It is easy to overlook the individual features that constitute a community, including types and mix of land use, lot sizes, building type, size and height, setbacks, street and sidewalk widths, parking requirements, and infrastructure, all of which are controlled and regulated by land use development codes, more commonly referred to as zoning. Zoning is the primary means communities employ to control and guide land use and development decisions affecting the physical form of these places. However, zoning is a rigid, legal framework that separates uses and prescribes standards without describing or even considering what development will or should look like.

Disenchantment with conventional zoning methods combined with innovative new approaches that address current and emerging issues are now readily available to learn from and adapt. A number of these approaches focus on design and form rather than use alone. The intentions of code reform focus on the creation of better public space, pedestrian friendly streets and communities, mixing uses and reducing parking requirements, all of which can lead to increased physical activity and healthy communities.

Key terms:

Active Living, Built Environment, Mixed-Used, New Urbanism, Sprawl, Smart Growth, Recreational Physical Activity, Utilitarian Physical Activity
The genesis of this work was a studio course in the Fall of 2006 at Virginia Tech. The subject was Henry Street, in Gainsboro Virginia, a predominantly African American neighborhood of the City of Roanoke. The neighborhood is an archive of impressions and collective memories on the brink of discovery. From the very beginning, it seemed to me, that Gainsboro could be a wonderful place. A neighborhood with undulating, tree lined walking streets, shops, offices and cafés.

Since that first studio, there have been many studios, seminars and colleagues that have influenced this compilation and I am grateful for all of the feedback I have received.

I would like to express my utmost gratitude to both of my advisors, Prof. Brian Katen and Dr. Diane Zahm, for their continued support throughout the research and preparation of this document and the corresponding planning document. Your critiques, advice and guidance has been indispensable.

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Beyond the help of my professors and the faculty of the College of Architecture and Urban Studies, I would like to thank Nicolas Bertrand. You have been a constant source of support and inspiration for the last eight years; thank you for always believing in me. Finally, I would like to thank my family, for their love and support over all of these years; I could not have done this without you.
# Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title Page</td>
<td>1</td>
</tr>
<tr>
<td>Abstract</td>
<td>2</td>
</tr>
<tr>
<td>Acknowledgment</td>
<td>3</td>
</tr>
<tr>
<td>Table of Contents</td>
<td>4</td>
</tr>
<tr>
<td>List of Figures</td>
<td>6</td>
</tr>
<tr>
<td><strong>CHAPTER 1: Introduction</strong></td>
<td>7</td>
</tr>
<tr>
<td>1.1.0 Need For Research</td>
<td>8</td>
</tr>
<tr>
<td>1.1.1 Built Environment</td>
<td>8</td>
</tr>
<tr>
<td>1.1.2 Declining Trends in Public Health</td>
<td>8</td>
</tr>
<tr>
<td>1.1.3 Physical activity: Recreational versus Utilitarian</td>
<td>8</td>
</tr>
<tr>
<td>1.1.4 Breaking the Mold: Outside of Traditional Landscape Architecture</td>
<td>9</td>
</tr>
<tr>
<td>1.2.0 Intent</td>
<td>9</td>
</tr>
<tr>
<td><strong>CHAPTER 2: Literature Review</strong></td>
<td>10</td>
</tr>
<tr>
<td>2.1.1 Changing Patterns of Development</td>
<td>11</td>
</tr>
<tr>
<td>2.1.2 Understanding the built environment</td>
<td>12</td>
</tr>
<tr>
<td>2.1.3 Design for Health: Active Living, Context Sensitive Solutions, New Urbanism, Smart Growth</td>
<td>13</td>
</tr>
<tr>
<td>2.1.4 Physical Activity: Disproportionate burden of minority populations</td>
<td>16</td>
</tr>
<tr>
<td>2.1.5 Opportunities for Improvement</td>
<td>17</td>
</tr>
<tr>
<td>2.1.6 Regulatory Alternatives For Healthier Communities</td>
<td>18</td>
</tr>
<tr>
<td>2.2.0 Conclusion</td>
<td>20</td>
</tr>
<tr>
<td><strong>CHAPTER 3: Case Studies</strong></td>
<td>21</td>
</tr>
<tr>
<td>3.1.0 Purpose</td>
<td>22</td>
</tr>
<tr>
<td>3.1.1 Seaside, Florida</td>
<td>22</td>
</tr>
<tr>
<td>3.1.2 Watercolor, Florida</td>
<td>25</td>
</tr>
<tr>
<td>3.1.3 Baldwin Park, Florida</td>
<td>26</td>
</tr>
<tr>
<td>3.2.0 Case Studies in Smart Growth</td>
<td>27</td>
</tr>
<tr>
<td>3.2.1 High Point, Washington</td>
<td>27</td>
</tr>
<tr>
<td>3.2.2 Elmwood Village, New York</td>
<td>28</td>
</tr>
<tr>
<td>3.3.0 Conclusions</td>
<td>28</td>
</tr>
<tr>
<td>Synthesis and Summary</td>
<td>28</td>
</tr>
<tr>
<td><strong>CHAPTER 4: Design Research</strong></td>
<td>31</td>
</tr>
<tr>
<td>4.1.0 Overview</td>
<td>32</td>
</tr>
<tr>
<td>4.1.1 Design Process</td>
<td>32</td>
</tr>
<tr>
<td>4.1.2 The Problem</td>
<td>33</td>
</tr>
<tr>
<td>4.1.3 Critical Factors</td>
<td>34</td>
</tr>
<tr>
<td>Physical Activity</td>
<td>34</td>
</tr>
<tr>
<td>Senior Citizens (65+)</td>
<td>34</td>
</tr>
<tr>
<td>Minorities and the Poor</td>
<td>34</td>
</tr>
<tr>
<td>4.1.4 Identification of Site</td>
<td>37</td>
</tr>
<tr>
<td>4.1.5 Context</td>
<td>37</td>
</tr>
<tr>
<td>4.1.6 History</td>
<td>39</td>
</tr>
<tr>
<td>4.1.7 Goals and Objectives</td>
<td>40</td>
</tr>
<tr>
<td><strong>CHAPTER 5: Design Evolution</strong></td>
<td>41</td>
</tr>
<tr>
<td>5.1.0 Research Questions</td>
<td>42</td>
</tr>
<tr>
<td>5.1.1 Proposal</td>
<td>42</td>
</tr>
<tr>
<td>Improvisation</td>
<td>42</td>
</tr>
<tr>
<td>The Familiar</td>
<td>43</td>
</tr>
<tr>
<td>The Framework</td>
<td>43</td>
</tr>
<tr>
<td>Natural Systems</td>
<td>43</td>
</tr>
<tr>
<td>Compositions</td>
<td>44</td>
</tr>
<tr>
<td><strong>Synthesis of Design Implementation</strong></td>
<td>44</td>
</tr>
</tbody>
</table>

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Related to the topic of physical activity and minority populations in the context of the built environment.
INTRODUCTION
Chapter 1: Introduction

“Lack of activity destroys the good condition of every human being, while movement and methodical physical exercise save it and preserve it.” -PLATO

1.1.0 Need For Research

Thesis statement: How might current research in landscapes for healthy living influence the design of neighborhoods, communities, and cities to promote more incidental physical activity?

Today’s society has seen great advancements in the field of public health and modern scientific technology, but despite this progress America faces an unprecedented national public health crisis. According to the 2003-2004 National Health and Nutrition Examination Survey (NHANES), an astonishing 66% of U.S. adults are either obese or overweight, a percentage that has significantly increased over the past 25 years. Even more astounding is that one in four American adults remain sedentary during periods of leisure (CDC, 2001). Understanding the complex set of factors that influence these statistics mandates collaboration between disciplines, particularly those traditionally outside the realm of public health and nutrition. In particular, there is growing evidence to support correlation between the built environment and physical health, creating an atmosphere conducive to input from designers and planners. Thus, this paper explores the question of how current research in landscapes for healthy living might influence the design of neighborhoods, communities and cities to promote increased forms of utilitarian physical activity.

1.1.1 Built Environment

Low-density, automobile-dependant patterns of development can discourage health-promoting, incidental physical activity, including walking or biking to and from work and school, or even errands within reasonable distances. Sprawling development patterns have created car-cities that begin to immobilize the pedestrian and siphon people out of inner city core areas to the suburban fringe, where the car becomes a necessity. These development patterns have contributed to a more sedentary lifestyle and engineered physical activity out of the day-to-day lives of the typical American.

A 1997 national study concluded that 83% of all auto trips were short and non-work related. Moreover, of these 83%, 14% of them were within one-half mile of home (Frank et. all, 2003). Incorporating parks, greenways and community open space into daily activity and offering them as an alternative means of mobility could help more Americans achieve the recommended levels of physical activity while contributing to a healthier lifestyle. Movements such as new urbanism and smart growth, with projects like Seaside, Florida and High Point, Washington respectively, are attempting to address health issues related to sprawl by promoting incidental physical activity. Following these ideas, community design that encourages access to parks, greenways and community open-space may help reduce the pervasiveness of obesity through increased opportunities for active recreation.

1.1.2 Declining Trends in Public Health

According to the Surgeon General’s report on physical activity and health (November 1999), more than sixty percent of American adults do not achieve recommended levels of regular physical activity and an astonishing twenty-five percent do not participate in any leisure-time physical activity. These statistics are even more alarming when combined with the knowledge that the U.S. is, for the first time ever, experiencing an ever-aging population where physical activity decreases as age increases. In addition, it is well documented that less educated, low income, minority populations suffer a disproportionately higher risk of developing health problems associated with insufficient levels of physical activity. To successfully impact the declining trends in public health, particularly in minority communities, planners and designers must understand the complex nature of the obesity epidemic and associated health problems.

1.1.3 Physical Activity: Recreational versus Utilitarian

Physical activity exists in many forms, each with different characteristics, qualities and intentions. However, physical activity can broadly be separated into two categories: recreational and utilitarian. When most people think of physical activity they are thinking of recreational forms of exercise such as, jogging, hiking, tennis, basketball, or even weightlifting, along with other sport-physical activities. In contrast to this type of physical activity, utilitarian activities are those that serve as the means of accomplishing a given task. For example, walking to work provides you with unintentional exercise or physical activity. The walking is a by-product of getting to work, where, getting to work is the primary objective or purpose of walking.

The built environment influences both recreational and utilitarian forms of activity, and as landscape architects and planners, we impact the form and character of the built environment.
According to the U.S. Department of Health and Human Services report Physical Activity Fundamental to Preventing Disease (2007),

“Encouraging more activity can be as simple as establishing walking programs at schools, work sites and in the community. Some communities have an existing infrastructure that supports physical activity, such as sidewalks and bicycle trails, and work sites, schools, and shopping areas in close proximity to residential areas. In many other areas, such community amenities need to be developed to foster walking, cycling, and other types of exercise as a regular part of daily activity.”

– CDC

1.1.4 Breaking the Mold: Outside of traditional landscape architecture

Traditionally, the work of landscape architects has been focused more within the realm of recreational activity in the form of parks, greenways, and community open-space. Together these amenities create an appealing public aesthetic while providing communities with opportunities for active recreation. Yet, what role do parks and open space play in helping to keep Americans and their communities not just active, but healthy? Recreational activity is an intentional form of exercise during one’s leisure time, whereas utilitarian activity is an integral part of one’s daily routine. If evidence from the Surgeon General (1999) suggests recreational activity is experiencing a decline and utilitarian activity has the potential to be more influential in terms of increasing the level of public health, how do landscape architects break the recreational mold?

1.2.0 Intent

The intent of this paper is to explore the emerging field of active living through the lens of landscape architecture and urban planning. The primary objective is to address how planning and design are interrelated fields and must work together to create communities that support and encourage active living. This collaboration can result in policy reform that understands the importance of the built environment in contributing to increased physical activity and the role of designers as sculptors of that environment.
2 LITERATURE REVIEW
Chapter 2: Literature Review [part II]

"The future health of the nation will be determined to a large extent by how effectively we work with communities to reduce and eliminate health disparities between non-minority and minority populations experiencing disproportionate burdens of disease, disability, and premature death."

-GUIDING PRINCIPLE FOR IMPROVING MINORITY HEALTH

CDC

2.1.1 Changing Patterns of Development

In the years following World War II, the nation faced an unprecedented housing shortage. The Federal Government responded vigorously with programs targeting home ownership, specifically geared toward veterans and first time home owners. These mortgage programs helped to fuel the post-war housing boom of the 1950’s. For the first time, large-scale development was occurring as a new approach to home building that produced America’s first suburban subdivision--Levittown. These subdivisions (of which Levittown was just one) were uncharacteristically low-density, architecturally mono-type communities, located at the periphery of existing cities on large expanses of inexpensive, open land (Frumkin, Frank and Jackson, 2004). This new approach to home building was quickly discovered to be highly profitable due to cheap land costs, prefabricated construction methods and government subsidies. Running parallel to this new suburban development pattern was the practice of zoning to protect residential interests in the suburbs and commercial and business interests within central business districts (CBD) in cities.

The overwhelming popularity of these suburban communities reinforced demand, resulting in further construction. In turn, the construction of suburban communities created an increased demand for infrastructure needed to support traveling further distances. In 1956, after much lobbying by the American Road Builders Association and major American automobile manufacturers, the Interstate Highway System was authorized by the Federal-Aid Highway Act of 1956 under President Dwight D. Eisenhower. The intervention of the interstate highway system changed the form of cities perpetually. The highly specialized network of roads enabled the dispersion of factories and offices from their traditional location in urban centers to the ever-expanding periphery, creating the ‘centerless city’ (Frumkin, Frank and Jackson, 2004).
evolved to describe it. The buzz-term ‘sprawl’ has been defined by various organizations, but ultimately can be described as the low density development outside of any compact urban area or village center, with distinctly separated functions – homes, shops, workplaces only connected via limited access roadways or highways. This development pattern results in an auto-dependent society, with the personal automobile at the center, and limited to no access to public transportation. In addition, sprawling development patterns discourage health-promoting incidental physical activity also referred to as utilitarian physical activity, including walking or biking to and from work and school or even errands within reasonable distances. Sprawl has created car-cities that immobilize the pedestrian and siphon people out of inner city core areas to the suburban fringe where the car becomes a necessity.

2.1.2 Understanding the Built Environment

The built environment can present both opportunities and barriers to physical activity and therefore can greatly influence people’s behaviors. Recent studies suggest that a person’s immediate environment, also described as one’s own neighborhood, is one of the more important factors influencing a their level of physical activity (Jackson and Kochtitzky, 2003). Among these studies researchers have identified several important environmental variables, including sidewalks (presence/absence and condition), traffic, topography, lighting, landscaping, the presence of others and safety as determinants of physical activity. Among these variable, studies consistently show that the greatest perceived barrier to physical activity is “lack of a safe place”. The second perceived barrier is the lack of sidewalks (CDC, 2003). In addition, Jackson and Kochtitzky state that “people tend to get less exercise as outlying suburbs are further developed and the distances between malls, schools, and places of employment and residence increase”. Conversely, the higher degree of density (greater compactness) affects travel behavior by locating activities closer together, reducing the need to use a vehicle and therefore increasing the mode choice options (Frank et al., 2003).

American society is a composition of various social stratification’s. However, few of us enjoy the personal and financial resources to minimize the constraints on our behavior and opportunities within the built environment (76). For most groups, the built environment presents fewer options with respect to utilitarian, recreational and social purposes. These disadvantaged groups include disabled citizens, children, the elderly and minorities. The scope of this paper focuses on low-income, African American communities specifically, but also notes

• Lower the design speed when appropriate.
• Maintain the road’s existing horizontal, vertical geometry and cross section and undertake only resurfacing, restoration, and rehabilitation (3R) improvements.

Policy Models For Reform

Performance-Based Zoning (PBZ) - Unlike conventional zoning PBZ regulates land use according to how well the use performs according to set measures and standards. This technique is often used as a means to regulate industrial uses as they relate to the qualities of air, water and or noise.

Unified Development Codes - UDC organize all development related regulations, including zoning and subdivision regulation into a single document to enhance predictability and administration.

Traditional Neighborhood Design (TND) - An ordinance designed to reduce sprawl and auto-dependence by consolidating community needs at the neighborhood scale. These ordinances can apply to both infill and greenfield developments.

Reverse Zoning/TND Lite - This mechanism of code reform reverses traditional minimum standards and maximum standards–what was once a minimum development standard now becomes the adjusted maximum and vice versa. Typically, this approach affects setbacks, parking spaces, lot widths and right-of-way widths.

Form-Based Codes (FBC) - FBC’s focus less on land uses and rather stress the appearance of the streetscape, and the relationship between built form and public space.

Design Guidelines - Design guidelines are not legally binding, but they do establish a suggested set of standards that aims to maintain a certain level of quality and architectural or historic character, addressing features such as building facades, public spaces, or landscaping.

(Schilling, 2005) and (EPA, 2008)
the importance of the elderly, as the United States and other prominent nations are currently experiencing a growth in this demographic.

For the American poor, their economic status alone presents a major constraint on the range of available options within the built environment. For low-income Blacks, there are even fewer available choices. Poor African Americans suffer disproportionately from obesity, and are increasingly concentrated within urban centers, making it vital to understand the dynamic within this particular setting.

Much of the existing literature suggests that older urban environments such as central cities, have more of those landscape features that are hypothesized to support active living. Among these features are, highly connected grid pattern streets, higher densities, sidewalks and mass transit. However, additional factors including insufficient parks and open space, higher rates of real and perceived crime, fewer jobs within walking distance, limited access to grocery stores and healthy food sources, and higher traffic volumes do begin to more accurately account for lower levels of physical activity and active living among low-income, minority communities (Day, 2006).

2.1.3 Design for Health: Active Living, Context Sensitive Solutions, New Urbanism, Smart Growth

The majority of local governments whether knowingly or not, encourage the development of the conventional, single family subdivision which perpetuates the monotony of sprawl. Any effort to promote walking and biking as a means of active transportation must take into account the impediments to walking and biking brought by environments built after World War II (Moudon, 2004). These environments have been primarily shaped for and by the automobile and are characterized by purely residential, commercial and industrial zones. The classic example of which is Levittown, NY; America premier suburban subdivision of the 1950’s as illustrated by photographs 1 and 2. (page 10)

However, there are those out there that believe there is a better way. Among these visionaries is architect-planner Andrés Duany and author/consultant Peter Katz. In addition to individuals in the field, organizations such as the Robert Wood Johnson Foundation, and Active Living by Design have also joined the movement to establish a framework for establishing healthy communities. Some of the better known movements in the field of healthy community design are active living, context sensitive solutions, new urbanism and smart growth.

Active Living

According to the Robert Wood Johnson Foundation active living is a way of life that integrates physical activity into daily routines with the goal of accumulating at least 30 minutes of activity each day. Active living is not limited to utilitarian or recreational forms of activity; instead this lifestyle encourages exercise for pleasure or transportation, playing in the park, gardening in the yard, taking the stairs, and participating in group activities. Active living is a coordinated, trans-disciplinary approach for re-integrating physical activity back into the lives of Americans as a means of addressing obesity and other health concerns associated with sedentary lifestyles.

The primary objective of active living activists is to create environments that value physical activity. However, this is more than creating places with sidewalks, street trees and greenways. This approach recognizes the complexity of sedentary behavior and seeks to affect change through a holistic approach that connects design with policy, programs, promotions, preparation and physical projects (activelivingbydesign.org, 2007).

Context Sensitive Solutions

Context Sensitive Solutions (CSS) is a collaborative, interdisciplinary approach to transportation that involves all stakeholders to develop a transportation facility that fits its physical setting and preserves scenic, historic and environmental resources, while maintaining safety and mobility (Federal Highway Administration, 2005). This approach is intended to help reshape the goals and outcomes of transportation projects around the country. CSS has roots in the conference “Thinking Beyond the Pavement”, held in Maryland in 1998. At this conference practitioners gathered to discuss the quality of transportation projects and how improvements could be made on both project implementation and evaluation. The conference yielded a set of core principles that define the basis of CSS and provide flexibility: (contextsensitivesolutions.org, 2005).

- Use the flexibility within the standards adopted for each State.
- Recognize that design exceptions may be optional where environmental consequences are great.
- Be prepared to reevaluate decisions made in the planning phase.
• Consider developing alternative standards for each State, especially for scenic roads. Recognize the safety and operational impact of various design features and modifications.

Using the CSS approach to transportation design, designers are allowed greater flexibility to respond to the specific context in which they are working in. The process begins with an understanding of local resources including aesthetic, archaeological, community/economic, cultural, environmental (or “natural”), historic, recreational, and scenic (topics: preserving and enhancing resources, 2005). In the last ten years, the CSS has gained momentum and is proving beneficial to improving the character and quality of transportation projects. Below are just a few of the benefits of the CSS approach:

• Broadening the definition of “the problem” that a project should solve by involving stakeholders
• Conserves environmental and community resources CSS saves money. By shortening the project development process and eliminating obstacles
• Gains support from the public and from the regulators.
• CSS helps prioritize and allocate scarce transportation funds in a cost-effective way (Benefits of CSS, 2005).

New Urbanism

New urbanism, much as the name suggests, is a new way of looking at urbanization or how we develop; it is a paradigm shift in the way we design, build and live in our communities. The idea behind this new approach to community design, “builds on the idea that physical form is a community’s most intrinsic and enduring characteristic” (Katz, 2004). This re-conceptualization seeks to modify land use development regulations to create policy that enables planners, designers, citizens, developers, and stakeholders to easily move from a shared physical vision of a place to its built reality (16). Together with like-minded colleagues, Duany formed what became known as the Congress for the New Urbanism (CNU) in the early 1990’s. This group of professionals included both designers and planners, among those in attendance were Peter Calthorpe, Michael Corbett, Andres Duany, Elizabeth Moule, Elizabeth Plater-Zyberk, and Stefanos Polyzoides. Motivated by the disinvestment in central cities and the plague of placelessness, this group of individuals originally convened to discuss how to systematically change the ground rules for development in North America. From the beginning the group was progressive in their way of thinking and one of the outcomes of their first meeting resulted in the “Ahwahnee Principles”. This set of principles outlines a set of ideas based on the past and present knowledge of the ‘problems’ regarding typical development. These principles include the notion that planning should be complete and integrated; community size should be based upon easily accessible walking distances; communities should integrate mass transit; communities should have a heart complete with commercial, civic, cultural and recreational uses; communities should supply an ample network of open space. For a complete listing of the principles as they relate to community, region, and implementation, see appendix I. However, these principles were not entirely new, in fact, similar logic guided the majority of community development in America prior to World War II, but became largely lost in the post-war housing boom era and years since.

The New Urbanist movement has gained recognition across the U.S. with developments like Seaside, FL (1978), Celebration, FL (1994) and Kentland, MD (1988). Today, each of these projects is seen as iconic New Urbanist development that proves alternatives to zoning can work. According to Anthony Flint, author of This Land: the battle over sprawl and the future of America (2006), there are neighborhoods and communities being developed along the principles of new urbanism in forty-three of the fifty states.

While New Urbanism is a popular anti-sprawl movement, combining aspects of design and planning, it is not alone. Smart Growth offers yet another perspective on growth management and healthy living with an emphasis on infill development as a method of conserving land and increasing efficiencies.

Smart Growth

Like new urbanism, the goal of smart growth is to curb sprawl through the renewal of existing cities, and more compact, better designed development located near public transit. Smartgrowth.org states that in general smart growth “invests time, attention, and resources in restoring community and vitality to center cities and older suburbs”. The movement is grounded by a set of ten principles (smartgrowth.org, 1996-2008):

1. Create Range of Housing Opportunities and Choices
2. Create Walkable Neighborhoods
3. Encourage Community and Stakeholder Collaboration
4. Foster Distinctive, Attractive Communities with a Strong Sense of Place
5. Make Development Decisions Predictable, Fair and Cost Effective
6. Mix Land Uses
7. Preserve Open Space, Farmland, Natural Beauty and Critical Environmental Areas
8. Provide a Variety of Transportation Choices
9. Strengthen and Direct Development Towards Existing Communities
10. Take Advantage of Compact Building Design

* Those principles outlined in bold are those that are most applicable, in terms of creating healthy communities that encourage incidental physical activity.

However, unlike new urbanism, the message behind smart growth is not quite as simple as building great neighborhoods. Smart growth refers to a broader set of policies that governors and state legislators can use to help target growth in areas that are already designed to accommodate growth while directing growth away from greenfields and environmentally sensitive areas Flint, 2006). An important distinction to be made between Smart growth and New Urbanism is that Smart Growth recognizes the need for growth and does not attempt to depict growth as the enemy, rather, Smart Growth suggests that growth can be better planned, designed and distributed (85). Advocates of both Smart Growth and New Urbanists are believers in the market. New urbanists feel the framework (zoning) should be tweaked to allow more NU developments to occur, therefore reducing the high prices associated with NU communities. While advocates of Smart Growth agree zoning is an issue, they support broader political change. Changing the way we develop to reverse sprawl requires political measures such as new incentives and disincentives for developers, along with structural changes to the way state funding for roads and infrastructure is distributed (85).

One of the major differences between New Urbanism and Smart Growth is that Smart Growth focuses redevelopment efforts within existing cities, in other words, promotes infill development. Smart Growth activists believe that if more people would rediscover the joys of city living, which according to Flint “represent the highest expression of civilization and culture, the most efficient use of land, the places most likely to promote community, and the most environmentally friendly organization of human habitation”(85).

Each of the ‘movements’ discussed above recognize the relationship between characteristics of urban physical form and sprawl which impacts behavioral choices and overall public health. None of these movements is considered the end-all solution, rather each approach offers a unique way of looking at the set of issues and suggests methods for improving the built environment. Aside from all the praise and attention New Urbanism and Smart Growth have received, one critique remains: New Urbanism and Smart Growth encourages gentrification. Gentrification is the displacement of urban poor and minority residents by wealthier new arrivals (Frumkin et al., 2004). This condition can result from neighborhood and community improvements associated with NU and Smart Growth.
2.1.4 Physical Activity: Disproportionate burden of minority populations

“The automobile has given improved mobility primarily to the middle class, middle aged. But these owner-drivers have not merely gained new mobility through the car; they have also rearranged the physical location patterns of society to suit their own private needs, and unwittingly in the process destroyed and severely limited the mobility and access of all others.”


In the past, active living, and to a larger extent, New Urbanism and Smart Growth have focused the bulk of their efforts reforming and restructuing the built environments of upper to middle-class, suburban communities. However, statistics show that low-income, Black and Latino populations suffer disproportionately higher rates of overweight and obesity. In fact, the National Health Interview Survey (NHIS) found in an analysis of more than 68,000 U.S. adults, the highest obesity rates were associated with the lowest income and education levels (Day, 2006). Further studies show similar trends, especially among urban women, despite controlling for ethnicity. According to the CDC (Vital & Health Statistics, Series 10, No. 228, May 2006) Black women, are particularly impacted, with thirty-nine percent reported as obese in 2004. Even more startling, the CDC states that seventy-nine percent of African American women ages 20 or older are overweight (2004).

Physical activity and nutrition are not uniform among the American population. Both have important physical, mental and cultural aspects that affect one’s overall health. Seeking to understand the complexity of overweight and obesity in low-income, Black populations must acknowledge that these trends are tied to broader patterns of disadvantage.

As a result, African Americans suffer the highest rates of overweight and obesity, even when compared with other racial and minority groups. In addition, Black Americans experience higher rates of chronic disease that can be linked to higher rates of obesity and overweight. The health disparities among African Americans in the U.S. has not only increased the prevalence of chronic disease, but also contributed to lower life expectancy and higher rates of infant mortality. For instance, in 1999 the average American could be expected to live to age 77.8, compared to an average of 73.1 years of age for the average African American (CDC, 2006).

Table 1 illustrates a 2003 study by the CDC depicting the health gap among African Americans and other racial and ethnic groups. The table shows African American have significantly higher rates of age-adjusted death rate for heart disease, cancer, diabetes, and HIV/AIDS.

### TABLE 1

<table>
<thead>
<tr>
<th>2003 Age adjusted Death Rates for Selected Causes of Death, per 100,000 Population</th>
<th>ALL POPULATIONS</th>
<th>AFRICAN AMERICANS</th>
<th>ASIAN AMERICANS &amp; PACIFIC ISLANDERS</th>
<th>% RELATIVE DISPARITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAUSES</td>
<td>832.7</td>
<td>1,065.90</td>
<td>465.7</td>
<td>128.90%</td>
</tr>
<tr>
<td>HEART DISEASE</td>
<td>232.3</td>
<td>300.2</td>
<td>125.3</td>
<td>135.30%</td>
</tr>
<tr>
<td>CANCER</td>
<td>190.1</td>
<td>223.3</td>
<td>113.5</td>
<td>105.60%</td>
</tr>
<tr>
<td>DIABETES</td>
<td>25.3</td>
<td>49.2</td>
<td>17.3</td>
<td>184.40%</td>
</tr>
<tr>
<td>HIV/AIDS</td>
<td>4.7</td>
<td>21.3</td>
<td>0.7</td>
<td>2542.80%</td>
</tr>
</tbody>
</table>

Sources: Centers for Disease Control and Prevention (CDC), National Center for Health Statistics (NCHS), Health United States, 2006, Table 29

Factors influencing obesity in low-income African American communities

Obesity is a complex issue resulting from many factors, including biological factors, attitudes toward body image, and cultural food preferences. While these factors may be outside the realm of design and planning other factors such as food insecurity and physical inactivity are subject to intervention through built form (Day, 2006). In addition to facing increased risk for overweight and obesity, African Americans and Mexican Americans are biologically predisposed to carrying body fat in their upper body, including intra-abdominal fat that is more difficult to lose (Day, 2006). In terms of social attitudes, body image varies greatly with ethnicity. For example, among African Americans the ideal body size for a woman is larger than that of white women. This cultural difference helps explain why obesity does not necessarily generate negative body images among African American women specifically. It is also important to understand that Black women compare themselves within their own community and not the larger societal ideals (Day, 2006). Cultural diets are another aspect that greatly influences overall health within African American communities. Traditionally, diets are high in cholesterol and saturated fats that contribute to poor health when combined with physical inactivity. Furthermore, severely limited access and availability of healthy food options in minority neighborhoods combined with the high cost of eating healthy has exacerbated the effects of cultural eating habits among low-income, African American communities.

Neighborhood characteristics are closely related to nutrient intake and dietary patterns, physical activity levels, and risk of heart disease (Freudenberg et al. eds. 2006). A recent study on neighborhood characteristics indicates that there were more than three times as many supermarkets in the wealthier neighborhoods when compared to poorer areas (109). In addition the same U.S. study reports that fast food chains such as McDonald’s and Wendy’s, were more common in the poorer areas than in the more affluent areas (109). This evidence suggests
that there is vast gap between healthy food access in low income, minority populations that are known to be more highly concentrated in cities and urban areas. Therefore, as designers and planners who craft the built environment we have a responsibility to address these barriers through policy reform and built work.

Studies show that “people with lower incomes and less education are less likely than others to get sufficient physical activity” (Day, 2006). A study by Giles-Corti and Donovan (2002) states that nearly half of those with less than a high school education report no physical activity during periods of leisure compared to less than 20 percent of college graduates. Only ten percent of Blacks engage in sustained physical activity for at least 30 minutes per day, meeting the recommended minimums suggested by the Surgeon General. Insufficient physical activity is a result of societal factors including poverty, limited social capital, poor access to information on physical activity and fewer opportunities for recreational physical activity. Moreover, researchers have identified individual factors that present barriers to physical activity in poor, Black communities. Individual barriers may have even greater impacts on one’s ability to partake in physical activity. These factors include cost (including membership fees, equipment fees, or even child care during exercise); lack of time (possibly due to multiple jobs or responsibilities); limited education regarding risk factors, perceived safety or fear of crime, and gender (Day, 2006). Day (2006) states, “individuals must be reassured that they will not stand out uncomfortably in terms of race, (gender), or ethnicity, and will not be targeted by racial harassment or violence”. Forty-one percent of non-White respondents report they are fearful walking in their neighborhoods alone at night, compared to thirty-one percent of White respondents (Bureau of Justice Statistics, 2002).

2.1.5 Opportunities for Improvement

Health-related problems, including insufficient physical activity and poor nutrition within the urban setting can be complex and multifaceted. These communities of disparity have more acute needs and fewer resources to overcome obstacles. No single-level approach can adequately address the magnitude of these issues facing today’s urban communities (Freudenberg et al. eds. 2006). “Effective solutions are often intertwined and are based on the success of the others” (114). Strategies may include the individual, community, and governmental policy levels to sufficiently acknowledge the importance of nutrition and physical activity.

Individual-Level Interventions - Individual life-style choices also known as behavioral factors greatly influence a person’s diet, health, and level of activity (both utilitarian and recreational). From a public health standpoint, individual interventions are the most commonly used method of affecting behavioral changes. This intervention strategy involves education and empowerment as the primary means to promote long-term nutritional and physical health (Freudenberg et al. eds. 2006) and (Cottrell et al., 2006).

Community-Level Interventions - One of the major barriers to good nutrition and physical activity lies in the living conditions present in urban areas, including reduced access to healthy food choices, abundance of fast food establishments and unsafe neighborhoods lacking safe connections and destinations. The establishment of farmers’ markets and community gardens can provide fresh, nutritious, and locally grown produce as a neighborhood resource. “In addition studies have shown that improving public transportation can also improve the food environment of those living in low-income urban areas” (Freudenberg et al. eds. 2006). Therefore, policies that encourage farmers’ markets and produce vendors can help to increase the awareness and consumption of healthier foods in low-income, urban communities (115).

The physical environment can also provide health benefits by encouraging incidental physical activity. More compact, dense development patterns create an environment where shops and residences are located within close proximity to one another, creating an opportunity to walk or bike efficiently to and from facilities.

Governmental-Policy-Level Interventions - The growing concern over obesity-related health trends has recently inspired local governments to launch new initiatives aimed specifically at combating issues relating to physical activity and health. For example, the City of Roanoke, Virginia has included in its “Vision 2020” initiatives for improving streetscapes to create a safe and “attractive environment for pedestrians, bicyclists, and transit riders, as well as for automobile drivers” (Roanoke City, 2001). In addition, Roanoke as added and adopted a bike plan and street design guidelines aimed at increasing levels of incidental and recreational physical activity.

2.1.6 Regulatory Alternatives For Healthier Communities

The rapid transformation of cities and suburbs into megalopolitan regions has been part of a larger process of economic growth and change that has destabilized and transformed many aspects of modern day living. Reality prevents us from rewinding back to the 1960’s and 1970’s to apply what we now know about planning, design and community development. Decentralized urban areas are our reality. We have to learn how to make this reality work, and this goes beyond issues of city planning and design.
Outdated development regulations and planning theory is not the solution. To change the design of new development that addresses current and emerging public issues requires changing the legal templates. Public policy and regulatory measures must recognize that design and planning concepts cannot be separated from one another or their implementation mechanism. Moreover, the complex issues facing planners and designers require interdisciplinary collaboration. This collaboration is essential to produce efficient and constructive changes in the way cities and towns are developed. Given these realities, this section outlines emerging alternatives to conventional zoning with particular attention to how policy relates to urban form and design characteristics.

Encouraging a mix of uses as well integrating parks, green-ways, and community open-space into daily activity and shifting the focus from the automobile to the pedestrian could help more Americans achieve the recommended levels of physical activity and live a healthier lifestyle. While community design that encourages access to parks, green-ways and community open-space may help reduce the pervasiveness of obesity through increased opportunities for active recreation. Movements such as new urbanism and smart growth are attempting to combat health issues related to sprawl by promoting incidental physical activity.

Form-Based Codes

“Zoning and building codes of the past 50 years generally outlaw elements necessary for walkable urbanity…. Rather than reform existing zoning codes, it generally is best to throw them out and start from scratch, putting in place a form-based code that will make it easy to do the right thing. A form-based code focuses on how the buildings address the street and sidewalks, leaving decisions to the market about types of uses, the amount of parking provided on site, and architecture.”

- Chris Leinberger,
Urban Land November/December 2004

The Form-Based Codes Institute (FBCI) defines a form-based code as “a method of regulating development to achieve a specific urban form” (formbasedcodes.org, 2008). A form-based code is a legal document that regulates land development through a carefully crafted set of controls guiding the built form, while employing more flexible parameters regarding building use and density. The goal of form-based codes is to create a predictable public realm based on a shared community vision with greater emphasis placed on physical form. Unlike Euclidean zoning, form-based codes are intended to provide a vibrant mix of uses, with particular attention to safe, attractive, and enjoyable public spaces (streets and neighborhood parks). The code is a concise and clear graphic prescription for height, siting, and various other building elements to address the basic necessities of forming good and functional public space.

Form-based codes are commonly comprised of the following five elements:

- Regulating Plan
- Public Space Standards
- Building Form Standards
- Administration
- Definitions

Like most land development ordinances, the Regulation Plan is a plan or map that indicates where different building form standards apply. This plan or map is based on the community ‘vision’ regarding the physical character of the area addressed by said code. The public space standards are specifications that pertain to elements within the public realm including sidewalks, street furniture, street trees, travel lanes, and on-street parking (formbasedcodes.org, 2008). Building form standards control the configuration, features, and functions, of buildings that define and shape public space. These specifications include height, siting, elements and uses. While particular attention is paid to physical form, use is not forgotten. In form-based codes, uses are illustrated through cross sectional diagrams. This allows the reader of the code to fully comprehend what is meant by mixed use; showing how different uses can be accommodated within one building, yet separated vertically. Administration defines the process and application of a specific project, while the definitions section provides a glossary of terms to ensure precision in application.

In addition to these standard elements, form-based codes can also include:

- Architectural Standards
- Landscape Standards
- Signage Standards
- Environmental Resource Standards
- Annotations

Architectural standards regulate the use of exterior building materials and quality. These standards can also be outlined graphically and should focus on the quality and durability of materials as well as the proper configuration of a few exterior elements such as roof pitch, arcades, and porches. Landscape standards refer to regulations pertaining to landscape design and materials on private property as they impact the public realm. While this may seem a bit intrusive, these standards are optional and concern issues such as parking lot screening and shading, and maintenance of sight-lines to assure optimum pedestrian comfort and safety. Signage standards provide guidance in the size, materials, placement and lighting of signs to create a unified and coherent character within a codified area. Environmental resource standards...
are additional regulations localities can utilize to control storm water runoff and infiltration, development on steep slopes (protect against erosion), tree protection and even solar access. The adoption of environmental resource standards can help reduce of overall impact of development on the immediate and surrounding environment, and encourage environmental responsibility. Lastly, annotation provides both text and illustrations that help to explain the intentions specified in the code.

Form-Based Codes aim to create adaptive, memorable and livable communities, much like those of Europe or even Charleston, or Savannah. If one studies these types of older pre-zoning towns you will discover that land use is a secondary issue, because at the time, market forces dictated the mix of uses. Moreover, while building uses may have changed with time, the structure of the building itself remains unchanged.

Design is the thread that connects these places and makes them unforgettable. “Great streets are those that are well defined, well-proportioned public spaces, and are integrated within the block network” (Dover, 1996). The goal of form-based codes is to create a coherent public realm that responds to the regional context and local character, and is conducive to civic engagement.

Studies suggest that among both personal and social factors reported to deter individuals from engaging in physical activity, lack of time is the leading cause (Brownson et al., 2001). This finding alone supports the use of innovative tactics as an alternative to standard zoning, such as form-based codes that combine uses and increase densities creating conditions that support utilitarian physical activity. In addition, a number of studies both in the U.S. and abroad have consistently shown a high preference for neighborhood streets as a place for physical activity. For instance, a 2001 study by Brownson found that 66.1% of American adults reported neighborhood streets as a destination for physical activity, compared with just 24.8% of American Adults reporting some degree of physical activity on walking and jogging trails specifically (Brownson et al., 2001).

Design Guidelines
A second alternative to traditional Euclidean zoning is design guidelines. The purpose of the Design Guidelines is to coordinate and orchestrate the overall development of a city, town, village or neighborhood so that projects help each other succeed and result in a better, livable community. Design guidelines emerged through the conversation of historic preservation and the process of evaluating how new or renovated structures begin to fit into the context of a historic district. Unlike Form-Based Codes, design guidelines are typically not legally binding, rather they are advisory. The primary use of design guidelines is to influence the architectural style of buildings within a specific context (Madden and Spikowski, 2006).

Design guidelines are less binding and as previously mentioned, they are not a legal tool for implementing land use. However, design guidelines do offer communities interested in promoting growth while preserving what makes them special - scenic landscapes, historic downtowns, and places of unique cultural character, a complementary land use planning tool. Design guidelines are often used in conjunction with an overlay district. An overlay district is a tool commonly used to adapt conventional zoning to special situations such as historic or downtown districts. The overlay district has its own unique set of additional standards that replace the conventional zoning of that specific area.

Hopkins, Minnesota adopted an overlay district in order to preserve the small-town, unique character of Main Street, compliment the existing historic architecture, and to enhance the pedestrian orientation of downtown Hopkins while encouraging streetscape design that is inviting and at the scale of the pedestrian (hopkinsmn.com, 2006-2007). In addition to the overlay district, the city also constructed a set of guidelines that serve as recommendations. However, if public financing is involved in the construction or rehabilitation of the building, these guidelines are mandatory. The design guidelines issued in Hopkins represent a commonly used set of recommended elements and are represented in a clear and concise manner. A typical set of design guideline includes a statement of the objective, the guideline, and the standard.

The set of design guidelines for Hopkins is composed of sixteen elements:
- Awnings
- Signs
- Height
- Setbacks
- Roofs and Parapets
- Utility Areas and Mechanical Equipment Storage
- Width
- Fenestrations (Windows and Doors)
- Materials and Detailing
- Color
- Franchise Architecture
- Streetscapes
- Lighting
- Parking
- Landscape
- Rear Entrances

Generally, each guideline is accompanied by an illustration or photograph of what is
recommended, and may also include an example of what is not preferred.

As part of their 1997 Downtown Initiative to promote revitalization of the downtown area, Austin, Texas appointed a Design Commission to lead the community in drafting a set of design guidelines. The Commission’s goal was to create a safe, comfortable, and pedestrian-friendly downtown that would encourage mixed use and pedestrian-scaled development. While these goals were in contrast to the majority of the standards in place for development, these guidelines were presented as a challenge to the status quo in Austin. The guidelines were developed to respond to a specific set of issues pertaining to the quality of life and viability of downtown Austin. Among the primary issues the Commission confronted was building location, population density, function at street level, location and orientation of on-site parking, building uses, pedestrian comfort and activity at the street level, and sidewalk safety.

2.2.0 Conclusion

Urban living conditions present both benefits and challenges, specifically for the elderly, poor, and minority groups. Among the challenges are reduced accessibility to healthy food options, limited community resources, abundance of fast food establishments, unsafe neighborhoods and insufficient public amenities including bike lanes, sidewalks, and neighborhood parks. Opportunities for improvements in policy and behavior education can provide urban residents the needed support to overcome obstacles. Additionally, existing infrastructure and the precedent of higher density can provide a greater degree of proximity that encourages residents to walk and bike more. Innovative solutions to policy reform offer vast new opportunities for creating urban environments that foster equality in food access and incentives for increasing physical activity.
CASE STUDIES
Chapter 3: Case Studies

3.1.0 Purpose

Case studies are a method for conducting and assisting in research. A case study is an examination of critical factors, utilizing a holistic and multi-perspective analysis, meaning that various relevant groups and viewpoints have been taken into consideration throughout the research.

The purpose of this series of critical-instance case studies is to directly explore the concept of walkability with the intent to better understand the critical components of active living environments. Specifically, these case studies investigate alternative approaches to conventional community design and its impact on influencing incidental physical activity. Each of the following case studies examines the characteristics of the built environment through the lens of community health: Seaside, FL and Watercolor, FL are examples of new urbanist communities, Baldwin Park, FL and High point, WA are examples of smart growth, and Elmwood Village, NY looks at the role of design guidelines in promoting physical activity.

3.1.1 Seaside, Florida

Project Name: Seaside
Project Location: Santa Rosa Beach, FL

Seaside Florida is known as the first New Urbanist project. Designed in 1978 by Andrés Duany and partner Elizabeth Plater-Zyberk (DPZ) in conjunction with property owner and town founder Robert Davis, this resort-village embodies the principles of the new urbanists and is the realization of a truly walkable community. The small village of just 80-acres is located in the Florida panhandle midway between Fort Walton Beach and Panama City Beach, on what is better known as Florida’s Emerald Coast.

The underlying principles, according to DPZ are: “the built environment must be diverse in use and population; it must be scaled for the pedestrian yet capable of accommodating the automobile and mass transit; and it must have a well-defined public realm supported by an architecture that reflects the ecology and culture of the region” (DPZ.com, 2008).

The village of Seaside represents a rebirth of town planning, where collaboration between designers and planners worked together to craft the aesthetics and policies needed to create a walkable community. At the time of the conception and into construction, Walton County Florida had no zoning ordinances. This allowed the masterminds behind the project to write the original zoning code. The result was a code that concisely integrated zoning and design through a series of specifications including “dimensions, styles, color, and form for every detail of house building, from lot size and setbacks to window and porch trim” (ULI). This code has enabled the village to sustain a certain postcard quality, while at the same time fostering a sense of community through the unique use of individualism and a sense of civic responsibility.

In contrast to typical post-World-War II subdivisions with a limited hierarchy of streets: one large arterial and a single classification of residential street, Seaside developed around a hierarchy of streets and thoroughfares descending in size from the main street (Mohney and Easterling eds., 1991). The community is a distinct composition of footpaths, alleys, small streets, and large streets or boulevards and avenues. The flexible hierarchical network allows a variety of routes that distribute traffic flow throughout the town more efficiently than a single arterial (55).

The Urban Code establishes an interdependency between road width, landscaping, lot size, and housing type. Regulation of the “spatial modeling of the street is perhaps its most important function” (55). For instance, as Kurt Andersen points out in the compendium Seaside (1991), streets with back alleys or sideyards may have smaller roadways, smaller lots, and reduced setbacks while larger boulevards may have larger setbacks, larger lots, and taller buildings. The streets in Seaside are controlled by an architectural code that augments the urban code. The architectural code is suggestive of a style of building. The housing types are based on studies of traditional southern vernacular from places such as Charleston and New Orleans’ Vieux Carré. The architectural code for example mandates the front porch to be a critical element of southern residences. The porch mediates the space between building and landscape and between the public and private realm. This clear delineation between public and private contributes to the success of the street.

The following photographs illustrate critical components in the planning and design of Seaside to make the community walkable.
Figure 5
- Narrow travel lanes
- On street parking
- Detached sidewalk
- Street trees (shade and aesthetic appeal)
- Appropriate street lighting
- Buffer between public and private space
- Tactile surfaces

Figure 6
- Emphasis on pedestrian
- Median as a park
- On-street parking doubles as informal sidewalk
- Porches facing front street (increase perception of safety)
- Lighting responds to circumstance

Figure 7
- Footpath through neighborhood to pocket park

Figure 8
- Integrated community and residential spaces
- Landscape buffer
- Expansive pedestrian zone
- Narrow travel-way
- Appropriate use of signage
Figure 9

- On street parking doubles as tree planting strip
- Narrow travel-way Integrated Pedestrian network
- *No designated sidewalk
3.1.2 Watercolor, Florida

Project Name: Watercolor
Project Location: Seagrove Beach, FL

Watercolor is a New Urbanist, master-planned community adjacent to the village of Seaside, located in Seagrove Beach Florida. Thus far three phases have been completed (Phase I and II completed in 2002; Phase III completed 2005) The community is roughly 500 acres and has been held by the St. Joe Company since 1927. Unlike Seaside, Watercolor is not complete and is still being further developed by Arvida developers in conjunction with architect Jacques Robertson.

Watercolor is a planned community that is founded on the principles of environmental stewardship. The fundamental belief behind such a development is the protection and enhancement of the natural environment. The St. Joe Company has three mantras that ground each of their projects begin with: conservation by protection, conservation by design, and lastly conservation by cooperation. While Watercolor is a premier beachfront community, intentionally designed for conservation and protection of environmental features and natural systems; the community was designed to cater to the pedestrian while also “accommodating” the automobile. The focus on environmental conservation and land stewardship have unintentionally created a more compact, walkable community.

The community of Watercolor boasts fifty percent of the 499 acres as green space, nature trails, and countless miles of connected sidewalks. The parks and gardens are an essential component of a walkable community. These are the public spaces that unite the community and serve as places that meet, play and interact with nature; Watercolor abounds with opportunities for both recreational and utilitarian physical activity. With more than six parks offering areas for picnicking, open-air performances, biking, hiking, jogging, frisbee or pick-up soccer games, opportunities for recreational physical activity are plentiful. In terms of utilitarian physical activity, the community is design to be mixed-use at varying scales. The overall design includes not only mixed use at the smallest scale where uses are mixed vertically within a single building, but also at the next spatial level, the larger parcel (figure 7). At the parcel level, Watercolor has a distinct town center that contains various mixed-use buildings, such as those shown in figure 6. Each of these buildings contains services such as shopping, dining, and banking, all designed to accommodate the larger town population. The close proximity of shops, cafés, parks and open spaces with residences combined with elegantly designed pedestrian networks with attention to detail encourages walking and biking as an efficient and enjoyable mode choice.

However, at the larger district level Watercolor leaves something to be desired. While the community of Watercolor is considered to be mixed use and does incorporate many of the critical elements of such a development, it does suffer from what I refer to as “town center disease”. Town center disease refers to a complex that many mixed-use developments suffer from, in which most, if not all of the town services are limited to the town center and not distributed throughout the community. This is not entirely negative, these town centers are typically within waking distance of the majority of residences and therefore accessible via utilitarian forms of activity. Although it is not the most desirable outcome either. Mixed-use at the neighborhood or district level is more than a designated town center; it should consist of home and professional offices located within residential neighborhoods, next-door, or at the ground level of apartments. There should be a neighborhood grocery, not just a full service grocery outside the town boundaries, and civic amenities including schools and libraries integrated into the neighborhood fabric.

The following photographs illustrate critical components in the planning and design of Watercolor to make the community walkable.

Figure 10
- One-way traffic
- Large, landscaped median
- Detached sidewalk
- Bike racks
- Variety of paving materials and patterns (beneficial for way finding)
- Shops/Dinning on ground level
- Designated outdoor dining areas (not intruding on sidewalk space)
- Upper level residential units extend ‘active’ hours
3.1.3 Baldwin Park, Florida

**Project Name:** Baldwin Park  
**Project Location:** Orlando, FL

Baldwin Park is a traditional neighborhood development (TND) located in Orlando Florida, minutes from downtown, just off of East Colonial Drive. Prior to the development of the Baldwin Park community, this 1,100-acre site was the location of the Orlando Naval Training Center (NTC). Demolition of the NTC began in 2000 and the project was completed in 2006. Today, Baldwin Park is one of the largest infill redevelopment projects in the U.S. containing approximately 3,600 homes, 950,000 square feet (88,255 square meters) of retail and office space, 8,000 residents and more than 400-acres of parks, lakes and open space (ULI, 2004).

Baldwin Park was intentionally designed to foster a sense of community, promote walkability, and restore and improve existing natural systems (baldwinparkfl.com, 2008). Unlike many planned developments, Baldwin Park has no walls or gates and instead is integrated into the surrounding community. In addition to the parks and trail system within the community, Baldwin Park is also connected to a larger pedestrian network via Cady Way Trail. This trail opened in 1994 and accommodates cyclists, joggers, walkers and skaters alike. The trail itself is only 3.5 miles in length, and runs from the nearby Fashion Square Mall, through Baldwin Park, and on to Cady Way Park, but connects users to over 50 miles of walking paths with benches and tranquil rest areas in and around the neighborhood.
3.2.0 Case Studies in Smart Growth

3.2.1 High Point, Washington

Country Name: High Point

Project Location: Seattle, WA

Built in 1942 as military housing, this deteriorated and impoverished West Seattle neighborhood has recently undergone a complete renovation. The 120-acre site is bound by South West Juneau Street to the North, 35th Avenue South West on the West, South West Myrtle Street to the South and the hillside above Longfellow Creek on the East.

Proposal:

The community of High Point, Washington entered the initial stages of redevelopment in 2004 and is anticipated to complete construction in 2010. The revitalization of the existing High Point Garden Community through pedestrian-oriented community design will contain affordable housing, parks and open spaces, community services and facilities and infrastructure improvements.

The project would provide approximately 21 acres of open space, including a greenbelt, community parks, a new neighborhood center (approx. 26,350 square feet), neighborhood parks, pocket-parks, market and community gardens, and common, open-space along with roughly 1,600 housing units (High Point Revitalization Plan, 2002).

One of the critical elements of this proposal is the inclusion of “new urbanist” principles, such as pedestrian orientation, transit support and mixed uses. Creating a mix of uses enables many residents to live within walking distance of retail, services and transit. This mixing of land uses and pedestrian-scale design promotes walking while discouraging personal automobile use.

The revitalization of the High Point community also involved the reinstatement of the street grid from the curvilinear streets of the 1940’s. In order to promote safer, more pedestrian-oriented streets, the pavement widths range from 25 feet to 32 feet, which serves to slow or calm automobile traffic and reduce cut-through patterns. The majority of the interior streets adhere to the 25 foot width whereas the perimeter streets have the larger dimension of 32 feet; there are a select few residential streets with 28 feet of paved roadway width. In addition to lowering traffic speed, reducing the widths of right-of-ways results in additional area for open space and housing within the site.
Critical Elements:
Small blocks
Narrow Streets
Wide Sidewalks
Planting Strips/Medians
Walkways
Front Porches
Community Garden

High Point is a unique combination of both smart growth and new urbanism. The proposed redevelopment is intended to reconnect the community with the rest of West Seattle through new urbanism. However, the project is also a form of infill which is a fundamental aspect of smart growth. Therefore, this case study is an example of how each of these alternatives is malleable and can be adapted to better serve specific circumstances and context.

3.2.2 Elmwood Village, New York

Project Name: Elmwood Village
Project Location: Buffalo, NY

Recently named one of ten great neighborhoods in America by the American Planning Association, Elmwood Village is located at the crossroads of a historically significant parkway system and home to an impressive collection of world-class architecture within the City of Buffalo, New York. Elmwood Village is a vibrant, mixed-use neighborhood that dates back to Joseph Ellicott’s 1804 plan for the City of Buffalo. The neighborhood is just south of downtown Buffalo, bound by Richmond Avenue to the West, Delaware Avenue to the East, Virginia Street to the South with Forest Avenue serving as the northern most boundary.

This neighborhood is the result of one distinct planning or design effort, rather it is the product of over two centuries worth, all woven together to create the eclectic, cultural tapestry evident there today. The earliest of these planning efforts was orchestrated by Frederick Law Olmsted in his 1868 Park and Parkway System master plan. In addition to Delaware Park located in the northeast corner of the neighborhood, and three of Olmsted’s tree-lined parkways, this area of Buffalo is also home to extraordinary works of architecture. Among these architectural gems are H.H. Richardson’s Buffalo State Hospital complex, Frank Lloyd Wright’s William Heath House, Eliel and Eero Saarinen’s modernist Kleinhan’s Music Hall and E.B. Green’s Greek-revival Albright Knox Art Gallery.

Despite the laundry list of community assets, even residents of Elwood Village were unable to resist the flight of the 1980’s and 1990’s to the surrounding suburbs. Suffering from rapid decline the Elmwood Village Association (EVA) was formed to spur economic and cultural resurgence. One of the group’s first accomplishments was the successful narrowing of Elmwood Avenue, shifting the focus from automobile use to pedestrian uses through widening of the sidewalks and reduction of rights-of-ways. The resulting streetscape has created one of the busiest commercial districts within Buffalo, consisting of more than 200 boutiques, restaurants and taverns. In conjunction with these improvements the EVA adopted a set of design guidelines to, “ensure that future development (which includes new construction as well as alterations to existing buildings) of the Elmwood District maintains and enhances the unique character and scale of the community” (Buffalo Strategic Plan, 2005).

Critical Elements:
Unique character (sense of place)
Clearly defined spaces
High density and proximity
Active Community
design guidelines
Pedestrian scale

3.3.0 Conclusions

Synthesis and Summary

As a result of conducting the above case studies the following have been identified as critical factors influencing the walkability of a community:

• Land use patterns
• Density
• Land use mix
• Presence of neighborhood level services
• Integrated public transit
• Relationship to surrounding context
• Character and quality of the street
• Presence or absence of sidewalks
• Street trees and accessory plantings
• Street furniture
• bike lanes

Land use patterns greatly affect the proximity between places and therefore influence how people move throughout their communities. The higher the degree of proximity, the more interconnected the spaces and places tend to be. Consequently, patterns of land use with a high degree of proximity create more walkable, less automobile-dependent communities. This movement toward more active living communities is typical of traditional neighborhoods that developed organically over time, and also a critical component to new communities that focus on active living such as those examined through case studies.

Closely related to land use is the concept of density. Density gauges how compact the built environment is and is a measure of both structures and people. Typically, the higher the density, the shorter the trip distance, therefore the more walkable a place tends to be. While there is some criticism of this generality, few dismiss the idea that density is an indispensable requirement for reducing trip distance while simultaneously increasing the viability of transportation alternatives including walking, biking and public transit (Frank et al., 2003).

In addition to proximity and density, land use mix is an essential component to successful, walkable communities as revealed by the selected case studies. In contrast to typical suburban development, which is characterized by single use districts believed to increase trip distance and decrease the use of transit and utilitarian physical activity as feasible modes of transportation. Mixed land use refers to the combination of many different types of uses including residential, office, commercial, entertainment and services. The concept of mixed use can be measured both in terms of vertical and horizontal mixing. Vertical mixed use occurs when different uses are stacked on top of each other within a single structure, such as housing located over top of a commercial establishment. Horizontal mixed use combines different uses within close proximity to one another, such as the creation of a town center or even entire community. As demonstrated by the following case studies, a high level of mixing increases proximity thereby creating a diverse and vibrant neighborhood, ideal for walking, biking and public transit.

Another critical finding that resulted from conducting these case studies is the relationship between the specific community or neighborhood and the larger context of the city. It is important to note that this factor is heavily based on observation and greatly dependent on context, specifically in terms of ‘vacation’ communities such as Seaside. Many new urbanist and even smart growth communities tend to be isolated from the larger urban environment, suffering from what I refer to as island syndrome. Symptoms of island syndrome include separation and isolation from outside context, reliance on the automobile for access to full scale grocery, gas, entertainment, parks and open space and the majority of jobs. Communities that do suffer from island syndrome are typically located outside of the urban boundaries, where larger tracts of land can be purchased at cheaper prices. As a result the developments lack connection with the larger pedestrian and open space networks and are often located further from job centers. While these communities do contain land use patterns that encourage higher densities, mixed uses and a greater degree of proximity within the development they still require the automobile to accomplish if not routine daily tasks, then at least weekly necessities. Vacation communities such as Seaside and Celebration, Florida are more susceptible to this condition due to the transient nature of residents and their changing needs, but any development can fall victim to this syndrome. Baldwin Park is an example of how new urbanism and smart growth communities can reconnect development with the larger urban environment via Cady Way Trail and integrated bike lanes and sidewalks that extend outside the community into the surrounding neighborhoods.

In addition to land use patterns, urban design characteristics can greatly influence how an individual perceives and uses the built environment. Each of the communities studied for the purposes of this paper either contained specific features identified in the literature review as supporting walkability and bikability or did not. Some of the communities did a better job than others at achieving active friendly environments, but either way the features being observed included:

• Street Hierarchy
• Dimensions of right of way (ROW)
• Aesthetic of streets (street trees, pavement and perceived safety)
• Presence and width of sidewalk
• Bike lanes
• Character and quality of public space
• Level of neighborhood services
• Variation between neighborhood services and community amenities
• Degree of mixed use
• Degree of integration with surrounding context
• Incorporation of public transit
  • Condition of stop
  • Ease of use

The majority of the functional design criteria are incorporated in all of the communities, with transit needing the most improvement. According to my observations, the majority of transit stops are located the fringe of these communities and often not incorporated into the
developments at all. This may be due to the composition of the communities, each primarily middle to upper income, white families owning private automobiles. It may also be that because most of these communities excluding Seaside and Elmwood Village, are relatively new or not yet completed transit has not yet been incorporated.

It is important to recognize both consistancies and inconsistancies among each of the above case studies. While each of these communities or neighborhoods do contain the functional features such as sidewalks, public open space and town centers each case applies these elements with respect to its unique context. For instance, Seaside has a street hierarchy consisting of footpaths to boulevards and often lacks sidewalks, because the street itself functions as a public space. Conversely, Baldwin Park maintains a more basic hierarchy of streets including alleyways, residential streets and collector streets each with respective sidewalks. Where the sidewalk is the primary pedestrian zone and the road or street is reserved for motorist. Each case is unique, but both provide access to walkable and bikable, active friendly environments.

Still, it is insufficient to conclude community design impacts overall physical activity despite conducting case studies. It must be noted:

- that people may self-select, preferences of the environment (including sidewalks and neighborhood parks)
- only a small number of variables have been studied to date and
- reliable and valid measures of environmental variables are not available.
Chapter 4: Design Research

The difference between design that is simply design and design that serves as research has to do with the goals and outcomes of each. Designers who are conducting research through their creative practice create work that is intended to address both a particular design brief and a larger set of questions at the same time. In most cases the inquiry is sustained over a period of time and the designers create a body of work in response—projects and practices that serve as experiments though which they interrogate their ideas, test their hypotheses and pose new questions.

ANNE BURDICK
Design Research, 2003

4.1.0 Overview

Research can play a significant role not only in the education of landscape architects, but also the practice of landscape architecture. At the professional level, research informs every project and provides the theoretical understanding from which we base the framework of our design approach and future implementation. On the other hand, academia provides systematic education of research methods and can serve as a laboratory to test ongoing research in the field, as well as a forum to encourage interdisciplinary dialogue and collaboration. In his writing and design, architect Walter Hood suggests “holistic inquiry” as a research tool used to comprehensively grasp both existing and past environments in order to evaluate and respond to the multidimensional forces that shape our neighborhoods and communities (Hood, 1997). I use Hood’s process of holistic inquiry as a point of departure for what I refer to as design research. I believe this approach to research enables designers to view the ‘site’ as if you were a vital community member, allowing creative, yet practical solutions to real community issues.

Relying solely on theoretical and quantitative research methods generates a one-dimensional environment in which it is easy to be handicapped by dynamic economic, physical and social constructs present within neighborhoods. Therefore, my research involves not only more conventional theory-based research methods, but also the practice of design as a vehicle to enrich understanding. Furthermore, as designers, some understanding can only come to complete fruition through the process of design. Therefore, design research as a scholarly method of inquiry presents the following advantages:

• Design research presents an intuitive mechanism for designers to test theoretical findings.
• When applied, design research reveals weaknesses and gaps between theory and reality; bridges gap between theory and practice.
• Design research expresses particular attitudes about place and also its culture from an insider’s perspective.
• Design research enables one to assess real community issues through innovative design solutions that are built on a body of theoretical research.
• Allows social and cultural patterns and history to be transformed into physical form.

In the context of my research, I have used design to explore and interpret my understandings garnered from the existing body of theory and literature to create a setting that embodies the ideas behind successful and active living environments. While specific research findings provide the initial framework and vision for the proposed intervention, the design process also involves tweaking and modification that responds directly to place and context. This process of design evolution develops a richer and more complete understanding of the issue(s).

4.1.1 Design Process

4.1.1.1 Defining the Problem

Healthy communities are those that seamlessly integrate physical activity into everyday living. More specifically, active living communities strive to incorporate 30 minutes of moderate physical activity, or enough to satisfy minimum requirements set by the Surgeon General. Researchers have long hypothesized that older neighborhoods and urban centers are more likely to contain the critical infrastructure that supports active living environments. Examples of this type of supporting infrastructure include sidewalks, street trees, and lighting, combined with mixed land uses within close proximity of residential areas. However, often times these older neighborhoods and urban areas have higher concentrations of racial and ethnic minority groups that carry a disproportionate burden of physical inactivity and associated poor health.

Gainsboro is the oldest neighborhood of the City of Roanoke. Today the neighborhood is characterized by working class, aging, African American residents. The neighborhood is laid out with a combination of traditional grid pattern streets and typical suburban subdivision cul-de-sacs. This neighborhood is an ideal location for a pilot study because of the mix of street types, proximity to downtown and composition of neighborhood residents. However, the area lacks continuous sidewalks, neighborhood parks, community amenities such as a local grocery and small-scale retail. In addition the neighborhood lacks defined gateways that contribute to an enhanced sense of community. It is likely that this neighborhood could benefit substantially
from enhanced pedestrian corridors, greater connectivity within the neighborhood and with the larger urban area, and the productive re-use of vacant parcels.

4.1.2 The Problem

The characteristics of urban form significantly influence an individual’s perception with regard to the desirability of walking, bicycling, or engaging in utilitarian or recreational physical activity within a particular setting. A great majority of the built environment is consciously designed. However, more and more often streets are designed primarily for one set of users, the motorists. Motorists experience the physical space and design in a fundamentally different way than do pedestrians or cyclists. For instance, while the motorist may travel longer distances at higher speeds, both pedestrians and cyclists travel shorter distances that are a few miles at most and more typically range from ½ mile to only a few hundred yards. The motorist experiences the built environment and landscape almost as if it were a blur, a backdrop between points A and B; a landscape designed to be legible at higher speed. This is evident through the size and typeface of road signs designed to be read from a distance, the scale of detail or lack thereof, and even the spacing of elements along a given segment of road, all designed to keep traffic moving through space. For a motorist, trees, buildings, and signage are easily read as a cohesive strand, although these elements may in reality be separated by great distances. Furthermore, elements such as paving details, benches, trash receptacles, lighting, and plant material contribute to the character of a place; the elements that invite us to pause, linger and rest may go unnoticed by the motorist. Conversely, an individual on foot or bicycle is powerfully influenced by the design characteristics of their immediate surroundings, including streets, parks, squares, plazas, buildings, lawns, sidewalks, bus stop shelters, crosswalks, trash bins, curbs, fences, signage, plant material, and a host of other elements (Frank, Engelke and Schmid, 2003).

While many federal and state programs have focused intensively on the planning and development of ‘transportation systems’ the majority of these programs have focused on the automobile. The end result of which has been an unattractive, potentially dangerous and often absent pedestrian zone. In large part, this planning and design movement has not incorporated alternative forms of transportation, including public transportation, and more importantly, pedestrian networks that can pay additional health dividends. Planning and design for the purpose of encouraging and promoting physical activity has been given little if any emphasis. In Health and Community Design, authors Lawrence D. Frank, Peter O. Engelke and Thomas L. Schmid (2003) suggest this shift in emphasis may, at least in part, have deep roots in the bias of city planners dating back to the City Beautiful movement, which focused on wide city boulevards and curvilinear suburban streets, at the expense of fine grain grid streets. This shift in emphasis brought about the transition from the City Beautiful movement to the movement known as the City Efficient. The movement was hugely popular among the then emerging field of city planning, which placed greater emphasis on modern, rational principles focused on functional considerations, such as the, “protection of public health, the free-flowing movement of people and goods throughout the city, and the efficiency of business operations” (153).

For the first time in the history of city design and planning were architects and planners disregarding principles that had long ordered basic relationships between design elements to accommodate the ever-increasing presence of the automobile. As it were, many of these ideas coincided nicely with the goals of the newly established field of transportation engineering. Unfortunately, the focus on the automobile downgraded streets from, “multifaceted instruments of urban design to cogs in a functional machine with a single purpose: to move automobile traffic as efficiently as possible” (153). As a result, the street as a community public space was lost.

Streets are the life blood of our communities; not only are streets the main components of the built environment, but they are the primary spaces in which people, walk, jog, and bicycle. They are social spaces for events including rallies and parades; streets contribute to a unique sense of place and add to its desirability (154). The street is the focus of urban experience; an amorphous, interactive space defined by building facades, surfaces and gestures, “a place where communal
and individual realities mingle” (Ally Ireson and Nick Barley eds., 2000). Streets are not one dimensional and should not be designed for one set of users. Streets are important design elements that significantly influence the basic fabric of any place, urban, suburban or rural. Streets can facilitate physical activity through greater connectivity or discourage even basic forms of physical activity due to dead ends, no sidewalks, and fear for safety.

Today the urban and rural environments we build seem to demonstrate a fragmented approach to planning, designing and building our communities. The street network has been narrowly defined by transportation planners and engineers, among others, as a linear space for transporting people and goods with the primary user being the motorist (Frank et al., 2003). Unfortunately, this limited perspective of the street as a conveyor, has created streets that are not only disconnected from destinations, visually uninspiring and lacking what Jane Jacobs (1961) refers to as ‘natural proprietors’ that contribute to a sense of safety.

To compound this problem, landscape architects have primarily focused on designing to accommodate recreational forms of physical activity in the form of neighborhood and regional parks, greenways, and community open space. Landscape architects have yet to fully embrace the design of spaces for utilitarian physical activity. Recreational physical activity is defined as forms of exercise undertaken intentionally, typically during one’s leisure time. When most people think of physical activity, they are usually envisioning activities such as hiking, mountain biking, jogging, weight lifting, soccer, or swimming among many others that are considered recreational in nature. Utilitarian physical activity on the other hand, is physical activity undertaken in order to accomplish another purpose. Classically, this can be described as walking or cycling to work, or school, walking to shop, the post office or even walking to the neighborhood cafe. The key is that the activity (walking or cycling) is a by-product of achieving another goal (Frank, Engelke and Schmid, 2003). The CDC suggests that non-structured forms of exercise such as walking to accomplish tasks or simply walking may be critical to improving the overall health of Americans. Moderate forms of physical activity including walking for 30 minutes can be Incorporated into a person’s daily routine, becoming part of their lifestyle and therefore requiring no additional commitment or fees associated with structured fitness programs and facilities. Furthermore, adherence rates for moderate, less strenuous forms of exercise are typically higher than those associated with more strenuous fitness regimes (54).

### 4.1.3 Critical Factors

“All parts of the body which were made for active use, if moderately used and exercised at the labor to which they are habituated, become healthy, increase in bulk, and bear their age well, but when not used, and when left without exercise, they become diseased, their growth is arrested, and they soon become old.”

HIPPOCRATES,
On the Articulations (ca. 460-377 B.C.)

**PHYSICAL ACTIVITY**

A mere century ago, all that was needed in terms of healthy physical activity was woven into the everyday patterns of life. A large portion of the population was based in agriculture, where long days of physical exertion were typical. Those people who lived in more urban environments often worked in factories, on construction sites, or other service related positions that also required a significant amount of physical effort. For urban and rural residents alike, occupational physical activity, combined with the necessity of walking to and from work, school, and shopping destinations created a society rich in unintentional physical activity due in large part to the economic and cultural circumstances present in their built environment.

Today, with changes in the built environment due to current land use regulations and advancements in modern technology that provide “conveniences” such as garage door openers, ride-on law mowers, elevators, and automatic car washes, physical activity has virtually been engineered out of our daily lives. Today’s ‘post-industrial’ economy centers around sedentary desk jobs where one can go the entire day without stepping foot outside of the office. One result of that is more than half of U.S. citizens do not engage in the minimum physical activity recommended the Surgeon General. This trend in inactivity has spurred the CDC to define the term sedentary lifestyle to describe those “persons with no or irregular leisure-time activity” in the previous two to four weeks. Leisure-time physical activity is exercise including sports, recreation, or hobbies that are not associated with activities as part of one’s regular daily routine (CDC, 2008). This lack of physical activity may be the result of longer work days, more responsibilities at work and home, longer commute times, and an overall emphasis on the automobile as the primary means of transportation.

The automobile has improved mobility, primarily for the middle aged, middle class American, but at what cost? According to the American Heart Association (2008), the estimated cost of overweight and obesity in the U.S. in 2002 was $132 billion. This figure includes both the
direct costs ($92 billion) and indirect costs ($40 billion). More than the billions of dollars this epidemic costs the U.S. annually, the overall health of the nation has suffered greatly.

Your quaint suburban home with its attached garage transports you into your vehicle where you are now properly suited to enter into the realm of transportation infrastructure designed specifically for you, the driver. After driving to work you enter your corporate parking garage, and take the elevator to your office with a view of the congestion of the street below. At the end of the day, you will reverse this scenario and end up back at home, never having stepped outside. With this sedentary lifestyle becoming more and more typical, it is no wonder obesity rates are increasing, along with other public health concerns, including increased instances of type 2 diabetes and heart disease.

It is also becoming more evident that intentional physical activity is not a uniform phenomenon, but varies quite significantly by age, type, purpose and location of the activity relative to the participant. Furthermore, society is not heterogeneous and all groups respond differently to the characteristics of the built environment. Table 2 illustrates differences in physical activity by age group, in the United States.

### TABLE 2

<table>
<thead>
<tr>
<th>Physical Activity by Age Group: United States, 2000</th>
<th>18-24 years</th>
<th>25-44 years</th>
<th>45-64 years</th>
<th>65-74 years</th>
<th>75+ years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active</td>
<td>40%</td>
<td>30%</td>
<td>30%</td>
<td>27%</td>
<td>16%</td>
</tr>
<tr>
<td>Sedentary</td>
<td>21%</td>
<td>34%</td>
<td>41%</td>
<td>46%</td>
<td>50%</td>
</tr>
</tbody>
</table>

Defined as engaging in sufficient moderate (min. 5 times per week for 30 minutes a day) and/or vigorous (min. 3 times per week for 20 minutes a day) physical activity.


**SENIOR CITIZENS (65+)**

Changing Demographic:

In part due to the dramatic increase in life expectancy over the past century, by the year 2050, for the first time ever, the percentage of people over the age of 60 will exceed the percentage of children under the age of 14. According to the CDC (2007), the number of older Americans will more than double to 70 million, or one in five by 2030; America is quickly become a nation dominated by aging seniors. While the prevalence of chronic disease and illness (80% of older Americans are living with at least one chronic disease) naturally increases with age, this generation of seniors is unlike that of their parents (CDC, 2007). This group of seniors is more likely to be better informed and more affluent. Furthermore, the U.S. is not alone in this aging demographic trend; in fact seniors (age 60+) is the fastest growing group in all of the world’s wealthiest nations.

**Economic Impacts:**

The report, The State of Aging and Health in America 2007 by the CDC projects that by 2030 the nation will face an increase of twenty-five percent in national health care expenditures as a response to this changing demographic. These alarming statistics and unprecedented shifts in demographics have increased awareness to the importance of improving the health of aging Americans. Promoting healthy behaviors such as walking as a means of physical activity can help lower health-care costs and also reduce the risk factors of many chronic diseases.

**Incentive for Action:**

Risk factors increase the probability of morbidity and premature morbidity and are typically inherited, environmental and behavioral in nature. Generally speaking, risk factors can be divided into two main categories: modifiable and non-modifiable. In 2000, thirty-five percent of U.S. deaths were caused by modifiable risk factors or factors that are controlled by individual behavior (Cottrell et. all, 2006). More specifically, three factors including smoking, poor diet, and physical inactivity were determined to be the root behaviors responsible for these deaths. However, aging does present a unique set of barriers in terms of modifying behaviors, specifically behaviors associated with physical activity.

While regular physical activity is believed to play a critical role in helping to ward off or delay the onset of both physical and mental health issues, as they relate to age, the built environment may severely limit opportunities for active living for seniors. Unlike other age groups, the elderly face numerous difficulties with respect to the built environment, often to the extent that even pedestrian-friendly environments may not adequately accommodate them.

**Specific issues:**

- Erosion of physical ability
- Slower walking speeds
- Loss of hearing and or eyesight
- Diminished sense of balance

In addition, scientific data also clearly indicated that the level of physical activity declines with age (table 2). This can be attributed to increasing responsibilities of work and family with
middle age and changes in physiology as one continues to age (Frank et. all, 2003). Despite declining levels of activity in older Americans Dr. Richard J. Hodes, M.D. and Director of the National Institute on Aging says older people need to exercise. Dr. Hodes states that in the past exercise was judged “too dangerous, too vigorous and that older people, because of frailty, were more likely to be injured or damaged by exercise”. However, numerous studies have now shown not only is physical activity and exercise safe for seniors, but it also has tremendous benefits. Participating in aerobic exercise and weight training can “significantly increase muscle mass, more importantly, muscle strength, and most importantly of all, to translate that increase in strength into the ability to carry out functions of daily living; to climb stairs, to shop, to carry packages. Things that are important to maintaining independence and health throughout the lifespan” (Dr. Richard J. Hodes, M.D., 2002).

MINORITIES AND THE POOR
Demographic overview

As the American population ages, it is also becoming more and more diverse, both ethnically and racially. However, the health status of minorities continues to lag behind that of non-minority populations. The burden of chronic disease and illness as stated in the literature review portion of this document varies widely, but disproportionately affects African Americans and Hispanic populations. Data from the 2004 National Health Interview Survey (NHIS) indicates that “39% of non-Hispanic white adults aged 65 years or older reported very good or excellent health, compared with 24% of non-Hispanic blacks and 29% of Hispanics” (CDC, 2007).

In 2000, those who identify themselves only as African American constitute approximately twelve percent of the American population -- almost 35 million individuals, according to the 2000 U.S. Census. However, the U.S. Census Bureau projects that by the year 2035 there will be more than 50 million citizens of African American descent in the United States, comprising just over fourteen percent of the population. This steadily increasing trend has remained consistent with every recent census. According to projections by the U.S.Census Bureau, racial and ethnic minority groups are expected to increasingly contribute to a larger percentage of the overall American demographic. Following current and past trends, this suggests that an ever growing portion of the population will be subjected to health disparities. To be effective in finding an appropriate remedy, programs and policies must be based on preventative research and supported by inter-governmental partnerships, businesses, faith-based organizations and communities themselves.

Incentive for Action:

The linkage between low-income status and racial or ethnic discrimination and neglected health is well documented. Individuals with lower incomes are shown to have a higher risk of mortality, contracting a chronic disease, becoming overweight or obese, or suffering from other negative health effects (Frank, 2003). In addition, there is a correlation between both minorities and low income individuals and decreased incidences of physical activity.

This may be attributed to:

- Less leisure time
- Less expendable income
- Fewer neighborhood amenities

Ironically, these disparities are exacerbated by the lower rates of automobile ownership (reflected by lower rates of vehicle miles per person illustrated by table 3) among the poor and minority groups as compared with higher-income households. In a society that is auto-dependent, these groups are increasingly limited in terms of reaching destinations across a region, including:

- Employment
- Commercial retail
- Entertainment
- Personal destinations
- Gyms
- Recreation facilities
- Grocery stores
- Pharmacies

TABLE 3

<table>
<thead>
<tr>
<th>Travel patterns by racial/ethnic status, United States</th>
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</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>African American</td>
</tr>
<tr>
<td>------------------</td>
</tr>
<tr>
<td>Person miles of travel</td>
</tr>
<tr>
<td>Vehicle trips (as driver)</td>
</tr>
<tr>
<td>Transit trips</td>
</tr>
<tr>
<td>Walk trips</td>
</tr>
</tbody>
</table>

However, the lack of automobile ownership increases the reliance on public transportation and the need for increased opportunities for utilitarian physical activity as illustrated by table 3. Utilitarian physical activity is defined as “activity done for a purpose, such as walking to the store or to the theater, or to work” (Frumkin, 2004).

4.1.4 Identification of site

Gainsboro is fortunate to be one of the only neighborhoods of the City of Roanoke that has experienced a growth in population. In 1990 the population was 767, and at the time of the 2000 Census the population had increased to 967. While this population growth is best explained by the opening of Our Lady of the Valley Nursing Home that can accommodate a total of 170 residents at capacity. The addition of Eight Jefferson Place, just north of the neighborhood boundary, will provide apartments for up to 150 residents which is expected to contribute to further growth within Gainsboro. The City of Roanoke has a population of approximately 94,914 according to the 2000 Census, of which sixty-nine percent are white and twenty-seven percent are African American. However, Gainsboro is very much the reverse, the majority of neighborhood residents are African American (73%) with a smaller portion of white residents (23%). Furthermore, Gainsboro is an aging community with the largest percentage of residents over the age of 65 (30%), compared with only sixteen percent at the city scale. Additionally, Gainsboro is located within a belt of low-income tracts, grouped at the center of the city (U.S. Census Bureau, SF3, 2000).

As noted in the literature review, low-income, minority populations are more susceptible to chronic disease caused in part by patterns of physical inactivity. Furthermore, as age increase so to does the incidence of chronic disease and illness, therefore making Gainsboro an ideal community to test intervention strategies. Along with an ideal neighborhood demographic, the City of Roanoke has made a commitment toward designing a more attractive, active and multi-modal community in keeping with the principles of this research and proposal. Specifically, the Comprehensive Plan outlines a series of strategic initiative for implementing policies including, but not limited to:

“Improving Streetscapes. Creating great streets will improve both Roanoke’s image and its function, providing not only a safe but also an attractive environment for pedestrians, bicyclists, and transit riders, as well as for automobile drivers.”

“Healthy Community. Education and libraries, health facilities, and social programs are the basic infrastructure for a healthy community. A focus on high profile, positive programs will organize people-oriented services under a series of easily understandable umbrellas, communicating civic vision, attitude, and commitment.”

Opportunities for Response

REACH U.S. is a multilevel, national program that is part of the CDC’s initiative to eliminate ethnic and racial disparities in health. Racial and Ethnic Approaches to Community Health Across the U.S. (REACH U.S.) has worked to establish a “national infrastructure to promote evidence- and practice-based public health programs, community-based participatory approaches, and the integration of systemic influences” to aid in the successful elimination of racial and ethnic health disparities in the following six categories: (1) cardiovascular disease, (2) immunizations, (3) breast cancer and cervical cancer screening and management, (4) diabetes, (5) HIV/AIDS, and (6) infant mortality (REACH at a glance, CDC. 2006).

4.1.5 Context

Today, Gainsboro is located within the designated downtown sector of Roanoke, just north of the Norfolk-Southern Rail line and west of Route 581. The neighborhood is comprised mostly of dated housing stock, vacant lots and abandoned buildings. The character of the physical landscape is that of undulating topography and culverted streams. Historically, the streets of Gainsboro consisted of a highly interconnected, grid pattern of narrow streets. The hierarchy consisted of four primary street types including north-south through streets, east-west connector streets, alleyways and occasional diagonals. While some of this historic pattern is left, much of it has been replaced with wider, suburban style streets, often with cul-de-sacs or dead-ends through redevelopment efforts. Areas along Gilmer Avenue offer a glimpse of what Gainsboro once offered. Particularly, the eastern most section between Jefferson Street and 2nd street;
Compact lots that are deep and narrow, generally ranging from 2,500 to 5,000 square feet where houses conform to lot restraints and occupy anywhere from 40-50 percent of the total lot. The setback from the street responds to topography, but is fairly consistent around 30 feet. (SEE IMAGES) These conditions stand in stark contrast with that of new construction. The more 'modern' areas of the neighborhood are characterized by larger, suburban style lots ranging from 7,000 to 18,000 square feet where houses are setback a minimum of 30 feet, often times more and more houses occupy only 7-15 percent of the overall lot area.

Despite the hardships Gainsboro has faced as a neighborhood, it has retained much of its historic past through its few remaining landmark buildings. Among these, St. Andrews Catholic Church, Hotel Roanoke, The Roanoke Higher Education Center (previously the Norfolk & Western Railway building), and the Gainsboro Library are listed on the National Register of Historic Places. In addition to these landmark buildings, portions of residential areas including that of Gilmer Avenue have been identified for consideration on the National Register.

**Description of Site and Surrounding Context: Gainsboro Road and Gilmer Avenue**

The site I have chosen to explore my research through a design intervention is the intersection of Gainsboro Road and Gilmer Avenue. This intersection presents a unique set of characteristics, in part because it is the convergence of two different street types that both traverse the entire neighborhood of Gainsboro. Gainsboro Road is a collector street carrying heavy volumes of traffic at relatively high speeds through the heart of this historic neighborhood. Conversely, Gilmer Avenue is a local street, primarily residential in character, distributing traffic within the context of the neighborhood. The intersection is also within walking distance of the neighborhood library, the Our Lady of the Valley senior living facility, and St. Andrews Catholic Church. The intersection is the pivotal entrance into the historic neighborhood from downtown Roanoke, just minutes from downtown, Hotel Roanoke, and the revitalized, historic Henry Street.

Streets are more than public infrastructure, more than a physical linear place, and more than a way of transporting people and goods from place to place. Streets are places to be on, places to come to, places of memory and places of inspiration. Streets compose the form and structure and comfort of urban communities (Jacobs, 1993). Streets provide a setting for meeting and greeting others; streets are places of happenstance, places of exchange, places of rhythm, places of politics and places of intrigue. Streets allow people to engage the outside; nature, people and place. While streets are all these things, not all streets are created equal; some streets are better than others.

Streets are malleable and susceptible to change overtime. Such is the case with the streets of Gainsboro.

**4.1.6 History**

The Gainsborough (original spelling) neighborhood is the oldest neighborhood in the city of Roanoke, dating back to 1834. Soon after the establishment of the town, the area became better known as 'Big Lick' after its location on the salt marshes or licks. In 1852 the arrival of the Virginia and Tennessee Railroad just missed 'Big Lick', running due south of the incorporated
town of Gainsborough. As commerce and population grew, the town began to gradually move south toward the railroad and what is currently the Henry Street area of Gainsboro. The move of "Big Lick" left the remaining settlement to be known there after as Old Lick, which became a predominately African American community. However, in 1882 both Old Lick and Big Lick were incorporated, creating the City of Roanoke.

From the time of establishment and into the twentieth century the Gainsboro neighborhood was an integrated community. However, during the 1920's the area became home to predominantly African American residents. During this time Henry Street, what is now 1st Street, became the thriving commercial heart of the neighborhood and African American community. It was on Henry Street where the residents of Gainsboro and the city's other African American communities would go to see and be seen; it was where all the action was, from music, to shopping and even the dentist. Throughout the 1920's and into the 1950's, the era of segregation, this area flourished. However, during the 1960's and 1970's, the decades following segregation, the area became the target of urban renewal or "slum clearance" programs. It was this single period that forever changed the physical fabric of Gainsboro.

Urban Renewal began as a federal program in the late 1940's to help improve inner-city housing conditions, and restore poorly planned, physically deteriorating and unsafe urban settings (often referred to as "blighted areas"), and bring about reinvestment in central cities. While this program may have been designed with the best of intentions, it ultimately resulted in the demolition of vast expanses of neighborhoods and important cultural landscapes, replacing them with what was then considered improved public housing facilities. In addition to improving housing conditions, urban renewal provided funding mechanisms for large projects including hospitals, highways and civic centers.

Like many inner-city neighborhoods in the U.S., Gainsboro continues to deal with the consequences of urban renewal programs of the 1960's and 1970's. The programs and policies associated with urban renewal did more than remove "blighted areas", in Gainsboro the era is known for displacing numerous families to accommodate the construction of Route 581. The highway not only displaced families but also destroyed much of the fine grain, grid pattern of historic streets, and all but removed the century-old neighborhood cemetery. In addition to the disruption caused from urban renewal, Gainsboro was once again subjected to 'improvements' in the mid 1990's with the realignment of Gainsboro Road that serves as a gateway into the historic neighborhood. The realignment intended to provide direct access between downtown and Orange Avenue, but the physical design encourages high speeds that are inappropriate for a neighborhood setting and has unintentionally created a barrier at the center of it.

**Synthesis of Opportunities**

Fortunately, Gainsboro is located near downtown providing various opportunities to connect
- Close to downtown
- Proximity to Lick Run Greenway
- Washington Park located at boundary
- Vacant lots provide great opportunities for revitalization
- Rich palette of materials
- Charming existing sidewalks (along Gilmer provide framework for street improvements)

**4.1.7 Goals and Objectives**

How might current research in landscapes for healthy living influence the design of neighborhoods, communities, and cities to promote more incidental physical activity?

Goal: Reunite the neighborhood through the streets

Objective: Encourages pedestrian movement through design

Goal: Shift emphasis from motorist to pedestrian accommodation

Objective: Restructuring of streets and streetscapes
  - Create a unique sense of place that responds to context and circumstance
    - Familiar
    - Framework
    - Natural Systems

Objective: Establishment of neighborhood square that:
  - Accommodates public transportation
  - Serves as a catalyst for economic reinvestment
  - Promotes meeting, lingering and distributing
5
DESIGN EVOLUTION
Chapter 5: Design Evolution

“Design requires a space – the research lab – for design risk-taking, speculation and discovery, not only for specific applications but also to expand our knowledge of design itself.”

ANNE BURDICK
Design Research, 2003

5.1.0 Research Questions

Given that numerous studies have proven a link between the built environment and public health combined with the changing American demographic and dramatic rise in obesity levels in the U.S., the extension of research into the realm of community design and its implications on physical activity are essential to fully understand and engage this complex issue. The following set of questions has helped to focus and guide my research.

• How can design and planning professionals, specifically, learn to collaborate to create a richer solution through a more in-depth understanding of context and issues?

• How can Landscape Architecture and Urban Planning affect the layout of cities, towns, communities and neighborhoods to encourage healthy living?

• How does design encourage the use of the built environment?

• What are the issues relating to the use of the built environment?

• How can design increase utilitarian physical activity?

• How can landscape architects step out the realm of recreational physical activity to encourage more utilitarian physical activity?

• How can a design intervention respond to varying scales (block, neighborhood, city, and region)?

This set of questions established the framework from which I based my research on. Specifically, these questions refined my research topic and defined the body of literature I have drawn upon for my work, both in terms of design and scholarly writing. The process has since resulted in suggestions to help remedy the outlined issues in terms of design recommendation and interdisciplinary collaboration.

5.1.1 Proposal

The proposal is a layering of simple, but thoughtful gestures, based on holistic inquiry. Holistic inquiry is a term used by Walter Hood in his book Urban diaries (1997) and refers to an understanding of past and present, social, political, personal, economic and physical. The approach to knowing and understanding is based on the familiar, frameworks, natural systems, compositions and improvisation. The holistic inquiry presents a malleable structure that responds to context.

Improvisation

According to Hood, improvisational design is the “spontaneous change and rhythmic transposition of nonobjective compositions...within a spatial field created by a distinct framework” (6). Here, change and transposition are guided by an understanding of common, everyday objects and practices that constitute the familiar. The usefulness of improvisational design is that it departs from any specific design hegemony and empowers the designer to be creative. Utilizing improvisation as a method of inquiry enables the designer to mold existing and traditional forms into new and unique applications through the incremental transfer of ideas. This transformation establishes familiar objects in space, reinforcing the image of the community while extending tradition.
The Familiar

The use of the term ‘familiar’ refers to how one approaches the study of place. It is the process of developing an understanding through everyday elements and objects present within a particular set of circumstances. For me this process began in the Fall of 2006 when I was still what Dripps would describe as an outsider; someone not from the community, someone with different experiences, culturally, emotionally and physically. Through a series of self-guided walking tours I was able to develop an understanding of Gainsboro based on the layout, the architecture, the patterns and anomalies through texture and placement. Among these the familiar elements, the following have been identified as critical and have been expressed as components of the proposed design.

- Front porches
- Masonry walls
- Embedded steps
- Brick
- Stone
- Awnings
- Alleyways
- Frameworks

The Framework

The framework is the form or structure from which an intervention takes shape; they are silent forms awaiting identity. Here again, this process employs the understanding of past, present and future. The framework plays with the vertical and horizontal plans and provides a mechanism for extracting meaning and symbolism in a manner that is not arbitrary, rather it is significant and intuitive. The framework can also be a component of the familiar, yet is complex enough to be considered by itself. The richness of history present throughout Gainsboro, I discovered, was told in large part by the streets. Because this neighborhood was the origin of the larger city of Roanoke, there are decades worth of stories and conversations that are evident through a simple exploration of the street patterns of the past and present.

Throughout time there have been similarities that were carried forward, and those traditions that have been lost or forgotten with the passage of time and evolution of needs. The notion of the framework explores both street networks of the past and those present today. One of the major findings of this exploration is the continuation of the street grid. The grid, like most, is composed of four primary street types: the through-street running north and south, the connector streets that run east and west, the alleyway that can run east-west or north-south, and the diagonal. Of these four street types the diagonal is the anomaly. The diagonal deviates from the standard pattern of streets in that it does not follow any beat, nor does it parallel any specific directional axis, rather the diagonal slices through the grid.

Natural Systems

“The character and personality of a place is revealed in the facial contour, and expression of the landmark” (Morrish, 2005). The landform and terrain of our home is imprinted in our memories, influencing how we see the land around us. Gainsboro is a neighborhood upon a hill. William Morrish describes “a city upon a hill” as “elevated above the common land, The city on the hill sits midway between the terrestrial and celestial worlds on a plane called earth.” He goes on to state “the elevated city symbolizes prominence, civitas and urbanity” (Morrish, drawing 10).

Gainsboro’s most prominent feature is that of undulating landform. The change in elevation is not always obvious, but traveling on most any north-south street reveals the beauty that is Gainsboro. The ‘hill’ using Morrish’s term, takes on may forms throughout the neighborhood, from the simple foundation of a building and magnificent stone walls, to the steps that cut into the landscape revealing its depth.
**Compositions**

The familiar, framework, and natural systems combined with the history has left remnants, marks, and scars on the physical structure of Gainsboro. Little of the original housing stock is left; previous interventions have not always created the result first envisioned. Abandoned properties have created nuisances and become the focal point of disrepair. The economic infrastructure has relocated and the introduction of transportation infrastructure (Rt. 581 and the railroad) as edges of the community has further isolated the neighborhood, socially, and economically from the downtown area as well as other neighborhoods. The story of Gainsboro is the typical tale of the fate of African American neighborhoods in urban America. Gainsboro is physical testament to the outside actions of urban renewal and housing abandonment.

The composition of the familiar, framework, and natural systems weaves ideas from past and present to create a layering of investigation and utility. The design implications, explored in plans, sections, perspectives and writing, are a translation of research, functional uses and observations.

### 5.1.3 Synthesis of Design Implementation

“No single street tells the whole story of a city: all of them are usually necessary for comprehension of where we are, what it is to be in a particular urban territory, as well as for orientation.”

Lucy Bullivant  
*City Levels, 2000*

A new urban park in Gainsboro is an example of turning a liability into an asset. Gainsboro’s neighborhood square is planned as a 8 acre square at the southern entrance into the historic neighborhood. The area is characterized by a mixture of residential, civic and vacant lots distributed around the immediate site as well as throughout the neighborhood. The neighborhood square achieves a spatial layering and material richness that is reminiscent of the historic public realm.

The proposal for the square at the intersection of Gainsboro Road and Gilmer Avenue is organized into four quadrants that are connected via an urban plaza that doubles as a forecourt to the buildings that compose the edge of the square. The materials of the square and gardens are simple, few, and conventional. The inspiration for these materials was discovered earlier in the design process through the use of the holistic inquiry. Brick is the most prevalent material and different applications utilize various brick types and sizes. Brick is found on building facades, crosswalks, and sidewalks. In addition, the use of two types of stone-black, galaxy granite is used throughout the reflecting garden for the basin and wall, while local quarry stone is used for risers and textured paved surfaces. The stone detailing updates the masonry traditions of using brick and stone to enhance aesthetics and double as a method of retaining earth. The trees are a combination of river birch, oaks and ornamental including star magnolias and flowering cherry trees. The river birch grows quickly and tolerates urban conditions well, their multi-stemmed, rough bark appearance contrasts nicely with the spreading canopy and smoother bark of the oaks. While the river birches filter sun and provide visual interest in the plaza space, the oaks provide the linear park with a sense of permanence and majesty while providing dense shade during hot summer days. The ornamental species allow dappled light to play on the neutral mineral surfaces of the reflecting...
garden and provide burst of color and fragrance throughout the spring and summer months. Crushed stone and lawn provide textural interest and complement stone and arboreal features. Overall, the use and application of materials references African American craft traditions to great and elegant and taut composition that emphasizes the act of hand construction and craftsmanship.

The result is a series of public spaces that accommodates strolling local residents with the everyday necessities that have been gradually removed from the neighborhood over time. Washington park terminates the northern end of the roughly 2.5 mile linear park, while the Roanoke River Greenway and park system terminates the pedestrian way to the south. Although the linear park serves as a median to facilitate crossing the four lanes of Gainsboro Road, that is not its only function. While the concern of crossing the road safely is a priority, the intent of the linear park is to provide Gainsboro residents with a pleasurable, multi-functional space that unites the neighborhood and reconnects residents with the amenities of the larger city.

Patrons of a cafe on the ground floor of one of the residential buildings facing the square adjust their chairs and orient their gazes to the lawn and trees that comprise the urban community garden. Young adults and teenagers cluster together in front of the record shop with laptops, iPods and cell phones, sharing the latest beats and gossip. Dog walkers pass through the square to grab a coffee before they make their way to the linear park for their daily stroll. Children doddle next to their parents as they enter the neighborhood grocery, and lovers enjoy the more subdued atmosphere of the reflection garden.
“The automobile has given improved mobility primarily to the middle class, middle aged. But these owner-drivers have not merely gained new mobility through the car; they have also rearranged the physical location patterns of society to suit their own private needs, and unwittingly in the process destroyed and severely limited the mobility and access of all others.”

K.H. Schaeffer and Elliot Sclar, Access for All: Transportation and Urban Growth (1980)

6.1.0 Findings

As discussed throughout this paper, environmental barriers to physical activity encompass various negative qualities of neighborhoods—most notably perceived and real safety from crime, assault, harassment, injury and traffic as well as limited or lack of neighborhood sidewalks. The proposal for a neighborhood square at the heart of the Gainsboro neighborhood is an example of modifying the physical environment to create a more active-friendly neighborhood. The proposal seeks to (1) provide safe places for exercise near homes; (2) locate attractive, routine destinations near homes; (3) connecting destinations with safe, convenient, and aesthetically pleasing transportation systems; (4) provide well-maintained, well-lit, and continuous sidewalks and bike lanes.

Socially supportive atmospheres (the presence of other people exercising) also help reduce barriers and further encourage physical activity within urban neighborhoods. Among Blacks, characteristics that could impact active living include low incomes and education levels, limited access to health care, and a history of victimization from violence and racism (Day, 2006).

6.1.1 Compare Contrast

According to “Roanoke’s Character Districts,” the Gainsboro neighborhood is a combination of downtown, village center, traditional, suburban and industrial districts. Each district is defined in Roanoke’s newly adopted Street Design Guidelines (2007) as:

1. **Downtown** is characterized by a pronounced skyline, pedestrian friendly streets and a mixture of retail, office, residential, and light industrial uses. Downtown streets form an interconnected grid and are designed to accommodate both vehicular and pedestrian use. Buildings are typically set close to the street and often adjoin each other. On-street parking is common and off-street parking is generally concentrated in parking structures or is located to the side or rear of buildings.

2. **Village Center** Roanoke’s traditional neighborhoods typically feature small commercial centers that allow residents to live, work, and shop in a local setting. Village centers are characterized by a mixture of high-density uses, including neighborhood-oriented retail, office, and residential uses. Buildings are typically set close to the street and often adjoin each other. On-street parking is common and off-street parking is located to the side or rear of principal buildings.

3. **Traditional neighborhoods** are characterized by small to medium sized lots (from a few thousand square feet to a quarter acre); one and a half- or two-story houses often with porches, consistent building setbacks, and an interconnected grid of narrow, sidewalk and tree-lined streets, often including alleys. These neighborhoods developed between the 1890s and 1940s adjacent to downtown and as the streetcar system expanded outward. Traditional neighborhoods often feature churches, neighborhood schools, and small neighborhood commercial centers. Traffic volumes and speeds are typically low and on-street parking is common.

4. **Suburban** neighborhoods are characterized by large lots (greater than 7,000 square feet), a variety of housing sizes and styles, deep front yard setbacks, wide curvilinear streets, and prominent driveways and garages. These neighborhoods developed after World War II as dependency on the automobile increased. Off-street parking in driveways is typical, and sidewalks are frequently absent.

5. **Industrial** centers and corridors are intended to serve as employment hubs that attract workers from the City and the region. These centers are typically located along arterial streets, interstate highways, railroads, or rivers. They are characterized by large sites with perimeter fencing, outdoor storage, deep setbacks, large expanses of parking, and a principal entrance. They usually lack pedestrian facilities and landscaping or streetscapes.

These definitions alone illustrate why Gainsboro is lacking in continuity and has an overwhelming sense of disconnect from the larger city. Under current zoning, the proposal for a neighborhood square at the intersection of Gainsboro Road and Gilmer Avenue would require at least one application for rezoning. The south-western most parcel is currently zoned RM-2 or Residential Mixed Density District. The purpose of this district as stated by the Code of the City of Roanoke is, “intended to allow for a mix of single-family detached, two-family, townhouses, and multifamily dwellings in order to provide a range of housing choices”
<table>
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<tr>
<th>PROPOSED USES</th>
<th>RM-2</th>
<th>CN</th>
<th>MXPUD</th>
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<td>Home occupation, excluding personal service, subject to Sec. 36.2-413</td>
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<td>Outdoor display area, subject to Sec. 36.2-412</td>
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<td>Dwelling, Multifamily</td>
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<td>Medical clinic</td>
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<td>Office, general or professional</td>
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<td>Community market</td>
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<td>Live-work unit, subject to Sec. 36.2-416</td>
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<tr>
<td>Studio/multimedia production facility</td>
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<td>Bakery, confectionary, or similar food production, Retail</td>
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<td>Building supplies and materials, Retail</td>
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<tr>
<td>Dry cleaning and laundry pick-up station</td>
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<tr>
<td>Laundromat</td>
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<th>PROPOSED USES</th>
<th>RM-2</th>
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<tbody>
<tr>
<td>Club, lodge, civic, or social organization</td>
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<td>Community center</td>
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<td>Eating establishment</td>
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<td>Health and fitness center</td>
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<td>Meeting hall</td>
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<td>Artist studio</td>
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<td>Community garden</td>
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<td>Day care home, Child</td>
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<tr>
<td>Post Office</td>
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<tr>
<td>Parking structure facility, subject to Sec. 36.2-426</td>
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(2001). This designation does not permit mixed use buildings, commercial uses, or professional offices necessary to complete the vision of the neighborhood square. However, the remaining three quadrants zoned CN or Commercial-Neighborhood District support the proposal. Specifically, the CN district is intended to encourage a development pattern that consists of ground floor commercial uses with offices and residential uses located on the upper levels. Furthermore, the Code states that this district is intended to “promote pedestrian-oriented development, with buildings located close to the street, pedestrian-scaled signage, main entrances oriented to the street frontage sidewalk, windows or display cases along building facades which face the street, and significant building coverage of the site” (Sec. 36.2-314). This district also de-emphasizes on-site parking in favor of on-street parking and/or parking structures that is also consistent with the proposed design intervention and design guidelines. Table 4 illustrates potential uses that could be included in the design proposal and whether or not that specific use is allowed by the current or proposed zoning classification.

6.2.0 Overview

The challenge in planning and designing great streets lies in the ability to accommodate the needs of various users through achieving the proper balance between function and form. As part of the synthesis of the literature review, a set of preliminary design guidelines have been formulated that respond to the issues present in the built-environment that may inhibit physical activity. The guidelines provide the basic framework from which the site design-features and criteria for further implementation have been based upon.

The design guidelines have been developed to reflect the following goals:

- Accommodate all users with particular attention to pedestrians
- Integrate public transportation and the necessary amenities that accompany public transit (bus stops, benches, shelters, trash receptacles, lighting)
- Tailor recommendations to reflect design to encourage active living

The following design principles were used to develop design guidelines to meet the above goals:

- Minimize paved surfaces; more specifically minimize pavement dedicated to travel lanes
- Pedestrian accommodations shall be provided for on all arterial and collector streets
- Detached sidewalks shall be used on all arterial and collector streets
- Bicycle lanes shall be provided along all arterial streets
- Designated parking lot spaces will be kept to a minimum
- On street parking should be used as a traffic calming device on local and collector streets

6.2.1 Design Guidelines

**Generally**

- The minimum width of local residential streets was reduced from 36 feet to 30 feet
- Flexibility in the design of new streets was introduced by providing options. For example, sidewalk and planter strips were designated as minimums and can be increased at the request of the developer
- For collector streets, landscaped medians are required if the projected traffic volume exceeds a specific threshold
- Parking will be included based on the adjacent land use and requires an additional 7 feet per direction
- Bicycle lanes are required on arterial streets
- Planter strips are required on all streets, with minimum widths designated that can be increased by the developer
- Traffic calming devices such as bulbouts or traffic circles are encouraged to enhance the pedestrian environment

**Local Streets:** Local streets carry low level capacity traffic through residential neighborhoods. This type of street is characterized by low traffic speeds, many driveway entrances, sidewalks and high levels of pedestrian activity. Local streets constitute the majority of streets within the network of city streets.

**Key revisions to the local street standards include:**

- The minimum width of local residential streets would be reduced to 30-32 feet depending on the expected traffic volume. Current standards require 34-36 feet
- Landscape strips, separating the curb from the sidewalk, would be required on local residential streets
- Maximum block length would be reduced from 1,200 feet to 600 feet for low-volume residential streets and from 1,300 feet to 800 feet for medium-volume residential streets
- Rolled curbs would no longer be permitted
- Traffic circles would be required at intersections of two local streets where the ultimate combined volume will exceed 1,000 vehicles daily or the unimpeded distance on any of the approaches not subject to stop control exceeds 600 feet. The Public Works Director would have discretion to waive this requirement on a case-by-case basis

**Collector Streets:** A collector street is typically a low to moderate capacity road that connects local streets with arterial roads. Collector streets or roads can vary greatly from wide
boulevards entering urban areas to residential streets, more small-scale in nature. Despite the 
range, collector streets are rarely more than four travel lanes wide.

Key revisions to the collector street standards include:

- Landscape strips, separating the curb from the sidewalk, would be required on most new 
streets
- Maximum block length would be reduced from 1,300 feet to 1,000 feet for collector streets
- Bicycle travel could be accommodated on sidewalks along new collector streets
- Bulbouts would be encouraged at intersections to reduce the crossing distance for 
pedestrians and discourage speeding through intersections
- Traffic circles would be required where a residential collector intersects a local street and 
the ultimate combined volume will exceed 1,000 vehicles daily or the unimpeded 
distance on any of the approaches not subject to stop control exceeds 600 feet. The 
Public Works Director would have discretion to waive this requirement on a case-by-
case basis
- A roundabout would be required where two collector streets intersect and the ultimate 
combined entering traffic volumes will exceed 2,000 vehicles daily. A traffic signal may 
be required in lieu of a roundabout at the discretion of the Public Works Director

Arterial Streets: An arterial road is a moderate to high-capacity road, typically ranging from 
two to six travel lanes. This type of road services large volumes of traffic in and around urban 
areas to and from urban centers. One of the distinguishing characteristics of arterial roads is the 
lack of residential entrances via driveways or alleys directly onto the road.

Key revisions to the arterial street standards include:

- Bulbouts would be allowed at some intersections to reduce the crossing distance for 
pedestrians and discourage speeding through intersections
- Bicycle travel could be accommodated on sidewalks along new arterial streets

6.3.0 Strategies for Reforming Regulatory Codes to Promote Healthy Communities

Although active living policy may not drive current land use decisions, it may in the future 
given the relationship between active living, smart growth and new urbanism. Based on the 
current body of research and the findings presented in the body of this paper, the following is 
a set of recommendations for local governments interested in reforming regulatory codes to 
promote healthy communities.

6.3.1 Legal Considerations

Prior to embarking on any code reform, it is essential to review the state enabling statute. 
Most states still use the 1926 Standard State Zoning Enabling Act (SSZEA) as the basis, and not 
surprisingly, many states are relatively unchanged. Specifically, look at the “Grant of Power” 
 provision of the SSZEA. This section lays out the powers that have been explicitly granted to 
local governments and includes such things as:
- Height, number of stories and size;
- Lot coverage
- Yards, courts and other open spaces;
- Density; and,
- Location and use of structures and land
(Sitkowski and Ohm, 2006).

6.3.2 Code Reform Strategies

In addition to the code reform models presented earlier that present alternatives to zoning 
through the adoption of a new code (i.e. Form-Based-Code), the following strategies offer local 
governments that are still interested in promoting active living, but are hesitant to overhaul their 
existing zoning code completely, opportunities to make improvements and set the stage for 
future reform. Local governments can:

1. Encourage pedestrian-friendly streets; shift emphasis from automobile to pedestrian
   - Require on-street parking
   - Set maximums for parking requirements
   - Reduce street widths
   - Reduce setbacks (frame public space)
2. Promote mixed-use development
   - Establish mixed-use zones
3. Create incentives to spur infill development
   • Increase density allowances
   • Lower impact fees (where applicable)
   • Offer property tax abatements
   • Reduce lot sizes, setbacks, and parking requirements

4. Adopt Transportation Oriented Design (TOD) standards
   • Require connected street patterns (not cul-de-sacs)
   • Improve public transportation

5. Streamline development review and other government processes
   • Provide more certainty for developers
   • Reduce fees for projects that promote active living

6. Clarify the existing code
   • Eliminate inconsistencies
   • Include illustrations, diagrams, and photographs

7. Empower Citizens
   • Create a shared vision
   • Hold community charrettes
Chapter 7: Conclusion and Reflection

7.1.0 Conclusion

The problems of cities are not new, especially in terms of public health. However, society has overcome the infection associated with the colonial ear and the pestilence and epidemics of the industrial city. Today, cities are engines of economic growth, centers of culture and intellectual development, but now our cities are also a breeding ground for inactivity.

Inactivity and overweight are associated with increased incidences of type II diabetes, colon cancer, heart disease and obesity. Physical inactivity has emerged as one of the major public health challenges of the twenty-first century; it’s not surprising, this trend has developed in tandem with urban sprawl. As this paper illustrates, there is a vastly growing body of research suggesting features of the physical environment as factors in discouraging physical activity and therefore contributing to these epidemics.

Public health research divides physical activity into four purpose-related categories: (1) recreational or leisure time activity, (2) occupational-related activity, (3) household-related activity, and (4) transportation-related activity (Moudon, 2004) and (CDC, 1996). Public health studies have also shown that walking and biking are unique forms of activity in that they transcend these traditional classifications (148). In addition, walking and biking are popular, accessible, affordable, and can be incorporated into one’s daily routine as suggested by active living, context sensitive solutions, new urbanists, and smart growth advocates.

These new approaches to community design focus more on the characteristics of the built environment and less on land use with the intentions of creating a more pedestrian-friendly, safe, and attractive community that encourages routine physical activity. The shift that is suggested here and supported by research will require a transformation in thinking across disciplines, many policy areas and with in all levels of government.

To create such a change, it is imperative that physical inactivity be treated as highly relevant across a variety of fields (design, planning, public health and government). The problem of physical activity can not be viewed in individualistic terms; the issue of physical inactivity can not be solved solely through motivating individuals to exercise. Physical inactivity must be listed among the consequences that have accompanied our strategies for building communities. Since World War II we have neglected thousands of years of historical precedent with respect to building healthy, enjoyable, and sustainable places. However, major policy tools are in place and can be used and modified to effectively support the need for active-living.

7.2.0 Reflection

Process

The process of design research in the context of an interdisciplinary set of issues attempts to bridge the gap between, theory and research, and practice. Design research provided a laboratory for testing hypotheses, verifying findings from the literature, and most importantly, served as location for implementation. The resulting design serves as an in-depth demonstration of how planning and design can work together to create a built environment that is conducive to physical activity, specifically, utilitarian physical activity.

While this process revealed many opportunities for collaboration, it also exposed obstacles. For instance, planners and designers often utilize a very different framework of thinking, working, and solving problems. This can be a strength, but often serves as a point of contention creating friction between disciplines and hindering progress. Additionally, there are concerns regarding scale. Both planning and design take place at varying scales, but often policies are drafted to apply to a broad set of circumstances and not to a specific site. While broad-brush policies do have advantages, at the site scale these (set backs, parking requirements, and/or minimum lot size) can be burdensome for designers.

Collaboration

The professions of public health, landscape architecture, urban design and planning share a vastly growing common-ground, centered on how best to address the needs of communities. However, the challenge now is discovering how these professions can come together and learn from one another to create comprehensive solutions to a complex set of issues.

The growing interest in how policies and the built environment serve to encourage or discourage health-related behaviors is attested to by the new focus on these issues in journals, along with the growing involvement of governmental and nongovernmental organizations. Over the past few decades much of the routine physical activity associated with daily tasks have been removed. As designers and planners, we are tasked to take responsibility for the built environments that we shape and work together to make our communities more supportive of healthy lifestyles.
Further Research

I do believe that there is a substantial need for further research, particularly in terms of design application studies such as the scenario explored in this paper. While active living and pedestrian-friendly community design are not ‘new’ topics, the connection to built form and its relationship with public health is just emerging as a major factor influencing public health. Still, research and data is very limited and highly subjective to issues regarding self selection. Further research should address the theoretical frameworks of the environmental conditions and sample size, as well as characteristics of areas (at the neighborhood and district scale). Future research with a multidisciplinary focus is likely to provide a better understanding of both the behavioral and environmental aspects of physical activity as it relates to the built environment.

Post Occupancy Evaluation

Post Occupancy Evaluation involves systematic evaluation of opinion about buildings and spaces in use, from the perspective of the people who use them. It assesses how well the intervention addresses the problem, meets users’ needs, and identifies ways to improve future design, performance and fitness for purpose.

Post occupancy evaluation is different from conventional market research and surveys in that it relies on the direct, unmediated experiences of users as the basis for evaluating how an intervention works for its intended purpose. Benefits of post occupancy evaluation include:

- A greater understanding of how buildings support and/or detract from the activities of the neighborhood square. Often slight adjustments can be made based on observations to increase usability and effectiveness.
- Greater understanding of this particular intervention can strengthen future projects similar in nature by avoiding the same mistakes and implementation flaws.
- Post occupancy evaluation is also a valuable tool for assessing project quality - essential when organizations are required to demonstrate that project programs are being responsibly managed.

For this particular intervention post occupancy evaluation should ideally take place longitudinally or over an extended period of time. Initially, a group of participants should be selected to observe over time. This group, known as the experimental group is exposed to set of interventions such as incentives to use the neighborhood grocery and cafes via utilitarian forms of activity or hired to work in an establishment within walking distance of home. Overtime, this group will be analyzed and health outcomes should be recorded and compared to a control group. The control group would not receive incentives for walking or biking and may live further from the neighborhood square.

In addition to health outcomes, the design and implementation should also be observed and analyzed. This can be as simple as recording the peak hours of operation, the most used spaces and the least used spaces, the effectiveness of crosswalks, and paving materials, and the degree of use for sidewalks and bike lanes.

Observations should take place regularly, over a given period of time. Initially for a period of 3-6 weeks, routine daily observation should take place. Following this intense period of observation a series of conclusions and initial findings should be documents from which point future observation will be based. At minimum, observations should occur on a monthly basis for the first year for which local students from the College of Architecture and Urban Studies at Virginia Tech could be utilized.
References


Community Principles
1. All planning should be in the form of complete and integrated communities containing housing, shops, work places, schools, parks and civic facilities essential to the daily life of the residents.
2. Community size should be designed so that housing, jobs, daily needs and other activities are within easy walking distance of each other.
3. As many activities as possible should be located within easy walking distance of transit stops.
4. A community should contain a diversity of housing types to enable citizens from a wide range of economic levels and age groups to live within its boundaries.
5. Businesses within the community should provide a range of job types for the community’s residents.
6. The location and character of the community should be consistent with a larger transit network.
7. The community should have a center focus that combines commercial, civic, cultural and recreational uses.
8. The community should contain an ample supply of specialized open space in the form of squares, greens and parks whose frequent use is encouraged through placement and design.
9. Public spaces should be designed to encourage the attention and presence of people at all hours of the day and night.
10. Each community or cluster of communities should have a well-defined edge, such as agricultural greenbelts or wildlife corridors, permanently protected from development.
11. Streets, pedestrian paths and bike paths should contribute to a system of fully-connected and interesting routes to all destinations. Their design should encourage pedestrian and bicycle use by being small and spatially defined by buildings, trees and lighting; and by discouraging high speed traffic.
12. Wherever possible, the natural terrain, drainage and vegetation of the community should be preserved with superior examples contained within parks or greenbelts.
13. The community design should help conserve resources and minimize waste.
14. Communities should provide for the efficient use of water through the use of natural drainage, drought tolerant landscaping and recycling.
15. The street orientation, the placement of buildings and the use of shading should contribute to the energy efficiency of the community.

Regional Principles
1. The regional land-use planning structure should be integrated within a larger transportation network built around transit rather than freeways.
2. Regions should be bounded by and provide a continuous system of greenbelt/wildlife corridors to be determined by natural conditions.
3. Regional institutions and services (government, stadiums, museums, etc.) should be located in the urban core.
4. Materials and methods of construction should be specific to the region, exhibiting a continuity of history and culture and compatibility with the climate to encourage the development of local character and community identity.

Implementation Principles
1. The general plan should be updated to incorporate the above principles.
2. Rather than allowing developer-initiated, piecemeal development, local governments should take charge of the planning process. General plans should designate where new growth, infill or redevelopment will be allowed to occur.
3. Prior to any development, a specific plan should be prepared based on these planning principles.
4. Plans should be developed through an open process and participants in the process should be provided visual models of all planning proposals.

Appendix II: City of Roanoke Virginia
Sec. 36.2-203. Development standards and supplemental regulations.

Sec. 36.2-312. Residential Mixed Density Districts (RM-1, RM-2).
(a) Purpose. The residential mixed density zoning districts are intended to allow for a mix of single-family detached, two-family, townhouse, and multifamily dwellings in order to provide a range of housing choices.
(b) Uses. The uses permitted as of right or by special exception in the RM-1 and RM-2 Districts shall be as set forth in Section 36.2-340.
(c) Principal structures per lot. In the RM-1 District, only one (1) principal structure shall be permitted on a single lot. In the RM-2 District, more than one (1) principal structure may be permitted on a single lot subject to the yard and impervious surface ratio requirements of Table 312-1. When a lot contains more than one (1) principal structure, the lot frontage and lot area requirements of Table 312-1 shall apply only to the lot, and not to the principal structures on the lot.
(d) Dimensional standards. The dimensional standards for lots within the RM-1 and RM-2 Districts shall be as set forth in Table 312-1.

Table 312-1. Dimensional Matrix for Residential Mixed Density Districts (RM-1, RM-2)

<table>
<thead>
<tr>
<th>Standard</th>
<th>RM-1</th>
<th>RM-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density (minimum square footage of lot area per dwelling unit), except two-family dwelling (duplex)</td>
<td>2,500</td>
<td>2,500</td>
</tr>
<tr>
<td>Density (minimum square footage of lot area per dwelling unit), two-family dwelling (duplex)</td>
<td>3,500</td>
<td>2,500</td>
</tr>
<tr>
<td>Lot area, minimum (square feet)</td>
<td>5,000</td>
<td>5,000</td>
</tr>
<tr>
<td>Lot area, maximum (square feet)</td>
<td>--</td>
<td>25,000</td>
</tr>
<tr>
<td>Lot frontage, minimum (feet)</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Lot frontage, maximum (feet)</td>
<td>--</td>
<td>150</td>
</tr>
<tr>
<td>Front yard, minimum (feet)</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Front yard, maximum (feet)</td>
<td>20</td>
<td>30</td>
</tr>
<tr>
<td>Side yards, minimum combined width (feet)</td>
<td>8</td>
<td>8</td>
</tr>
</tbody>
</table>

Sec. 36.2-314. Commercial Districts (CN, CG, CLS).
(a) Purpose. This section establishes regulations for the following commercial zoning districts:
(1) The Commercial-Neighborhood District (CN) is intended to encourage a concentration of neighborhood-scaled retail, office, and service uses, in clearly defined, compact areas in close proximity to residential neighborhoods. The regulations of the district are intended to control the scale of nonresidential buildings in a manner that makes them compatible with and appropriate for surrounding residential areas and to encourage a development pattern that consists of ground floor commercial uses with offices and residential uses on the upper floor levels. The district is intended to promote pedestrian-oriented development, with buildings located close to the street, pedestrian-scaled signage, main entrances oriented to the street frontage sidewalk, windows or display cases along building facades which face the street, and significant building coverage of the site. Although parking areas may be provided, they are generally limited in size and are de-emphasized by their location on the site.
(2) The Commercial-General District (CG) is intended to permit motor vehicle dependent uses that are generally developed as single use developments on individual lots, subject to landscaping, access, and signage standards. Such development is generally characterized by individual curb cuts, access drives, and signage. It is intended that this district be applied primarily along heavily traveled arterial streets, with an emphasis on clustering such development at major intersections. While recognizing the motor vehicle traffic generated by the uses permitted in this district, it is the intent of the regulations of the district to encourage and recognize pedestrian access and public transit forms of transportation by locating parking to the side and rear of buildings and minimizing conflict through landscaping and signage.
standards. The uses permitted in this district generally require a high volume of traffic along the
frontage of the establishment and include horizontally oriented buildings. Such permitted uses
include general retail establishments, offices, service establishments, motor vehicle related sales
and service, eating establishments, and entertainment uses. The CG District is also intended to
accommodate travel-oriented uses such as hotels, motels, and gasoline stations.

(3) The Commercial-Large Site District (CLS) is intended to accommodate multiple buildings
and uses that are large in scale and generally characterized by multiple tenants or uses on a
single zoning lot which share common parking, curb cuts, driveways, and access to and from
public streets. These uses and areas are heavily dependent on the motor vehicle and tend to
result in large parking areas and outdoor display of merchandise. CLS District use includes
large motor vehicle sales and service establishments and community and regional shopping
centers. The district standards provide for landscaped buffers to minimize the impact of CLS
uses on surrounding areas.

(b) Uses. The uses permitted as of right or by special exception in the CN, CG, and CLS
Districts shall be as set forth in Section 36.2-340.

(c) Principal structures per lot. In the CN, CG, and CLS Districts, more than one (1) principal
structure may be permitted on a single lot, subject to the yard, floor area ratio, and impervious
surface ratio requirements of Table 314-1. When a lot contains more than one (1) principal
structure, the lot frontage and lot area requirements of Table 314-1 shall apply only to the lot,
and not to the principal structures on the lot.

(d) Dimensional standards. The dimensional standards for lots within the CN, CG, and CLS
Districts shall be as set forth in Table 314-1.

(e) Pedestrian access. In the CN, CG, and CLS Districts, designated pedestrian pathways of a
minimum width of five (5) feet shall be provided and marked from the public sidewalk, or the
public right-of-way where there is no public sidewalk, to the public entrance of any principal
building. Such pedestrian pathways shall be surfaced with concrete, asphalt, bituminous
pavement, brick or stone pavers, or a permeable paver system.

(f) Development standards for CN District.

(1) Maximum building footprint: Unless otherwise stated, the maximum gross ground floor
area (the “footprint”) of any new structure in the CN District shall be fifteen thousand (15,000)
square feet.

(2) Facade treatment: In the CN District, in order to promote pedestrian interest and activity
and to enhance security and safety by permitting visibility into and out of buildings, a minimum
of fifty (50) percent of the ground floor primary building facade shall be transparent from the
street through the provision of glass. Such transparency shall begin at a height no greater than
three (3) feet above the grade of the adjacent sidewalk or the finished grade of the site.

Table 314-1. Dimensional Matrix for

<table>
<thead>
<tr>
<th>Standard</th>
<th>CN</th>
<th>CG</th>
<th>CLS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density (minimum square footage of lot area per dwelling unit)</td>
<td>1,800</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Lot area, minimum (square feet)</td>
<td>5,000</td>
<td>10,000</td>
<td>90,000</td>
</tr>
<tr>
<td>Lot area, maximum (square feet)</td>
<td>20,000</td>
<td>130,680</td>
<td>--</td>
</tr>
<tr>
<td>Lot frontage, minimum (feet)</td>
<td>--</td>
<td>100</td>
<td>150</td>
</tr>
<tr>
<td>Lot frontage, maximum (feet)</td>
<td>200</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Front yard, minimum (feet)</td>
<td>--</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>Front yard, maximum (feet)</td>
<td>10</td>
<td>30</td>
<td>--</td>
</tr>
<tr>
<td>Side yards, minimum combined width (feet)</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Side yard, minimum (feet)</td>
<td>1</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Rear yard, minimum (feet)</td>
<td>3</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Height, maximum (feet)</td>
<td>45</td>
<td>--</td>
<td>6</td>
</tr>
<tr>
<td>Floor area ratio, maximum</td>
<td>--</td>
<td>5.0</td>
<td>5.0</td>
</tr>
<tr>
<td>Impervious surface ratio, maximum</td>
<td>100%</td>
<td>85%</td>
<td>80%</td>
</tr>
</tbody>
</table>

1 Where a buffer yard is required, as set forth in Section 36.2-647(c), that is greater than the
required minimum side yard established in Table 314-1, including where no minimum side yard
is required, the required buffer yard shall govern the required minimum side yard requirement.

2 There shall be no minimum side yard in the CLS District, except that where a CLS District
abuts a residential district, the minimum side yard shall be twenty-five (25) feet from the
abutting residually zoned lot.

3 Where a buffer yard is required, as set forth in Section 36.2-647(c), that is greater than the
required minimum rear yard established in Table 314-1, including where no minimum rear yard
is required, the required buffer yard shall govern the required minimum rear yard requirement.

4 There shall be no minimum rear yard in the CLS District, except that where a CLS District
abuts a residential district, the minimum rear yard shall be twenty-five (25) feet from the
abutting residually zoned lot.

5 There shall be no maximum height of structures in the CG District, except that where a lot in
the CG District abuts a residential district, the maximum height of any structure in the CG
District shall be forty-five (45) feet.

6 There shall be no maximum height of a structure in the CLS District, except that where a lot in
the CLS District abuts a residential district, the maximum height of any structure in the CLS
District shall be one (1) foot of height for one (1) foot of setback from the abutting residually
zoned lot.

(Ord. No. 37633, § 3, 11-20-06; Ord. No. 37984, § 3, 12-17-07)
Sec. 36.2-326. Mixed Use Planned Unit Development District (MXPUD).

(a) Purpose. The Mixed Use Planned Unit Development District (MXPUD) is intended to encourage the orderly development of mixed residential/commercial sites and to encourage innovative development patterns that create a desirable environment, particularly for lots which contain a number of constraints to conventional development. These regulations are designed to achieve the following objectives:

1. Promote efficient use of land and infrastructure through high quality urban design;
2. Promote a development pattern in harmony with existing development and the objectives of the City’s Comprehensive Plan;
3. Permit a compatible mix of commercial and residential uses;
4. Provide safe, efficient access and traffic circulation;
5. Create opportunities to use new technologies in managing the quality and quantity of storm water; and
6. Encourage the preservation of steep slopes, floodplains, historic structures and areas, and unique, natural, or geological formations.

(b) Applicability.

1. Any area meeting the requirements of this section may, by amendment to this chapter, be zoned Mixed Use Planned Unit Development District (MXPUD), and such area shall be designated MXPUD on the Official Zoning Map.
2. Development within an area zoned MXPUD shall occur on one (1) lot, or if more than one (1) lot, on lots which are contiguous or would be contiguous but for their separation by a street or an alley.
3. Development within an area zoned MXPUD shall include a combination of permitted residential and commercial uses or a combination of different permitted residential uses.

(c) Uses. Uses permitted as of right or by special exception in the MXPUD District shall be as set forth in Section 36.2-340 and may be designated in a development plan for a Mixed Use Planned Unit Development District (MXPUD), subject to review by the Planning Commission and approval by the City Council.

(d) Development standards. All applications for review and approval of a Mixed Use Planned Unit Development District (MXPUD) shall comply with the following standards of development:

1. General standards:
   A. The development plan shall emphasize compatibility with the surrounding neighborhoods.
   B. The development shall be designed and arranged in such a way as to promote energy efficiency and encourage solar access.

   C. Proposed streets, parking areas, and pedestrian circulation systems shall provide safe and convenient access to and from the development and for all lots within the development.

   D. Sewage collection and water distribution systems shall be laid out in an efficient manner.

   E. Landscaping and open space shall be used to provide shading, screening, and erosion and sedimentation control.

   F. The development shall reflect the existing topography and natural character of the site by minimizing grading and by preserving existing trees.

2. Dimensional standards: The dimensional standards within the MXPUD District shall be as set forth in Table 326-1.

3. Utilities: All utility lines, including electric power, telephone, and cable television lines, and similar utilities, shall be located underground.

Table 326-1. Dimensional Matrix for Mixed Use Planned Unit Development District (MXPUD)

<table>
<thead>
<tr>
<th>Standard</th>
<th>MXPUD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density (minimum square footage of lot area per dwelling unit)</td>
<td>1,800 square feet</td>
</tr>
<tr>
<td>Lot area, minimum</td>
<td>Shall be specified during the review and approval of the development plan for the MXPUD District</td>
</tr>
<tr>
<td>Lot frontage, minimum</td>
<td>Shall be specified during the review and approval of the development plan for the MXPUD District</td>
</tr>
<tr>
<td>Front yard, minimum</td>
<td>Shall be specified during the review and approval of the development plan for the MXPUD District</td>
</tr>
<tr>
<td>Side yard, minimum</td>
<td>Shall be specified during the review and approval of the development plan for the MXPUD District</td>
</tr>
<tr>
<td>Side yard within the MXPUD District</td>
<td>Shall be specified during the review and approval of the development plan for the MXPUD District</td>
</tr>
<tr>
<td>Rear yard, minimum</td>
<td>Shall be specified during the review and approval of the development plan for the MXPUD District</td>
</tr>
<tr>
<td>Rear yard within the MXPUD District</td>
<td>Shall be specified during the review and approval of the development plan for the MXPUD District</td>
</tr>
<tr>
<td>Height, maximum</td>
<td>No maximum height, except where MXPUD District adjoins a residential district, in which case the height of any structure within the MXPUD District shall not exceed one (1) foot of height for one (1) foot of setback from the adjacent residentially-zoned lot</td>
</tr>
<tr>
<td>Impervious surface ratio (maximum cumulative ratio for a MXPUD District)</td>
<td>80%</td>
</tr>
<tr>
<td>Usable open space (minimum square footage per dwelling unit)</td>
<td>300 square feet</td>
</tr>
</tbody>
</table>

(e) Procedural requirements. In addition to the requirements for zoning amendments set forth in Sections 36.2-540 and 36.2-541, applications for a MXPUD District shall include a
Sec. 36.2-331. Historic Neighborhood Overlay District (H-2).

(a) Purpose. The purpose of the Historic Neighborhood Overlay District (H-2) is to identify, preserve, enhance, and maintain those architectural and historic landmarks, structures, and districts which are listed, or are eligible for listing, on the Virginia Landmarks Register or the National Register of Historic Places, or which individually or collectively represent a distinguishable entity of local historic, cultural, or architectural importance.

(b) Applicability.

(1) The City Council may, in the manner provided for amending this chapter, pursuant to the procedures set forth in Section 36.2-540, designate as a Historic Neighborhood Overlay District (H-2) appropriate areas which:

   (A) Contain landmarks or structures that are listed, or are eligible for listing, on the Virginia Landmarks Register or the National Register of Historic Places, or which individually or collectively represent a distinguishable entity of local historic, cultural, or architectural importance;

   (B) Are adjacent to landmarks designated as historic by the Virginia Department of Historic Resources or are adjacent to other structures, landmarks, or areas having important historic, architectural, or cultural interest; or

   (C) Contain buildings or places in which historic events occurred or which have special public value because of notable architectural or other features relating to the cultural or artistic heritage of the community, or are of such significance as to warrant conservation and preservation.

(2) Any Historic Neighborhood Overlay District (H-2) designated by the City Council as provided for in subsection (1), above, shall be shown as an overlay to the existing underlying district on the Official Zoning Map. As such, the provisions in this section shall serve as a supplement to the underlying base zoning district regulations. Where a conflict exists between the regulations relating to the H-2 Overlay District and those of any underlying base zoning district, the more restrictive provisions shall apply.

(c) Certificate of Appropriateness. In the H-2 Overlay District, a Certificate of Appropriateness (see Section 36.2-530) shall be required for the erection of any new structure, the demolition, moving, reconstruction, alteration, or restoration of any existing structure or historic landmark, including the installation or replacement of siding, or the reduction in the floor area of an existing building, including the enclosure or removal of a porch. A Certificate of Appropriateness shall not be required for ordinary maintenance, as defined in Section 36.2-530(b)(4), or in-kind replacement with the same materials, proportions, and design. The Zoning Administrator, in consultation with the Agent to the Architectural Review Board, shall determine whether an activity requires a Certificate of Appropriateness.

(d) Review standards for new construction or exterior modifications.

(1) The following standards shall be applied by the Architectural Review Board in considering a request for a Certificate of Appropriateness for new construction or exterior modifications to an existing structure in the H-2 Overlay District:

   (A) The design shall be compatible with the character of the H-2 Overlay District with respect to building location and scale, roof forms, windows and doors, siding, trim, and porches; and

   (B) The design of existing architectural features, with respect to proportion and texture, shall be retained.

(2) In addition to the standards of subsection (1), above, the Architectural Review Board may
adopt specific Architectural Design Guidelines for the H-2 Overlay District, or a portion of the H-2 Overlay District. The Architectural Review Board shall consider the applicable guidelines in its decisions to issue or deny a Certificate of Appropriateness.

e) Review standards for demolition. The following standards shall be applied by the Architectural Review Board in considering a request for a Certificate of Appropriateness for demolition of a structure or historic landmark within the H-2 Overlay District:

(1) The purpose and necessity of the demolition are in accordance with the intent of the Historic Neighborhood Overlay District (H-2);

(2) Loss of the structure would not be adverse to the district or the public interest by virtue of its uniqueness or its contribution to the district; and

(3) Demolition would not have an adverse effect on the character and surrounding environment of the district.

Sec. 36.2-332. Neighborhood Design Overlay District (ND).

(a) Purpose. The Neighborhood Design Overlay District (ND) is intended to promote quality City design by coordinating the development of designated Rehabilitation and Conservation Areas. The City finds and determines that the standards of the ND Overlay District promote compatibility between buildings and structures in the City’s traditional neighborhoods, maintain property values, and promote pedestrian-friendly, walkable streets.

(b) Applicability.

(1) The City Council may, in the manner provided for amending this chapter, pursuant to the procedures set forth in Section 36.2-540, apply the Neighborhood Design Overlay District (ND) to areas of the City that are designated Rehabilitation and Conservation Areas. The regulations of this section shall apply to the construction of, an addition to, or the exterior modification of a dwelling in a designated ND Overlay District.

(2) Any Neighborhood Design Overlay District (ND) designated by the City Council as provided for in subsection (1), above, shall be shown as an overlay to the existing underlying district on the Official Zoning Map. As such, the provisions in this section shall serve as a supplement to the underlying base zoning district regulations. Where a conflict exists between this section relating to the ND Overlay District and those of any underlying base zoning district, the more restrictive provisions shall apply.

c) Design standards. In considering an application for a zoning permit, the Zoning Administrator shall apply the following standards for construction of, an addition to, or the exterior modification of a dwelling in the Neighborhood Design Overlay District (ND):

(A) The required front yard shall be determined by Section 36.2-205(f)(2)(A) and (B).

(B) A new dwelling shall have two (2) stories above the grade of the front yard where lots on both sides have two-story dwellings.

(C) The width of single-family and two-family dwellings shall be within twenty (20) percent of the average of the widths of other single-family and two-family dwellings on the same side of the same block. The front of multifamily dwellings shall be broken into sections of thirty (30) feet or less in width through offsets of the vertical plane of the facade of at least twelve (12) inches.

(D) Where lots on both sides have dwellings, the height of the foundation facing the street shall be no more than twenty (20) percent greater than the height of the tallest adjoining foundation and shall be no less than twenty (20) percent below the height of the shortest adjoining foundation. Where a dwelling exists only on one (1) side, the foundation height shall be within twenty (20) percent of the height of that adjoining dwelling. Such measurements shall be taken at comparable locations on the respective foundations (i.e. left side, right side). There is no foundation height requirement where no dwellings exist on either adjoining lot.

(2) Roofs:

(A) The rise-to-run ratio for the dwelling’s main roof shall be 6:12 or steeper.

(B) The roof of a new dwelling shall have a minimum of three (3) surfaces, except where the gable end faces the street and a porch extends the full width of the dwelling, in which case the roof may have a two-surface configuration.

(C) Eave and gable overhangs for all new dwellings and additions to dwellings shall be at least twelve (12) inches. However, an addition to an existing dwelling shall not be required to have overhangs wider than those of the existing dwelling.

(D) The rise-to-run ratio of roofs covering porches or entrances shall be equal to or shallower than the main roof.

(E) Above-grade entrances on a building facade facing a required front yard shall be covered with a roof with a minimum width and depth of thirty-six (36) inches.

(3) Entrances and windows:

(A) The dwelling shall have at least one (1) entrance facing the primary front yard. The number of doors facing the primary front yard shall be limited to one (1) door for every eighteen (18) feet of dwelling width. Single-family and two-family dwellings may have two entrances facing the primary front yard regardless of dwelling width if the second entrance is recessed at least six (6) feet behind the main front entrance.

(B) Doors facing a street shall have panel insets or windows.

(C) At least fifteen (15) percent of the front of the dwelling shall consist of window or door openings. At least ten (10) percent of the side of a dwelling which is not the front of the dwelling and which faces a street shall consist of window or door openings. Roofs, gables, and foundations shall not be included in determining the area of the front or the side of the dwelling.

(D) Windows on the front facade shall have a height that is at least one and one-half (1 1/2)
times their width.

(E) Windows on the front of the dwelling shall be arranged in a manner that is compatible with
that of other dwellings in the district. In general, windows on separate stories of the front should
be vertically aligned and windows on the same story should be horizontally aligned.

(F) All stairs facing a required front yard shall have solid risers.

(G) A sidewalk at least four (4) feet in width shall be provided between the front porch of
a new dwelling and the street. The sidewalk shall be constructed of an impervious material
customarily used for sidewalks in the district.

(4) Siding and trim:
(A) The siding of any dwelling, exclusive of trim materials, shall not be oriented vertically.
(B) Windows and doors shall be surrounded by trim which is at least three and one-half (3 1/2)
inches wide, except for dwellings with masonry veneer, in which case no trim around doors or
windows is required. However, an addition to or modification of an existing dwelling shall not
be required to have window and door trim that is wider than that of the existing dwelling.
(C) Vertical corner boards at least three and one-half (3 1/2) inches wide shall be provided on
all dwelling corners, except where the dwelling has a masonry veneer.
(D) Any exterior wooden elements on a dwelling’s facade facing a required front yard shall be
painted or be stained with an opaque stain.

(5) Porches:
(A) Single-family and two-family dwellings shall have a front porch at least one-half (1/2) the
width of the dwelling’s facade, and having a depth of at least six (6) feet. The front porch shall
face the primary front yard.

(B) For new and existing dwellings, the front porch shall not be enclosed with siding.

(C) Front porch railings shall have a top and bottom rail. Baluster ends shall not be exposed.

(D) Front porch columns shall be uniform in shape and style and be at least five (5) inches
wide at their bottom and top. Front porch columns shall have a base and cap that are at least one
(1) inch thick and are at least one hundred twenty (120) percent of the width of the column.

(E) The underside of front porches and stairways between pier supports shall be enclosed.

(6) Additions and accessory structures:
(A) An attached garage or carport shall be offset at least twenty-four (24) inches behind the
front facade of the dwelling. The bay door of an attached garage shall not face the primary front
yard.

(B) An addition to an existing dwelling shall be located on the rear or side of the dwelling,
except a porch may be added to the front of the dwelling. An addition to the side of a dwelling
shall be set back from the dwelling’s front face by twenty-four (24) inches or more.

(Ord. No. 37633, § 5, 11-20-06; Ord. No. 37984, § 3, 12-17-07)

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