Health Impact Assessment

Waters' Edge Proposed Development:

Age 55 and Older Targeted Community

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Fort Collins, Colorado

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HIA Research Team

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Chad Reischl

The Waters' Edge Rapid Health Impact Assessment (HIA) focuses on a proposed development for residents age 55 and older in Fort Collins, Colorado, and was commissioned for the developer, Actual Communities, Inc. The approximately 900 homes proposed for Waters' Edge are designed for aging well in the community and include Phase I west of Turnberry Road and Phase II east of Turnberry Road. This assessment focuses on the Phase I portion of the development, with a conceptual plan for 400 homes, but also addresses Phase II, directly east of Phase I, which will include 500 homes, as well as retail, services, and amenities.

The Waters' Edge plan is about creating a community that supports and enhances the lives of those who want to age well in their community. Aging well in place focuses on empowering residents with access, mobility, safety, opportunities for physical and social activities, and specific design features so that they can live rich and fulfilling lives. This is a challenge throughout the U.S. and particularly in Colorado, as the state deals with a projected 150 percent growth rate by 2030 of adults age 65 years and older (Aging in Colorado, 2012). The challenges of this population increase include the fact that most older adults have at least one chronic health condition, such as arthritis, heart disease, diabetes, cancer, and hypertension (CDC, 2014).

While good healthcare is vital to aging well, a growing body of research indicates that the built environment can have an enormous effect on human health. The availability of transportation options, high-quality housing, and access to healthy food all shape peoples' behaviors and influence their health status and quality of life. Urban planning decisions can significantly impact physical and mental health, safety, and social well-being, and should be assessed to understand their effects on residents, particularly the aging. The design features addressed in this HIA related to seniors include access to homes, amenities, and services, moving through the home safely, providing places for healthy eating and meal preparation, socializing, active and leisure activities, and enjoyment of the outdoors.

Health Impact Assessment Background

A health impact assessment (HIA) is a process or tool to assess the impacts of policies, planning projects, and programs on population health. It informs decision-makers about the potential impacts of proposals and offers recommendations to optimize beneficial effects and minimize adverse consequences.

Actual Communities, Inc. hired Safe and Healthy Communities (SHC), a nonprofit organization, to conduct a rapid HIA (HIA conducted in four months or less) of the planned Waters' Edge development, including elements within the community and access and connections to nearby neighborhoods and amenities.

The goals of the Waters' Edge HIA:

- **Analyze** the Waters' Edge development design for its strengths, weaknesses, opportunities, and mitigations (SWOM) to create opportunities for healthy aging with thoughtful urban form, home design, and amenities and services that support vibrant communities and individuals.
- **Synthesize** data obtained from evidence-based research, including demographic data, two age 55+ community-based surveys, and walkability/bikeability audits, to assess potential health impacts.
- **Recommend** options to improve the positive and minimize the negative health consequences for future residents of the proposed development and those in nearby neighborhoods. Recommendations are based on analysis of the literature, development design, and survey findings.

SHC began the HIA in April 2015 and took approximately four months to complete. The research team followed the North American HIA Practice Standards (Bhatia et al., 2014) to develop each HIA stage. SHC conducted a comprehensive review of regional data, health indicators and healthcare literature, completed a survey with extensive interviews, and consulted with an array of experts and stakeholders.

Existing Data from Survey

The Waters' Edge HIA survey of adults age 55 and older was conducted in April and May 2015. The majority of the survey respondents lived in the Fort Collins and Denver areas of Colorado's Front Range. The initial participants, selected from among people known to the researchers, recommended additional survey participants. The strategy focused on obtaining responses from a diversity ages, ranging from age 55 to age 85+. The survey asked respondents about their perceptions of their current health, amount of exercise such as walking and biking, and what they valued regarding nearby amenities and services.

Eighty percent of respondents rated their health within the last 12 months as good, very good, or excellent. Despite these high health ratings, only 55 percent of respondents rated themselves as active or very active, and over 50 percent stated they use a wheelchair or scooter to get to locations for reasons other than exercise. Slightly over two-thirds of respondents (67.5 percent) reported they were satisfied with their current health. Respondents ranked what they thought would encourage them to become more active and social, such as close proximity to recreation centers, swimming pools, and playgrounds. Over 70 percent stated that closeness to walking paths and trails was important; 79 percent, however, ranked bike paths of low importance. Half of the respondents ranked closeness to undeveloped/ natural land as important for choosing where to live.

The majority of the respondents ranked well-maintained streets with accessible sidewalks and low traffic and vehicle speeds as important for safe walking. Parking that is conveniently located for services, the availability of specialized transportation services, nature trail systems, and well-lit walking areas also were ranked as being No. 1 or No. 2 in importance. Many responded that it was important to have a mix of ages where they lived, but if it only age 55 and older lived in their development, they would like to be nearby neighborhoods with families. Half of the respondents ranked well-designed crosswalks as an important feature of an active built environment.

Health Factors and Recommendations

The primary health issues of the Waters' Edge HIA include connectivity and mobility, access to services and amenities, mental and social health, safety inside and outside the home, and physical activity. (See About this Report at right.)

The HIA team developed recommendations from its survey results of adults age 55+ living in or near Fort Collins and Denver on Colorado's Front Range. The team also used information and recommendations from the AARP (American Association of Retired Persons) Livability Index, Healthy Sustainable Communities Index, other HIAs, as well as assistance from the Larimer County and City of Fort Collins staff and other design team members to create this HIA's recommendations. The recommendations are listed at the end of chapters and also are consolidated at the end of this document. Recommendations that are appropriate for multiple chapters are listed in the development design analysis chapter and supported with research in other chapters.

Monitoring and Follow-Up

Monitoring project decisions will help determine who should follow-up on implementing recommendations, and for the longer-term, to understand which recommendations were adopted (or not) and why, and who implemented them. At Waters' Edge, monitoring could be accomplished with help from the Colorado State University (CSU) public health faculty and students, local nonprofit organizations, homeowner associations, and others.

An evaluation will help determine whether implemented recommendations made a difference in the health of Waters' Edge residents. Important first steps for an evaluation are to collect baseline health data of the future residents to monitor their health over time. Data could include information such as body mass index and blood pressure.

The Waters' Edge development design includes many proven sustainable-design concepts that focus on health and well-being of residents. This HIA provides additional analysis and recommendations intended to foster a safe, accessible, and well-connected neighborhood that supports physical activity and healthy lifestyles within Waters' Edge and surrounding neighborhoods.

About this Report

Health Impact Assessment Chapters

1. **The Aging Community** provides an introduction to health and the built environment, focusing on the needs of older people.

2. **HIA Methodology and Survey Findings** explains how the survey was conducted and selected results.

3. **Waters' Edge Development Design Analysis** includes an analysis of the community design with a focus on improving connections within the neighborhood and mobility beyond it.

4. **Access to Community Services and Amenities** discusses elements of healthy communities, including access to healthy food, hospitals and other goods and services with maps showing distances to the proposed development.

5. **Safety Inside and Outside the Home** focuses on safety within the home and throughout the community.

6. **Physical Health and Mental Well-Being** includes exercise options that are good for aging and mental health, and also discusses the benefits of pets and nature.

7. **Monitoring, Evaluation, and Conclusions**

References and Appendices
1. Community Amenities and Bike Route Maps
2. Recommendations and Monitoring Table

Key Recommendations for Waters' Edge

1. Community Infrastructure and Planning

- Encourage a healthy active lifestyle through a community plan that connects homes with shops, grocery store, services, open space, and natural areas and encourages residents to walk and exercise within the community.

- Develop residential neighborhoods (Phase I and II) and the town center (Phase II) with shops and services that provide convenient access for daily needs, amenities, and activities.

- Provide bike lanes along nearby roads and safe, wide, well-lighted sidewalks and open space paths dedicated to walking only.

- Develop a plan for urban agriculture, including community gardens, orchards, and a farmers' market, to provide healthy fresh food and opportunities for exercise and socializing.

-Offer opportunities for nurturing mental and physical health, life-long learning, and socializing through activities such as pottery, woodworking, golf, swimming, tai-chi, yoga, and meditation.

2. Homes

- Develop a variety of types and sizes of homes, including smaller more affordable houses and apartments.

- Include detailed design features for healthy living and aging in homes, such as no-step entrances to homes, seats in showers and tubs, and stoves that turn themselves off.

- Design homes with technology that supports aging in place, including features such as extra electrical outlets and high-voltage plugs located conveniently for people in wheelchairs, and provide back-up energy options in case of a power outage.

- Provide access and views to nature from all homes to support mental health.

3. Amenities and Services

- Develop shops and services in the Phase II town center that provide for daily needs and socialization, such as a grocery store, a restaurant, and a café with fresh healthy food.

- Develop offices, studio/workshops, classrooms, and other spaces in the clubhouse and Phase II town center for work and volunteer opportunities, art/cultural activities, and lifelong learning.

- Provide a community kitchen with food preparation facilities in Phase II development that promotes cooking and eating nutritional foods, cooking classes, and socializing.

- Develop a recreation center in Phase II with a pool, spa, and spaces for exercise equipment and classes, and incorporate a wellness program to provide nutrition classes, counseling, and health monitoring.

3. Transportation and Access

- Offer convenient, healthy, accessible, and low-cost alternatives to driving, with transportation options that connect people to social activities, economic opportunities, and medical care.

- Investigate barriers to using public transportation, and educate residents about local and regional bus schedules, bike maps, free shuttle services for disabled seniors, and other transportation resources.

- Develop bike facilities such as connected bike lanes, as well as bike racks at shops and services developed in Phase II.

- Consider developing car-share, bike-share, and accessible shuttle services within the community.

4. Open Space, Parks, Natural Areas, and Community Gardens

- Provide open space throughout the community and adjacent to homes for exercising, socializing, and mental health benefits.

- Provide paths and loops in open space with natural viewpoints, wayfinding signs, and information about mileage, natural habitats, and the benefits of nature.

- Design natural areas that provide aesthetically pleasing environments and support wildlife habitats and diversity, and design community infrastructure such as stormwater detention ponds to feature such natural environments.

- Develop parks, including a dog park, to encourage exercise and socializing.

- Ensure safe, lighted walking-only paths.

- Provide restrooms and water fountains at regular intervals on the walking paths and at the city park.

- Work with Colorado State University (CSU)'s master gardener program to establish community gardens and gardening classes. Provide an information kiosk at the community gardens with instructions on gardening and nutrition.

- Provide seasonal space that may be used for a farmers' market when orchards and gardens are producing.

5. Health Promotion and Monitoring

- Develop healthcare amenities in Phase II, such as offices for physical and occupational therapy.

- Enhance a playground with multigenerational play structures for seniors and grandkids.

- Offer opportunities for volunteering, mentoring, and life-long learning, and provide classes, for example, on nutrition, financial planning, and the benefits of physical activity and access to nature and others.

- Work with CSU faculty and students to develop and complete a baseline health survey of Waters' Edge future residents, and monitor residents periodically to evaluate health outcomes.

- Install equipment to check vital signs such as blood pressure, weight, and pulse oximetry at the recreation/wellness center, to be developed in Phase II, and provide video/ telehealth services for residents to communicate with healthcare providers.

- Provide opportunities to walk even in inclement weather, including dedicated space and equipment in the recreation center.

- Offer cardiopulmonary resuscitation training (CPR) and install automated electronic defibrillators (AEDs) throughout the community, and especially at the clubhouse and recreation/wellness center.

1.0 Overview of Aging

AARP defines a livable community as "*one that is safe and secure, has affordable and appropriate diverse housing and transportation options, and [offers] supportive community features and services. Once in place, those resources enhance personal independence, allow residents to age in place, and foster residents' engagement in the community's civic, economic, and social life.*" (AARP Policy Book, 2015-2016, p.9-1).

AARP surveys consistently have shown that older adults overwhelmingly desire to age in their homes and communities (Keenan, 2010). That is why it is important to create communities that support and enhance the lives of people who want to age in place. The next generation of older adults will benefit from policies enacted now as well as new developments that (a) expand the availability of housing with universal design principles that accommodate residents and visitors of varying physical abilities; (b) encourage complete streets that serve all users regardless of mode of transportation; and (c) empower all aging populations with mobility, access, safety, and specific design features so that they may live fulfilling lives connected to each other, their networks, and their communities (Keenan, 2010).

One in three Americans is age 50 or older.

According to the World Health Organization (WHO), by 2050 there will be more people age 60 and older than children worldwide for the first time in history. In the U.S., the population of adults age 65 and older is projected to increase greatly over the next several decades (WHO, 2007). The U.S. will lead all other developed countries with 73 million adults age 65 and older by 2030 and 83.7 million by 2050 (Hogan, Ortman, & Velkoff, 2014). Today one in three Americans is age 50 or older. By 2030, one out of every five people in the U.S. will be 65 or older (www.aarp.org/livable-communities). As the "baby boomers" age, there will likely be increases in rates of morbidity (disease), disability, and dependency, with unprecedented demands on health care services (Meisner, Weir, & Baker, 2013).


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Colorado's total population is approximately 5 million, with approximately 1.15 million (22 percent) age 65 years and older (Colorado Department of Local Affairs, 2015). By 2030, as the population and specifically the boomers age, Colorado will experience a projected 150 percent increase in the number of adults that are 65 years and older (Aging in Colorado, 2012).

According to the 2010 Census, Colorado's overall life expectancy is highest in Boulder, Douglas, and Larimer Counties. Eight percent of the total population of Larimer County, or 35,541 residents, are age 65 or older; in the City of Fort Collins, the proportion is 7 percent, or 12,640 residents (Compass of Larimer County, 2014).

The City of Fort Collins's total 2014 estimated population is 155,400 and the average annual population growth rate is 2.04 percent (2014) (http://www.fcgov.com/visitor/fcfacts.php). The estimated population is 89 percent white, 10 percent Hispanic or Latino, and 1 to 3 percent other races, including Asian and Black (or African-American). Some 20,574 residents are between the ages of 55 and 85+. Over 13,032 households contain people over age 60 out of 57,829

households in Fort Collins. The median home income is $53,780 with 52.3 percent of the population completing four or more years of college (U.S. Census Bureau, 2009-2013).

In Fort Collins, the senior population is expected to double in 15 years. This fact creates a dramatic change in a college town that has become known for its youthfulness with a previous median age of 29 years old. In 2014, the number of citizens aged 65 and older surpassed younger individuals (Coltrain, 2014).

In Fort Collins, the senior population is expected to double in 15 years.

Shift in Needs and Priorities of Aging Adults

The boomer population is more educated, politically involved, technologically savvy, and physically active than previous generations, and is predicted to be more ethnically diverse, with longer life expectancies (Hogan et al., 2014). This unique aging demographic will likely cause a radical change in the idea of how people age in America, altering the structure of communities, the built environment, and health care.

With the shift in age towards an older adult population, the needs and priorities of the community also have begun to shift. In many places in the U.S., this demographic trend is changing how communities are developed, with more attention being focused on the built environment. An environment designed and built for aging well in place can more effectively handle the environmental, social, physical, and economic challenges that our aging population faces.

While the built environment traditionally has focused on the aesthetics and morphology of infrastructure, it should also consider the social, economic, and ecological needs of society. The way communities are designed has a direct influence on human behavior (Peter, Lawrence, & Thomas 2003). The Centers for Disease Control and Prevention (CDC) describes the built environment as all of the physical parts of where we live and work (CDC, 2011). This includes buildings, parks/green space, supporting infrastructure (water supply, energy, and networks), access to food, health care, social activities, and transportation. For the purpose of this report, the built environment is a community that is designed for productive aging; these communities stress opportunity, engagement, contribution, and choice (Austin, Des Camp, Flux, McClelland, & Siepport, 2013).

Determining the built environment and its impact on social, physical, economic, and health needs for aging adults can be challenging, particularly since these needs can vary considerably from age 55 to age 85. For example, older adults may experience difficulties with certain physical and social activities like walking one-quarter mile, walking up 10 steps, standing for two hours, reaching, grasping, shopping, socializing, and relaxing (Grier, Schoenborn, & Vicker, 2006).


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As many older adults face more chronic health conditions, and physical and social activities continue to become more difficult, activities and the physical environment may need modifications. For Colorado residents, there are economic benefits to aging in your own home. Colorado passed the Homestead Act to help individuals save money on their property taxes. This exemption removes part of the value of properties from taxation and lowers taxes. It is available to individuals who are 65 and older and have lived in their homes for at least 10 years and applies to 50 percent of the first $200,000 of a home's assessed value ("Find the best retirement community," 2015). In addition to

the Homestead Act, taxpayers over age 65 also qualify for a $24,000 tax exemption for pension and Social Security benefits. People that fall in the 55 to 64-year age bracket qualify for a $20,000 exemption. Additionally, the same pension subtraction applies to military retirement benefits for current military personnel and those receiving retirement benefits ("Find the best retirement community," 2015).

AARP works to improve the quality of life of older adults and encourages adoption of polices that promote livable communities for older adults (Lynott & Harrell, 2013). Similarly, this HIA recognizes the importance of the following AARP's evidenced-based priorities.

AARP/Evidenced-based Priorities for Waters' Edge Development, Fort Collins, Colorado

1. **Leverage the current and potential contributions of older adults in your community.** Look for opportunities to engage older adults as volunteers, entrepreneurs, and contributors to their community.

2. **Recognize the value of retaining older adults' connections to both people and place**. These associations are valuable to both the individual and the community and cannot be quickly or easily replicated in a new environment.

3. **Ensure ease of access to the built environment**. Universal design of our homes, parks, streets, walkways, and transit infrastructure promotes access and engagement.

4. **Support housing affordability and choice**. Housing options should be available and affordable to people at all income levels.

5. **Invest in a range of transportation options**. One in every five people age 65+ does not drive. Many need to use public transportation, and others need the additional support of paratransit, reduced-fare taxis, or volunteer-driver programs.

6. **Improve health**. Communities benefit when they have access to healthy food options, opportunities for walking, biking and exercise, and access to health facilities.

7. **Foster safety and personal security**. Community safety and security initiatives prevent injuries, promote neighborhood cohesion, and maximize opportunities for residents to be active and engaged.

8. **Support older adults and their family caregivers** through long-term support and services. These programs enable residents to stay in their homes as they age.

9. **Coordinate planning processes**. Community land use, housing, transportation, supportive services, and community health care planning should be interconnected.

10. **Engage residents of all ages in community planning**. Decisions regarding land use, housing, transportation, and services have broad effects on the lives of residents.

1.1 Health Impacts and Costs

According to the U.S. Department of Health and Human Services, a person recently reaching age 65 has an average life expectancy of an additional 19.2 years (20.4 years for females and 17.8 years for males) (West, Cole, Goodkind, & He, 2014). These numbers represent an age increase of 30 years since 1900. Currently, an aging adult is more likely to experience poor health outcomes, such as cardiovascular disease, Type 2 diabetes, depression, and some types of cancer (CDC, 2011). The leading cause of death in Colorado in 2013 was heart disease and stroke combined, accounting for 24 percent of all deaths (Compass of Larimer County website, 2011). Obesity rates in the U.S., already 35 percent among adults, are projected to increase to 45 percent by 2020 (Farber, Shinkle, Lynott, Fox-Grage, & Harrell, 2011). Most older adults have at least one chronic condition, and many have a multitude of chronic conditions such as arthritis, heart disease, diabetes, cancer, and hypertension (CDC, 2014).

The growth of our older adult population is going to have a significant impact on our health care system, with financial responsibility for health-care coverage impacting primarily the federal government. Medicare covered almost 93 percent of people in this age group in 2011 (U.S. Department of Health and Human Services, 2012). In 2011 older consumers averaged out-of-pocket health care expenditures of $4,769, an increase of 46 percent since 2000 (Social Security and Elderly Poverty, 2015). In contrast, the total population spent considerably less, averaging $3,313 in out-of-pocket costs. Older Americans spent 12.2 percent of their total expenditures on health, almost twice the proportion spent by all consumers (6.7 percent) (U.S. Department of Health and Human Services, 2012). “Health costs incurred on average by older consumers in 2011 consisted of $3,076 (64 percent) for insurance, $786 (16 percent) for medical services, $714 (15 percent) for drugs, and $193 (4 percent) for medical supplies” (Department of Health and Human Services, 2012).

The built environment has the potential to alleviate a portion of medical costs to society while creating vibrant and healthy communities. Where one lives, works, and plays has a large impact on a person’s physical activity level and personal state of mind, which impacts health status. According to the CDC, maintaining healthy lifestyles by way of community design interventions could reduce the estimated annual medical costs of obesity alone by $147 billion (CDC, 2014).

Aging adults increasingly are choosing to age in place and enjoy their independence (Harrell, 2014). All communities should investigate and implement strategies for older adults to access long-term housing, transportation, and social infrastructure options for individuals who prefer to live on their own and age at home. In Western society, we have typically associated growing older with a steady decline in movement, continual loss of independence, gradual drop in social interactions, and a decrease in overall health. In the past, it was accepted, if not expected, that an aging adult could be isolated within their home or institutionalized within an assisted living facility or a skilled nursing facility. Very little effort was made to ensure the built environment was adaptive to the changing needs that aging brings. This often created an unsafe environment that can be extremely constricting and fosters dependence rather than independence (Older Americans, 2012). With such a large demographic shift toward older adults, it is becoming increasingly important, during the planning phase of all new developments and redevelopments, to plan for the needs of individuals age 55 and older.

1.2 About the Waters' Edge Development

Waters' Edge is a proposed healthy, environmentally sustainable, age 55+ targeted community in Fort Collins, Colorado. The 223-acre site is located to the east and west of Turnberry Road, on the city's eastern border with Larimer County. Waters' Edge is designed to offer the Fort Collins region a holistic approach to healthy and active living for a community of empty nesters and other older adults. Waters' Edge is planned according to universal design concepts and for aging in place. All 900 homes will offer single-level living, with a master bedroom on the main level, in a wide variety of housing types and sizes, including one-bedroom condominiums, ranch-style homes, townhomes, and estate homes.

The development plan is an integrated design effort that includes the design team, the developer, and the community. The multidisciplinary design team includes architects, landscape architects, land-use planners, developers, financial advisors, health professionals, engineers, and environmental and energy specialists. Phase I includes the development of a neighborhood of 400 homes and a clubhouse targeted for residents age 55 and older located west of Turnberry Road. Phase II is the development of 500 homes on land east of Turnberry Road that will also include retail, services, urban farming, fitness facilities, and other amenities, as well as an assisted-living facility.

A number of planning documents are being developed for Water' Edge, including an energy and sustainability study and plan that addresses water use and quality and the development's carbon footprint; this HIA therefore has few recommendations pertaining to these issues. Additional studies and plans include landscape design sketches of future potential paths and trails and their connection to Richards Lake, Hearthfire, and other nearby neighborhoods; a sketch of Richards Lake with potential improvements and constraints for the neighborhood; and a new landscape plan.

1.3 About the Health Impact Assessment

An HIA is a process or tool to assess the impacts of policies, redevelopment projects, and programs on population health. An HIA is also defined as a systematic process used to make evidence-based and community-based judgments on the health impacts of public and private decisions and to identify and recommend strategies, design changes, and mitigation measures with the purpose of protecting and promoting public health (Bhatia et al., 2014).

When policy-makers, urban planners, community organizations, and advocacy groups participate in and have data from a Health Impact Assessment, decisions are better informed, and decision-makers have the opportunity to provide the best outcome for communities.

Actual Communities, Inc. hired Safe and Healthy Communities (SHC), a nonprofit organization, to conduct a rapid HIA (an HIA conducted in four months or less) of the planned Waters' Edge development, including access and connections to nearby neighborhoods and amenities. SHC conducted a broad scan of potential opportunities for improving the health of future residents of Waters' Edge, primarily for Phase I and secondarily for Phase II, as well as the project's adjacent neighborhoods and properties. SHC identified health research and data about age 55+ residents in the region. The scoping phase helped identify key health issues using secondary data (data already collected) and a review of research and documents about seniors and health.

As part of the assessment phase, SHC identified the needs, preferences, ideas, and concerns related to healthy active living specific to the aging population by conducting a survey that informed this HIA's recommendations for the proposed development.

The purpose of an HIA is to inform decisions using health and community data and providing recommendations. Decision-makers for the Waters' Edge development are the developer, who makes final decisions about the design and construction implementation, the Fort Collins City Council, which must adopt the development plan before it can be developed, and the Colorado State Land Board, the owner of a conservation easement east of Phase II.

HIA Stages

An HIA involves six key stages: screening, scoping, assessment, recommendations, reporting, and monitoring and evaluation (see stages below). The research team followed the North American HIA Practice Standards Version 3 to develop each stage of this HIA. The goals of the HIA are to analyze the Waters' Edge development design using a SWOM analysis (strengths, weaknesses, opportunities, and mitigations) to assess the ability of the project to provide for healthy aging with thoughtful urban form, home design, and amenities and services that support vibrant communities and individuals. SHC synthesized data obtained from demographic research and two age 55+ community-based surveys to assess potential health impacts, and developed recommendations to improve the positive and minimize the negative health consequences for future residents of the proposed development and adjacent neighborhoods. Recommendations are based on the analysis of the development design, research, data, and survey findings.

Waters' Edge HIA Stages

Phase I/II – Screening and Scoping

- Determine the need for an HIA (seniors are a vulnerable population; decisions impacting health are being made within the proposed development design; the plan could contribute to improved health for adjacent neighborhoods).
- Characterize the built environment through site visits and walking audits.
- Collect demographic and socioeconomic data specific to Colorado, Larimer County, and Fort Collins.
- Obtain data on the built environment and environmental and public health.
- Conduct an initial literature/research review.
- Identify a list of initial potential health indicators, including:
  - Physical health/activity
  - Environmental health, such as water quality and air quality (not included due to rapid assessment)
  - Healthy food access
  - Traffic safety
  - Accessibility to transportation, services, and amenities
  - Connectivity and mobility
  - Noise (less of an issue but discussed briefly)
  - Mental health/isolation
  - Crime (data indicated this is not a major issue in Fort Collins)
  - Social engagement/interaction
  - Social equity (higher income area, so less of a health issue)
  - Community and personal safety inside and outside home

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Phase III/IV – Assessment and Recommendations

- Conduct a more detailed health literature review for health risks identified using evidence-based research.
- Identify related indicators/ benchmarks (where they can be found).
- Conduct interviews with residents age 55+ living in the Fort Collins and Denver areas of Colorado.
- Develop maps and take photographs.
- Develop draft recommendations.
- Analyze and summarize data from the survey.

Phase V/VI – Reporting and Monitoring/Evaluation

- Complete the final recommendations and provide a monitoring plan.
- Completed a draft HIA, send out for review, incorporate review comments, and finalize the HIA report.

2.0 Methodology

As people age, they often feel more vulnerable and consider safety a high priority. According to AARP studies, personal safety is more of a concern for family caregivers, people with disabilities, nondrivers, and people with lower incomes (Harrell, Lynott, Guzman, Lampkin, 2014). "People and communities have differing perspectives: one type of community does not fit all." (Harrell, Lynott, Guzman, 2014, p. 2).

> The goal of the survey was to have a better understanding of how to create an age 55+ community that focuses on aging in place in an environmentally sustainable, healthy, safe, and independent way.

To gain more specific data closer to the Fort Collins area, SCH conducted a series of interviews related to the built and social environment to understand the needs and preferences of age 55+ residents. SHC developed a survey that included questions about safety, exercise, transportation, means for social interaction, and access to goods and services, and then conducted interviews in April and May of 2015.

Survey data was collected by the lead health assessor for this HIA, and eight trained research assistants and their instructor. A convenience sample of 40 English-speaking adults age 55 and older participated in the survey. Most respondents lived in Colorado's Northern Front Range (Fort Collins, Longmont, Loveland, Boulder) and the Denver metropolitan area; three out-of-state respondents also were interviewed. Over two-thirds of the surveys were completed in person; the rest were completed over the phone and a few via email. All respondents were informed of the purpose of the survey and the confidentiality terms, and were given the opportunity to ask questions and the option not to participate or to stop their participation at any point. No incentives were provided for participation in the survey.

To pilot-test the questionnaire, SHC conducted three interviews of older adults in early April. SCH made changes to the questionnaire to improve instruction and readability and to ensure that the wording was readable at or near a sixth-grade level and understandable to older adults. The survey was incorporated into a proprietary survey system, Survey Gizmo, to allow for consolidation of data and easier analysis.

To improve validity, two other questionnaires were used and then adapted for this project. Many questions that were adapted for this questionnaire came from *What Is Livable? Community Preferences of Older Adults* (Harrell, R., Lynott, J., Guzman, S., & Lampkin, C. (2014). Questions were also adapted from *Operationalizing Environmental Indicators for Physical Activity in Older Adults* (Strath, S., Isaacs, R., & Greenwald, M. J., 2007). The HIA team also asked respondents to identify their general activity level, provide data on their current walking activities, and rate their physical and emotional health. A few demographic factors were included, such as ethnicity, age, and gender. Ten open-ended questions inviting general comments concluded the survey. Table 1 on page 17 provides the responses to the survey's demographic categories.

2.1 Survey Findings

Age, Sex, Marital Status, Race, and Education Level

The average age of the forty adult respondents was 64.8 years, with a standard deviation of plus or minus 10.4 years. Slightly over 40 percent of respondents were in the 55 to 64-year age range and 30 percent were in the 65 to 74-year age range. Nearly 30 percent of respondents were 75 years or older. Slightly more females (52.5 percent) participated than males (47.5 percent). Marital status was distributed approximately in thirds, with 40 percent of respondents widowed, 33 percent married, and 26.6 percent divorced. Overall, survey respondents were primarily white (90 percent) and educated; over 62 percent had an associate degree or higher. These percentages were similar to the general population of Fort Collins.

Income

Over 50 percent of respondents said their income level was between $16,000 and $74,000 annually. Five percent of respondents said they made less than the poverty level for Colorado ($16,000), and 30 percent said they made more than $75,000 annually. Almost 60 percent (57.4) said they were retired, and almost one-third (32.5 percent) were currently working. Over 90 percent of respondents reported they were satisfied or very satisfied with their current standard of living.

Mobility

Over 80 percent (82.5) said they drove. Almost 90 percent (87.5) said they did not use public transportation. Only 15 percent of respondents said they used a bicycle for transportation.

Place of Residence/Community

The majority of respondents said they live in a suburban area (37.5 percent) or city (40 percent), with approximately 22 percent classifying where they lived as a town (12.5 percent) or rural (10 percent). Over half (52.5 percent) said they lived with a spouse or partner, and nearly one-third (32.5 percent) lived alone. Nearly 80 percent (77.7) owned their home, and 12 percent rented. The vast majority of respondents (82.5 percent) said they lived in a single-family home; the rest said they lived in a multifamily dwelling (apartment, condominium, or duplex). Safety was not a primary concern for respondents: 87.5 percent said they felt safe in their home. When asked about how they felt about their community, 77.5 percent of respondents were satisfied or very satisfied.

Nearly 80 percent of respondents owned their home.

Table 1: Demographic Characteristics by Total. **Total (n=40)**

Mean Age (+/- Standard Deviation)	64.8 (+/-10.4)
Age Ranges	
55-64	42.5% (17/40)
65-74	30% (12/40)
75-84	15% (6/40)
85+	12.5% (5/40)
Gender	
Female	52.5% (21/40)
Male	47.5% (19/40)
Race	
White	90% (36/40)
Black or African-American	5% (2/40)
American Indian/Alaska Native	0%
Asian	0%
Native Hawaiian/Other Pacific Islander	0%
Other	5% (2/40)
Drive	
Yes	82.5% (22/40)
No	17.5% (7/40)
Rent or Own	
Own	77.5% (31/40)
Pay rent to nonrelative	10% (4/40)
Pay rent to relative	2.5% (1/40)
Do not own, but pay no rent	10% (4/40)
Self-Report Health Status Last 12 Months	
Excellent	17.5% (4/40)
Very Good	30% (12/40)
Good	32.5% (13/40)
Fair	12.5% (5/40)
Poor	7.5% (3/40)
Self-Report Activity Level	
Very active	20% (8/40)
Active	35% (14/40)
Somewhat active	35% (14/40)
Not active	10% (4/40)
Do you ever walk or use a wheelchair or scooter to get to locations for reasons other than exercise?	
Yes	52.5% (21/40)
No	47.5% (19/40)
Unsure	0%
Do you ever bicycle to locations for reasons other than exercise?	
Yes	15% (6/40)
No	85% (34/40)
Unsure	0%
Do you ever take public transportation to any places?	
Yes	12.5% (5/40)
No	87.5% (35/40)

Health Status

Eighty (80) percent of respondents rated their health within the last 12 months as good, very good, or excellent, and 20 percent rated their health as fair/poor. Despite these high health ratings, only 55 percent of respondents rated themselves as active or very active, and over half (52.5 percent) said they used a wheelchair or scooter for reasons other than exercise. Two-thirds of respondents (67.5 percent) reported they were satisfied with their current health.

A 2013 survey by the Health District of Northern Larimer County of adults within Fort Collins also rated their own health. The health district survey was much larger, with 1,462 adults participating from Fort Collins. Among respondents age 55 and older, 88.5 percent rated their health as good, very good, or excellent. Among older respondents, 11.5 percent rated their health status as fair/poor, compared to only 3.7 percent among those younger than 55.

Opinions on 55+ Communities

Half of survey participants (50 percent) for this HIA said they were not interested in living in a 55+ community. Twenty (20) percent said they were interested in living in an older-adult community, and almost one-third (30 percent) were unsure. However, when asked what they were more interested in—a restricted age 55+ only, a targeted age-55+ (preferred but not restricted by age), a mix of ages, or something different--the two most common responses were: mix of ages and targeted age 55+. Some respondents favored a restricted age 55+ only, but many felt it was important to have a mix of ages within the community or nearby in adjacent neighborhoods with families that could provide opportunities for exchange with different ages. Some responses included:

-"I go between a mix of ages and targeted age 55, but choose mix of ages, like a usual neighborhood."
-"I like a mix of all ages to keep me young."
-"Targeted age 55 and older; it would be nice to be around people my own age, but I would not like to restrict younger families from joining the neighborhood."
-"I think a mix of ages is better."
-"55+ is not a bad thing, but I prefer a mix of ages…[and] a neighborhood that does have families nearby."
-"I enjoy the 55 and older community because they are more similar in likes and needs."
-"Older than 55+; maybe 65+ would be better."

Locational Preferences

The primary factor influencing choices on where to live was close proximity to family and friends.

The primary factor influencing respondents' choices on where to live was close proximity to family and friends (67.6 percent). The next most important factors were proximity to healthcare services (43.8 percent) and fresh-food grocery stores (40 percent). Half of respondents ranked being near transit services as the least important factor influencing the location of living arrangements. Not surprising, given the large number of retirees responding to the survey, around 60 percent of respondents ranked closeness to employment opportunities among the least important factors. Proximity to a variety of services indicated the most highly rated were cafes/restaurants (79 percent), banks (75 percent), and retail shopping (62.5 percent).

Respondents also ranked secondary factors influencing their choice of living arrangements. Over 70 percent (70.6) said closeness to walking paths/trails was important; however, 79 percent ranked bike paths of low importance. Half ranked closeness to undeveloped/natural land as important.

Slightly more than half (52.4 percent) ranked proximity to entertainment facilities, such as a movie theater or bowling alley, as important, and nearly half (48.2 percent) noted proximity to farmers' markets as important. Nearly two-thirds (62.9 percent) did not feel close proximity to a public library was important.

Proximity to facilities for relaxing and socializing were also ranked; the highest rankings were recreation centers (62.5 percent), swimming pools (56.3 percent), and playgrounds (43.8 percent). Some 59 percent of respondents ranked closeness to a senior/community center (or other activity center focused on older adults) as less important.

Transportation, Housing, and Safety

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The vast majority (82.2 percent) ranked well-maintained streets with accessible sidewalks as important; low traffic volume was rated important by nearly two-thirds (62.5 percent). Respondents also ranked as important: parking conveniently located for services (84.2 percent), the availability of specialized transportation services (79 percent), nature trail systems (73.7 percent), and well-lit walking areas (77.3 percent). Bus services (61.4 percent) and slow-traffic road design (65 percent) were somewhat less important. More than half of respondents (52.1 percent) ranked well-designed crosswalks as an important feature of the built environment.

Finally, respondents were asked to rank housing and safety preferences for their neighborhood. Respondents preferred that houses be well-maintained (94 percent) and affordable to people with a range of incomes (54.6 percent). Eight in 10 respondents (80.6 percent) indicated they preferred different types of housing, like apartments, single-family homes, townhomes, and (80 percent) close proximity to assisted-living communities. Age-restricted communities, preferred by 68.2 percent, close proximity to long-term care facilities, preferred by 66.7 percent, and programs such as health services coordinated by neighbors 70 percent also were popular neighborhood preferences. Almost 60 percent (58.3) of respondents said communities should be open to all ages.

2.2 Open-Ended Survey Question Findings

Do you think that your neighborhood is a good neighborhood for walking and/or biking? Please list all features that encourage or discourage (or act as a barrier to) walking and/or biking.

1. Overall safety is very important in encouraging or discouraging walking or biking. The amount of lighting was specifically mentioned as important, along with well-maintained sidewalks. Respondents' comments related to the conditions that encouraged walking in their neighborhoods included: "good lighting…well-traveled…sidewalks level and less fall risk…sidewalks are large, but have some cracks."

2. Respondents also commented on traffic, road speeds, and bikes. Some said they felt encouraged to walk or bike: "It's good, not a lot of cars," and "slow-speed neighborhood streets encourage walking and biking." Conditions that discouraged walking and biking included: "Streets are busy and have too much traffic…the only barrier is a busy street… some of the streets have a little too much traffic to walk with small children…the streets can be very busy during certain hours of the day which is concerning for my safety…having to cross or ride on busy streets discourages walking or biking to some destinations." One respondent indicated feeling less safe with bikes, and another said specifically, "I don't like trails that are combined [with bikes and walkers] when walking dogs; it's less safe."

One respondent said it was encouraging to "have a work-out friend," which supports the research that having a group or individual to hold yourself accountable to leads to greater success in continuing to exercise for the longer term.

Other than walking and biking, what other forms of exercise do you enjoy? Why?

Some respondents said they did not exercise beyond walking, but a number mentioned lifting weights, yoga, indoor exercise classes, stationary biking, and swimming. Others used weight or cardio equipment to supplement walking, especially in inclement weather. One respondent said, "Silver Sneakers [aerobics and weight-lifting] is something my husband and I both like a lot." Golf was also mentioned, along with hiking, gardening, and skiing.

Digital Image. 5 Aug 2015.ciytofcorning.com

What features (amenities) would you like at a park or open space? Why?

Top features mentioned for parks and open space:

1. Benches, picnic tables, comfortable seating
2. Pool, playground, play area for grandkids
3. Shaded or covered areas and trees for shade
4. Trails, walking paths (that are smooth)
5. Pond or lake to relax, with boating and fishing
6. Drinking fountains

Other features mentioned:

Exercise stations along path, outdoor exercise equipment for seniors, concerts in the park, gathering areas such as a small stage for community events, outdoor chess/checker board, bird feeders, open areas, dog-friendly area, ballfields, large signs to say where I am, and plenty of restrooms

What are your favorite gathering places?

When asked where they like to gather and socialize, one respondent said, "I definitely like eating with others since I live alone," but many answered they liked to gather at the homes of friends and family, church, parks, restaurants, recreation centers, and community facilities for activities such as a book club, presentations, or movies.


Digital Image. 5 Aug 2015.123rf.com

What would your dream age-55+ home look like?

Many respondents replied that they wanted a ranch-style home (one level with no stairs and few or no exterior steps). Respondents also wanted: an open floor plan, a living area for their mother-in-law, additional rooms, a large kitchen, a big open kitchen and dining area, two bedrooms and bathrooms, seating in a shower and bath tub, a workshop, a nice deck, a front porch, a small yard, and an attached garage. Respondents also wished for proximity to medical facilities, restaurants, and a small park; a homeowners association to help with outside maintenance; places they could walk and greet neighbors and for grandchildren to play; and a quiet neighborhood, with lots of trees and older people with whom they could become friends.

How important is it for you to be able to age in your home and community? What needs to be nearby in your community for you to be able to age in place?

Most respondents said it was important to very important to age in place. They wanted nearby grocery stores, doctor's offices/medical facilities, family and friends, and transportation. Next came places to eat, a library, a bank, a church, and a nursing facility for a parent. One person mentioned the need to have cardio-pulmonary resuscitation (CPR) training or an automated external defibrillator (AED) machine nearby in case of a heart attack. Also interesting, one person responded that technology helps keep people in their homes: "I can see mom (cameras in her home) on phone many times in a day and know she is good, eating, and safe."

2.3 Partnership for Age-Friendly Communities--Health and Wellness Survey

The Foundation on Aging for Larimer County, Inc. and the Larimer County Office on Aging convened a group of community organizations that developed into the Partnership for Age-Friendly Communities (PAFC). The purpose of this group is to create a sustainable environment that supports and promotes age-friendly communities with affordable housing, access, health and wellness, and a supportive culture for aging.

The PAFC health and wellness priority group identified several objectives and strategies. The first is to reduce barriers for healthy living and make physical activity, particularly walking, a priority. The team developed a survey to assess the barriers in Larimer County. It received 317 survey responses, of which about 100 were from website or electronic newsletter links.

The survey results showed 95 percent exercise at least once a week, with walking as the most common (85 percent) form of exercise. About one-third (35 percent) of respondents identified no barriers to walking; however, the rest identified barriers including health issues (45 percent), no good places to walk (42 percent), safety issues (36 percent), no desire to walk (33 percent) and lack of time (22 percent). The most common health issues limiting the ability to walk were chronic illness and recent injury or surgery. Respondents who said they had no good places to walk most frequently identified barriers such as weather (58 percent), limited places to sit and rest (31 percent), poor sidewalks (28 percent), and lack of public restrooms (24 percent). The chief safety concern was fear of falling (63 percent). A review of the responses indicated survey participants are aware of the importance of exercise and make an effort to exercise at least three times a week (76 percent).

2.4 Walkability/Bikeability Audits

In April and May 2015, SHC conducted a walkability/bikeability audit in the areas surrounding the proposed Waters' Edge development. This type of audit considers and promotes the needs of pedestrians and bicyclists as a form of transport and is important to better understand and improve the connectivity of the Waters' Edge development with the surrounding neighborhoods. The survey found that several of the surrounding neighborhoods had varying conditions that would encourage or discourage safe walking and biking. The neighborhood north of Waters' Edge has no sidewalks or road shoulders; walkability/bikeability therefore is very limited. The neighborhood to the south of the proposed development has both sidewalks and bike lanes. The neighborhood to the east of the proposed development has sidewalks, but no bike lanes. The main road leading to the Waters' Edge development, Turnberry Road, has a narrow road shoulder beginning at the current Brightwater Drive. Turnberry Road southbound from Waters' Edge to Richards Lake Road does not have a sidewalk on the east side.

2.5 Survey Findings and Recommendations

Findings	Recommendations
Busy traffic is a barrier to walking, and half the respondents use a scooter or wheelchair. Nearly eight in 10 rank bike paths of low importance.	Focus on green, dog-friendly walking paths and less on bike paths. Develop paths for walking only, with no bikes allowed.
Two-thirds are widowed or divorced, and one-third live alone. Eight in 10 respondents own their homes.	Develop smaller homes with some units more affordable for seniors at lower income levels.
Being close to family and friends is the most important factor in choosing a location in which to live.	Reinforce elements in the development design, such as accessory dwelling units or in-law suites to house family members, caregivers, care-takers, or provide rental income.
Most do not use public transportation, and some requested specialized transportation services.	Investigate barriers and educate residents about using public transportation, including free shuttles for disabled seniors. Provide a dedicated resident transportation coordinator. Provide bus schedules, bike maps, and other alternative transportation resources.
Respondents desired amenities including exercise and cooking classes, weight-lifting, card and board games, gardens, book clubs, bowling, golf, movie showings, a swimming pool, and a lake or pond, as well as a farmers' market.	Provide a recreation/community center that offers fitness, social, and cultural activities with a variety of facilities and programs such as bowling, book club, woodworking, pottery, movies, and golf. Develop landscape amenities such as a lake or pond and an area for a farmers' market.
Cardiac disease is prevalent in the aging population.	Offer cardio-pulmonary resuscitation (CPR) training and consider installing automated electronic defibrillators (AEDs) throughout the development and at the clubhouse and recreation center.

Lack of places to rest, lack of shade, and inclement weather were big barriers to walking.  Digital Image. 5 Aug 2015. en.wikipedia.org/wiki/Parklet	Consider parklets (pictured left) with covered benches to provide resting places. Parklets are sidewalk extensions that offer a place to sit while taking in the activities on the street.
Support convenient exercise options that are appropriate for the aging population.	Design exercise stations along a community path, with signs that show exercises graphically and explain them in large print.

3.0 Connectivity and Mobility

How easily and safely we can get from one place to another has a major effect on our quality of life. Livable communities provide residents transportation options that connect people to social activities, economic opportunities, and medical care, and offer convenient, healthy, accessible, and low-cost alternatives to driving.

Connectivity is important in planning infrastructure for older adults because it reduces travel distance and vehicle trips and encourages walking and biking. Connectivity is critical to ensure mobility for all community members, regardless of age or physical ability level. This is a key concept of "universal access." Mobility, on the other hand, is the ability to move around easily and safely by car, transit, bike, or on foot. Mobility is also an important consideration for developing healthy communities for older adults because the ability to remain mobile prevents social isolation and encourages physical activity (Harrell, et al., 2014).

3.1 Waters' Edge Development Design – Strengths, Weaknesses, Opportunities, and Mitigations

This section documents a cursory analysis of the Waters' Edge Development (see Map A on page 28) related to health and well-being for its future residents. The following analysis looks at the "strengths" and "weaknesses" of the project, both within the proposed community and extending outside to adjacent neighborhoods. Each strength or weakness is followed by an associated health impact in parentheses. The physical and mental well-being chapter has most of the additional information about the health impacts but other chapters also have significant details. This section also includes a list of "opportunities" or ways in which strengths may be enhanced within or close to the development, and a list of "mitigations" or concepts on how to improve the potential adverse effects of certain aspects of the project. The opportunities and mitigations are considered the recommendations for this chapter and are also listed in Appendix 2.

Strengths of Waters' Edge Plan

I. Internal
   a. Quiet neighborhood, with an absence of trucking routes, major arterial streets, and adjacent industrial uses; plan should not increase noise levels, except during construction; phased construction could help reduce noise (stress and mental health)
   b. Traffic calming measures, roundabouts, islands (driver and pedestrian safety and comfort)
   c. Detached sidewalks with shade trees (pedestrian safety and comfort)
   d. Connectivity on trails/paths/streets, including mid-block crossings on Morningstar Way (walking and biking)

e. Lakefront access, destinations for walking, and multi-use trails (connections to nature, mountain/water views)
f. Mix of housing types with opportunities to age in place, diversity of people, economic levels, and lifestyles (social interaction/ cohesion)
g. Homes are ranch style single-level (safety)
h. Significant access to and amount of open space and trails including out the back doors of homes (recreation/exercise/ access to nature)


Chad Reischl

i. Trails connect to trails beyond development (expanded opportunities for recreation and exercise)
j. Clubhouse (Phase 1) with pool, exercise equipment, programming, workshop and artisan studio area (recreation/exercise, social cohesion/interaction)
k. Limited parking at recreation center (walking/biking, alternative modes)
l. Existing park/playground (recreation opportunities/family visits with grandchildren)

II. External
a. Bike lanes on Turnberry Road connect to Fort Collins bike system (access to fitness option)
b. Multiuse trails connect to trails in adjacent neighborhoods (extend range of walkability/bikeability)
c. Proposed recreation/community center in Phase II, east of Turnberry Road (access to exercise options/social activities/services)

Weaknesses of Waters' Edge Plan

I. Internal
a. Plan has all front-loaded-garage homes with driveways that cross sidewalk (risk of pedestrian injuries as drivers back out onto streets, less room for porches where residents could interact with pedestrians, fewer street trees/less shade, decreasing pedestrian comfort)
b. Newly planted trees need 15 to 20 years to produce adequate shade for pedestrians (decrease walking and being outdoors)
c. Plan does not engage detention pond, a potential natural area and desirable destination if developed with circular trail, benches, and shade structures (additional access to nature, habitat for animals)
d. Nontraditional street layouts (curves, loops, cul-de-sacs) can decrease physical activity and neighborhood socialization and may confuse an aging population (decrease walking/biking)
e. Development compartmentalized by housing type, reducing interaction among diverse populations (separation by disability and income)
f. Bike lane from Turnberry Road to playground ends on Morningside Way and should continue through to the west end of the development (lack of connectivity)


Chad Reischl

II. External
   a. Distances to services limits walking/biking and could encourage all trips by car (risk of traffic accidents, cost of car ownership, few options for nondrivers)
   b. Over five miles to hospital, and few medical services within three-miles radius (medical services access for nondrivers)
   c. Bus service nearly three miles away (lack of transportation options)

Opportunities of Waters' Edge Plan (to improve on strengths)

I. Internal
   a. Expanded recreation opportunities along lake–fishing pier, restrooms, benches—to create activity and gathering spaces and a destination for walking and biking
   b. Enhanced landscaping and recreation opportunities at detention pond--walking trail and seating area overlooking natural area. A small grove of cottonwood trees around a culvert at the SW corner appears to have housing lot on top of/encroaching on grove in plan, but could be developed as a seating area overlooking the naturalizing landscape (see Map B)
   c. Ample open areas for gathering spaces and shade structures, picnic shelters, gazebos, shaded benches, and plazas for events that also support chance meetings among residents. Developer has suggested planters with herbs throughout the development for use in cooking and to encourage chance meetings
   d. Playground enhanced with multi-generational play structures (image in Chapter 6.1 Physical Activity) and a bathroom
   e. City-approved additional trail access to playground from north and east, in addition to existing south and west pathways


Chad Reischl

   f. Improved pedestrian crossings at major intersections/crossing points--Morningstar Way and Brightwater Drive--and at existing city park, used by families and children from adjacent subdivision (see Map A)
   g. Roundabout to establish entry point/sense of place, frame neighborhood, and as possible venue for public art

II. External
   a. Better access to services for daily needs—café/coffee shop, grocery store, shops, recreation center--to provide walking/biking destinations, meeting places, an alternative to long drives for services
   b. Two-mile walking path around Phase I perimeter with more options for one-half and one-quarter mile loop trails
   c. Two-mile path includes Richard's Lake, a project that could be also undertaken with neighboring subdivision (see Map A)

Mitigations of Waters' Edge Plan

I. Internal

a. Fewer driveways that cut across sidewalks and more shared or paired driveways for adjacent houses, and alleyways behind houses. If some driveways across sidewalks are needed, ensure adequate sight lines on both sides of driveway; also restrict evergreens other than low-growing or ground-cover juniper within 30 feet of driveways, street trees or shrubs within 10 feet of drives, and shrubs taller than three feet within tree lawns

b. Shade structures and landscaping with shade trees and benches for sitting/resting; structured canopies or grape/vine arbors at rest points along major walking routes

c. Way-finding signage with large print, including maps with distances posted at key intersections of streets and trails, near bathroom/water fountains at pool area, and along walk/bike trails; also offer similar large-print hand-held maps

Digital Image. 5 Aug 2015. mccommgroup.com

d. Visual landmarks for way-finding at prominent corners with distinctive colors or architectural designs reflecting neighborhoods, including tower-like elements, walls, fences, mail kiosks, public-art, shade structures, entry monuments, or maintenance structures (see images at right)

6 Aug 2015.sites.google.com

e. Compliance with Americans with Disabilities Act (ADA) for all walkways within residential courtyards/mews

f. Integrated mix of housing units, sizes, and price points, where possible, to encourage diversity and more socially integrated and visually interesting community; add townhomes and apartments to single-family neighborhoods; adjust lot sizes, adding different housing types to edges/corners

Digital Image. 5 Aug 2015. vireods.com

g. Programming and events at different points within community to encourage mingling and easy access

h. Car-share service, community ride-pool, and ADA-accessible shuttle to provide easy access to medical care, grocery stores, and other services

i. Wellness programming--yoga and meditation classes, nutrition classes, mobile health checks, flu shots--at clubhouse, recreation center, and, if possible, healthcare services in Phase II town center.

II. External

a. Safe pedestrian and bike crossings and wayfinding between Phase I and Phase II town center destinations (see red circles at crossing areas in Map B)

b. Bus service extended to Waters' Edge (work with Transfort transit service for the City of Fort Collins: The minimum density needed for bus service might be reached with Phase II development and another future development on Mountain Vista Drive. If a bus stop is not proposed closer to the development, a proposed bus stop at Mountain Vista and Summit View is approximately 1.75 miles from the southwest corner of Waters' Edge at Turnberry Road and Brightwater Drive. Residents could ride a bike to the station, or a shuttle service could be provided to the proposed bus stop from the Waters' Edge community).

Map A: This map delineates: a) a path around the detention area, which could become a natural area (blue) for the east end of the development; b) an easier and shorter route to the playground from the north and west (red); c) a north-south trail that connects with three east west trails so pedestrians could walk short loops through the natural areas shown (red); and d) a two-mile loop around the property (purple and red). This trail network within the project area includes the two-mile perimeter path, a one-quarter-mile path, and shorter paths for in-between options.

Map B: This plan shows enhanced pedestrian safety with crosswalks (orange circles) and the primary crossing points to future development east of Turnberry Road (red circles), as well as a primary connection between walking/equestrian trails on the east side with possible walking/equestrian trails on the west side (green circle). Ideas for further enhancing pedestrian safety include curb extensions, alternative paving, and traffic control measures.

4.0 Overview of Community Amenities

Community amenities are the anchor of neighborhoods, providing benefits such as connectivity, services, and access to open space, which enhance livability. The Waters' Edge development plan presents a significant opportunity to improve the social and mental health of future residents and neighbors through a wide variety of amenities designed for healthy and active older adults.

Community amenities are the spaces, uses, and services that are available and accessible to everyone in a community. They typically include resources needed for daily living. For the Waters' Edge HIA, amenities for a 55+ community include public and institutional uses, such as walking paths, parks, recreation facilities, health-care facilities, a grocery store, and shops and restaurants.

Baby boomers love their communities, but would like to be closer to amenities such as shopping, activities, entertainment, and medical care. Features most important to boomers who move for retirement or plan to purchase a new home include: access within six to 10 blocks of a doctor's office (63 percent), and within one-half mile of a grocery store (62 percent), hospital (61 percent), place of worship (60 percent), and pharmacy (53 percent) (Farber et al., 2011). However, later in life, boomers say being close to doctor's office is more important (83 percent), as is living within one-half mile of a grocery store (80 percent), hospital (83 percent), place of worship (76 percent), and pharmacy (81 percent) (AARP's Boomer Housing Survey, 2011).

The uses of retail spaces in the Waters' Edge Phase II town center have not been determined at this point in planning. However, the developer Actual Communities, the design team, and the HIA survey respondents all have identified preferred services. HIA respondents said their top preferences were to live near family and friends, healthcare services, and fresh-food grocery stores, and the services they wanted close to home included cafes/restaurants, banks, and retail shopping (more details in 2.1 Survey Findings).

Providing preferred services could help meet residents' needs, encourage walking, and promote the local economy. The costs and benefits of retail uses, however, ultimately depend on the specific uses chosen. If the commercial space provides, for example, access to high-quality food, the morbidity from nutrition-related chronic disease such as diabetes may decrease. Matching retail to local unmet needs and preferences also is consistent with business success for retailers. Alternatively, some retail uses may pose risks for community health; alcohol sales, for example, are associated with physical and mental health problems related to drinking. Rates of assault also are correlated to the density of liquor stores in an area (Gruenewald et al., 2006). Consumption of healthy foods like fruits and vegetables correlates with access and proximity to supermarkets. The same study reported that full-service restaurants are linked with a healthier diet, while there is little association between fast-food restaurants and consumption of healthy food (Morland et al., 2002).

4.1 Healthy Food Access

Built environments can support healthy living in a variety of ways, including access to healthy foods. Nearly one in three Coloradans do not live near a healthy food retailer, which limits many residents' ability to purchase and consume fruits and vegetables (Compass of Larimer County website, 2011). Increasing the local availability of fresh fruits and vegetables can be accomplished by developing community gardens and orchards, where people can exercise and socialize while helping tend the produce. The HIA team assessed locations of amenities within a 10-mile radius of Waters' Edge. Tables in 4.2 provide the addresses of the nearest grocery stores, retail shops and services, and healthcare services as of spring 2015 (maps are in Appendix 1).

Good nutrition can help lower the risk of many chronic diseases. Research shows, however, that the average American now consumes almost 1,000 more calories per day than in the 1950s. Good nutrition maintains health for the entire body, enabling all body systems to function optimally; it also provides energy and promotes sleep and good mental health, as well as healthy aging. The U.S. Surgeon General's guidelines recommend at least two servings of fruit and at least three servings of vegetables per day, for a total of five or more daily servings of fruits and vegetables (CDC, 2009). Healthy centenarians eat mostly a plant-based diet, and when they take in protein it is mostly fish (Buettner, 2015). Urban agriculture can increase the availability of local fruits and vegetables and provide opportunities to eat healthier, exercise, and reduce stress.

What Is Urban Agriculture?

Urban agriculture is a system of growing, processing, and distributing food in or around an urban area. At its most fundamental level, it embodies the practice of growing food in cities and suburbs with an eye toward local consumption and enhancing community health, sustainability, and resiliency. (Smit & Nasr, 1992). At Waters' Edge, urban agriculture might take the form of community gardens, a community-supported agriculture operation (CSA), and/or a farmers' market.

In addition to all the potential physical and nutritional benefits of gardening, community gardens also provide a powerful element of mental rejuvenation and stress reduction through direct contact with soil and nature. They provide opportunities to organize around other issues and build social engagement (Twiss, 2003). Urban agriculture can be combined with aquaponics to farm fish to produce a healthy protein source (NIH, 2015). Local urban agriculture can help reduce carbon footprint, compared to large-scale commercial-industrial farming and filter pollutants from the air and nature (Jackson et al., 2013).

The Sustainable Communities Index (SCI) healthy development checklist and indicators are used to review and evaluate common types of land use projects against comprehensive health and sustainability. For this HIA, a few indicators are discussed on page 32 (www.sustainableSF.org).

Status of Healthy Food Access at Waters' Edge Site

1. The closest fresh-food grocery stores (King Soopers and Walmart) are about three miles from the site. SCI recommends a full-service supermarket within one-half mile of homes. Waters' Edge Phase II can accommodate and plan for a small-scale grocery store.

2. There are no publicly accessible community or school gardens in the area. SCI recommends having a garden in a community. The closest community garden is about five miles away, and no larger-scale commercial gardens or other urban agriculture operations exist.

3. There are no farmers' markets near Waters' Edge. SCI specifies a maximum one-half mile distance from a farmers' market.

4.2 Community Amenities/Services Inventory

The HIA team in the spring of 2015 assessed grocery stores, retail shops and services, recreation/community centers and healthcare services within a 10-mile radius of Waters' Edge (See Appendix 1 for maps). Tables below provide the addresses and mileage to these amenities.

Grocery/Retail

Oriental Grocery Store	710 East Magnolia St. Fort Collins, CO 80524	5.9 miles from Richard's Lake
India Rice N Spice	2531 South Shields St. Fort Collins, CO 80526	9.3 miles from Richard's Lake
Fort Collins Food Co-Op	250 East Mountain Ave. Fort Collins, CO 80524	5.1 miles from Richard's Lake
Safeway	460 South College Ave. Fort Collins, CO 80524	6.5 miles from Richard's Lake
Walmart	1250 East Magnolia St. Fort Collins, CO 80524	4.7 miles from Richard's Lake
Bangkok Asian Market	1100 West Mountain Ave. Fort Collins, CO 80521	9.7 miles from Richard's Lake
Whole Foods Market	2201 South College Ave. Fort Collins, CO 80525	8.1 miles from Richard's Lake
Beaver's Market	1100 West Mountain Ave. Fort Collins, CO 80521	6.3 miles from Richard's Lake
King Soopers	1842 North College Ave. Fort Collins, CO 80524	4.5 miles from Richard's Lake

Medical

UC Health- Poudre Valley Hospital	1024 South Lemay Ave. Fort Collins, CO 80524	5.3 miles from Richard's Lake
UC Health-Family Medical Center Walk-In Clinic	1025 Pennock Place Fort Collins, CO 80524	5.3 miles from Richard's Lake
Concentra Urgent Care- Fort Collins Lemay	1025 Pennock Place Fort Collins, CO 80524	4.8 miles from Richard's Lake
The Little Clinic	1842 North College Ave. Fort Collins, CO 80524	3.4 miles from Richard's Lake
Salud Family Health Center	1635 Blue Spruce Dr. Fort Collins, CO 80524	3.6 miles from Richard's Lake

Physical Therapy/ Therapies

Art and Science Physical Therapy & Pilates	344 East Mountain Ave. Fort Collins, CO 80524	4.9 miles from Richard's Lake
Colorado Physical Therapy Specialist	210 West Magnolia St. Fort Collins, CO 80521	5.6 miles from Richard's Lake
Center for Neurorehabilitation Services	1045 Robertson St. Fort Collins, CO 80524	5.4 miles from Richard's Lake
Fort Collins Physical Therapy and Sports Center	1325 East Prospect Rd. Fort Collins, CO 80525	6 miles from Richard's Lake
Colorado Rehabilitation & Occupational Medicine	2620 East Prospect Rd. Fort Collins, CO 80525	7.8 miles from Richard's Lake

Pharmacies

Walgreens Pharmacy	743 South Lemay Ave. Fort Collins, CO 80524	4.9 miles from Richard's Lake
Walmart Supercenter Pharmacy	1250 East Magnolia St. Fort Collins, CO 80524	4.4 miles from Richard's Lake
Safeway Pharmacy	460 South College Ave. Fort Collins, CO 80524	5.6 miles from Richard's Lake
City Drug	209 North College Ave. Fort Collins, CO 80524	5 miles from Richard's Lake
King Soopers	1842 North College Ave. Fort Collins, CO 80524	4.5 miles from Richard's Lake

Alternative Medicine

Sacred Vessel Acupuncture	1301 Riverside Ave. Fort Collins, CO 80524	5.3 miles from Richard's Lake
Nature's Healing Center	1031 Robertson St. Fort Collins, CO 80524	5.5 miles from Richard's Lake
Human Kind Health Center	143 Remington St. Fort Collins, CO 80524	5.3 miles from Richard's Lake
Achieving Health	420 South Howes St. Fort Collins, CO 80521	5.9 miles from Richard's Lake

Dentists

Comfort Dental: Fillmore Jamie L DDS	934 South Lemay Ave. Fort Collins, CO 80524	5.2 miles from Richard's Lake
Foothills Family Dental	523 Remington St. Fort Collins, CO 80524	5.7 miles from Richard's Lake
Alpine Dental Health	718 South College Ave. Fort Collins, CO 80524	6.4 miles from Richard's Lake
Aronson Family Dental	1217 East Elizabeth St. Fort Collins, CO 80524	5.3 miles from Richard's Lake
North Beach Gen Dentistry	1102 East Lincoln Ave. Fort Collins, CO 80524	5.5 miles from Richard's Lake
Perfect Teeth	1856 North College Ave. Fort Collins, CO 80524	4.1 miles from Richard's Lake
Colorado State University	Compte de Larimer Fort Collins, CO 80523	6.2 miles from Richard's Lake

Veterinarian Offices

Access to veterinarian services is an important consideration for older adults.

Chappelle Small Animal Hospital	1601 U.S. 287 Fort Collins, CO 80524	5.6 miles from Richard's Lake
Laporte Animal Clinic	3333 County Rd. 54G Laporte, CO 80535	7.4 miles from Richard's Lake

Recreation/Community Senior Centers

Fort Collins Senior Center	1200 Raintree Dr. Fort Collins, CO 80526	9.3 miles from Richard's Lake
Northside Aztlan Community Center	112 E. Willow Street, Fort Collins, CO 80524	4.9 miles from Richard's Lake

Telehealth

Access to immediate care, anytime and anywhere, would help improve the aging population's health, and telehealth may be one way to accomplish this. Telehealth uses electronic information and telecommunications technologies to support long-distance clinical health care, patient and professional health-related education, public health, and health administration. Telehealth virtually connects medical experts and patients, sharing audio, visual, video, and data. Technologies include videoconferencing, the Internet, store-and-forward imaging, streaming media, and land and wireless communications (http://www.hrsa.gov/ruralhealth/about/telehealth/).

Pushed by key factors like our aging population and the growth of chronic diseases, this emerging industry is expected to more than quadruple from $9.6 billion (2013) to $38.5 billion in 2018 (Whiting, 2014). In the future, community planning should allow for easy use of telemedicine through devices such as blood pressure and pulse oximetry monitors. There are barriers to bringing healthcare to homes and communities, but they are being overcome. Over half the households that have not used online healthcare communications indicate that they are comfortable with the idea of using online tools to communicate with their healthcare provider. Studies show that patients already are using the Internet to seek information to guide them in their healthcare decisions, and Internet use continues to rise among adults age 65 and older. (Whiting, 2014).

4.3 Access to Services and Amenities Recommendations

Recommendations
Create at least one community garden, possibly at existing city park, so people from surrounding neighborhoods can participate. Provide irrigation for gardens (grey water system), drinking water, and shade, workshops, tours, plant sales. Plan with help from the City of Fort Collins' community gardens (see http://www.fcgov.com/gardens).
Provide amenities for the gardens, including a small greenhouse to extend the growing season, a compost area, and watering facilities.
Install a kiosk at the community gardens with gardening instructions and information about fruits, vegetables, and nutrition, printed in large type. Share information and links to Colorado State University (CSU) and local master gardener programs.
Design a community kitchen and other gathering places and programming for food preparation classes to encourage the use of the gardens and for social engagement and to promote healthy eating habits and lifestyles.
Ensure that Waters' Edge Phase II development includes a small-scale grocery store with fresh fruits and vegetables.
Work with Meals on Wheels and other local nonprofits to ensure access to food before Phase II development is built. Partnering with local organizations is especially important if a grocery store is not able to locate within the development.
Provide space at the Phase II town center that may be used for a seasonal farmers' markets, and work to integrate produce from Waters' Edge orchards and gardens.

Offer telehealth services at the Phase I clubhouse and at Phase II recreation center, equipped with blood pressure, weight, and pulse oximetry devices and private monitors made available for residents to communicate with healthcare providers via video service. Telemedicine is particularly important if a health clinic is not able to locate within the Phase II development.

5.0 Safe Housing

In the U.S., aging boomers are redefining what it means to transition into retirement by incorporating design features in the home that support healthy aging in place. Nearly 75 percent of respondents plan to stay in their homes as they age, according to an AARP poll of adults age 45 and older (AARP, 2010). Increasingly, seniors are requesting information on active aging, aging in place, lifelong homes, universal design, and age-friendly communities. However, a recent paper suggests that Americans have a cultural resistance to preparing for the challenges of aging (San Antonio & Rubinstein, 2004). The principles of universal design consider the full range of human perceptual, cognitive, and physical abilities, as well as different body sizes and shapes. Universal design provides guidelines to ensure equal opportunity and access for everyone, particularly those who are aging and those with disabilities (Universal Design, 2015).

Thoughtful and flexible design features address the changing needs of an aging population. Design features that enhance accessibility, increase safety, conserve energy, and introduce smart technology encourage aging in place so that older people can maintain meaningful, healthy, and engaged lifestyles. Recommendations for home features are outlined in the following pages.

Housing Preferences

There is a great need for housing for people age 55 and older. The U.S. is unprepared to adequately house an aging population with distinct needs (Mankiw, & Weil, 1989). The boomers also are significantly different than past generations in their lifestyle needs and desires as they age. A recent AARP survey revealed that boomers are very engaged in creating a new architectural paradigm in our communities.

A recent AARP survey revealed that boomers are very engaged in creating a new architectural paradigm in our communities.

Aging boomers, for example, prefer walkable communities that resemble the traditional architecture and layout of communities in history (Lampkin, 2012). While boomers like how their houses are currently serving them, they also are starting to recognize that they could add design features to enhance how they will live in the future. When weighing design features they would want in early retirement versus later years, boomers responded differently regarding the importance of a bedroom on the main level (79 versus 91 percent); nonslip floor surfaces (60 versus 83 percent); electrical switches positioned slightly lower to allow for easier reach and from a wheelchair (34 versus 49 percent); electrical outlets positioned slightly higher for convenient reach (35 versus 50 percent); lever-handled door knobs (50 versus 68 percent); and easy-to-use climate controls (64 versus 73 percent) (Lampkin, 2012).

Finally, since boomers are healthy and more physically active than previous generations, they have delayed planning for later years. However, they recognize they may need accommodations later on; only 41 percent say they expect to be equally active and healthy in later years, and only 35 percent believe they will always be able to drive (Lampkin, 2012).

The benefits of a well-designed home for aging in place include reduced injuries from a home with few or no steps, safer railings, brighter lighting, and features such as grab bars and curb-less showers (MetLife, 2010). Adequate room for maneuvering in a wheelchair makes it possible to return from illness, accident, or surgery sooner; people recover more quickly in their own homes, and the cost of inpatient rehabilitation is reduced. As health declines, less assistance may be needed in a home where the bathroom, bedroom, and entry are accessible; and the difficulty of and injuries from caregiving are reduced when the living environment has been prepared for these tasks (MetLife, 2010).

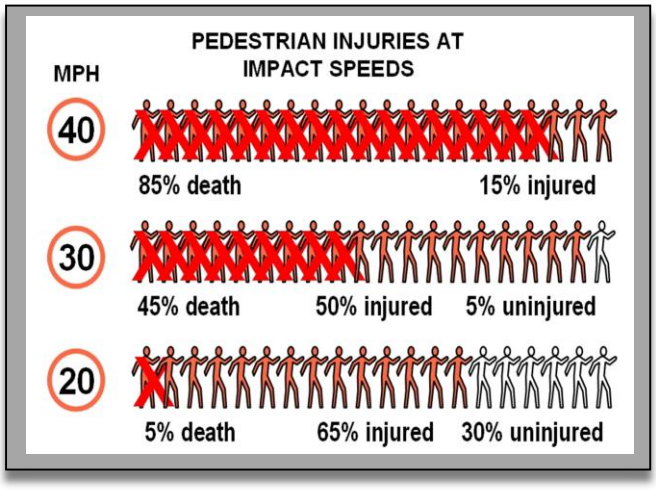
5.1 Safe Transportation

In 2008, U.S. adults age 65 and older comprised less than 13 percent of the population but were involved in 15 percent of vehicle fatalities and 19 percent of pedestrian fatalities. An older vehicle occupant is 18 percent more likely to die in a crash than someone under age 65 (Farber et al., 2011). Studies comparing fatal and nonfatal pedestrian crashes involving older and younger adults show that, on a per capita basis, the crash rates for pedestrians 65 to 74 years old are lower than any other age group and there is only a small increase in the crash rate for individuals older than 74. However, in the event of a crash, fatality rates increase steadily with age, reaching a high of 25 percent for crash victims over 74 years old (Zegeer et al., 1993).

Livability and Age-Friendly Communities Policies and Recommendation

Fort Collins has several policies to ensure complete streets, or thoroughfares that serve all users of all ages and abilities, including pedestrians, bicyclists, motorists, and transit riders. The city also offers convenient transportation options, transportation coordination, volunteer state drivers, and services for persons with disabilities. However, there is no policy in place for commitment to livability and age-friendly communities (AARP, 2015). Providing education and support to the Fort Collins City Council for adopting a policy advocating for universal design, livability, and age-friendly communities would support the needs of a large and growing percentage of older residents to age in place in safe and healthy environments.

Safe Streets Speed limits



The importance of vehicle speeds is clear; a pedestrian hit by a vehicle at 20 miles per hour (mph) has a 95 percent chance of survival, while the odds of surviving a 40 mph impact are only 15 to 20 percent (Leaf & Preusser, 1999). According to the AARP Livability Index (2015), the speed limits in the neighborhoods surrounding Waters' Edge are on average 30.9 mph. A safe speed limit for a median U.S. neighborhood is 28 mph, so the speeds near Waters' Edge are reasonable. In the surrounding area, there are 6.7 fatal crashes per 100,000 people per year; by comparison, there are 7.6 fatal crashes per 100,000 people in a median U.S. neighborhood (AARP, 2014). Recommendation: Traffic-calming measures such as curb extensions can help keep speeds within the development at 20 MPH and 35 mph on Turnberry Road, and to ensure safety at key intersection crosswalks.

Only half (51 percent) of the stations and vehicles in the Fort Collins area's transportation system are ADA-accessible, compared to the 81.7 percent accessibility of stations and vehicles in the median U.S. neighborhood. The Waters' Edge site consequently has significant challenges regarding access and transportation for aging and disabled people (AARP, 2014).

Also, as people age, their ability as drivers to judge left-turn gaps diminishes. Roundabouts can help, although it is difficult for pedestrians with limited vision in roundabouts to determine when traffic has stopped and it is safe to cross (AARP, 2014).

As seen in the tables below, crime rates and fatal car accidents in the Fort Collins area are low and have decreased or remained the same between 2012-2013, so no recommendations are offered. Recommendations in the Development Design Analysis chapter address traffic calming, roundabouts, and ADA-accessible shuttles.

Fatal Car Accidents in Fort Collins and Lakewood, Colorado (2012, 2013) City-Data.com

	Fort Collins (est. pop 148,612)		**Lakewood** (est. pop 145,516)	
	2012	2013	2012	2013
Fatal accident count	4	3	9	6
Vehicles involved in fatal accidents	6	5	12	10
Fatal accidents involving drunken persons	3	1	2	1
Fatalities	4	3	9	6
Persons involved in fatal car accidents	6	6	16	8
Pedestrians involved in fatal accidents	1	1	5	2

http://www.city-data.com/accidents/acc-Fort-Collins-Colorado.html#ixzz3XWM8Ooxu
http://www.city-data.com/accidents/acc-Lakewood-Colorado.html#ixzz3XWM8Ooxu

5.2 Crime

Crime Rates in Fort Collins (FC) & City and County of Denver by Year (Per 100,000)

Type	2007		2008		2009		2010		2011		2012		2013	
	FC	Denver	FC	Denver	FC	Denver	FC	Denver	FC	Denver	FC	Denver	FC	Denver
Murder	1	47	2	40	2	39	0	22	3	34	2	39	0	40
Rape	70	296	75	282	87	343	64	367	56	396	44	376	57	514
Robbery	33	1,045	39	951	68	946	50	926	46	1,143	40	1,165	37	1,132
Assault	314	2,164	433	2,088	378	2,165	324	1,976	315	2,135	305	2,291	263	2,401
Burglary	695	5,694	784	5,173	752	4,763	643	4,501	560	4,868	598	5,129	531	4,918
Theft	3,487	11,594	3,582	10,547	3,604	12,628	3,706	12,944	3,553	14,040	3,379	14,544	3,137	15,506
Auto Theft	294	5,121	241	3,596	230	3,488	202	3,226	159	3,587	142	3,670	140	3,487
Arson	23	178	23	147	17	136	36	128	15	95	15	97	12	96

http://www.city-data.com/crime/crime-Fort-Collins-Colorado.html
http://www.city-data.com/crime/crime-Denver-Colorado.html

5.3 Home Safety Recommendations

There are many ways for homes to be adjusted to accommodate the changing needs of aging inhabitants regarding safety, comfort, and independence. Many seniors have compromised functioning of their senses, motor skills, and cognitive abilities, which have a notable effect on how they navigate space and experience their surroundings. These conditions may make older adults feel vulnerable, so increasing their sense of security and personal safety are just as important as facilitating mobility and comfort in the home. Falls are a significant cause of injury and death in older adults, and preventing falls is a primary concern. Aging-in-place design minimizes hazards while increasing comfort and accessibility, which makes homes suitable for people of any age or physical ability.

The following recommended elements for aging in place are adapted from AARP's HomeFit program, MetLife's *Aging in Place 2.0*, Home Innovation Research Labs, and *Home for a Lifetime: Interior Design for Active Aging*, from the American Society of Interior Designers (ASID).

Recommended Elements for Aging-in-Place Home Safety, Comfort, and Independence

Exterior

- Low-maintenance exterior (vinyl, brick)
- Low-maintenance shrubs and plants
- Deck, patio, or balcony surfaces no more than one-half inch below interior floor level

Garage or Carport

- Wider than average carports to accommodate lifts on vans
- Door heights at least 9 feet to accommodate some raised roof vans
- 5-foot minimum access aisle between accessible van and car in garage
- If code requires floor to be several inches below house entrance for fume protection, entire floor can slope from front to back to eliminate need for ramp or step

Overall Floor Plan

- Main living on main level, with full bath
- No steps between rooms or areas on the same level, no sunken areas
- 5-foot by 5-foot clear/turn space in living area, kitchen, a bedroom and a bathroom
- Hallways a minimum of 36 inches wide (wider preferred) and well-lit
- Easy-to-use rocker-style light switches, rather than traditional toggle switches
- Smoke and carbon monoxide detectors on every floor and heard in all bedrooms
- Interior doors 32 inches of clear width, requiring a 36-inch door
- Levered-door hardware
- Smooth, nonglare, slip-resistant floor surfaces, both interior and exterior
- Flooring: color/texture contrast to indicate change in surface levels
- Low-pile (less than one-half-inch) density carpet with firm pad
- Lever handled or pedal-controlled faucets, thermostatic or anti-scald controls, pressure-balanced faucets
- Backup power sources in case of a power outage

Windows

- Plenty of windows for natural light
- Lowered windows or taller windows with lower sill height
- Low maintenance exterior and interior finishes
- Easy to operate hardware

Entrances and Exits

- No-step, no-trip threshold, flush preferable, exterior maximum of one-half-inch beveled, interior maximum of one-quarter inch
- Lever-style door handles
- Security peephole or viewing panel on the exterior door
- Bench near exterior door for placing packages while locking or unlocking door
- Sensors on outdoor light fixtures to automatically turn lights on at dusk and off at dawn and/or when motion is detected
- Large easy-to-see address numbers visible from the street
- Even and smooth pavement on exterior walkways
- Wide doorways, 32 inches of clear width, requiring at least a 36-inch-wide door
- Doors with swing-away or swing-clear hinges
- At least one no-step entry with overhead cover
- Sensor light at exterior no-step entry focusing on the front-door lock

- Nonslip flooring in foyer
- Doorbell in accessible location
- Ramps with slope no greater than one inch rise for each 12 inches in length, adequate handrails, 5-foot landing provided at entrance, two-inch curbs for safety
- Easy-to-manipulate door locks; avoid traditional thumb-activated mechanisms.

Stairways, Lifts, and Elevators

- No-step design, or sturdy handrails on both sides (one and one-quarter-inch diameter); include horizontal step depth for easy side-stepping
- Steps covered with tightly placed, woven, low-pile carpet with thin padding
- Nonslip adhesive strips applied to uncarpeted steps
- Contrast strips on top and bottom stairs to increase visibility, color contrast between treads and risers on stairs
- Pre-framed space for future elevator shaft in multi-story homes (stacked closets), or minimum stairway width of four feet to allow space for lift
- Light fixture to illuminate the stairs/soft path lighting for nighttime

Kitchen and Laundry

- Task lighting for sink, stove, and other work areas
- Stove or cooktop with controls at front
- Stoves that turn themselves off
- Lightweight ABC-rated fire extinguisher within reach of stove
- Wall support and provision for adjustable and/or varied height counters and removable base cabinets
- Upper wall cabinetry: three inches lower than conventional height
- Open shelving for easy access to frequently used items
- Adjustable, pull-down or similar shelving for safe access to upper cabinets
- Roll-out cabinetry shelves beneath counters, lazy susans in corner cabinets
- Easy-to-grasp D-shape or loop handles on cabinets and drawers
- Accented stripes on edge of countertops to provide visual orientation to the workspace
- Counter space for dish landing adjacent to or opposite all appliances
- Kitchen surface at appropriate height for working while seated
- Multi-level work areas to accommodate cooks of different heights
- Clear space for turns in wheelchair of 30 by 48 inches clear at appliances, or 60 inches diameter
- Lever-touch or sensor-style kitchen faucet (ideally pressure-balanced, temperature regulated, at or below 120°F)
- Pull-out spray faucet; levered handles
- In multistory homes, laundry chute or laundry facilities in master bedroom
- Easy-to-use front loading washer; washer and dryer on a raised platform 12 to 15 inches from floor

Appliances

- Easy to read controls
- Microwave oven at counter height or in wall
- Side-by-side refrigerator/freezer
- Side-swing or wall oven
- Raised dishwasher with push button controls
- Electric cook top with level burners for safety in transferring between the burners, front controls and downdraft feature to pull heat away from user; light to indicate when surface is hot

Bathroom

- At least one wheelchair-maneuverable bathroom on main level with 60-inch turning radius or acceptable T-turn space and 36-inch by 36-inch or 30-inch by 48-inch clear space
- Shower stall only, consider no tub, to reduce chance of injury

- Nonslip strips in the bathtub and/or shower
- Main bath stand-up shower: curbless and minimum of 36 inches wide
- Easy-to-use lever-touch or sensor faucets for sink, bathtub, and shower
- Bracing in walls around tub, shower, shower seat and toilet for installation of grab bars to support 250 to 300 pounds
- Attractive grab bars and grips in the bathtub, shower and adjacent to toilet
- Adjustable/hand-held showerheads, 6-foot hose
- Fold down seat in the shower
- Tub/shower controls offset from center
- Shower stall with built-in antibacterial protection
- Light in shower stall
- Water heater at or below 120°F to avoid scalding
- Slip-resistant flooring in bathroom and shower
- Toilet two and one-half inches higher than standard toilet (17 to 19 inches) or height-adjustable, or a toilet seat riser
- Wall support and provision for adjustable and/or varied height counters and removable base cabinets
- Contrasting-color edge border at countertops
- Wall-hung sink with knee space and panel to protect user from pipes
- Design of the toilet paper holder allowing roll changes with one hand
- Night-lights and/or illuminated light switches in the bathroom and hallway

Electrical, Lighting, Safety, and Security

- Light switches, thermostats, and other environmental controls in accessible locations no higher than 48 inches from floor
- Electrical outlets 15 inches on center from floor; may need closer than 12 feet apart
- Clear access space of 30 inches by 48 inches in front of switches and controls
- Rocker or touch light switches
- Audible and visual strobe light system to indicate when the doorbell, telephone, or smoke or CO2 detectors have been activated
- High-tech security/intercom system that can be monitored, with the heating, air conditioning, and lighting, from any TV in house
- Easy-to-see and read and pre-programmed thermostats
- Flashing porch light or 911 switch
- Home direct-wired to police, fire, and EMS (as option)
- Home wired for security
- Home wired for computers

Heating, Ventilation, and Air Conditioning

- HVAC should be designed so filters are easily accessible
- Windows that can be opened for cross ventilation, fresh air

Energy-Efficient Features

- In-line framing with two-inch by six-inch studs spaced 24 inches on center
- Air-barrier installation and sealing of duct work with mastic
- Reduced-size air conditioning units with gas furnaces
- Mechanical fresh-air ventilation, installation of air returns in all bedrooms, and use of carbon monoxide detectors
- Installation of energy-efficient windows with Low-E glass

Reduced Maintenance/Convenience Features

- Easy-to-clean surfaces
- Central vacuum
- Built-in pet feeding system
- Built-in recycling system
- Video phones

- Intercom system
- Composting bin

Education for Safety

- Outside paths free of leaves, moss, ice, mold, or other slipping hazards
- Rubber-backed rugs (or mats secured with double-sided rug tape or rubber carpet mesh) on bathroom floor, no throw rugs
- Wide and clear passageways between furniture
- Flashlights in multiple rooms
- Automatic nightlights in hallway, bathroom outlets, and near stairs
- Cell phone or other telephones available in or near multiple rooms (including the bedroom and bathroom)
- Touch control lamps and devices that automatically turn lights on and off at set times
- Electrical and phone cords secured along the wall to prevent tripping

Other Ideas

- Homeowners association (HOA) maintenance for daily and weekly tasks such as landscaping, gutter cleaning, and snow removal; metropolitan district for home maintenance and repair
- Annual home safety assessments and a multidisciplinary approach for assessment, including a registered nurse, occupational therapist, and contractor, as a service of HOA or a metropolitan district
- Extra electrical outlets to accommodate the need for medical technology in the home such as monitors and ventilators with high-voltage plugs or back-up energy resources in the case of a power outage.

6.0 Social and Mental Well-being

Social activity and engagement is very important for mental health, especially for older people. Thoughtful design of physical infrastructure and programming for social engagement has been found to reduce stress and isolation and are essential parts of community planning for successful 55 and older communities. Spaces designed for exercise and community activities can double as interactive places for group exercise, political events, community nights, live entertainment, meditation, dance and art classes, education seminars, cooking, and sports activities. Homeowner association organizations can give residents voice in community decision-making enhancing social engagement.

Digital Image. 5 Aug 2015. ptpubco.com

Russell, Bergeman, and Scott (2012) state that loneliness is a potential risk factor for a variety of physiological and psychological health problems, including decreased physical activity, higher obesity, blood pressure, and cardiovascular risk, poorer sleep, decreased self-esteem, greater levels of depression, pessimism, and anxiety, and lower levels of social skills. Interactions with family, friends, and others are critical to mental and physical health. Adams, Roberts, and Cole (2010) examined the changes in activity among older adults and the role these changes had in the relationship between health limitations and depression, and found that reduced socialization was associated with poor health and/or depression.

Faith and Spirituality

Religion, faith, and spirituality are significant coping strategies for the aging. Seniors repeatedly described how they turned to their faith for strength in getting through difficult times. In the past decade, research in this area has increased significantly. Results indicate that religious involvement is related to greater well-being, increased life satisfaction, reduced anxiety, and lower rates of substance abuse (McCullough, Hoyt, Larson, Koenig, & Thoresen, 2000). The Waters' Edge HIA survey and AARP have stressed the importance of having centers of faith nearby and accessible. Some 150 churches are located in the Fort Collins area, within approximately five miles of the proposed Waters' Edge development. The closest is the Annunciation Chapel, which is 1.7 miles from Richard's Lake. Providing transportation options like shuttle buses could increase access to churches.

Benefits of Nature

Access to nature can contribute in very positive ways to mental health. Studies show that even views of nature can decrease healthcare visits and speed up recovery from surgery (Frank, 2006). Inserting nature into the urban environment has the potential to provide an inexpensive intervention for many health issues such as chronic diseases and psychological well-being. Psychological improvement indicators include lowering high blood pressure in a very short period of time in nature (Hartig et al., 2003). People are more likely to exercise where the natural surroundings provide an interesting, pleasant, and safe environment, which can help reduce mental illness, obesity, and diabetes. Exercise in this environment also offers restorative effects, and reduces the effects of stress (Shanahan et al., 2015). A European study found that residents of areas with high levels of greenery were three times more likely to be physically active and 40 percent less likely to be overweight or obese than in similar areas with low levels of greenery.

A growing body of evidence over 30 years demonstrates links between exposure to nature and physical, psychological, and social well-being, although less is known about the types and amounts of nature people need to experience specific health benefits (Shanahan et al., 2015). One study that examined the impacts of exercise in green environments on self-esteem and mood found that improvements can occur very rapidly, and include better cognitive functioning after less than 10 minutes of viewing photographs of natural settings (Berto, 2005). Barton and Pretty (2010) found that five minutes of "green exercise" resulted in faster rates of feeling improvements in restoration and self-esteem than a full day of exposure, suggesting that the psychological well-being benefits do not increase linearly with time (Shanahan et al., 2015). Other studies have shown unequivocally that human well-being responds to the presence of nature, and that the scale of response can vary with duration of exposure (Maas et al., 2006). These studies are important because they have shown that variation in the types of nature, not just its presence, can be important for delivering a range of well-being outcomes (Fuller et al. 2007). The quality of nature, such as the richness of bird species and the number of different habitats experienced in a natural place, have been shown to improve the sense of well-being. Also, the presence of water bodies can elicit a positive outcome for psychological well-being (Shanahan et al., 2015).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Broader population-level studies have shown that increased green space is associated with reductions in deaths from cardiovascular disease (Mitchell and Popham, 2008) in asthma (Lovasi et al., 2008), and better general or self-reported health (Maas et al., 2006; Shanahan et al., 2015).

On an individual level, exposure to nature has also been shown to correlate with reduced stress or anxiety (Van den Berg and Custers, 2011), improved cognitive ability (Berman et al., 2008), reduced allergies (Hanski et al., 2012), enhanced social cohesion (Groenewegen et al., 2012) and enhanced happiness (MacKerron & Mourato, 2013; Shanahan et al., 2015). The most significant body of research to date has shown a strong positive correlation between exposure to nature and psychological well-being measured in a range of ways, including mental restoration, self-esteem, and anger (Hartig et al., 2003); blood pressure and heart rate (Hartig et al., 2003); and recovery times from illness (Ulrich, 1984).

The appropriate time frame for measuring different responses varies, because the effects of nature on a person have the potential to be immediate or delayed. Although many studies have shown that natural landscapes enhance the psychological well-being of individuals, the stress theory proposed by Ulrich (1983) suggests that increased complexity and crowding of vegetation (as a measure of nature quality) could decrease a person's feeling of safety and increase stress (Shanahan et al., 2015).

Nature in the City, a Fort Collins program that supports the protection and integration of nature, could be a good resource for Waters' Edge. One program goal is to provide residents easy access to nature within a 10-minute walk. Another is to have high-quality natural spaces that offer diverse social and ecological opportunities and support healthy environments for people and wildlife. The Nature in the City strategic plan outlines 33 polices that identify key outcomes categorized into five broad policy areas of connectivity, land use and development, city practices and policy coordination, long-term monitoring, and funding and incentives (http://www.fcgov.com/planning/natureinthecity).

Life-long Learning

Many boomers are thinking of retirement and aging in a whole new way -- with an emphasis on active, intellectually enriched living that includes mentoring, volunteering, and life-long learning. Life-long learning has become a catchphrase in the U.S. and abroad, and the results of many studies support the benefits of learning to seniors' mental, physical, and social health. These include improvements in self-esteem, ability to express ideas, feelings of being heard and overall improved well-being. These findings suggest the need to promote life-long learning as a way of life for all seniors through activities such as teaching and learning at community colleges, volunteering as docents at museums or art centers, and becoming involved in other cultural institutions (Moeller, 2009). Lifelong learning programs are becoming a popular business opportunity for a growing roster of colleges and universities, retirement communities, travel companies, and cultural institutions that need a flexible, cost effective, and knowledgeable workforce (Moeller, 2009).

Learning is beneficial for well-being at any age; generally, the higher the level of educational attainment, the better the health outcomes, including longevity. For example, after age 65, women without a high school diploma have a 36 percent higher mortality rate (chance of death) than women with a college degree (Hummer & Lariscy, 2011). Continuing to learn can mitigate some of the health declines typically associated with aging. Cognitive decline can be slowed or even reversed by actively engaging in learning activities (Shaie, 2005). Research by the Alzheimer's Society (www.alzheimers.org.uk) shows that learning activities in the late stages of life can delay the onset of the disease and reduce dependency on welfare support (The Guardian).

Greater knowledge about healthy lifestyles and how to efficiently use the health care system can lead to more healthful behaviors, such as quitting smoking, eating healthier foods, and increasing exercise. A Manninen & Meriläinen (2011) study indicated that participation in adult education generates multiple benefits for individuals and society, with between 70 and 87 percent of respondents experiencing positive changes in learning motivation, social interaction, general well-being, and life satisfaction. More specifically for the older participants, learning is a "cushion" softening difficult age-related changes like retirement, loss of friends and family members, and a decline in skills.

Learning can also help seniors deal with stress in their lives. Numerous studies indicate that adults often engage in learning activities to cope with major events and transitions. For example, 83 percent of the learners in one study described some past, present, or future life change as a reason for engaging in more education/learning (Aslanian & Brickell, 1980). However, many educational programs for seniors focus almost exclusively on leisure and enrichment learning. Adult educators need to move beyond leisure/enrichment learning and also create programs that help older adults adjust to the physical, mental, and psychological changes that occur with age. Additionally, to keep older adults excited and interested in what they are learning, adult educators need to design courses that teach knowledge and skills within a meaningful, personally relevant and useful context. An example might be learning Internet skills that can be taught by engaging older adults in genealogical and health-related research, or sending e-mails to their grandchildren (Duay & Bryan, 2006).

At many community colleges and universities, courses are taught by people in the community who are knowledgeable and passionate about a topic – such as seniors. Lasell College in Newton, Massachusetts, in 2000 also developed its own retirement community, Lasell Village, whose residents must agree to participate in classes, outside learning, and community participation to be eligible to live in the village (Moeller, 2009).

Volunteering and Mentoring can increase a senior's sense of purpose, meaning, and satisfaction, and lead to greater self-esteem, often at a time in life when many older adults may feel depressed or isolated. Tutoring an elementary student or mentoring a young adult provides the chance to transfer knowledge, skills, and values to the next generation. Seniors indicated that mentoring and volunteering made them feel like true contributors to society. They viewed learning as a shared experience in which teachers became learners and learners became teachers (Abramson, 2004).

Intergenerational Programs encourage seniors to continue being involved in the community – to give of their time and knowledge in exchange for the personal satisfaction that comes with volunteering and mentoring. With seniors as supportive role models, children and youth benefit from increased knowledge, skills, and self-esteem, and are more motivated to learn and develop better leadership and communication skills. Numerous programs around the country match seniors with children and youth who need extra attention and will benefit from forging a strong relationship with an older adult. Professionals and social service agencies find that intergenerational volunteer programs are creative and cost-effective in serving the increasing needs of youth and seniors. Intergenerational volunteer programs also have positive community-wide impacts (Abramson, 2004). A few examples of programs are:

- **Foster Grandparent Program** – Part of Senior Corps, a network of national service programs that provide seniors opportunities to put their life experiences to work for local communities, the Foster Grandparent Program arranges mentors, tutors, and caregivers for at-risk children and youth with special needs through community organizations, including schools, hospitals, drug treatment facilities, correctional institutions, and Head Start and day-care centers (www.seniorcorps.org/joining/fgp/index.html).
- **Shoreline/Lake Forest Park Senior Center** – Located in the Seattle area, the center's Power of One matches senior volunteers with schoolchildren to provide help in the classroom with studying or reading skills, and to work on classroom projects (http://www.seniorservices.org/sc/shoreline.asp).

6.1 Physical Activity

A well-designed built environment allows older adults the opportunity to participate in activities that increase physical activity. Most people age 50 and older drive themselves to get around their neighborhood (Binette, 2015), a finding that was supported by the survey conducted for this HIA. Built environments can be designed to encourage alternate means of transportation, including safe walking and biking trails to nearby destinations as a way to increase access to healthy activities. Considering the physical ailments from aging and their associated costs, including medical care and assisted living facilities, it would be socially and economically beneficial to improve aging adults' overall health and quality of life through the physical and social environment.

Transportation options and connections to a variety of services and activities--such as grocery stores, restaurants, shops, theaters, libraries, hair salons, gardens, places of worship, and farmers' markets--keep aging populations healthy and engaged. One review of studies showed that access to places for physical activity, combined with outreach and education, can produce a 48 percent increase in the frequency of physical activity (Centers for Disease Control and Prevention website, 2013).

Benefits of Physical Activity

The multiple benefits of physical activity for promoting well-being are undeniable, particularly among aging adults (King & King, 2010; Meisner et al., 2013). Physical activity is an effective practice to maintain active and independent aging. Moderate and high levels of physical activity are associated with healthy aging outcomes such as:

- living to an advanced age (Meisner et al., 2013);
- few or no disabilities (Meisner et al., 2013); and
- a low probability of disease or disease-related disability, high cognitive and physical functioning, and active engagement with life (Baker et al., 2009).

Calorie expenditures vary depending on the exercise, its intensity level, and the individual's weight. For someone weighing 160 pounds, one hour of high-impact aerobics will burn about 533 calories, low-impact 365 calories, water aerobics 402 calories, and walking two mph will burn 204 calories.

Similarly, physical inactivity was associated with more frequent reporting of disease and disability, low functional capacities, and being socially disengaged with life (Meisner, Dogra, Logan, Baker, & Weir, 2010). These three health outcomes are commonly used criteria for unhealthy aging (Meisner et al., 2013).

Reasons Why Seniors Don't Exercise

Despite the evidence, the majority of older adults do not engage in physically active lifestyles (Meisner et al., 2013) and adherence to physical activity programs is often low (Thurston & Green, 2004; Meisner et al., 2013). Research on the barriers to participating in physical activity for older adults shows that maximizing the safety and attractiveness of a walking path is more important than minimizing the distance to a destination. Safety emerged as the biggest concern that limits walking for everyday activities and exercise, according to participants in the Waters' Edge HIA survey and the Health and Wellness Survey conducted by the Foundation on Aging. The Waters' Edge survey found that primary safety

concerns were busy streets with heavy traffic and unsafe street crossings. Traffic lights that provide pedestrian signaling and offer additional time is important for the aging population to safely cross streets. Studies have documented the importance of destinations within walking distance as a key motivator for walking, suggesting that higher densities, greater connectivity, and mixed land uses support walking (Handy & Clifton, 2001). Older adults are more likely to engage in physical activity if they have nearby local services, favorable walking and traffic conditions, such as sidewalks and low traffic speeds, pleasant neighborhood aesthetics, such as parks and trees, and are able to access public transit (Strath et al., 2007).

The Waters' Edge HIA survey participants said factors that encourage walking for exercise included low traffic volume and slow speeds, proximity to walking paths and/or natural and undeveloped areas, and safe places to walk, with good lighting and smooth even sidewalks or paths that reduce the fear of falling.

The vast majority (95 percent) of older adults exercise at least once a week, and walking is the most common form of exercise, according to AARP and the Larimer County Partnership for Age-Friendly Communities (PAFC). PAFC respondents identified health issues, not having good places to walk, safety issues such as fear of falling and poor sidewalks, and having no desire to exercise as barriers to walking. The Waters' Edge HIA survey participants said factors that encourage walking for exercise included low traffic volume and slow speeds, proximity to walking paths and/or natural and undeveloped areas, and safe places to walk, with good lighting and smooth and even sidewalks or paths that reduce the fear of falling. In addition, walking could be encouraged with places to sit and rest; convenient restrooms and water fountains, and places such as a circuit or stationary treadmill to walk indoors in inclement weather. Other forms of exercise, such as dancing, swimming, bicycling, and low-impact balance/flexibility/cardio workouts also support health and well-being. New research by Dr. Jonathan Skinner reveals the social, mental, and physical benefits of social dancing for older people. Dancing staves off illness and counteracts decline in aging, according to studies of older people in Northern Ireland, Blackpool, England, and Sacramento, California (Skinner, 2009). Swimming is the fourth-most-popular sports activity in the U.S. (US Census Bureau, 2009), and is especially beneficial for older people, who can exercise longer in the water than on the land without increased effort or pain (Broman et al., 2006; Cider, 2006). Water-based activity can alleviate symptoms of chronic disease and aging, including improving joint function for those with arthritis and osteoarthritis (Westby, 2001; Hall et al., 1996; Bartels et al., 2007), decreasing disability (Sato, 2007), and maintaining bone health (Rotstein, 2008). Bicycling is another popular option of an enjoyable form of exercise with a relatively low cost that also provides an environmentally sustainable form of transportation. Bicycling appeals to all ages as an activity to do with children or grandchildren that is both fun and health-enhancing. Surveys show that 60 percent of Americans would ride a bicycle if they felt safe doing so, and eight out of 10 agree that bicycling is a healthy positive activity (AARP, 2014). Playgrounds that feature low-impact equipment for increasing balance, flexibility, and cardiovascular fitness (see image at left) have become increasingly popular as well (Renzulli, 2012).

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Exercise and Falls

The National Safety Council reports that each week more than 30,000 Americans over the age of 65 are seriously injured by falling, and nearly 250 die as a result (AARP website, 2015). According to a Rand Report (2003), exercise interventions reduced the risk of falls by 12 percent and the number of falls by 19 percent. Exercises that improve lower-body strength and balance have been shown to reduce the risk of falls by between 10 and 40 percent (Rubenstein & Josephson, 2002). Tai chi, a Chinese martial arts discipline combining yoga and meditation, seems particularly effective in reducing falls (Wolf, 2003). The Centers for Disease Control and Prevention confirms the practice of tai chi to improve balance and prevent falls, especially among individuals 60 and older (AARP, 2010).


5 Aug 2015.tinyurl.com/7jlbre7

Physical, Social, and Psychological Benefits of Pet Ownership

Numerous studies in the U.S., Britain, and Australia have shown positive health outcomes from pet ownership. The benefits align with the public health goals outlined in the CDC's *Healthy People 2000* related to increasing physical activity and fitness and improving mental health (Jennings, 1997). The "pet effect" accounts for physical, social, and psychological benefits that support healthy living, longevity, and a sense of meaning.

It is not clear why pets provide health benefits (Herzog, 2011). A potential negative aspect of pet ownership is the increased risk of falling because of a pet. Two factors, however, might explain why pet ownership and care are associated with positive health outcomes: companionship and increased social interaction. These two influences are particularly important for those at risk of social isolation, such as the elderly.

Despite the responsibility and added cost of a companion animal, pets provide a sense of meaning and purpose, since domestic animals depend on humans for care (Tuan, 1984). Pet ownership is associated with better self-care, perhaps a major reason for the positive health benefits of animals in the home (Dembicki, 1996). Dog ownership increases physical activity, walking in particular, compared to not having a dog (Johnson, 2010). Pet ownership and care also are associated with significant cardiovascular benefits. Petting dogs was shown to lower systolic and diastolic blood pressure (Baun, 1984; DeSchriver, 1990), and cardiac patients with pets were less likely to die in the following year following a heart attack compared to cardiac patients without pets (Friedmann et al., 1980; Friedmann, 1995). Pet care also is associated with lower triglyceride levels (Anderson et al., 1992).

Animal companions seem to improve mental health. Nursing home inhabitants reported a significant positive change in mood from visits of volunteers with dogs compared to visits without dogs (Lutwack-Bloom, 2005). Attachment to pets has been linked to lessened feelings of loneliness (Katcher, 1982; Cohen, 2002) and less depression in the elderly bereaved, especially for those who had few confidants (Garrity, 1989). Pets act as social catalysts, leading to more social interaction with others, including strangers. (McNicholas, 2000). While most research focuses on individual benefits, at least one study suggests that owning a pet has a positive effect on the community by encouraging conversations (Salmon and Salmon, 1981; Rogers et al., 1993; Wood and Giles-Corti, 2005), social cohesion, and a sense of belonging (Wood and Giles-Corti, 2005).

6.2 Physical Health and Mental Well-being Recommendations

Mental/Spiritual Health
Consider providing residents transportation options to nearby churches or spiritual centers and providing access to church or spiritual activities at the Phase II recreation center.
Offer classes on the benefits of access to nature and physical activity online or at the recreation center in Phase II, in collaboration with faculty or students from Colorado State University (CSU), or community organizations or agencies such as the Health District of Larimer County.
Create open space areas, including naturally filtered stormwater ponds, to support wildlife habitat and diversity and to provide aesthetically pleasing environments, as specified in the development design.
Offer views of nature from all homes and public spaces to create the effect of a cohesive natural environment and to encourage the health benefits of natural views.
Establish a life-long learning classroom at the clubhouse and also at the Phase II recreation center.
Work with CSU, Front Range Community College, and other institutions to provide opportunities for Waters' Edge residents to teach courses and for faculty to teach classes at Waters' Edge.
Offer Waters' Edge residents information and opportunities to volunteer and mentor in the community.
Offer classes in relevant subjects such as financial planning and recording life histories.
Facilitate teaching, volunteering, and mentoring with children and youth, such as in a foster grandparents program, as a community activity.
Collaborate with Fort Collins' Nature in the City program to encourage the enhancement of natural places at Waters' Edge.
Physical Activity
Provide opportunities for social and physical engagement at the clubhouse and Phase II recreation center with activities such as group pool exercises, Tai Chi, yoga, and dance nights.
Provide a dog park to support the health benefits of exercise and companionship for dog owners.
Improve bicycling facilities such as bike lanes, and in Phase II, install bike racks near retail shops and services.
Create wayfinding signs at intersections, along paths, at the city park and other destinations, noting the mileage/steps between destinations, calories burned, and other fitness information.
Provide shady places to stop with natural viewpoints, and offer information about the site's ecology and natural habitats.
Provide restrooms and water fountains at regular intervals on paths and at destinations.
Develop even, smooth, well-lit sidewalks and paths to reduce the fear of falling.

Provide opportunities to exercise, even in inclement weather, with dedicated space in the Phase II recreation center for walking and with equipment such as treadmills and stair climbers.
Conduct a baseline health survey of Waters' Edge residents with CSU faculty and students, and monitor and evaluate survey responses periodically in years to come.

7.0 Monitoring and Evaluation

The final steps of an HIA are monitoring and evaluation. Monitoring is using a systematic review to observe and check the progress or quality of the recommendations over a period of time. This section focuses on which individuals, firms, agencies, or organizations could follow up on the recommendations to support and ensure implementation.

A systematic evaluation assists with determining the worth or significance of the HIA in influencing and making changes to the Waters' Edge community design and construction. An evaluation should be conducted that could include determining whether the HIA met the goals of the North American HIA Practice Standards (Bhatia et al., 2014), whether the recommendations were adopted into the community design, whether the City Council adopted the HIA and community design, and long-term, whether residents of Waters' Edge were pleased with their quality of life, their health, and the design and programming for their community.


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The final recommendations are intended to serve as a foundation for responding to the public health issues and concerns identified through the HIA process. The recommendations should be considered by firms, agencies, and organizations that have a role in meeting the needs of the future Waters' Edge residents and residents of adjacent neighborhoods.

The draft HIA was sent to the developer, Actual Communities, and the University of Colorado Health for review. It will also be shared with the Larimer County Partnership for Age-Friendly Communities and many others. The final HIA report will be included with the development plan when it is submitted for approval to the Fort Collins City Council. The HIA was commissioned by the developer to support, with research, many ideas already included in the plan, to conduct interviews to refine ideas, and to add new recommendations to be considered in the community design. Most of the recommendations are related to the built environment; some are programmatic, and a few are policy-related. Adopting the HIA recommendations as part of the community design will incorporate public health considerations in the planning, design, and development processes.

A number of institutions, agencies, and organizations, such as the Colorado State University (CSU) and the Health District of Northern Larimer County, could assist with monitoring and implementation of the recommendations and potentially serve as a resource to address the HIA recommendations. Many organizations and initiatives in Fort Collins, such as Nature in the City, the Gardens on Spring Creek, the Food Co-op, Meals on Wheels, the Audubon Society, the Larimer County Partnership for Age-Friendly Communities' Health and Wellness Committee, could assist with support and implementation.

An important step in evaluating the HIA and the health of future Waters' Edge residents would be to work with CSU faculty and students to develop and conduct a baseline resident health assessment and to monitor and re-evaluate measures periodically, every two to three years initially and then every five years. Evaluation could include measuring blood pressure, blood glucose, weight, and mental health. Residents, homeowner association (HOA) board members, and neighbors should be interviewed as part of the assessment, to assess how the HIA may have improved the quality of health and well-being of residents and neighbors through physical and program amenities such as gardens, a senior

playground, universally designed home features, use of open space, use of walking paths and sidewalks, and opportunities for socializing and learning.

7.1 Conclusion

A positive future for people aging in place is about creating a built environment that accommodates the changing needs of aging adults while supporting independence, social and physical engagement, and safety. Health is a vital theme in successful aging, along a satisfying lifestyle, a positive attitude, close relationships, independence, happiness, appreciation for life, and personal growth (Duay and Bryan, 2006).

The Waters' Edge HIA has reported on the results of two surveys of seniors in the Fort Collins and Denver areas of Colorado's Front Range, discussed research related to healthy and active senior living, and proposed recommendations to support the needs of the age 55 and older population to be able to age in place at Waters' Edge.

Some of the needs and adjustments for healthy and active aging include flexible housing design, places to gather and socialize as a community, convenient access to healthcare, spaces that promote exercise, engagement, and vitality, and an overall sense of safety. Living spaces should be constructed to support the effects of aging with features like well-lit interiors and exteriors, master bedrooms on the main level, stoves that turn themselves off, and large bathrooms with walk-in showers that have safety features such as seats and grab bars. Exterior spaces should include wide, flat, and evenly paved sidewalks, safe and accessible areas for exercise and social interaction, pleasant gathering spaces with shade and a variety of seating options, and natural areas for activities such as birding and gardening to encourage people to get outdoors. The aging population also requires access to supportive healthcare and physicians, with on-site physical and occupational therapy practices, quick and efficient first responders, and a nearby hospital.

Every development project informs more communities, developers and decision-makers about the links between the built environment and health and about how an HIA can be used constructively to achieve common goals and facilitate dialogue. The current Waters' Edge development plan goes a long way in promoting healthy living for an aging community. The recommendations contained in this HIA are guideposts to creating an exceptional community that promotes health, safety, and well-being for residents of all ages and abilities.

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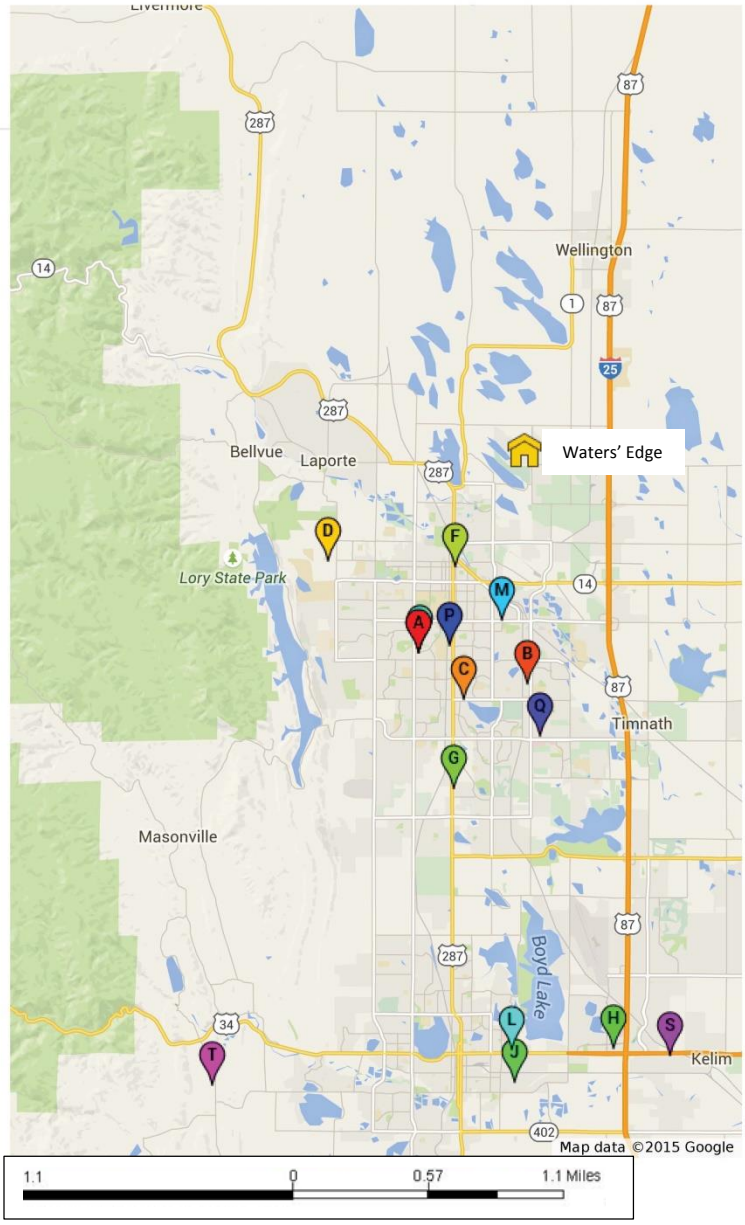
Waters' Edge Development

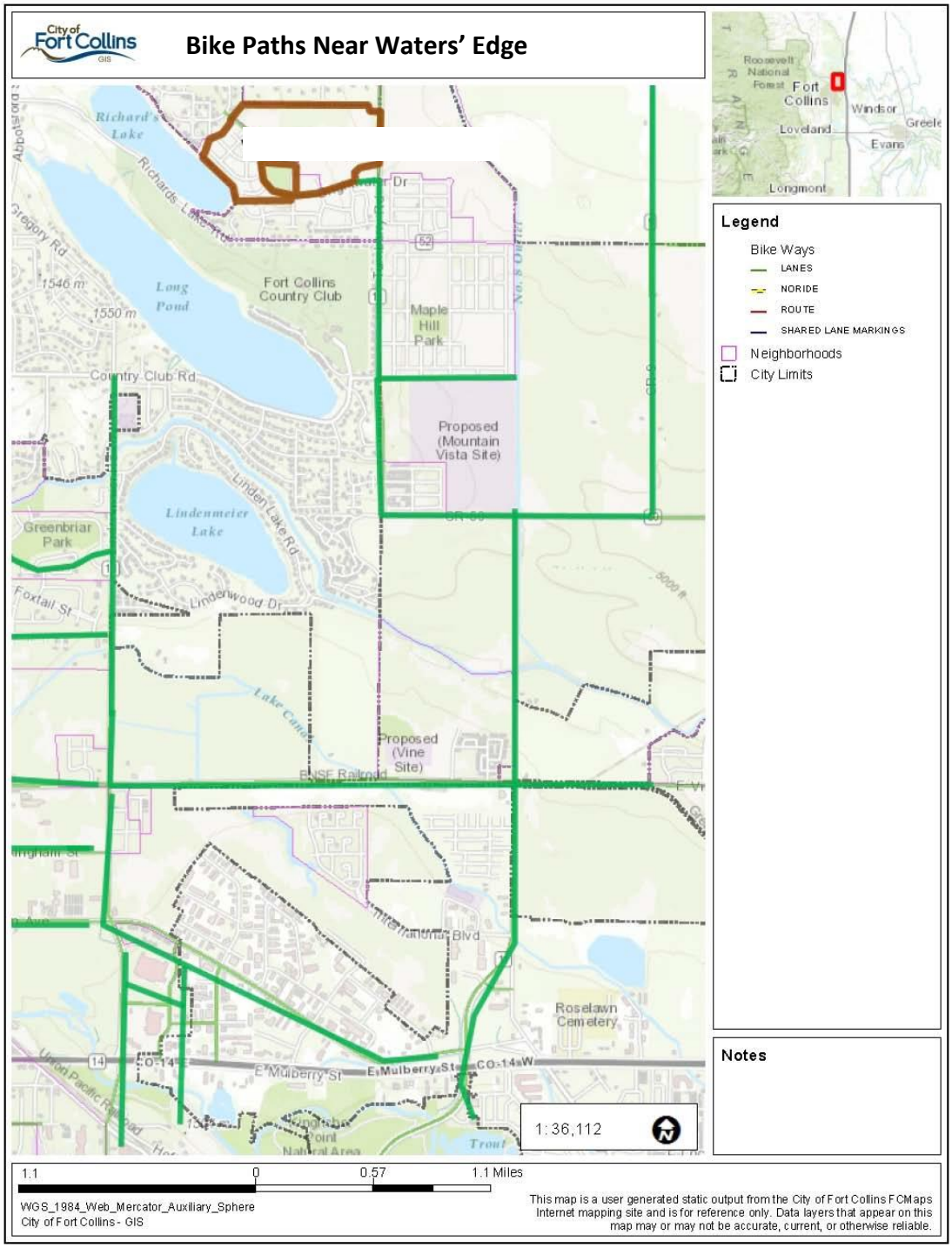
Waters' Edge Development Location

Waters' Edge

Healthcare and Physical Therapy Services

- Poudre Infusion Therapy, LLC
- Interim HealthCare of Ft. Collins CO
- Evergreen Home Health Care
- Apria Healthcare
- Caring Hearts Home Healthcare
- Nurse Next Door
- Big Tree Inc
- Vitality Home Healthcare | Northern Colorado Home Health Care Agency
- Columbine Poudre Home Care
- Preferred Homecare
- Columbine Health Systems
- Scott Family Health Loveland
- Fort Collins Physical Therapy and Sports Center
- Longmont Spine and Physical Medicine
- Harmony Hand-Physical Therapy
- Rebound Sports & Physical Therapy




Bike Paths Near Waters' Edge
Legend
Bike Ways
LANES
NORIDE
ROUTE
SHARED LANE MARKINGS
Neighborhoods
City Limits
Notes
Fort Collins Country Club
Maple Hill Park
Proposed (Mountain Vista Site)
Proposed (Vine Site)
Greenbriar Park
Lindenmeier Lake
Long Pond
Richard's Lake
Roselawn Cemetery
Country Club Rd
Linderwood Dr
Lake Canal
BNSF Railroad
E Mulberry St
CO-14
1:36,112
1.1 0 0.57 1.1 Miles
WGS_1984_Web_Mercator_Auxiliary_Sphere
City of Fort Collins - GIS
This map is a user generated static output from the City of Fort Collins FCMaps Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

Recommendations and Monitoring Table

The table below is a compilation of all the recommendations from this HIA. It offers a monitoring plan that indicates which plan the recommendation should be incorporated into and the organization or agency that should provide follow-up. The column on the right indicates status--whether action toward the recommendation has been completed. It is important to recognize that this HIA is a "living document," especially within the monitoring plan, and any changes from the HIA, such as adoption of recommendations, can be updated and shared with others. Some opportunities for follow-up, adoption, and implementation are already being addressed, for example in the landscape plan, or through the involvement of agencies and organization such as City of Fort Collins, Colorado State University, the Health District of Northern Larimer County, Nature in the City, Spring Creek Community Garden, Food Co-op, Meals on Wheels, Northern Colorado Local Food Cluster, Audubon Society, and Larimer County Partnership for Age Friendly Communities' Health and Wellness Committee.

Recommendation	Follow-up/Monitoring	Status 8/2015
SURVEY FINDINGS		
Focus on green, dog-friendly walking paths and less on bike paths. Develop paths for walking only, with no bikes allowed.	Future landscape plan	Not completed
Develop smaller homes with some units being more affordable to seniors at lower-income levels.	In development design	Completed
Reinforce elements in the development design, such as accessory dwelling units or in-law suites, to house family members, caregivers, and caretakers, or to provide rental income.	In development design	Adoption completed
Investigate barriers and educate residents about using public transportation, including free shuttles for disabled seniors. Provide a dedicated resident transportation coordinator. Provide bus schedules, bike maps, and other transportation alternative resources.	Future on-site coordinator	Not completed
Provide a recreation/community center that offers fitness, social, and cultural activities with a variety of facilities and programs such as bowling, woodworking, pottery, book club, movie showings, and golf.	Phase II design	Not completed
Offer cardio-pulmonary resuscitation (CPR) training, and consider installing automated electronic defibrillators (AEDs) throughout the development and at the clubhouse and recreation center.	CSU, American Red Cross, community college, or other institution for CPR; HOA or special district for AED installation	Not completed
Consider parklets with covered benches to provide resting places. Parklets are sidewalk extensions that offer a place to sit while taking in the activities on the street.	All phases near retail	Not completed

Design exercise stations along a community path, with signs that show exercises graphically and explain them in large print.	Detailed design Phase I; CSU faculty and students or Health District of Northern Larimer County for information on signage	Not completed
WATERS' EDGE DEVELOPMENT DESIGN ANALYSIS		
Expand recreational opportunities along Richard's Lake–fishing pier, restrooms, benches—to create activity and gathering spaces and a destination for walking and biking.	HOA for Richard's Lake neighborhood; current and future landscape plan	Partially completed
Enhance landscaping and recreation opportunities at detention pond--walking trail and seating area overlooking natural area. Consider creating overlooking a small grove of cottonwood trees around a culvert at the SW corner of the site (see Map B).	Nature in the City, Audubon Society; future landscape plan	Not completed
Provide ample open areas for gathering spaces and shade structures, picnic shelters, gazebos, shaded benches, plazas for events that also support chance meetings among residents. Install planters throughout the development with herbs for cooking and chance meetings.	Significant amount of open space in development plan; future landscape plan	Partially completed
Enhance playground with multigenerational play structures (see Chapter 6.1 Physical Activity) and a nearby bathroom. Include residents, their grandchildren, neighbors, and local youth in a "redesign day" for the playground.	City of Fort Collins; potential funding for multigenerational play structures from Humana health insurer and KaBOOM! nonprofit (both have funded similar projects in other states)	Not completed
Seek Fort Collins approval for additional trail access to the playground from the north and east, in addition to the current south and west access points.	City of Fort Collins; future landscape plan	Not completed
Improve pedestrian crossings at major intersections/crossing points, such as Morningstar Way and Brightwater Drive, and at the existing city park, which is used by families and children from the adjacent subdivision (see Map A).	City of Fort Collins; detailed Phase I design	Not completed
Develop a roundabout to establish an entry point and create a sense of place, a frame for the neighborhood, and possibly a venue for public art.	One roundabout in development design; CSU faculty and students for art at roundabout and other places	Partially completed
Develop better access to services for daily needs—café/coffee shop, grocery store, shops, recreation center--to provide	Phase II design	Not completed

walking/biking destinations, meeting places, an alternative to long drives for services.		
Create a two-mile walking path around Phase I perimeter and options for one-quarter and one-half-mile loop trails. The two-mile path would include Richard's Lake, a project that could be undertaken with the adjacent subdivision (see Map A).	Separate plan prepared	Completed
Reduce the number of driveways that cut across sidewalks, and develop more shared or paired driveways for adjacent houses and alleyways behind houses. If some driveways across sidewalks are needed, ensure adequate sight lines on both sides of driveways. Restrict evergreens other than low-growing or ground-cover juniper within 30 feet of driveways and street trees or shrubs within 10 feet of drives. Restrict shrubs taller than three feet within tree lawns.	Phase I design (mix of alleys and driveways); revised landscape plan; design has pathways in "ribbon" parks within green space behind homes	Partially completed
Develop shade structures, such as canopies or grape/vine arbors, and shaded benches at rest points along major walking routes.	Phase I landscape plan	Not completed
Develop way-finding signage, featuring large print and maps with distances and calories burned, and locate at key intersections of streets and trails. Install bathrooms/water fountains along walking paths and bike trails, and at the clubhouse area. Also publish large-print maps.	Detailed Phase I design	Not completed
Create visual landmarks for way-finding at prominent corners, using distinctive colors or architectural designs reflecting neighborhoods, tower elements, walls, fences, mail kiosks, public-art, shade structures, entry monuments, or maintenance structures.	CSU art and landscape Architecture students or University of Colorado Denver Planning and Architecture students	Not completed
Ensure Americans with Disabilities Act (ADA) compliance for all walkways and residential courtyards. Provide landscaping with shade trees and benches for sitting/resting.	Detailed Phase I design; future landscape plan	Not completed
Integrate a mix of housing units, sizes, and price points, where possible, to encourage diversity and a more socially integrated and visually interesting community. Add townhomes and apartments to single-family neighborhoods, adjust lot sizes, and add different housing types to edges/corners.	Phase I development design	Completed where possible
Program events and activities at various points within the community to encourage easy access and mingling for residents.	Potential on-site coordinator	Not completed

Offer convenient, safe, accessible, and low-cost alternatives to driving with transportation options, such as a car-share service, community ride-pool, and ADA-accessible shuttle to connect residents to social activities, economic opportunities, and provide easy access to medical care, grocery stores, and other needed daily services.	Future on-site coordinator; City of Fort Collins; FOCO shuttle for disabled	Not completed
Offer wellness programming--yoga and meditation classes, nutrition counseling, mobile check-ups, flu shots--at clubhouse, and recreation center, and, if possible, healthcare services in Phase II town center.	CSU faculty and students and other non-profits; Health District of Northern Larimer County	Not completed
Develop safe pedestrian and bike crossings and wayfinding between Phase I and Phase II town center destinations (see red circles at crossing areas in Map B).	Detailed Phase I design, Phase II design	Not completed
Extend bus service to Waters' Edge. The minimum density required to secure bus service could be reached with Phase II development and another future development on Mountain Vista Drive. If a bus stop is not proposed closer to the development, a proposed bus stop at Mountain Vista and Summit View is approximately 1.75 miles from the southwest corner of Waters' Edge at Turnberry Road and Brightwater Drive. Residents could ride a bike to the station, or a shuttle service could be provided to the proposed bus stop from the Waters' Edge community.	City of Fort Collins Transfort; future on-site coordinator	Not completed
Enhance pedestrian safety with crosswalks, curb extensions and special paving at primary crossing points between Phase I and Phase II development (see red circles on Map B), and consider other traffic control devices.	Detailed Phase I design	Not completed
ACCESS TO COMMUNITY SERVICES & AMENITIES		
Develop a large (25-plot) community garden in a main common area, possibly near existing city park, to include people from surrounding neighborhoods. Also develop smaller gardens on the east and west sides for easy access to fresh food, healthy activity, and social interaction. Provide raised beds, drinking water, and seating and shade for rest breaks and socializing. Provide a grey-water irrigation system for gardens, a compost area, and small	Future landscape plan; City of Fort Collins' Spring Creek community garden (http://www.fcgov.com/gardens); Northern Colorado Local Food Cluster (see http://www.nocofoodcluster.com/background/) University of Colorado Health CanDo program; Plan with help from City of Fort Collins' community gardens (see http://www.fcgov.com/gardens).	Not completed

greenhouse to extend the growing season. Program garden with workshops, tours, and plant sales.		
Install a kiosk at the community gardens with gardening instructions and information about fruits, vegetables, and nutrition in large type. Share information and links to CSU and master gardener programs.	CSU and master gardener programs; City of Fort Collins' Spring Creek community garden (http://www.fcgov.com/gardens); future landscape plan; Colorado Local Food Cluster (http://www.nocofoodcluster.com/background/	Not completed
Design a community kitchen and other gathering places and programming for food preparation classes to encourage the use of the gardens and for social engagement and to promote healthy eating habits and lifestyles.	Phase II design; CSU classes, healthy cooking classes at the City of Fort Collins' Spring Creek community garden (http://www.fcgov.com/gardens); Colorado Local Food Cluster (http://www.nocofoodcluster.com/background/	Not completed
Ensure Waters' Edge Phase II development includes a small-scale grocery store with fresh fruits and vegetables.	Phase II design	Not completed
Work with Meals on Wheels and other local nonprofits to ensure access to food before Phase II is built. Partnering with organizations is especially important if a grocery store is not able to locate within or near the development.	Meals on Wheels (http://www.fcmow.org/), Food co-op (http://fcfood.coop/)	Not completed
Provide space at the Phase II town center that may be used for a seasonal farmers' markets and work to integrate produce from Waters' Edge orchards and gardens.	Phase II design plan	Not completed
Offer telehealth at Phase I clubhouse and at Phase II recreation center, with devices to assess blood pressure, weight, and pulse oximetry and private monitors available for residents to communicate with healthcare providers via video service. Telemedicine is particularly important if a health clinic is not able to locate within Phase II development.	CSU faculty and students; healthcare facilities; Poudre Valley Hospital	Not completed
SAFETY INSIDE AND OUTSIDE THE HOME		
Work with the Fort Collins City Council to adopt a policy on universal design, livability, and age-friendly communities.	FOCO Mayor and Council; Partnership for Age-Friendly Communities (PAFC)--Health and Wellness	Not completed
Develop traffic-calming measures such as curb extensions to keep speeds between 20 and 35 mph on Turnberry Road, and to ensure safety at key intersection crosswalks.	Detailed Phase I design; homeowners association (HOA)	Not completed
Exterior—Provide: • Low-maintenance exterior (vinyl, brick) • Low-maintenance shrubs and plants • Deck, patio, or balcony surfaces no more than one-half inch below interior floor level	Detailed housing design	Not completed

Garage or Carport—Provide: • Wider than average carports to accommodate lifts on vans • Door heights at least 9 feet to accommodate some raised roof vans • 5-foot minimum access aisle between accessible van and car in garage	Detailed housing design	Not completed
Overall Floor Plan—Provide: • Main living on main level, with full bath • No steps between rooms or areas on the same level, no sunken areas • 5-foot by 5-foot clear/turn space in living area, kitchen, a bedroom and a bathroom • Hallways a minimum of 36 inches wide (wider preferred) and well-lit • Easy-to-operate rocker-style light switches, rather than traditional toggle switches • Smoke and carbon monoxide detectors on every floor, audible in all bedrooms • Interior doors 32 inches of clear width, requiring a 36-inch door • Levered-door hardware • Smooth, nonglare, slip-resistant flooring surfaces, both interior and exterior • Flooring color/texture contrast to indicate change in surface levels • Low-pile (less than one-half-inch) density carpet with firm pad • Lever handled or pedal-controlled faucets, thermostatic or anti-scald controls, pressure-balanced faucets • Backup power sources in case of a power outage	Detailed housing design	Not completed
Windows—Provide: • Plenty of windows for natural light • Lowered windows or taller windows with lower sill height • Low-maintenance exterior and interior finishes • Easy-to-operate hardware	Detailed housing design	Not completed
Entrances and Exits—Provide: • No-step, no-trip, preferably flush threshold, exterior maximum of one-half-inch beveled, interior maximum of one-quarter inch • Lever-style door handles • Security peephole or viewing panel on the exterior door • Bench near exterior door for placing packages while locking or unlocking the door	Detailed housing design	Not completed

• Sensors on outdoor light fixtures to automatically turn lights on at dusk and off at dawn and/or when motion is detected • Large easy-to-see address numbers visible from the street • Even and smooth pavement on exterior walkways • Wide doorways, 32 inches of clear width, with at least a 36-inch-wide door • Doors with swing-away or swing-clear hinges • At least one no-step entry with overhead cover • Sensor light at exterior no-step entry focusing on the front-door lock • Nonslip flooring in foyer • Doorbell in accessible location • Ramps with slope no greater than one inch rise for each 12 inches in length, adequate handrails, 5-foot landing provided at entrance, two-inch curbs for safety • Easy-to-manipulate door locks; avoid traditional thumb-activated mechanisms.		
Stairways, Lifts, and Elevators—Provide: • No-step design, or sturdy handrails on both sides (one and one-quarter-inch diameter); include horizontal step depth for easy side-stepping • Steps covered with tightly placed, woven, low-pile carpet with thin padding, • Nonslip adhesive strips applied to uncarpeted steps • Contrast strips on top and bottom stairs to increase visibility, color contrast between treads and risers on stairs • Pre-framed space for future elevator shaft in multistory homes (stacked closets), or minimum stairway width of four feet to allow space for lift • Light fixture to illuminate the stairs/soft path lighting for nighttime	Detail housing design	Not completed
Kitchen and Laundry—Provide: • Task lighting for sink, stove, and other work areas • Stove or cooktop with controls at front • Stoves that turn themselves off • Lightweight ABC-rated fire extinguisher within reach of stove • Wall support and provision for adjustable and/or varied height counters and removable base cabinets	Detailed housing design	Not completed

• Upper wall cabinetry: three inches lower than conventional height • Open shelving for easy access to frequently used items • Adjustable, pull-down or similar shelving for safe access to upper cabinets • Roll-out cabinetry shelves beneath counters, lazy susans in corner cabinets • Easy-to-grasp D-shape or loop handles on cabinets and drawers • Accented stripes on edge of countertops to provide visual orientation to the workspace • Counter space for dish landing adjacent to or opposite all appliances • Kitchen surface at appropriate height for working while seated • Multilevel work areas to accommodate cooks of different heights • Clear space for turns in wheelchair of 30 by 48 inches clear at appliances, or 60 inches diameter • Lever-touch or sensor-style kitchen faucet (ideally pressure-balanced, temperature regulated, at or below 120°F) • Pull-out spray faucet; levered handles • In multistory homes, laundry chute or laundry facilities in master bedroom • Easy-to-use front loading washer, washer and dryer on a raised platform 12 to 15 inches from floor		
Appliances—Provide: • Easy-to-read controls • Microwave oven at counter height or in wall • Side-by-side refrigerator/freezer • Side-swing or wall oven • Raised dishwasher with push button controls • Electric cook top with level burners for safety in transferring between the burners, front controls and downdraft feature to pull heat away from user; light to indicate when surface is hot.	Detailed housing design	Not completed
Bathroom—Provide: • At least one wheelchair-maneuverable bathroom on main level with 60-inch turning radius or acceptable T-turn space and 36-inch by 36-inch or 30-inch by 48-inch clear space • Shower stall only, consider no tub, to reduce chance of injury • Nonslip strips in the bathtub and/or shower • Main bath stand-up shower: curbless and minimum of 36 inches wide	Detailed housing design	Not completed

• Easy-to-use lever-touch or sensor faucets for sink, bathtub, and shower • Bracing in walls around tub, shower, shower seat and toilet for installation of grab bars to support 250 to 300 pounds • Attractive grab bars and grips in the bathtub, shower and adjacent to toilet • Adjustable/ hand-held showerheads, 6-foot hose • Fold-down seat in the shower • Tub/shower controls offset from center • Shower stall with built-in antibacterial protection • Light in shower stall • Water heater at or below 120°F to avoid scalding • Slip-resistant flooring in bathroom and shower • Toilet two and one-half inches higher than standard toilet (17 to 19 inches) or height-adjustable, or a toilet seat riser • Wall support and provision for adjustable and/or varied height counters and removable base cabinets • Contrasting-color edge border at countertops • Wall-hung sink with knee space and panel to protect user from pipes • Design of the toilet paper holder allowing roll changes with one hand • Night-lights and/or illuminated light switches in the bathroom and hallway		
Electrical, Lighting, Safety, Security—Provide: • Light switches, thermostats, and other environmental controls in accessible locations no higher than 48 inches from floor • Electrical outlets 15 inches on center from floor; may need closer than 12 feet apart • Clear access space of 30 inches by 48 inches in front of switches and controls • Rocker or touch light switches • Audible and visual strobe light system to indicate when the doorbell, telephone, or smoke or CO2 detectors have been activated • High-tech security/intercom system that can be monitored, with the heating, air conditioning, and lighting, from any TV in house • Easy-to-see and read and pre-programmed thermostats • Flashing porch light or 911 switch • Direct wired to police, fire, and EMS (as option) • Home wired for security	Detailed housing design	Not completed

• Home wired for computers		
Heating, Ventilation, Air Conditioning--Provide: • HVAC should be designed so filters are easily accessible • Windows that can be opened for cross ventilation, fresh air	Detailed housing design	Not completed
Energy-Efficient Features—Provide: • In-line framing with two-inch by six-inch studs spaced 24 inches on center • Air-barrier installation and sealing of duct work with mastic • Reduced-size air conditioning units with gas furnaces • Mechanical fresh-air ventilation, installation of air returns in all bedrooms, and use of carbon monoxide detectors • Installation of energy-efficient windows with Low-E glass	Detailed housing design	Not completed
Reduced Maintenance/Convenience Features—Provide: • Easy-to-clean surfaces • Central vacuum • Built-in pet feeding system • Built-in recycling system • Video phones • Intercom system	Detailed housing design	Not completed
Education for Safety—Provide: • Outside paths free of leaves, moss, ice, mold, or other slipping hazards • Rubber-backed rugs (or mats secured with double-sided rug tape or rubber carpet mesh) on bathroom floor, no throw rugs • Wide and clear passageways between furniture • Flashlights in multiple rooms • Automatic nightlights in hallway, bathroom outlets, and near stairs • Cell phone or other telephones available in or near multiple rooms (including the bedroom and bathroom) • Touch control lamps and devices that automatically turn lights on and off at set times • Electrical and phone cords secured along the wall to prevent tripping	Detailed housing design	Not completed
Other Ideas—Provide: • HOA maintenance for daily and weekly tasks such as landscaping, gutter cleaning, and snow	Homeowners association (HOA); metropolitan district; detailed housing design	Not completed

removal; metropolitan district for home maintenance and repair • Annual home safety assessments and a multidisciplinary approach for assessment, including a registered nurse, occupational therapist, and contractor, as a service of HOA or a metropolitan district • Extra electrical outlets to accommodate medical devices such as monitors and ventilators, with high-voltage plugs or back-up energy in the case of a power outage		
PHYSICAL HEALTH & MENTAL/SPIRITUAL WELL-BEING		
Mental/Spiritual Health		
Consider providing residents transportation options to nearby churches or spiritual centers and providing access to church or spiritual activities at the Phase II recreation center.	Local shuttle company; FOCO shuttle vans for the disabled	Not completed
Offer classes on the benefits of access to nature and physical activity online or at the Phase II recreation center.	CSU faculty or students; FOCO Nature in the City; Health District of Northern Larimer County	Not completed
Create open space areas, including naturally filtered stormwater ponds, to support wildlife habitat and diversity and to provide aesthetically pleasing environments, as specified in the development plan.	Significant open space in development design; Fort Collins Audubon Society	Partially completed
Offer views of nature from all homes and public spaces to create the effect of a cohesive natural environment and to encourage health benefits of natural views.	Detailed Phase I design	Not completed
Establish a life-long learning classroom at clubhouse and Phase II recreation center.	CSU, Front Range Community College, and other institutions	Not completed
Work with CSU, Front Range Community College, and other institutions to provide opportunities for Waters' Edge residents to teach courses and for faculty to teach classes at Waters' Edge.	CSU, Front Range Community College, and other institutions	Not completed
Offer Waters' Edge residents information and opportunities to volunteer and mentor in the community.	Future on-site coordinator	Not completed
Offer classes in relevant subjects such as financial planning and recording life histories.	CSU, Front Range Community College, and other nonprofit institutions	Not completed
Offer opportunities for teaching, volunteering, and mentoring with children and youth, such as a foster grandparents program.	http://www.seniorcorps.org/joining/fgp/index.html;http://www.seniorservices.org/sc/shoreline.asp http://www.pahouse.com/veon/lendahand/mentoring.htm	Not completed
Collaborate with Fort Collins' Nature in the City program to encourage the enhancement of natural places at Waters' Edge.	http://www.fcgov.com/planning/natureinthecity	Not completed

Physical Activity		
Install restrooms and water fountains at regular intervals on paths and at destinations.	Detailed Phase I and Phase II design	Not completed
Conduct a baseline health survey of Waters' Edge residents, and monitor and evaluate survey responses periodically in years to come.	CSU faculty and students; Health District of Northern Larimer County	Not completed
Offer opportunities for social and physical engagement at the clubhouse and Phase II recreation center with activities such as group pool exercises, Tai Chi, yoga and dance nights.	Phase II design	Not completed
Provide a dog park to support the health benefits of exercise and companionship for dog owners.	Detailed design Phase I; Phase II design	Not completed
Improve bicycling facilities such as bike lanes, and in Phase II, install bike racks near retail shops and services.	Phase II design	Not completed
Install wayfinding signs at intersections, between and within Phase I and Phase II sites, along paths, at the city park and other destinations. Note the mileage/steps between destinations, calories burned, and other fitness information to encourage physical exercise.	Phase II design	Not completed
Provide shady places to stop with natural viewpoints, and offer information about site's ecology and natural habitats.	CSU students and faculty	Not completed
Develop even, smooth, well-lit sidewalks and paths to reduce the fear of falling.	Future landscape plan	Not completed
Provide opportunities to exercise, even in inclement weather, with dedicated space in the Phase II recreation center for walking and with equipment such as treadmills and stair climbers.	Phase II design	Not completed