Assessment Study Area

Derby is the ten block commercial core of historic Commerce City, which is the study area for this HIA. The HIA considers potential health impacts of the Derby redevelopment on the population of historic Commerce City. Because the residents of historic Commerce City live close to Derby (within 2 ½ miles), they are most likely to frequent Derby, and are thus most likely to be affected by any physical changes that are made there.

Though not the focus of this HIA, other people who work in, shop or visit Derby are also likely to be similarly affected by Derby's renovation.

The boundaries and population distribution of historic Commerce City are shown on Figure 2. This section describes the population of historic Commerce City and identifies groups at high risk for physical inactivity or injury while being physically active.

Figure 2. Population of historic Commerce City

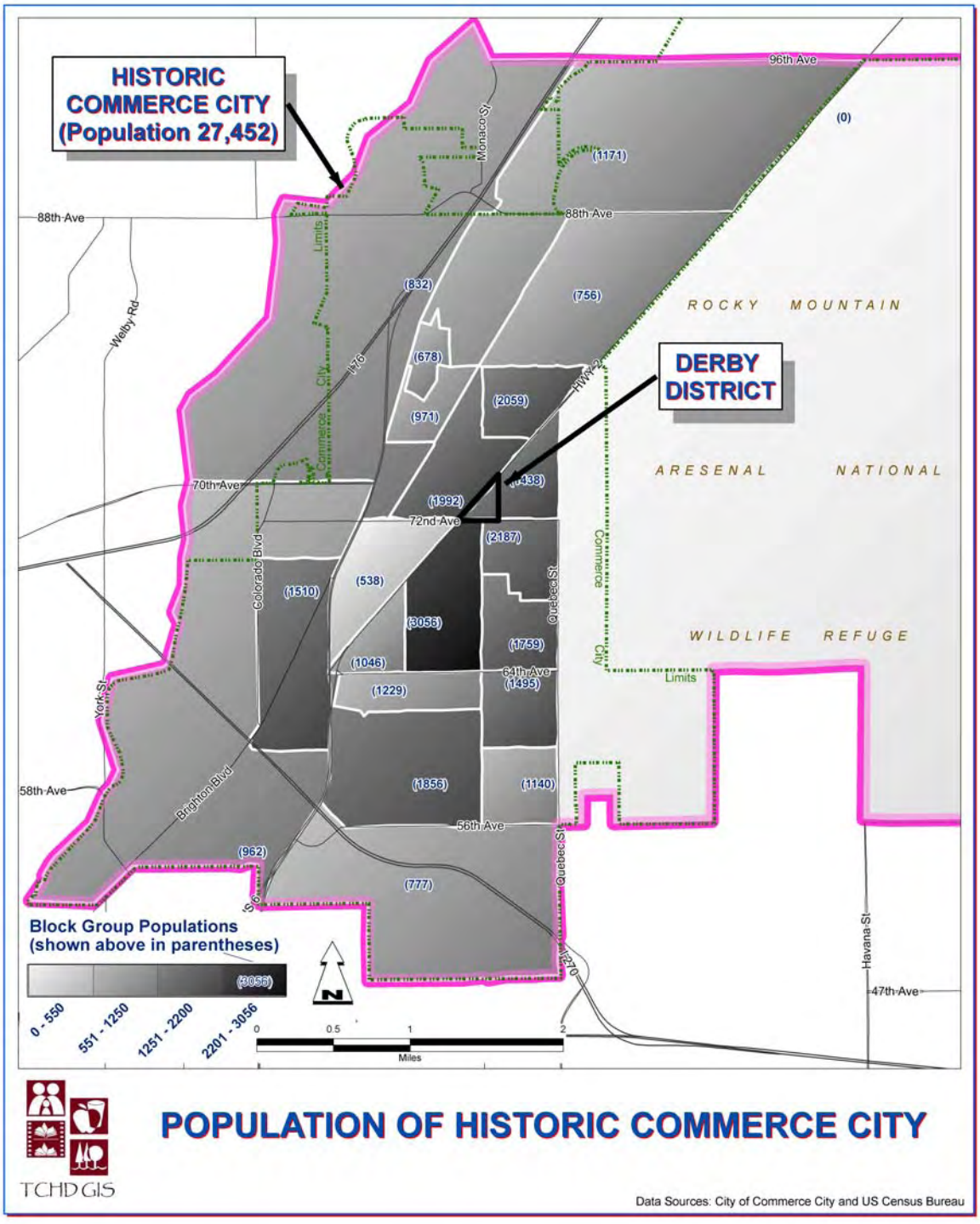


Table 1. Demographic characteristics of the population of historic Commerce City.

CHARACTERISTIC		
Race/Ethnicity	%	Number
White alone	66.1%	18,153
Black or African American alone	1.8%	489
American Indian and Alaska Native alone	1.1%	302
Asian alone	1.0%	278
Native Hawaiian and Other Pacific Islander alone	0.0%	5
Some other race alone	25.6%	7,016
Two or more races	4.4%	1,209
	100%	27,452
Not Hispanic or Latino by race	47.7%	13,097
Hispanic or Latino by race	52.3%	14,355
Total Population	100%	27,452
Age		
Less than 5	8.7%	2,384
5 to 12	14.6%	4,005
13 to 14	2.7%	751
15 to 18	6.2%	1,705
19 to 24	9.6%	2,646
25 to 34	15.7%	4,302
35 to 44	14.5%	3,988
45 to 54	11.8%	3,244
55 to 64	7.0%	1,926
65+	9.1%	2,501
Total Population	100%	27,452
Disabilities: Age 5+ Years		
Reported physical or sensory disability	12.2%	3,362
Household Income		
Less than $25,000	34.0%	2,968
$25,000 to $49,999	36.5%	3,187
More than $50,000	29.5%	2,581
Total Households	100%	8,736

Source: Summary File 3, Census 2000

The green shading highlights demographic groups that are at high risk for physical inactivity or injury while being physically active. Thse groups make up a significant percentage of the population of historic Commerce City. An explanation of the risks follows on the next page.

People at High Risk Either for Physical Inactivity or for Injury While Being Physically Active

For every public health hazard, some segments of the population are at greater risk than others. Several demographic groups face special barriers to getting enough physical activity or are more likely to be injured while being physically active. Proposed environmental changes for Derby can help reduce physical activity-related risks for these historic Commerce City residents when they are in Derby.

SENIORS: U.S. seniors rely on walking for travel and exercise more than most other age groups. Walking is more dangerous for seniors because they move more slowly and have poorer vision and hearing. By 2030 one in five adults in the U.S. will be over 65 years old[5].

More than 1 in 5 U.S. seniors do not drive. Senior pedestrians are more likely to be killed in a motor vehicle accident than other age groups[6,7].

www.pedbikeimages.org /Dan Burden

CHILDREN: When they walk, children face greater risks than adults. Young children lack traffic skills and are harder for drivers to see, while pre-teens and teens tend to take risks when walking and bicycling. Though walking or biking to school is a great way for kids to get regular exercise, in 1999 fewer than 1 in 7 children walked or biked to school, down almost 50% from 30 years ago. Parents cite traffic danger as a major obstacle[8].

PEOPLE OF LOW INCOME: Being poor is associated with a higher risk of chronic disease and obesity, as well as with lower levels of physical activity. Also, lower income children suffer more traffic injuries and fatalities than those from higher income families[9].

PEOPLE OF COLOR: Nationwide, pedestrian injuries and fatality rates for Hispanic and Black people are several times higher than those among White people. The reasons are complex. Researchers believe they may involve the probability of being a pedestrian or the road design in areas where minority persons walk, and cultural factors such as not being accustomed to high-speed traffic[9].

PEOPLE WITH DISABILITIES: 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 when injured[6].

Sidewalk obstructions like this telephone pole in Derby make it more difficult for a person with a walker or in a wheelchair to be physically active outdoors.

How Healthy is Commerce City?

The Commerce City Health Survey was conducted to assess health conditions and risk behaviors among residents of Commerce City using nationally standardized questions and methodology from the Behavioral Risk Factor Surveillance System (BRFSS). Data were collected through telephone interviews with a random sample of 303 adults 18 years of age or older during the fall and winter of 2006.

All survey participants are residents of Commerce City. Survey data could not be analyzed separately for the population of historic Commerce City. However, results of the survey are included in the HIA since they provide timely and accurate health data specific to residents of Commerce City. Appendix A explains the details of the survey methodology.

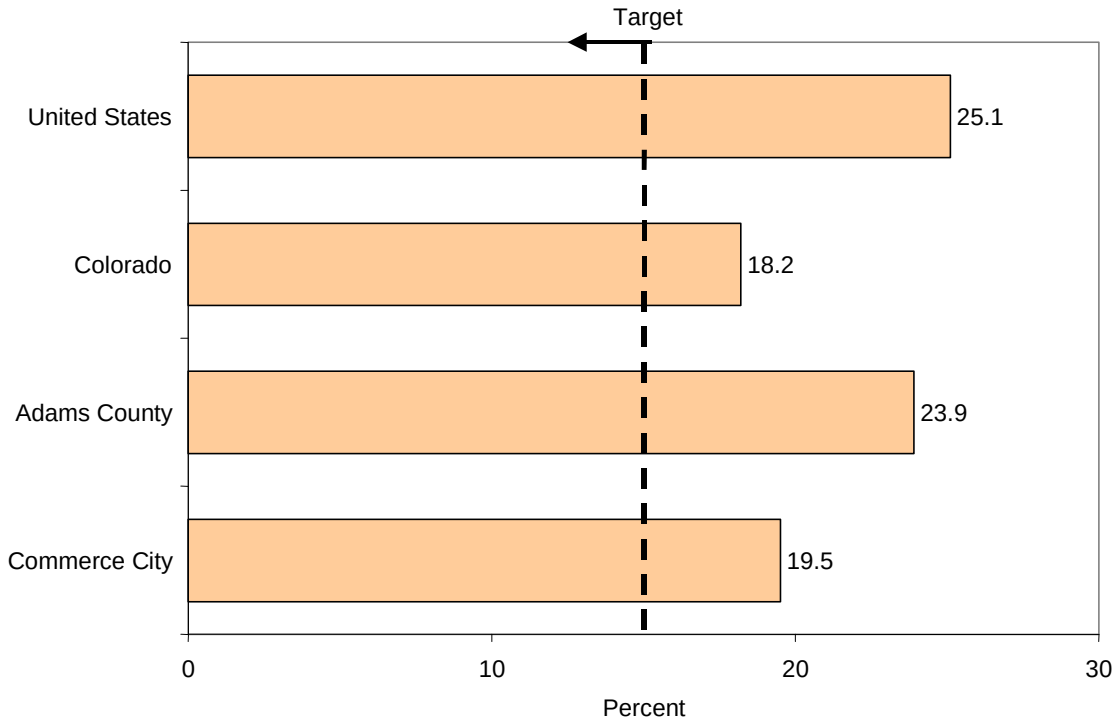
In this section, selected current health conditions and risk behaviors of Commerce City residents are compared to data from Adams County, Colorado and the United States. Where applicable, the Healthy People 2010 national objective is indicated.

Obesity and Nutrition

OBESITY

Obesity is defined as an excessively high amount of body fat in relation to lean body mass. Obesity is measured using a person's height and weight to calculate body mass index or BMI. Individuals with a BMI of 30 or more are considered obese. Obesity is a chronic condition caused by several factors such as individual behavior, environmental factors, and genetics. Some of the health consequences of obesity include high blood pressure, stroke, coronary heart disease, and diabetes.

Figure 3. Percent of adults who are obese (BMI≥30) in the United States, Colorado, Adams County and Commerce City, 2006.



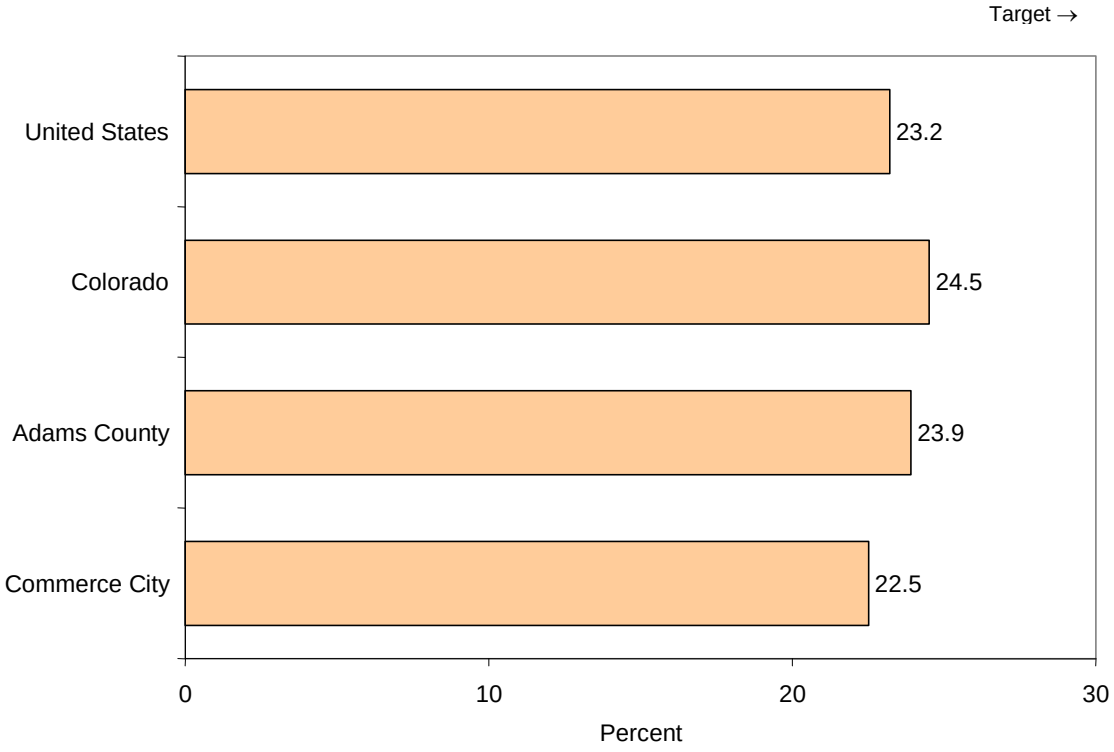
HEALTHY PEOPLE 2010 OBJECTIVE 19-2:
Reduce the proportion of adults who are obese (BMI≥30).
Target = 15%

SUMMARY: Commerce City does not meet the Healthy People 2010 target of 15% for obesity prevalence. There is no significant difference among the United States, Colorado, Adams County and Commerce City in the prevalence of obesity.

FRUIT AND VEGETABLE CONSUMPTION

Nutrition is essential for healthy growth and development and overall well-being. One area of primary dietary concern is the consumption of fruits and vegetables that are high in vitamins and minerals. The current 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.

Figure 4. Percent of adults who consume 5 or more daily servings of fruits and vegetables in the United States, Colorado, Adams County and Commerce City, 2005 and 2006.



HEALTHY PEOPLE 2010 OBJECTIVE 19-5:
Increase the proportion of persons aged 2 and older who consume at least two daily servings of fruit.
Target = 75%

HEALTHY PEOPLE 2010 OBJECTIVE 19-6:
Increase the proportion of persons aged 2 and older who consume at least three daily servings of vegetables, with at least one-third being dark green or orange vegetables.
Target = 50%

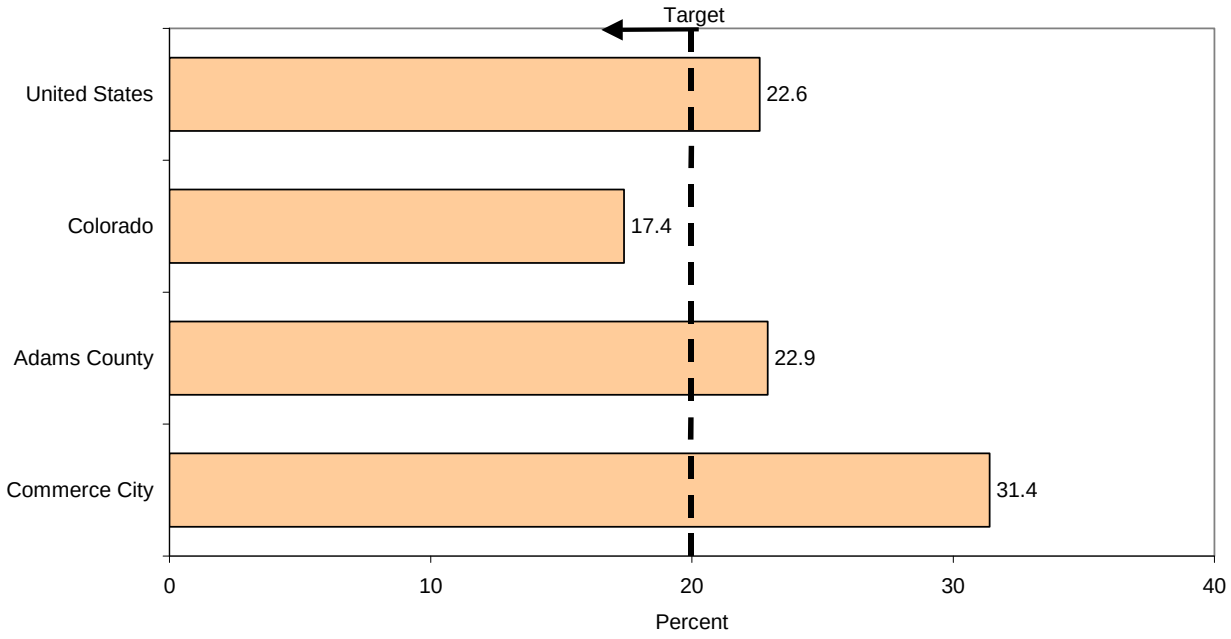
SUMMARY: Commerce City does not meet the Healthy People 2010 objective for fruit and vegetable consumption. There is no significant difference in the percentage of adults who consume 5 or more daily servings of fruits and vegetables between the United States, Colorado, Adams County and Commerce City.

Physical Activity and Fitness

NO LEISURE-TIME PHYSICAL ACTIVITY

Physical activity substantially reduces the risk of dying of coronary heart disease, the nation's leading cause of death, and decreases the risk for stroke, colon cancer, diabetes and high blood pressure. It also helps to control weight; contributes to healthy bones, muscles, and joints; reduces falls among older adults; reduces symptoms of anxiety and depression; and is associated with fewer hospitalizations, physician visits, and medications. Despite the proven benefits of physical activity, a large proportion of Americans do not participate in any physical activity during their leisure time.

Figure 5. Percent of adults who engage in **no** leisure-time physical activity in the United States, Colorado, Adams County and Commerce City, 2006.



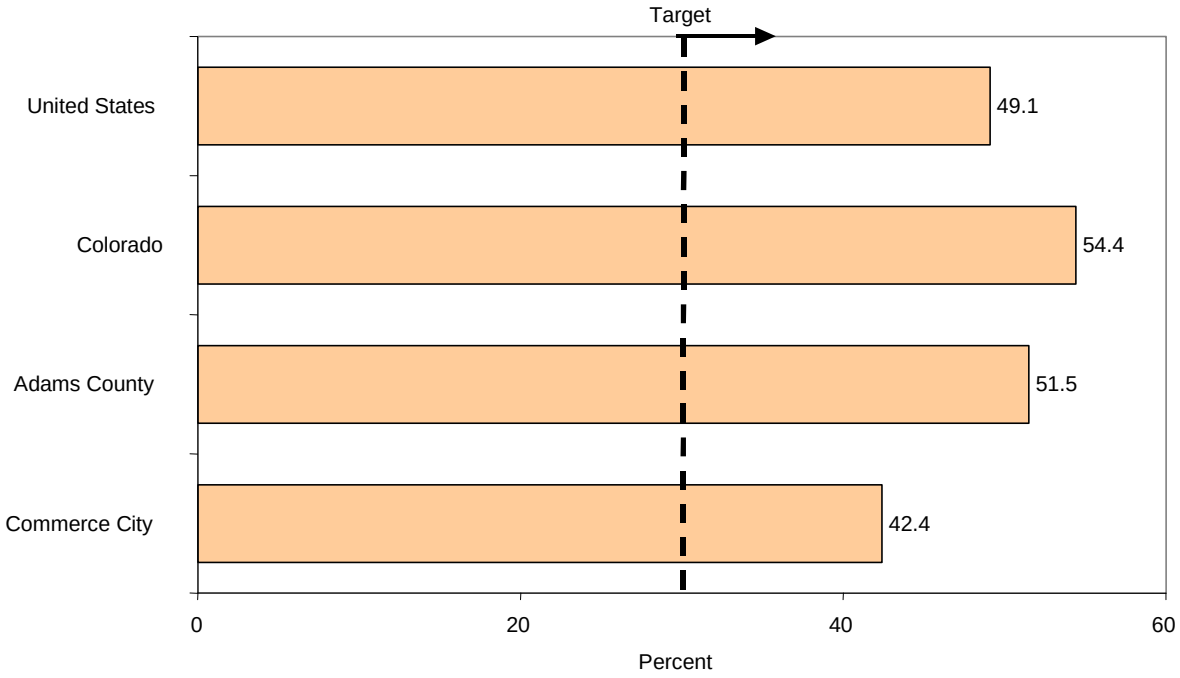
HEALTHY PEOPLE 2010 OBJECTIVE 22-1:
Reduce the proportion of adults who engage in no leisure-time physical activity.
Target = 20%

SUMMARY: Commerce City, Adams County, and the United States do not meet the national target for leisure-time physical activity. The percent of adults reporting no leisure-time physical activity is significantly higher in Commerce City as compared with the State of Colorado, which does meet the national objective at 17.4%.

REGULAR PHYSICAL ACTIVITY

In addition to leisure-time or recreational activity, physical activity can be obtained while at work (occupational activity) or through active transportation (such as walking or biking between destinations). 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.

Figure 6. Percent of adults who engage in regular moderate or vigorous physical activity in the United States, Colorado, Adams County and Commerce City, 2005 and 2006.



HEALTHY PEOPLE 2010 OBJECTIVE 22-2:
Increase the proportion of adults who engage regularly, preferably daily, in moderate physical activity for at least 30 minutes per day.
Target = 30%

HEALTHY PEOPLE 2010 OBJECTIVE 22-3
Increase the proportion of adults who engage in vigorous physical activity that promotes the development and maintenance of cardio-respiratory fitness 3 or more days per week for 20 or more minutes per occasion.
Target = 30%

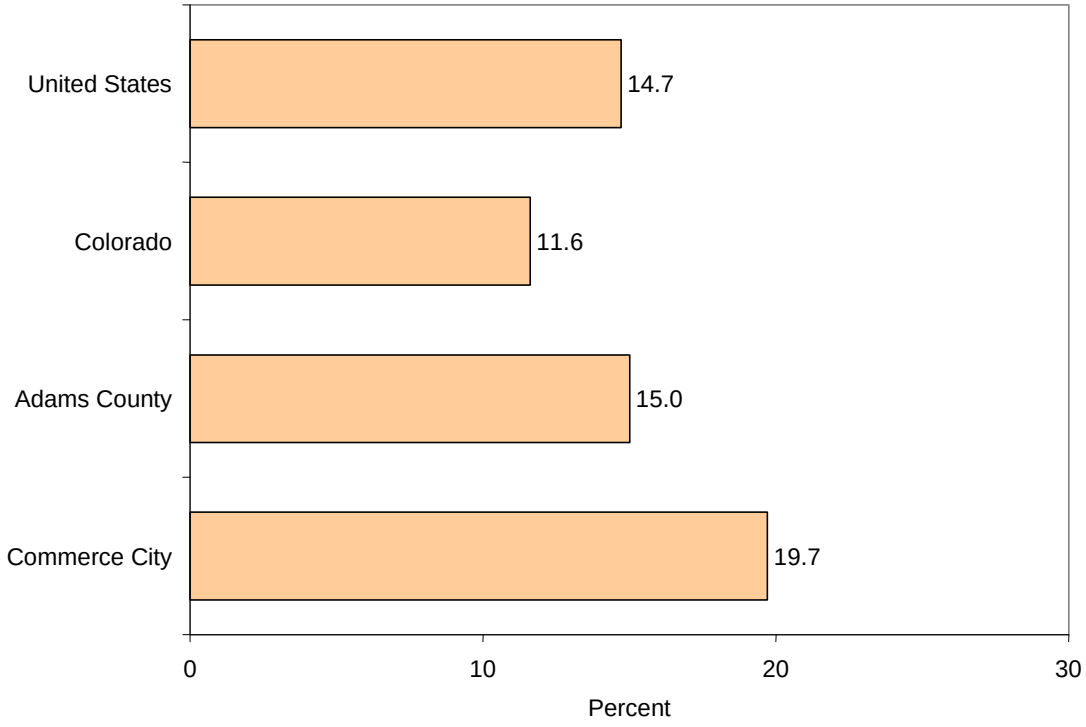
SUMMARY: The United States, Colorado, Adams County and Commerce City all meet the national target based on the measurement method used in this survey. However, the percentage of adults who report physical activity is significantly lower in Commerce City as compared with the State of Colorado.

Health Status and Chronic Disease

FAIR OR POOR HEALTH

General health status is a key indicator of quality of life and disability. General health incorporates components of both physical health and mental health; however, it is a stronger indicator of a person's overall physical health status. To assess this measure of health status, respondents are asked, "Would you say that in general your health is…excellent, very good, good, fair, or poor?" Persons who answer either "fair" or "poor" are more likely to have chronic health conditions, poorer mental health status, and activity limitations, all of which indicate a poorer quality of life.

Figure 7. Percent of adults who self-reported fair or poor health status in the United States, Colorado, Adams County and Commerce City, 2006.



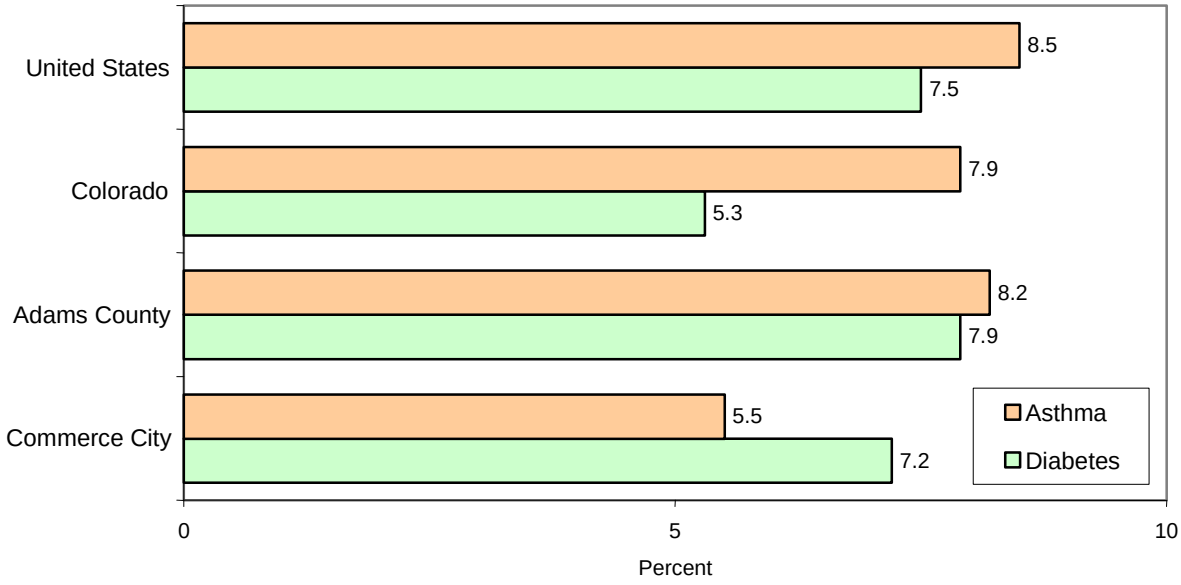
HEALTHY PEOPLE 2010 GOAL:
One of the two overarching goals of Healthy People 2010 is to increase life expectancy and improve quality of life. There is no specific objective for fair or poor health status.

SUMMARY: The percentage of Commerce City adults who reported having fair or poor health status is significantly higher than the percentage for the State of Colorado. There is no significant difference between the proportion of adults in the United States, Adams County and Commerce City who report fair or poor health status.

CHRONIC DISEASE

Chronic diseases are illnesses that are prolonged and are rarely cured completely. Two examples of chronic health conditions are diabetes and asthma. Both diseases are increasing in prevalence in the United States and hence are important public health challenges. In addition, both diabetes and asthma can contribute to impaired quality of life and substantial disability among people who have these conditions.

Figure 8. Percent of adults who report that they currently have diabetes or asthma in the United States, Colorado, Adams County and Commerce City, 2006.



HEALTHY PEOPLE 2010 GOAL 5:
Through prevention programs, reduce the disease and economic burden of diabetes, and improve the quality of life for all persons who have or are at risk for diabetes. Specific objectives include prevent diabetes (5-2), reduce the overall rate of diabetes that is clinically diagnosed (5-3), and reduce the diabetes death rate (5-5).

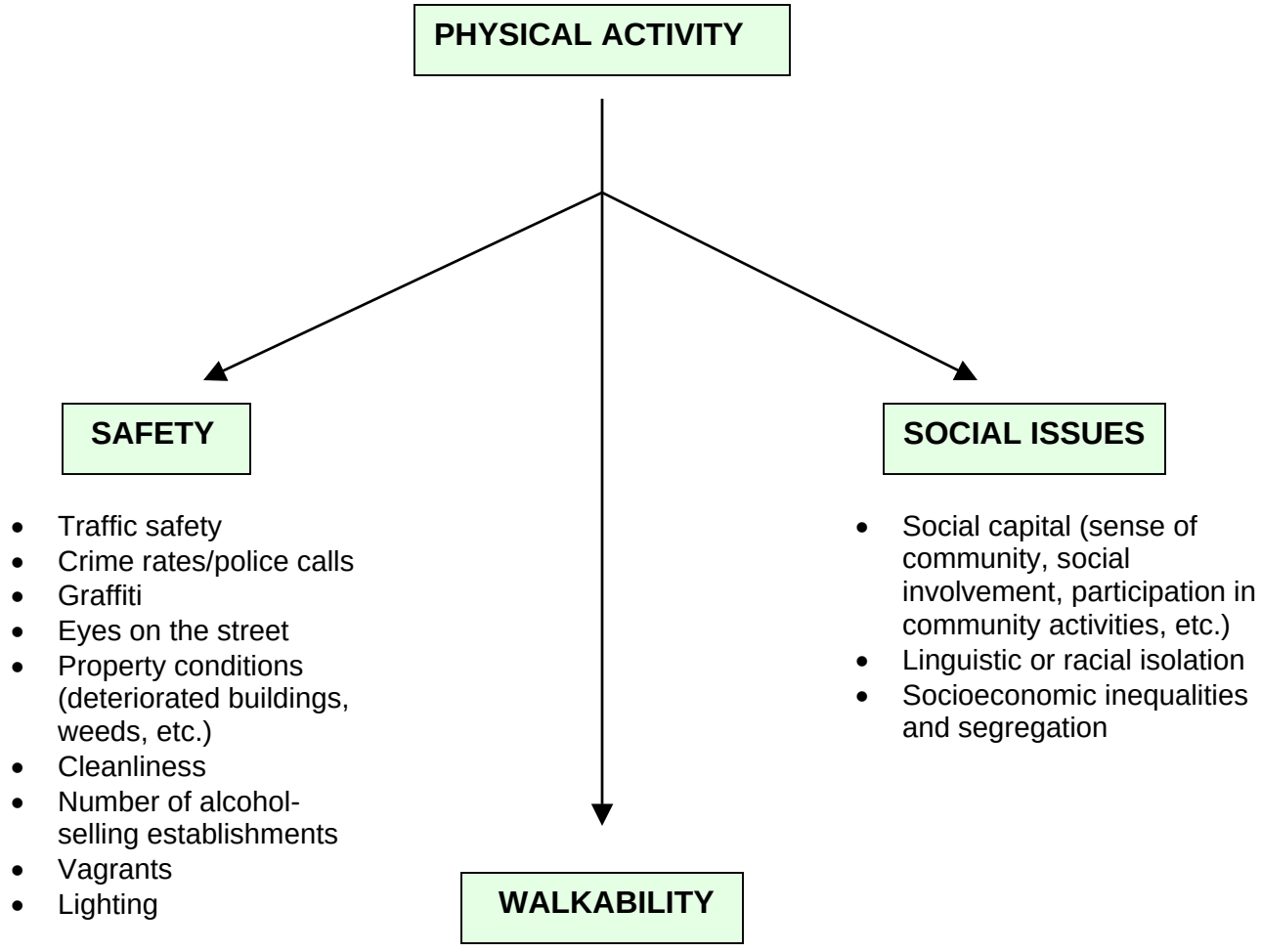
HEALTHY PEOPLE 2010 GOAL 24:
Promote respiratory health through better prevention, detection, treatment, and education efforts. Specific objectives include reduce asthma deaths (24-1), reduce hospitalizations for asthma (24-2), and reduce hospital emergency department visits for asthma (24-3).

SUMMARY: Although not statistically different, Commerce City has a slightly higher prevalence of self-reported diabetes and a slightly lower prevalence of self-reported asthma compared to the State of Colorado.

Effect of Derby Redevelopment on Physical Activity in Historic Commerce City

The Derby Sub-Area Master Plan, Planned Unit Development (PUD) zoning ordinance and Design Guidelines, and associated Capital Improvement Project budget requests address many of the environmental factors that are associated with physical activity, particularly those related to safety and walkability. The following sections provide a brief overview of each factor, summarize its current status in Derby, and analyze how the proposed redevelopment is likely to affect levels of physical activity among residents of historic Commerce City.

Some Environmental Factors Associated with Physical Activity



- Traffic safety
- Crime rates/police calls
- Graffiti
- Eyes on the street
- Property conditions (deteriorated buildings, weeds, etc.)
- Cleanliness
- Number of alcohol-selling establishments
- Vagrants
- Lighting

- Social capital (sense of community, social involvement, participation in community activities, etc.)
- Linguistic or racial isolation
- Socioeconomic inequalities and segregation

- 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

Traffic Safety

Throughout history, streets served as the living rooms of cities, accommodating travel, social and physical activities. In the 1940s America's streets evolved into corridors with a single purpose — moving vehicles. Today, it is relatively risky to walk or bicycle in the United States. Compared with a person traveling a half mile in an automobile, a pedestrian and bicyclist traveling the same distance are, respectively, 23 times and 12 times more likely to be killed[10]. About 13% of all traffic fatalities in the U.S. are pedestrians and bicyclists[7]. As noted earlier in this report, children and older adults are especially vulnerable.

Traffic Safety in Derby: Current Status

In community forums and walkability assessments, residents of historic Commerce City identified pedestrian traffic safety as an issue on some Derby streets, particularly its two gateways—72nd Avenue and Highway 2. They cited the width of the streets and lack of crosswalks and traffic signals as the two main barriers to crossing the streets safely. They also listed speeding or unyielding vehicles, lack of buffer between the sidewalk and traffic, and narrow, obstructed or damaged sidewalks as other pedestrian concerns.

Key Traffic-Related Issues on 72nd Avenue and Highway 2

- Lack of crosswalks
- Lack of traffic signals
- Streets too wide to cross
- Speeding cars
- Lack of buffers between sidewalks and traffic
- Narrow, obstructed or damaged sidewalks

72nd Avenue

72nd Avenue:

The signs say it is okay to cross here, but the street sends a different message. Pedestrians feel unsafe because the street is wide and the crosswalk is unsignaled.

72nd Avenue forms Derby's southern boundary. Traffic safety along 72nd Avenue warrants special attention because the street is a major travel corridor for local residents, especially children and families. It is home to Lester Arnold High School and in 2009 Adams 14 School District's new high school will open where 72nd Avenue enters Prairie Gateway east of Quebec Street. Three elementary schools—Hanson, Rose Hill and Kemp—are blocks away. Apartments and key Derby institutions such as the library and Our Lady Mother of the Church are located along its southern edge. Both bus routes serving Derby run along portions of 72nd Avenue.

72nd Avenue is also a strategic travel corridor. One of the few east-west streets in historic Commerce City, it will one day link the City's future North Metro rail station and Prairie Gateway on either side of Derby. Improving traffic safety here has the potential to increase the number of historic Commerce City children who can walk or bicycle to school, and the number of historic Commerce City residents who might choose to leave their cars at home when traveling to and from destinations in Derby.

For these reasons, the 2006 LiveWell grant funded the transportation planning firm Glatting, Jackson, Kercher and Anglin to conduct a traffic assessment and to recommend traffic safety and other improvements for the 72nd Avenue corridor to the City's Public Works Department. Public Works will need to perform a detailed traffic study of the recommendations before developing specific Capital Improvement Project budget requests to implement these corridor improvements.

Highway 2

Highway 2, Derby's northern and western boundary, is a state highway and regional commercial corridor. The Burlington Northern Railroad runs along its western side, creating a barrier between Derby and the western portion of historic Commerce City. Highway 2 presents the greatest traffic safety issues for pedestrians and bicyclists in Derby.

Highway 2:
Residents cited the lack of buffer between the narrow sidewalk and the highway as a serious danger to pedestrians.

"I took this photo hoping that they would improve traffic on Highway 2 because there are so many accidents. The crosses mark the site of two deaths along this road."

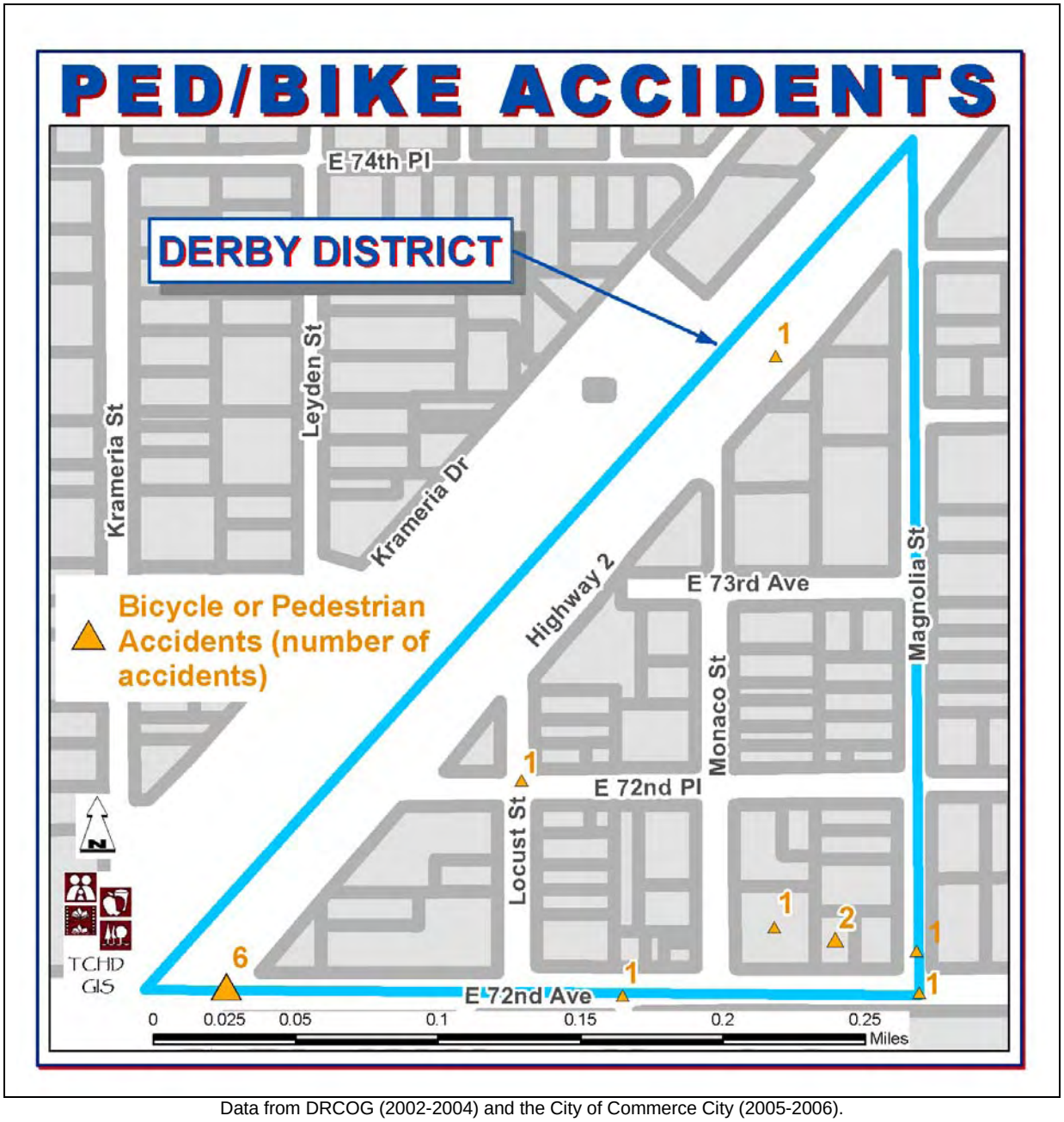
- Photovoice photographer

Adams City High School teens discuss issues and solutions related to walking to school in April, 2006.

Highway 2:
"Next to that huge highway, there are no crosswalks whatsoever."
Anthony Denning-Lenhart, Adams City High School student.

"You can really get hurt from walking in this area. It's not that safe a thing to do, but you do what you have to to get to school and to get where you need to be."
Kim Patterson, Adams City High School student, from ***"The Long (and Scary) Walk Home"*** video she helped film and narrate. See Appendix C.

Figure 9. Pedestrian and bicycle accidents in Derby, 2002-2006



Data from DRCOG (2002-2004) and the City of Commerce City (2005-2006).

Figure 9 confirms residents' concerns about traffic safety on Highway 2 and 72nd Avenue. Six of the 14 pedestrian and bicycle accidents involving a vehicle that occurred in Derby in a five year period took place at the intersection of the two streets, suggesting the intersection is a traffic safety problem.

Traffic Safety in Derby: How Will Redevelopment Affect It?

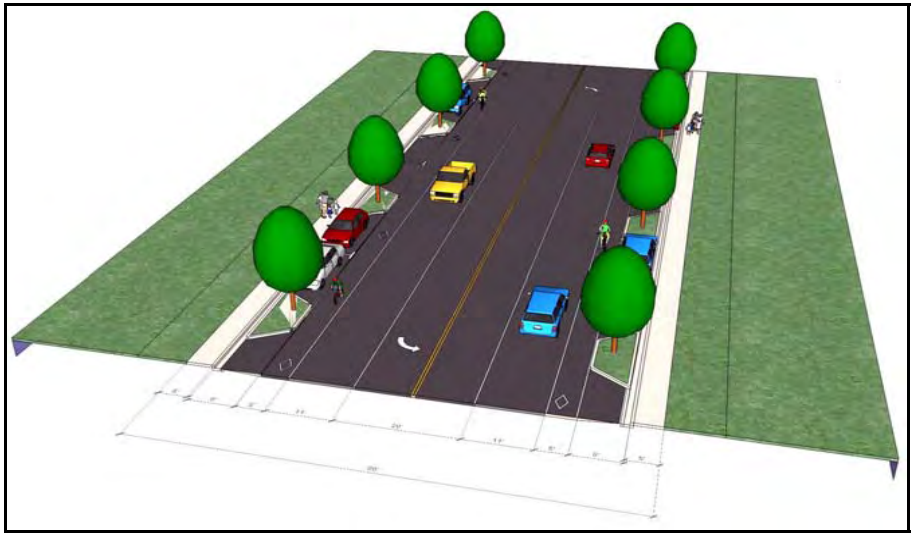
Traffic in Derby is likely to increase due to development in Prairie Gateway and the renewal of Derby . Thus, it is important to make traffic safety a priority to minimize traffic-related injuries to bicyclists and pedestrians.

Traffic safety can be improved through **traffic calming** measures, which are design features that slow traffic. Traffic calming has the added benefit of promoting healthy behaviors. In a multi-study assessment, the Centers for Disease Control and Prevention found that when traffic calming measures were installed with aesthetic improvements such as landscaping or lighting, physical activity in those areas increased by a median of 35%. The change was measured by the increase in the number or percentage of people walking or being physically active outdoors after measures were implemented[11].

The Derby Sub-Area Design Guidelines propose a variety of traffic calming measures. Associated Capital Improvement Project budget requests are currently being evaluated by the City for 2008-2012. This section discusses how some of these measures can make it safer for historic Commerce City residents to walk or bicycle on Derby's streets.

Proposed Derby Traffic Calming Measure	Traffic Safety Supporting Evidence for Measure	Effect on Pedestrian/Bicyclist Safety in Derby
1. Reduce vehicle speed limits on Derby streets.	The risk of a pedestrian being killed when hit by a car drops dramatically as the vehicle speed at impact decreases. A pedestrian hit by a car going 40 mph has an 85% chance of being killed, while a pedestrian hit by a vehicle traveling at 20 mph or less has a 95% chance of survival[6].	Favorable, with the degree depending on the amount of the speed reduction
2. Narrow traffic lanes through re-striping of lanes and addition of bicycle lanes on certain Derby streets.	The weight of evidence suggests that vehicle speeds decline somewhat and drivers behave less aggressively as individual lanes and street sections are narrowed. An analysis of 14 years of highway infrastructure changes found that widening lanes reduced traffic safety and actually caused a large increase in fatalities and injuries[6].	Favorable

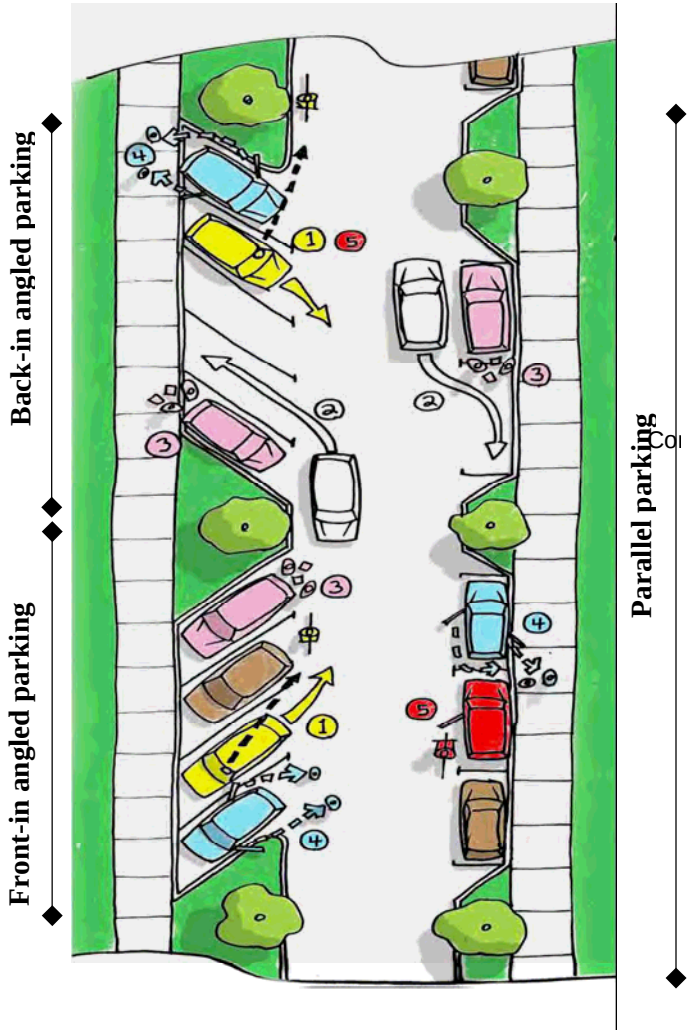
Possible Long Term Scenario for 72nd Avenue



Graphic courtesy of Glatting Jackson Kercher and Anglin

Proposed Derby Traffic Calming Measure	Traffic Safety Supporting Evidence for Measure	Effect on Pedestrian/Bicyclist Safety in Derby
3. Add crosswalks to streets internal to Derby. Add crosswalks on Highway 2 and 72nd Avenue, along with other traffic calming features (e.g., bulb-outs, medians). A "bulb-out" is a curb extension that narrows the width of an intersection.	With crosswalks, drivers are more cautious and more aware of pedestrians on relatively low-speed arterials[6].  The "Derby Diamond", shown above, is a stylized crosswalk proposed for Derby intersections. It utilizes colored pavement and planted "bulb-outs" to make crossing the street safer for pedestrians or bicyclists. On multi-lane roads with high volume traffic (12,000 vehicles per day), intersections with raised medians have significantly lower pedestrian crash rates compared to intersections with crosswalks alone[6]. To obtain maximum benefit, multiple traffic-calming measures should be installed simultaneously on both low volume and high volume streets.	Favorable
4. Reduce the number of lanes on Highway 2 and 72nd Avenue from four to three.	In dozens of "road diets" that reduced the number of traffic lanes from 4 to 3 (two through lanes with a center turn lane), the number of crashes decreased anywhere from 2% to 62%[6].	Favorable, with the potential for significant improvement

Proposed Derby Traffic Calming Measure	Traffic Safety Supporting Evidence for Measure	Effect on Pedestrian/Bicyclist Safety in Derby
5. Add angled back-in parking along arterial and main streets.	Benefits of angled back-in parking vs. front-in or parallel parking	Favorable



Graphic courtesy of Glatting Jackson Kercher and Anglin

1. ▪ Better visibility
   ▪ No backing blindly into travel lane
2. ▪ Easier backing compared to parallel
   ▪ Travel lane blocked for shorter time
3. Safer loading and unloading of trunk
4. Occupants channeled to sidewalk by doors
5. Bicycle friendly
   ▪ No "dooring"
   ▪ Allows bike lane
   ▪ Better visibility
6. Fewer collisions
7. Reduced liability

Personal Safety

Concerns about personal safety in outdoor public spaces, such as neighborhood streets and parks, can be a barrier to physical activity. Characteristics that make a place seem unsafe include a poorly maintained environment (e.g., litter, broken windows) and the presence of panhandlers and drunken people. Features that make places more susceptible to crime include lack of lighting, windows and activity at the street level [12] .

Research to date shows that crime or fear of crime is linked to lower physical activity levels in women, especially minority women, young people and seniors, and is a barrier to recreational walking for low income individuals[12].

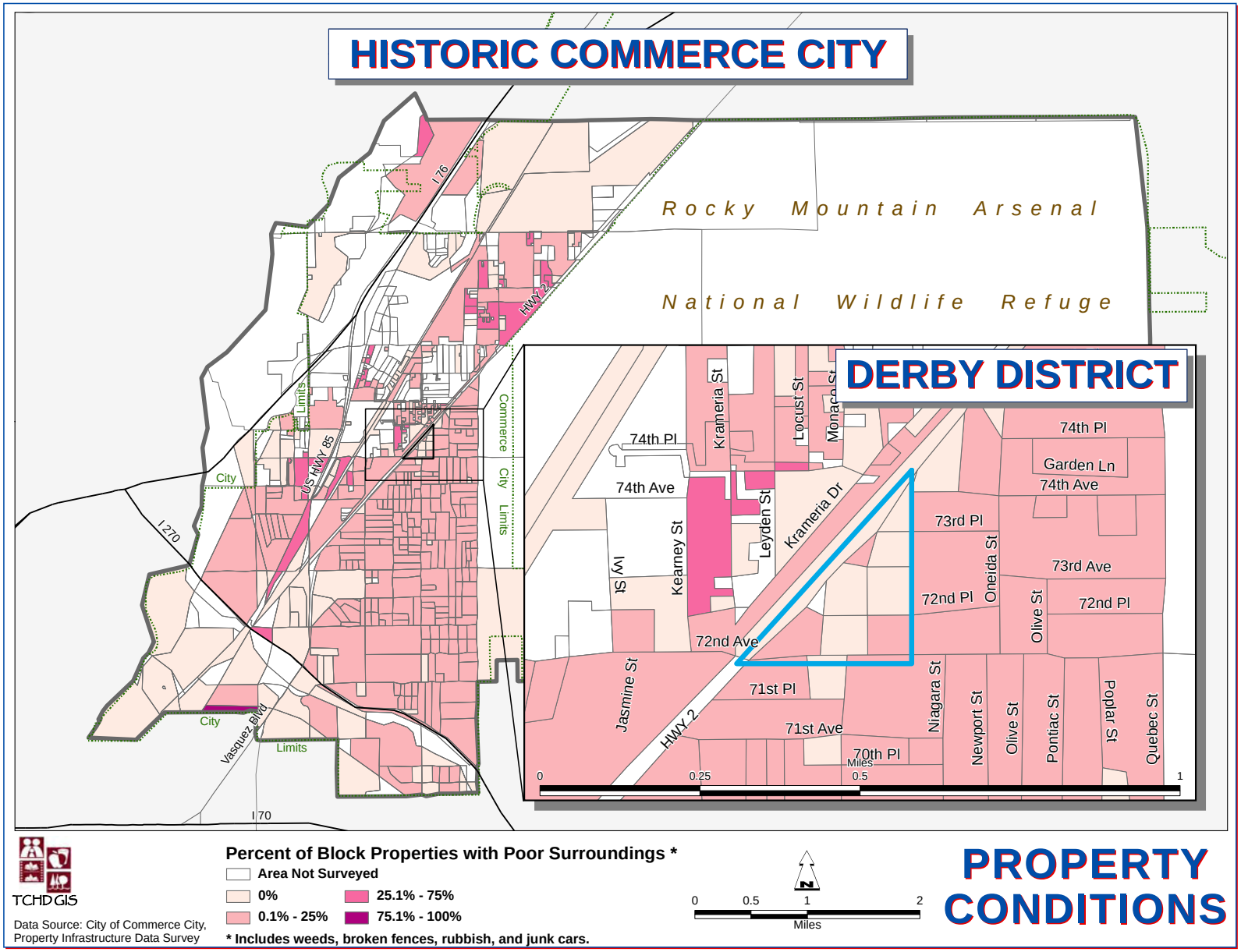
Personal Safety in Derby: Current Status

Property conditions in some parts of Derby send signals that the area is unsafe. These include deteriorated or abandoned buildings, weeds or rubbish in yards, broken fences, graffiti and dark alleys.

Derby scenes that signal a lack of safety—boarded up windows and a deserted, dark alley.

In 2004-2005, the Neighborhood Services Department conducted an inventory of properties in the City to evaluate building and property conditions. Figure 10 summarizes at the block level some of the outdoor conditions that were inventoried. At the time, most blocks in Derby appeared well-maintained relative to surrounding areas; issues with weeds, broken fences, junk cars and rubbish were concentrated in three areas.

Figure 10. Property conditions in historic Commerce City, including Derby



A walkability assessment question asked participants if any problems affected enjoyment of their walk in Derby. Participants frequently identified property conditions, including “dirty”, “lots of litter or trash” and “abandoned buildings”.

Fear of crime was another issue that historic Commerce City residents raised in community outreach meetings. Residents said they felt threatened by panhandlers and drunks who loiter in parks and other areas in Derby. At night few businesses are open other than bars and liquor stores that neighbors say are magnets for civil disturbances. Parents and teens, in particular, said they felt unsafe because of drug and gang activity in the area.

Los Valientes Park in Derby

“Where are the children? Could they be frightened by the gang activity? An otherwise beautiful park is scarred by graffiti on the tree – and what it signals to the families in the neighborhood”

- Photovoice photographer

Figure 11. Lighting and the location of crime and graffiti in Derby

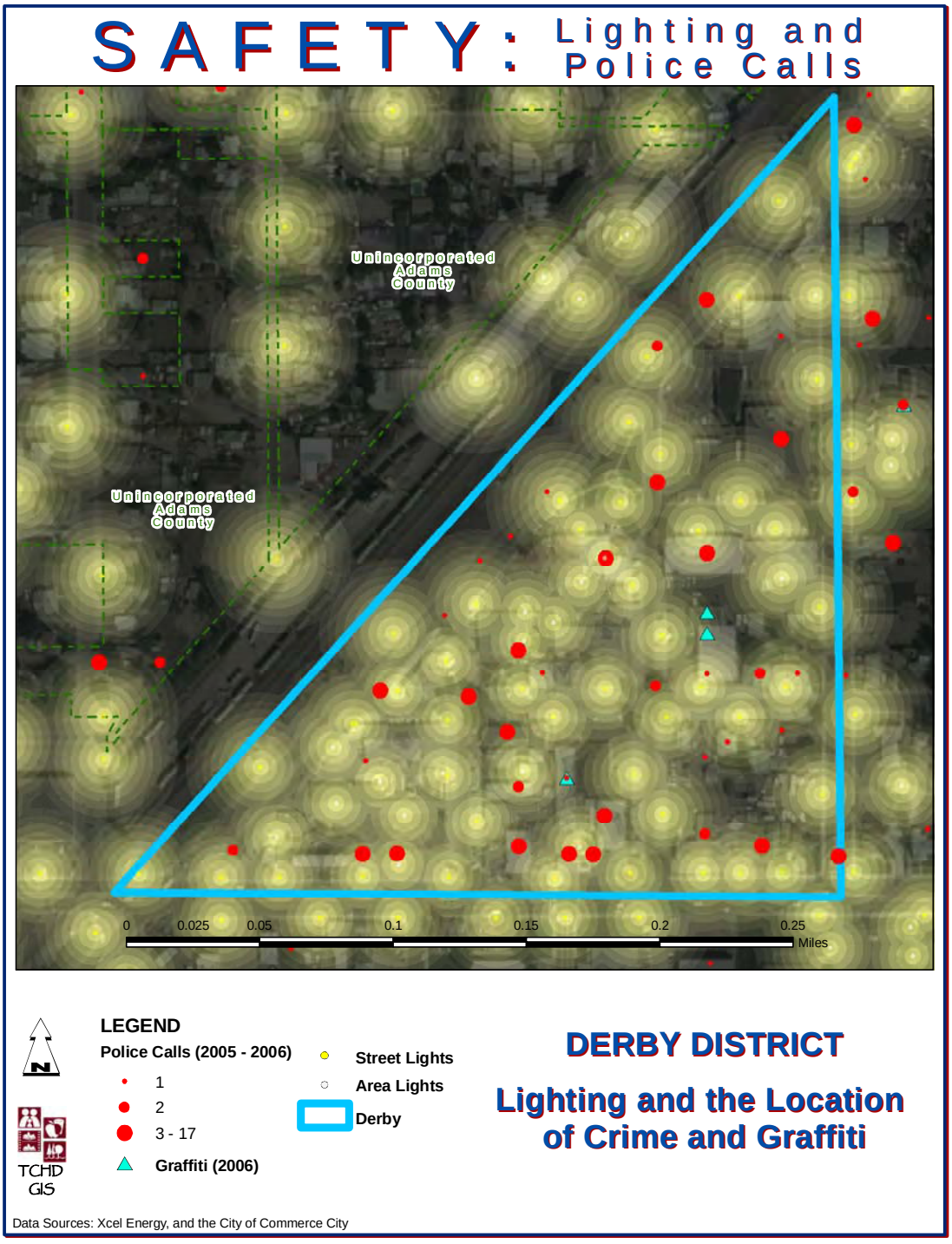


Figure 11 shows the locations of graffiti and police calls for crimes against persons that occurred in Derby during 2005 and 2006. Using police call data, TCHD calculated that Derby had approximately 9 times the number of crimes against persons than the rest of historic Commerce City (4,116 vs. 452 person crimes per square mile). Locations of street and area lights in Derby are overlain on the police call data and graffiti. Although one cannot draw conclusions from this data, the figure suggests that graffiti occurs in poorly lit areas and that police calls did not originate in either the best or least lit areas.

Personal Safety in Derby: How Will Redevelopment Affect It?

The Derby Design Guidelines contain many elements that address concerns about personal safety. This section summarizes the proposed changes and how likely they are to reduce real or perceived risks to historic Commerce City residents while they are in Derby, and possibly increase their physical activity levels as a result.

Proposed Derby Safety Measure(s)	Personal Safety Supporting Evidence for Measure	Effect on Real or Perceived Personal Safety or Physical Activity in Derby
1. Improved hierarchy of lighting, from the pedestrian to the street scale	Studies conducted in the U.K. concluded that improvements in lighting have a powerful capacity to reduce crime, incivilities and fear at night. In urban, mixed-use areas, they also have the potential to increase pedestrian street use after dark.[13]	Likely to reduce fear and possibly crime. May favorably affect physical activity levels.
2. Clean and Safe Initiative - Maintenance of all property visible to the public realm - New developments maintain their property and rights-of-way - Increased community surveillance in Derby in cooperation with the Police Department	Research indicates that evidence of disorder—deteriorated buildings, vacant lots, litter, graffiti—creates feelings of risk and fear. On the other hand, safe and clean neighborhoods invite outdoor activity.[12]	Likely to reduce fear. May favorably affect physical activity.

Proposed Derby Safety Measure(s)	Personal Safety Supporting Evidence for Measure	Effect on Real or Perceived Personal Safety or Physical Activity in Derby
3. More eyes on the street: - Window requirements - Building facades facing streets - Kiosks, street vending and displays - Active use areas close to the public realm - Alleys opened and activated - Reduced setbacks - 24/7 (round the clock) activity goal - Add public gathering spaces, seating - Increase number of residences in Derby - Expand range of commercial, retail uses - Increase overall density: residential and commercial	The "eyes on the street" concept was introduced in 1961. Since then, researchers from various disciplines have agreed that a dense mix of uses that generate significant daytime and nighttime activity create self-policing, safer neighborhoods.[15] Providing opportunities for socialization builds a sense of community, which reduces crime.[16] Community ***"happens when people are in the street, when people are speaking to each other, and when there are activities that bring people together."*** Felton Earls, Professor, Harvard School of Public Health[16].  	Likely to favorably affect personal safety

Walkability

Walkable neighborhoods offer many common destinations that people can easily walk to. They are defined by a mix of homes and stores, higher densities, and a network of connected streets, sidewalks, parks and trails. People can travel there safely by car, by bicycle or on foot, and often by transit. Through landscaping, eye-level attractions, shade and other amenities, walkable communities cater to the senses of pedestrians and bicyclists.

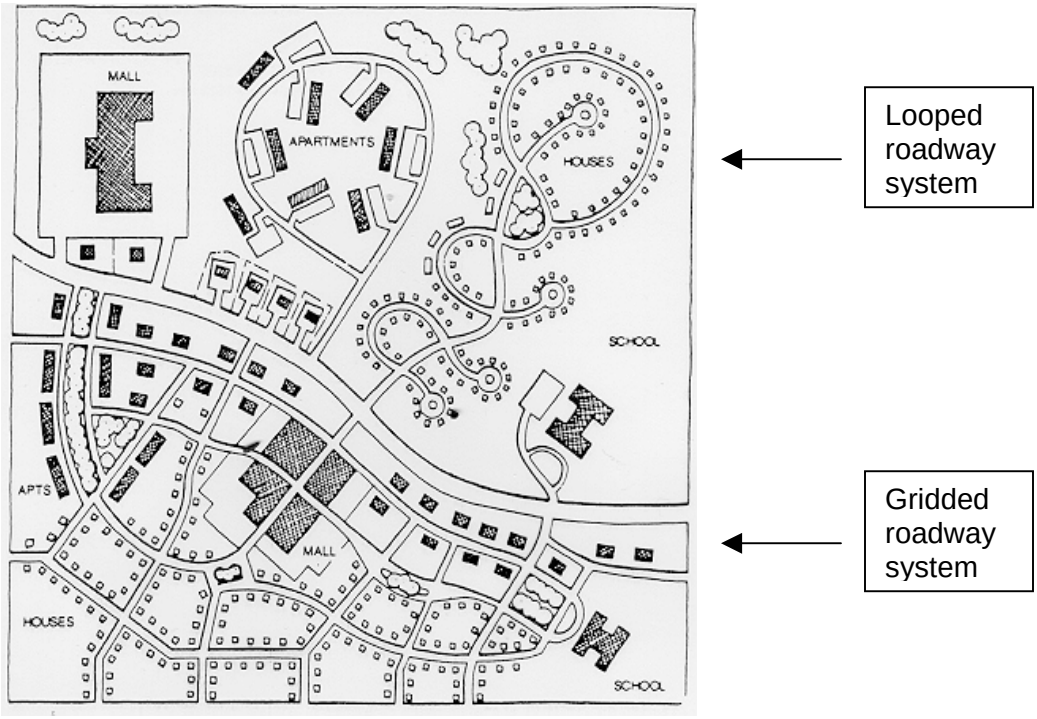
Walkability is positively correlated with social capital, a measure of how much people feel they belong to a community and will have their needs met[6].

Urban design and land use codes can help increase walking and bicycling by locating places where people live near places where they want or need to be, and by providing them safe, attractive and direct pathways to get there.

Walkability in Derby: Current Status

Derby is comprised almost solely of low density businesses and a few homes that pre-dated its purely commercial zoning. Both Derby business owners and historic Commerce City residents stated that they would like to see a greater variety of restaurants, retail, service and entertainment uses in Derby. The existing parks are small and do not function well as public gathering spaces. However, the Parks Department has created a redevelopment plan for the recently dedicated Joe Reilly Park in Derby, and with the opening of the Derby Resource Center in mid-July, the City fulfilled a long-standing community request for an activity and resource hub.

Derby has been described as having "good bones"——a gridded street network that creates direct routes. Streets laid out in an interconnected grid shorten the distance between destinations and thus encourage walking any bicycling.



.

Drawing by Duany Plater Zyberk, in ITE Journal 1989;59:17-18

Streets arranged in a grid support walking and bicycling more than looped or dead-end streets. Grids slow auto traffic and offer alternative, direct routes.

Figure 12. Sidewalk conditions in historic Commerce City, including Derby

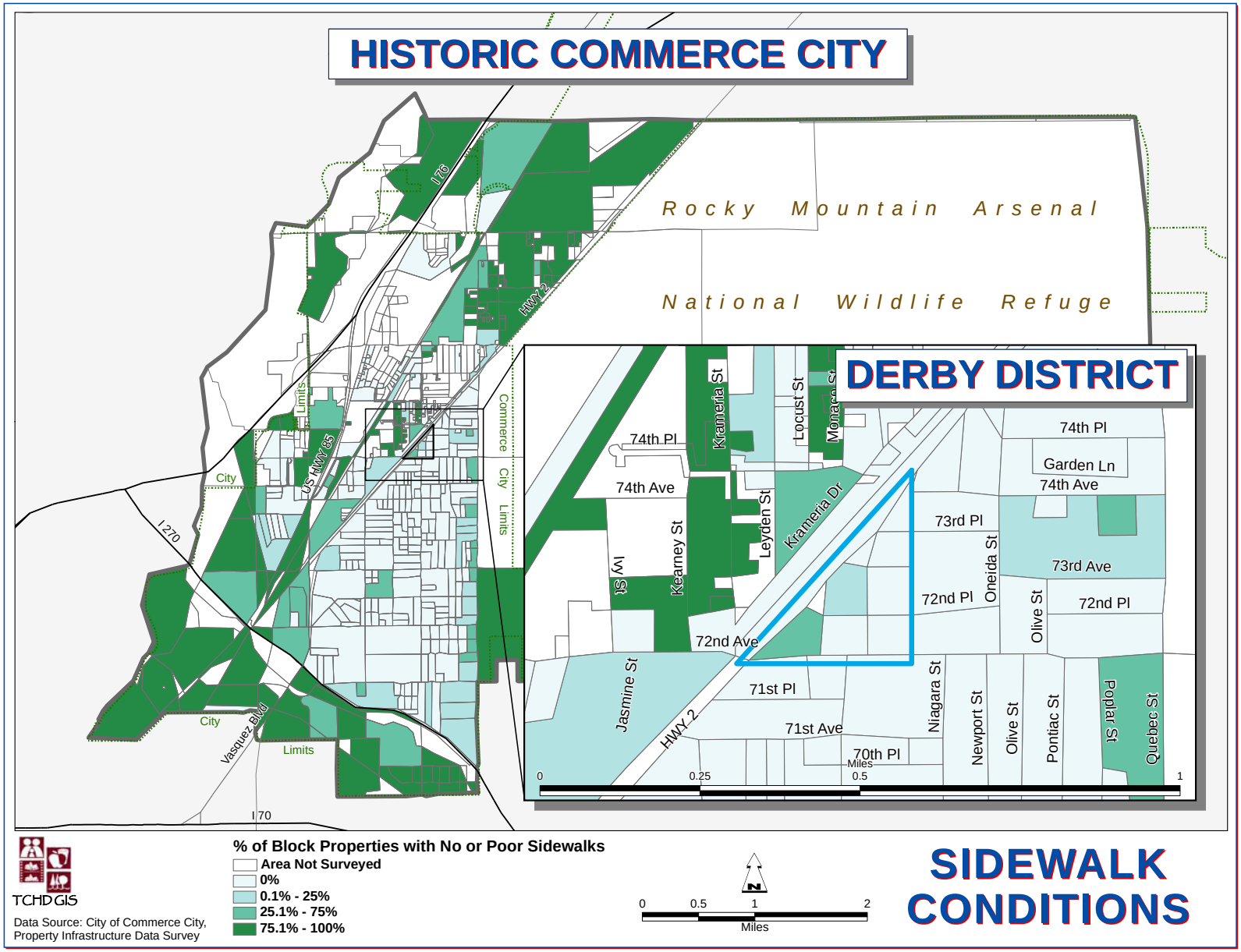
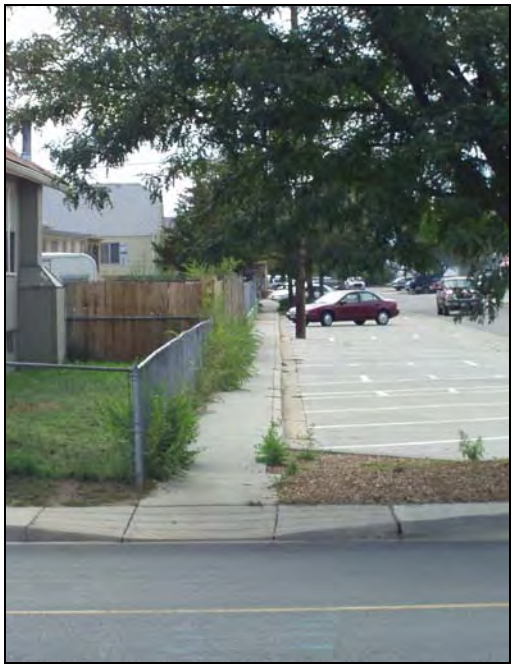


Figure 12 on the previous page maps data from the City's 2004-2005 Property Infrastructure Data Survey. It shows that, with a few exceptions, much of Derby has sidewalks. These sidewalks are in reasonably good condition. Yet, as some residents noted in their walkability assessment comments, most Derby sidewalks are very narrow (3' wide), which was the norm when they were built several decades ago. In addition, cars often park over the sidewalks, and some are obstructed or are overgrown with weeds or bushes, all of which discourage walking. The sidewalks do not interconnect through Derby's streets, alleys, parking lots and parks to form a continuous system of walking routes.



Many of Derby's sidewalks have obstructions or are too narrow for two people to walk side by side.

Figure 13. Bike routes, parks, and existing and future trails in historic Commerce City, including Derby

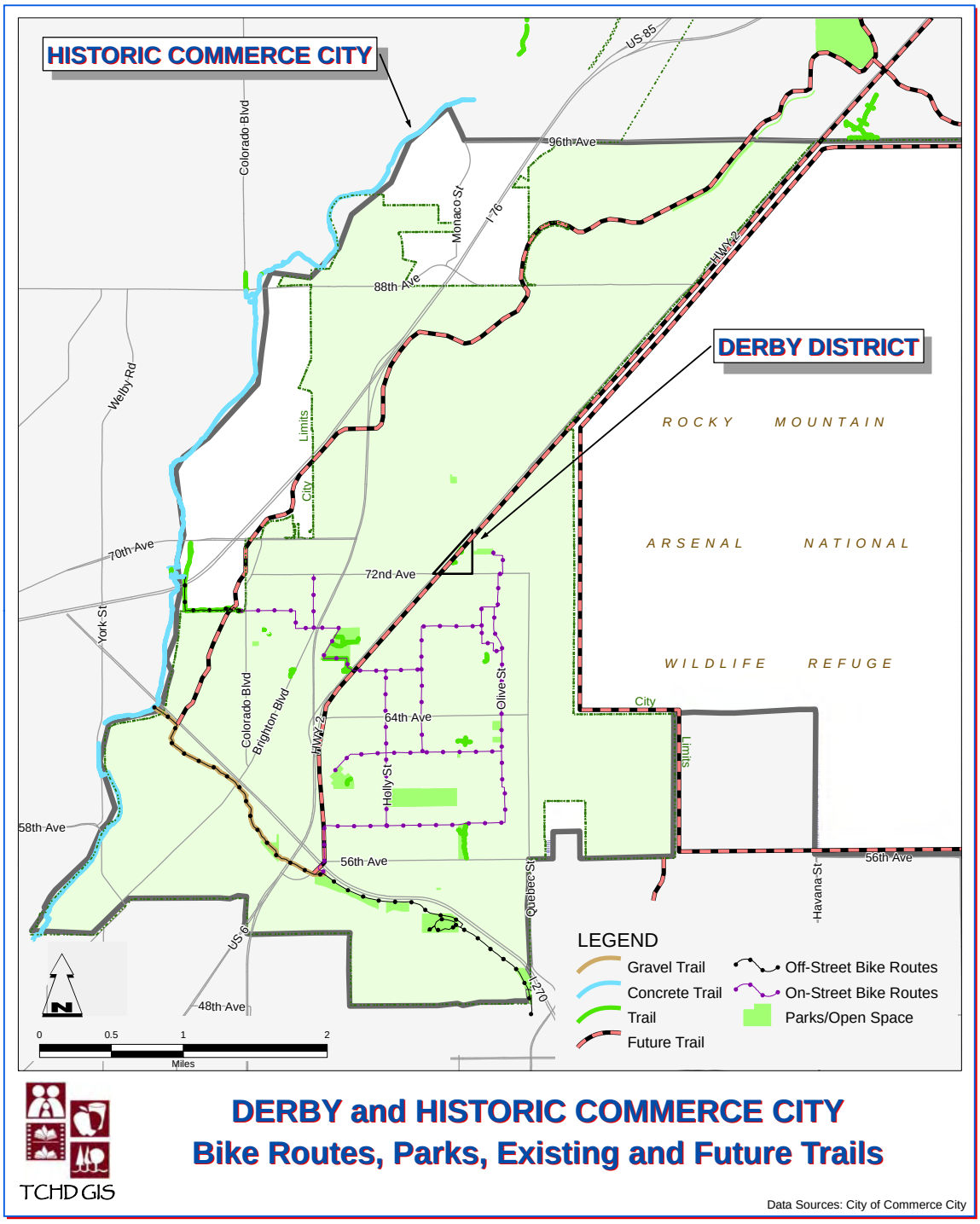
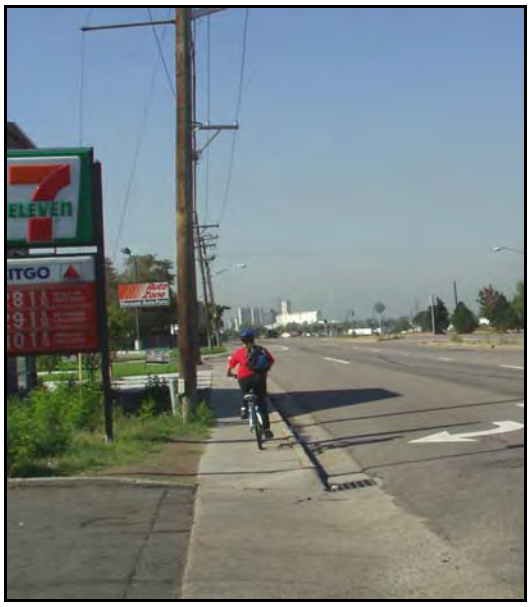


Figure 13 shows that Derby is devoid of trails, bicycle lanes and bicycle routes. Historic Commerce City has few trails and some designated on- and off-street bicycle routes, but there are no striped bicycle lanes. A future trail is planned along Highway 2, Derby's western boundary. This trail will be Derby's north-south link to the regional trail system. Currently, there is no planned east-west trail connection through Derby.



Bicyclists in Derby

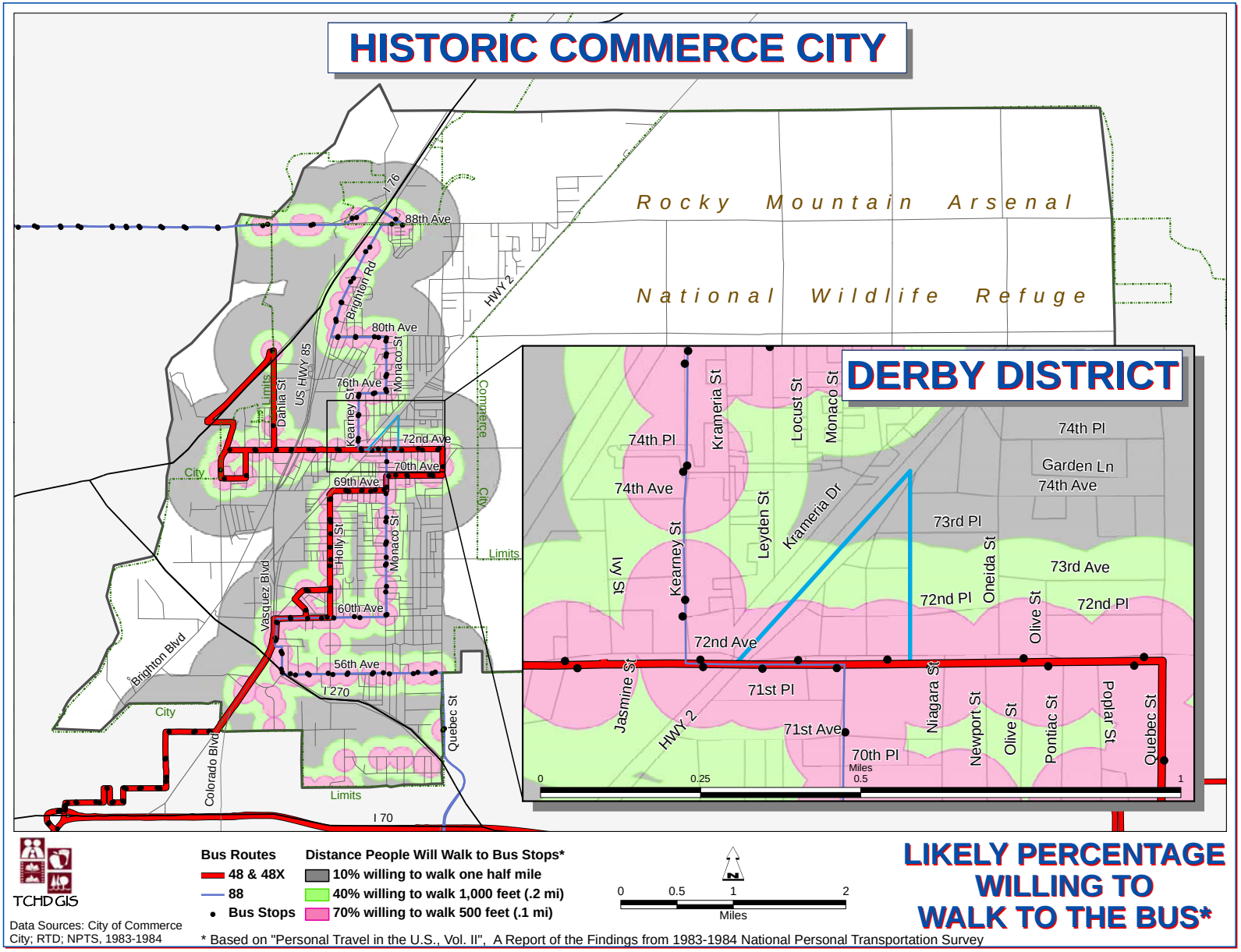
"Commerce City needs more bike paths. Riding bikes on narrow sidewalks is dangerous for pedestrians and bike riders."

Photovoice photographer

There are few trees along Derby's streets, and landscaping in some areas is sparse. Historic Commerce City residents have expressed a strong desire for more landscaping in Derby, particularly trees for shade and flowers for beauty.

The intersection of Monaco Street and East 72nd Place is a rare oasis of landscaping in Derby and a model for what could be accomplished throughout the area.

Figure 14. Likely percentage willing to walk to the bus and bus routes in historic Commerce City, including Derby



Derby has limited bus service and few bus shelters. As noted on Figure 14, two routes—the 48 and the 88—run along portions of 72nd Avenue.

Figure 14 also depicts the distances that people are willing to walk to a bus stop, as determined by the National Personal Transportation Survey[6]. Most of Derby is located within 1,000 feet of a bus stop, a distance that the survey found 40% of people are willing to walk to transit. The Regional Transportation District's August, 2006 summary report indicates that only 30-60 people a day get on or off the bus in Derby. In addition to improving air quality by reducing vehicle emissions, transit increases physical activity since every transit trip involves a walking segment. Redevelopment, improved bus facilities, and possibly revised bus routes or schedules will improve access to transit in Derby. This could increase the number of historic Commerce City residents who could take the bus to or from Derby for work, errands or recreation.

These typical bus stops in Derby are designed for utility, but lack shade and shelter to protect transit users from the elements.

Walkability in Derby: How Will Redevelopment Affect It?

Making Derby a healthier environment that is friendly to pedestrians and bicyclists as well as vehicles is an explicit goal of the Derby Sub-Area Design Guidelines. If implemented, the Guidelines will transform Derby into a highly walkable community. This section describes relevant proposed changes and provides evidence that changes to the physical environment do, in fact, promote physical activity through increased walking and bicycling. Thus, historic Commerce City residents will be more likely to walk or bicycle in Derby as it redevelops.

Proposed Derby Walkability Measure	Walkability Supporting Evidence of Measure	Effect on Walking/Bicycling in Derby
1. Mixed use development - Expands permitted commercial uses, emphasizing pedestrian-scale uses and de-emphasizing auto-oriented uses. - Protects existing residential; expands the range of permitted housing types. Focuses on increasing the number of residents and meeting the needs of diverse groups, including seniors. - Permits a broad range of public and civic uses. 2. Increased density of uses	A review of 11 studies showed that on average, people in highly walkable neighborhoods take twice as many walking trips—an additional 15-30 minutes per week—as people in less walkable neighborhoods. The difference was mostly due to an increase in utilitarian activity, such as walking to do errands or to go to work [16]. Research has shown that mixed use and density are both important in creating a walkable environment. Studies have not yet identified their independent effects[6]. Having many destinations that people can and want to walk to is one of the most critical factors in their choosing to walk[6].  *www.pedbikeimages.org/Dan Burden* An 11-year study that followed residents in Seattle found that people who moved to more walkable neighborhoods shifted some of their automobile trips to transit, bicycling and walking as a result[17].	Favorable impact on utilitarian activity (routine walking and bicycling)

Proposed Derby Walkability Measure	Walkability Supporting Evidence of Measure	Effect on Walking/Bicycling in Derby
3. Aesthetics and amenities - Art - Landscaping - Street furniture - Window and street displays - Awnings - Signage and kiosks - Plazas, courtyards Outside storage prohibited	Several studies have found that pleasant scenery, attractive surroundings and places for social gathering are linked to higher levels of physical activity.  www.pedbikeimages.org/Dan Burden In walkability assessments and community meetings, historic Commerce City residents identified improved aesthetics as a high priority. They also wanted more wholesome places to take their children, and wanted to minimize their children's exposure to unhealthy messages.  Derby street scene	Favorable

Proposed Derby Walkability Measure	Walkability Supporting Evidence of Measure	Effect on Walking/Bicycling in Derby
4. Connectivity - Clear, direct system of pedestrian routes: streets and alleys, wider sidewalks, trails, parking lots and greenways leading to destinations - Pedestrian connections to key institutions on south side of 72nd Avenue	Residents in neighborhoods with a grid street pattern, sidewalk continuity, and ease of street crossings tend to take more pedestrian and transit trips than residents in neighborhoods with more auto-oriented designs[6].	Favorable in combination with mixed use and density
5. Bicycle facilities, such as striped bicycle lanes and required bicycle parking	According to the Federal Highway Administration, cities with higher levels of bicycle commuting had on average 70% more bikeways and 6 times more bike lanes per roadway mile[6].  *www.pedbikeimages.org/Dan Burden* The Denver Regional Council of Government's most recent Travel Behavior Inventory (1997) found that the average bicycle trip in Metro Denver was 2.1 miles, less than 20 minutes in length. Also, about half of the region's motor vehicle trips are less than 3 miles[19]. This suggests that there are a large number of vehicle trips that could be shifted to bicycle trips in Derby if convenient and safe bicycle facilities were available.	Favorable for bicycling

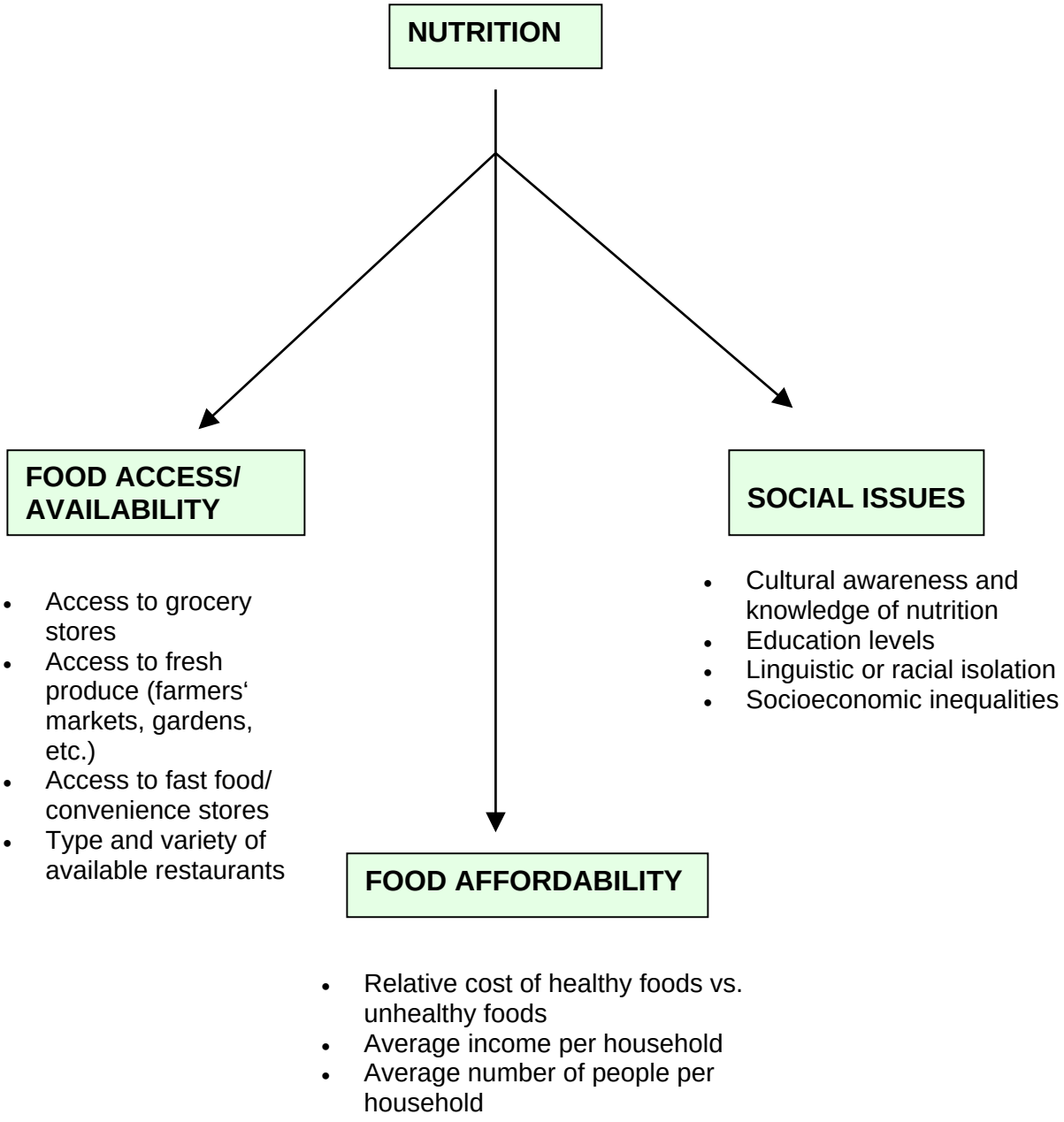
Proposed Derby Walkability Measure	Walkability Supporting Evidence of Measure	Effect on Walking/Bicycling in Derby
6. Where possible, increase sidewalk width to 8 feet and locate sidewalks on both sides of the street.	Residents identified wider, clear, safe sidewalks as a priority.	Favorable for walking
7. Improve parks. Create green "spine" of parks through Derby to Los Valientes Park.	Having access to parks and open spaces is associated with achieving recommended levels of walking[20]. People living within 10 minutes of a park are more likely to meet physical activity recommendations than those who don't.[21]  *www.pedbikeimages.org/Dan Burden*	Favorable for walking
8. Permitted uses: Parks and indoor and outdoor recreation uses such as skating rink, play fountain, bowling alley, lawn bowling, open green space, ping-pong, playground and other children's activities, running path, summer dance floor, rock climbing wall, roller blade, shuffleboard; health clubs and gyms, bicycle rentals.	Creating or improving access to places for recreational physical activity can result in a 25% increase in the percent of people who exercise at least three times a week[11].	Favorable for increased recreational walking or bicycling

Proposed Derby Walkability Measure	Walkability Supporting Evidence for Measure	Effect on Walking/Bicycling in Derby
9. Universal design, for senior and handicapped access 10. Pedestrian and transit-friendly design features as noted previously	Pedestrian and transit-friendly design, such as that proposed in Derby, improves mobility for seniors, the disabled and children who don't drive, as well as for the general population[5].  www.pedbikeimages.org/Dan Burden	Favorable for walking for all demographic groups

Effect of Derby Redevelopment on Nutrition In Historic Commerce City

The chart on the following page lists key environmental factors that affect nutrition, several of which are not influenced by land use decisions. Access to healthy foods may be affected by land use zoning. The following section provides an overview of food access and its current status in Derby, and analyzes how Derby's proposed Planned Unit Development rezoning ordinance and Design Guidelines might affect historic Commerce City residents' nutrition behaviors.

Some Environmental Factors Associated with Nutrition



Access to Healthy Food

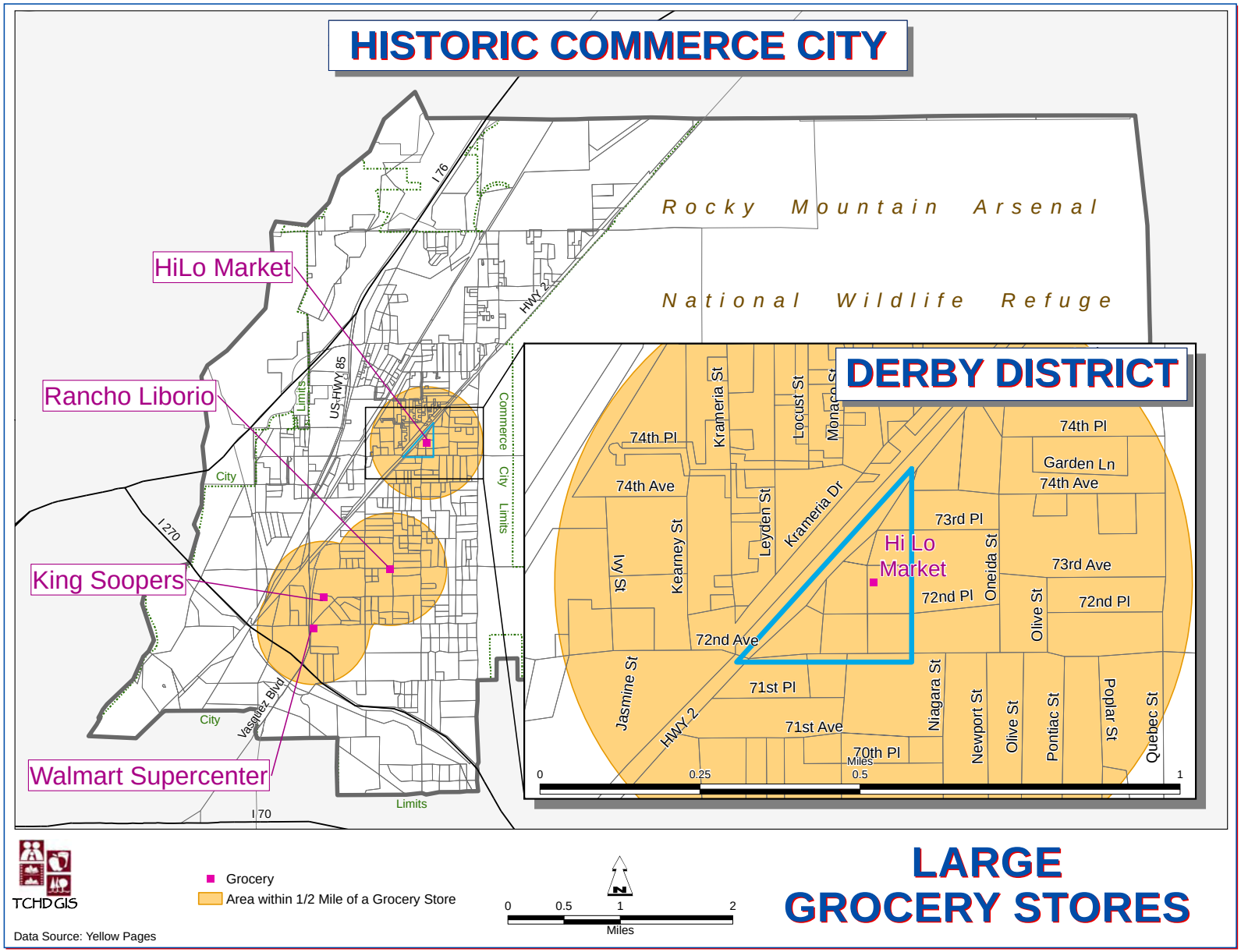
An increasing proportion of the population in the U.S. is overweight or obese, but only a relatively small percentage meets the government-recommended dietary guideline that recommends eating five fruits and vegetables a day. Among other factors, availability of foods influences what people eat. When access to food is a problem, a community faces a "grocery gap". This may mean that there are not enough grocery stores, or that people without cars cannot access them because the stores aren't on a bus route or within walking distance of their homes. In some neighborhoods, the only shopping options are convenience stores that have limited quantities of affordable, quality foods. There may be no farmers' markets or community gardens.

Access to Healthy Food in Derby: Current Status

Derby has its own grocery store, Hi Lo Market, in its core. Hi Lo has served the community for decades and remains a strong retail presence. In addition, as shown on Figure 15, three large grocery chains are located in historic Commerce City anywhere from ¾ mile to 2 ½ miles from Derby. Derby also has convenience stores that do not sell much fresh produce. There are no farmers' markets or community gardens in Derby. Overall, Derby does not suffer from a "grocery gap".

In community meetings, historic Commerce City residents stated they would like to see a wider variety of family restaurants locate in Derby.

Figure 15. Large grocery stores in historic Commerce City, including Derby.



Access to Healthy Food in Derby: How Will Redevelopment Affect It?

Derby's proposed rezoning ordinance and Design Guidelines will permit a greater variety of restaurants and venues for selling or growing fruits and vegetables and other fresh foods. Although market conditions will determine whether more and varied retail food establishments will locate in Derby, these zoning changes promote conditions that could improve historic Commerce City residents' access to healthy food.

Proposed Derby Food Access Measures	Supporting Evidence for Measure	Effect on historic Commerce City residents' access to healthy food
1. Temporary Use Permits: farmers' and public markets, food fairs, sidewalk merchants Permitted uses: grocery stores, restaurants, food and beverage retail sales (including kiosks, fruit stands), community gardens Conditional uses: drive-through restaurants, retail chain stores	Zoning is an effective tool to increase access to healthy foods[23].  Availability of healthy foods in markets is positively correlated with self-reported consumption of the same healthy foods[23].	Favorable environment for expanding healthy food options

Discussion and Conclusions

Many factors influence people's physical activity levels and diet. The built environment is only one of these factors, but it may be an essential one. Living in a safe, appealing, walkable neighborhood does not guarantee that people will cultivate healthy habits. However, living in a community where the streets discourage walking and there are few appealing places may ensure that they do not.

The purpose of this HIA is to evaluate the potential impact of Derby's planned redevelopment on physical activity and nutrition behaviors of the residents of historic Commerce City. An explicit goal of the Derby Master Plan is to create a healthy environment. The previous sections of this report document how the zoning ordinance and Design Guidelines establish the framework for achieving this goal. By designating land uses and providing clear guidance on architecture, public realm, and landscaping treatments in Derby, these documents point the way to recapture the area's economic and public health. The Design Guidelines address key issues that the historic Commerce City community identified during outreach activities, all of which support healthy behaviors: personal and traffic safety, walkability, and expanded social, retail and recreational opportunities. Our conclusion is that the Derby Sub-Area Master Plan, Planned Unit Development zoning ordinance and Design Guidelines will create physical conditions in Derby that will foster active living, and to a lesser extent, healthy eating by residents of Derby and other historic Commerce City residents who frequent Derby.

There are limitations to what we can conclude. There has not yet been sufficient research to identify the relative importance of the different community design features that promote physical activity. Likewise, though we have reported the scientific evidence that suggests how large an improvement in activity levels can be expected as a result of specific design features, achievement of those levels depends on the combination of features that exist in a neighborhood as well as demographic and attitudinal characteristics of the population. Thus, we are unable to make quantitative predictions about improved activity levels attributed to Derby's redesign.

Research suggests that a supportive physical environment may be fertile soil for cultivating healthy behaviors. In such an environment, programs to educate people about health and to motivate them to adopt healthy habits are more likely to succeed. The Derby Sub-Area redevelopment documents are powerful policy tools that City Council can use to create a health-supportive environment in Derby. Following are TCHD's recommendations for implementing Derby's redevelopment.

Recommendations for Implementation of the Derby Sub-Area Master Plan, Planned Unit Development Zoning Ordinance and Design Guidelines

1. **Commit to a phased program of Capital Improvement Project or other funding for traffic calming improvements in and around Derby. Make Derby's core (Monaco Street), East 72nd Avenue and Highway 2 priorities.**

   While some elements of Derby's redevelopment are subject to market forces, making Derby's streets safer and more appealing for all users is largely within the City's control. It is also one of the most visible and effective ways that the City can signal its commitment to Derby's economic restoration and to making it an active community environment for the benefit of historic Commerce City residents.

   It will take millions of dollars and many years to "calm" Highway 2 and East 72nd Avenue. It will also require ongoing negotiation with Burlington Northern Railroad, the Colorado Department of Transportation and the Regional Transportation District. However, actions to calm traffic should commence as soon as possible along Derby's two gateways because they are in greatest need and offer significant potential for return on investment in health, safety and economic development.

2. **Prepare a Bicycle and Pedestrian Master Plan for historic Commerce City.**

   Development of the envisioned bicycle and pedestrian circulation system for Derby will require transportation planning on a broader scale. A Bicycle and Pedestrian Master Plan for historic Commerce City could take several forms. It could be a stand alone historic Commerce City or citywide plan, or it could be folded into an updated Transportation Plan or Comprehensive Plan. The Plan should incorporate improvements outlined in the Derby Sub-Area Master Plan, and ideally should be modeled on a "Complete Streets" philosophy. Complete streets are designed and operated to enable safe access by users of all ages and abilities.

   There are many outside sources of funding to help plan and construct needed bicycle and pedestrian facilities. Financing is available primarily through DRCOG's Transportation Improvement Program and various federal and state administered programs. Among the latter, some innovative funding sources for bicycle and pedestrian travel are the Federal Lands Highway Program, which focuses on improving access to national parks (e.g., the Rocky Mountain Arsenal National Wildlife Refuge), the Recreational Trails Program and the Highway Safety Improvement Program, which emphasizes safe highway and railroad crossings.

   With an adopted Bicycle and Pedestrian Master Plan, Commerce City will be better positioned to compete for these funds over the long term. We encourage the City to make preparation of such a plan a high priority to hasten Derby's redevelopment.

3. **Integrate the green space and open space elements outlined in the Derby Sub-Area Master Plan (i.e., a green "spine" through Derby) into existing City plans for a system of parks, trails and open spaces through historic Commerce City and connecting with regional trails.**

   Existing plans include the Commerce City Bikeways and Trails Plan (1991), The Parks and Recreation Master Plan (1994), the Prairieways Action Plan (2000), and the Recreation Strategic Plan (2007).

   These systems should include naturalized stormwater management facilities since such facilities also function as open space while addressing flood control and water quality.

4. **Establish a coordinated Clean and Safe Initiative for Derby.**

   Several programs that could be included in such an initiative have already been proposed or are under discussion. They include code enforcement, the Police Department's Neighbors to Neighbors Program, employment of Crime Prevention Through Environmental Design (CPTED) techniques, creation of a Business Improvement District, and development of homeowner associations or other citizen groups that encourage citizen surveillance and foster a shared sense of responsibility for Derby. The non-profit Community Enterprise has been working for several years to facilitate the development of such neighborhood groups, and could be a strong partner in the effort, as could the Derby Business Association.

5. **Expand the level of ongoing collaboration with RTD with the goal of upgrading transit service and transit facilities (e.g., bus shelters) in Derby and historic Commerce City.**

   Communities that are well-served by bus and rail have development characteristics that make transit economical: streets laid out in a grid, density, a variety of local and regional attractions and transit stop locations that meet transit agency criteria. Today Commerce City is arguably underserved by transit. However, growth projections signal promise for improved transit service if the City and RTD coordinate closely from the early stages of new development and redevelopment.

6. **As residential development occurs in Derby, work to promote affordable housing and housing that incorporates universal design features.**

   TCHD supports the addition of a full range of housing options in Derby so that more residents and employees can reap the benefits of redevelopment. We encourage the City to put special emphasis on providing some proportion of affordable and universally accessible housing in the mix. Having such housing opportunities in Derby can help reduce inequities for those who face disproportionate health and safety risks associated with physical activity or nutrition: low income individuals, people of color, seniors, children and the disabled.

7. **Develop an implementation plan for those elements of the redevelopment effort that are within City control.**

   The City should identify for inclusion in the plan those elements over which it has exclusive or principal control. For each element the plan should prioritize objectives, potential implementation partners and a financing strategy. It should also assign responsibility for implementation, and set a schedule to periodically evaluate progress on implementation.

References

1. Mokdad, A.H., Marks, J. S., Stroup, D. F., and Gerberding, L. (2004). Actual causes of death in the United States, 2000. *Journal of the American Medical Association,* 291, 10, 1238-1245.
2. Pratt, Michael, Macera, Caroline A., and Guijing Wang. Higher direct medical costs associated with physical inactivity. 2000. *Physician and Sports Medicine* 28(10).
3. Kahn, E. B., Ramsey, L. T., Brownson, R. C., Heath, G. W., Howze, E. H., Powell, K. E., et al. (2002). The effectiveness of interventions to increase physical activity: a systematic review. *American Journal of Preventive Medicine,* 22 (4S); 73-107. Published by Elsevier Science Inc.
4. Feldstein, L.M., Jacobus, R. and Laurison, H. B. (2006). *Economic development and redevelopment: A toolkit on land use and health*. Retrieved June 15, 2007 from http://www.healthyplanning.org/ecdevtoolkit/EcDevToolkit.pdf
5. Denver Regional Council of Governments (2007). *Creating Senior-healthy communities: removing regulatory barriers. Summary of findings.* Denver, CO: National Research Center, Inc. Retrieved July 11, 2007 from http://www.drcog.org/index.cfm?page=EPAGrant
6. Ewing, R. and Kreutzer, R. (2006). *Understanding the relationship between public health and the built environment*. Retrieved April 3, 2007 from http://www.cnu.org/node/559
7. Federal Highway Administration. (2006). *University course on bicycle and pedestrian transportation* (Publication No. FHWA-HRT-05-133). McLean, VA.
8. Centers for Disease Control and Prevention. (2005). *Barriers to Children Walking and Biking to School – United States, 2004.* Morbidity and Mortality Weekly, 54(38), 949-952.
9. Frank, L. D., Engelke, P.O., and Schmid, T.L. (2003). *Health and Community Design: The Impact of the Built Environment on Physical Activity*. Washington, D.C.: Island Press.
10. Pucher J, Dijkstra L. (2003). Promoting safe walking and cycling to improve public health: Lessons from the Netherlands and Germany. *American Journal of Public Health*, 93, 1509-1516.
11. Centers for Disease Control and Prevention. (2006). *Guide to Community Preventive Services. Promoting physical activity*. Retrieved June 15, 2007 from http://www.thecommunityguide.org/pa/.
12. Loukaitou-Sideris, A. & Eck, J. E. (2007). Crime prevention and active living. *American Journal of Health Promotion,* 21(4 Supplement), 380-389.
13. Painter, K. (1996). The influence of street lighting improvements on crime, fear and pedestrian street use after dark. *Landscape and Urban Planning*, 35, 193-201.
14. American Planning Association. (2006, October). *Integrating planning and public health: tools and strategies to create healthy places.* (Planning Advisory Service Report Number 539/540). Chicago, IL: Morris, M. (Ed.).
15. Local Government Commission. (n.d.). Land use planning for safe, crime-free neighborhood. Retrieved June 10, 2007 from http://www.lgc.org/freepub/land_use/factsheets/plan_safe_neighborhoods.html.
16. Sallis, J.F., Frank, L.D., Selens, B.E., and Kraft, M.K., (2004). Active transportation and physical activity: opportunities for collaboration on transportation and public health research. *Transportation Research Part A – Policy and Practice*, 38(4), 249-268.

17. Active Living Research (2005, February). Designing for active transportation. San Diego, CA: McCann, B. Retrieved June 15, 2007 from http://www.activelivingresearch.org
18. Active Living Research (2005, February). Designing for active recreation. San Diego, CA: McCann, B. Retrieved June 15, 2007 from http://www.activelivingresearch.org.
19. Denver Regional Council of Governments (2006, November.) Pedestrian and bicycle element of the 2030 Metro Vision Regional Transportation Plan. Retrieved March 2, 2007 from http://www.drcog.org/index.cfm?page=PedestrianandBicycleElement
20. Robert Wood Johnson Foundation, The Synthesis Project. (2007, April). The built environment and physical activity: what is the relationship? (Policy Brief No. 11). Princeton, N.J.: Goodell, S. & Williams C. H. Retrieved May 4, 2007 from http://www.policysynthesis.org.
21. Frumkin, H., Frank, L. & Jackson, R. (2004). Urban Sprawl and Public Health: Designing, Planning and Building for Healthy Communities. Washington, D.C.:Island Press.
22. International City/County Management Association. (2006, August). Community health and food access (Item #E-43398). Washington, D.C.: Shenot, C. & Salomon, E. Retrieved on July 7, 2007 from http://bookstore.icma.org/.
23. Cheadle, Al., Psaty, B.M., Curry, S., Wagner, E., Diehr, P., Koepsell, T., et al. (1991). Community-level comparisons between the grocery store environment and individual dietary practices. *Preventive Medicine,* 20, 250-261.

Appendix A: Commerce City Health Survey Methodology

The Commerce City Health Survey was conducted by the Colorado Department of Public Health and Environment, under contract from TCHD. The survey was conducted using validated questions and established methodology from the national Behavioral Risk Factor Surveillance System (BRFSS). The BRFSS is an on-going telephone health survey system, tracking health conditions and risk behaviors in the adult population (18 years of age or older) living in households. Federal, state, and local health officials and researchers use information from the BRFSS to track health risks, identify emerging problems, prevent disease, and improve treatment. The BRFSS is a collaborative project of the Centers for Disease Control and Prevention (CDC) and U.S. states and territories. For more information go to: http://www.cdc.gov/brfss/.

The Commerce City Health Survey was conducted among a random sample of adults (one per household) who stated that they live in Commerce City . Data were collected through a telephone survey that used standardized and validated questions from the BRFSS survey. A total of 303 adult residents of Commerce City were interviewed during the fall and winter of 2006. The data from the 303 respondents were weighted to represent the total number of adult residents of Commerce City at the time of the 2000 U.S. Census (N=19,337). The weighting accounts for probability of selection (i.e., number of working telephones per household and number of adults per household) and differential likelihood of participation among gender and age groups.

Additional data from the Commerce City Health Survey is available upon request.

Appendix B: Derby Walkability Assessment

(Spanish version also available)

Thriving Communities: Commerce City Walkability Assessment

How walkable is your neighborhood?

Take a walk around your neighborhood and find out how walkable it is. Before you go, read this checklist over. Then, as you are walking, note *specific* locations (street/address) where you would like things to change. At the end of your walk, give overall ratings.

RATINGS: 1 = awful 2 = lots of problems 3 = some problems 4 = good 5 = very good 6 = excellent

Location of walk:_____

1.Do you have room to walk? YES ? NO ?	**Location of Problems (address)**
If no, what were the problems? (check all that apply) ? Missing sidewalks in places (sidewalks start and stop) ? Sidewalks were broken or cracked ? Sidewalks were blocked with poles, signs, dumpsters, shrubs, etc ? No sidewalks, paths, or shoulders ? Too much traffic ? Something else_____ **Circle Rating: 1 2 3 4 5 6**	

2. Was it easy to cross streets? YES ? NO ?	**Location of Problems (address)**
If no, what were the problems? (check all that apply) ? Road was too wide ? Traffic signals made us wait too long or did not give enough time ? Roads needed striped crosswalks or traffic signals ? Parked cars blocked our view of traffic ? Needed curb ramps or ramps needed repair ? Something else_____ **Circle Rating: 1 2 3 4 5 6**	

3. Did drivers behave well and respect walkers? YES ? NO ?	**Location of Problems (address)**
If no, what were the problems? (check all that apply) ? Drivers backed out of driveways without looking ? Drivers did not yield to people crossing the street ? Drivers turned into people as they were crossing the street ? Drivers drove too fast ? Drivers drove through red lights or stop signs ? Drivers sped up to make it through traffic lights ? Something else_____ **Circle Rating: 1 2 3 4 5 6**	

4. Was it easy to follow safety rules? YES ? NO ? Could you do the following? • Cross at crosswalks or where you could see and be seen by drivers? YES ? NO ?	**Location of Problems (address)**
5. Was your walk pleasant? YES ? NO ? If no, what was unpleasant? (check all that apply) ? Need more grass, flowers, or trees ? Scary dogs ? Scary people ? Dark areas, not well lighted ? Dirty, lots of litter or trash ? Dirty air from car exhaust or fumes ? Empty or abandoned buildings or lots ? Something else_____ **Circle Rating: 1 2 3 4 5 6**	**Location of Problems (address)**

6. Where can you walk to in your neighborhood? (check all that apply):

? Park/Trails/Playground
? Grocery Store
? Convenience Store/Gas station
? School
? Shopping center
? Friends' or relatives' house
? Bar/Pool Hall
? Post Office
? Restaurant (example: El Jardin)
? Bus/Other public transportation
? Church or other religious place
? Gym or recreational center
? Fast Food Restaurant (example: McDonald's)
? A place to hang out (specify)_____
? Other place_____
? Doctor/Medical clinic
? Food Bank
? WIC clinic
? After-school programs
? Library
? Liquor Store
? Dentist

How often do you walk to any of these places in your neighborhood?

? Often (at least once a week)
? Sometimes (at least once a month)
? Almost never

Are there places in your area you would like to walk to but can't? YES ? NO ?

If yes, what places? _____

Why can't you walk there? _____

_____

Overall, how walkable do you think your neighborhood is?

? Very walkable (great place to walk)
? Somewhat walkable (but needs work)
? Not walkable (terrible for walking)

Appendix C: DVD "The Long (and Scary) Walk Home"

From March to June, 2006, a group of Adams City High School teens participated in Kaiser Permanente's Educational Theater Program. The program teaches students about healthy eating and active living and empowers them to embrace and promote healthy behaviors. One thing the students decided to do was to promote walking and bicycling to school.

To assess the existing situation, they conducted a survey of 672 of their peers and determined that only 16% of the high school's students walked or bicycled to school. Several teens who participated in the Program made this video to document the barriers they personally faced while walking to school. The students presented the video and other work products to their parents, City staff and consultants at an April, 2006 community meeting. Their hope was to encourage changes to make it safer to walk and bicycle to school in historic Commerce City.

To start 3 minute video, click ■ long walk home final

List of Figures and Tables