DESIGNING FOR OPPORTUNITY: A MULTI-MODAL TRANSPORTATION DESIGN FOR THE HANCOCK CORRIDOR OF ATHENS, GA

by

ANNE ELIZABETH FLINN

(Under the Direction of Bruce K. Ferguson)

ABSTRACT

Over the past 50 years, transportation design in the United States has catered to the needs of the private automobile. While this form of travel grants high levels of mobility to car owning citizens, it also has far reaching, negative consequences. This thesis explores the ways in which auto-centric transportation planning contributes to the marginalization of low income and minority communities, and argues that transportation systems that embrace a variety of modes can play a vital role in community revitalization efforts. This argument is applied to a design application in the Hancock corridor of Athens, GA.

INDEX WORDS: multi-modal transportation; community revitalization; transportation justice; Hancock Avenue; Athens, GA.

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DEDICATION

This thesis is dedicated to my family, who have loved and supported me through all of my endeavors.

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CHAPTER 1

INTRODUCTION

Purpose

Landscapes reflect a place's identity, aesthetics, and values. While landscapes can play a positive role in both creating and affirming a community's character, they can simultaneously evolve to give physical form to deeply ingrained stereotypes and prejudices. The Landscape Architecture profession supports careful consideration of the aesthetics, environmental consequences, and functionalities of place-making; however, despite good intentions, the design and construction of the built environment can unintentionally contribute to societal injustices. The purpose of this thesis is to raise awareness of the social and environmental justice issues intimately linked with the landscape, and contribute to the efforts made by landscape architects to create more equitable places and play a positive role in dismantling socio-economic injustices that afflict our society (Fotel 2006; Harris 2007; Lipsitz 2007).

Scholars researching the relationship between space and power argue that landscape architects are responsible for "link[ing] social justice to spatial justice," and that a primary goal of the profession "should be to disassemble the fatal links that connect race, place and power … [and] consciously write and draw the underrepresented and disenfranchised into their schemes and plans"(Harris 2007; Lipsitz 2007). Shouldering this responsibility requires the identification of places that marginalize certain communities, assessment of these landscapes through a new lens, and the revision of design and planning standards that created these places.

The Problem

Transportation networks are one element of the built environment that link power and place. Construction of the nation's railroad system depended upon sacrifice of life and limb by Chinese immigrants forced to perform dangerous tasks, and demanded the removal of Native Americans from 155,000,000 acres of land. In 1896, *Plessy versus Ferguson* institutionalized racism when the Supreme Court upheld the legality of segregated railroad cars. In the American South, institutionalized racism pervaded the public bus systems, but also set the stage for several of the Civil Rights Movement's most notable achievements, including the 1955 Montgomery Bus Boycotts and the 1961 Freedom Rides. In from many cities. Finally, in 2005, evacuation efforts prior to Hurricane Katrina failed when many African Americans, who lacked access to a vehicle, found no way to leave the Gulf Coast. (Bullard and Johnson 1997; Brenman 2007).

In the twentieth century, U.S. transportation planning strategies have revolved around increasing the efficiency and access of private automobiles. The impacts of this auto-centric planning are numerous and touch all members of society. However, there is growing awareness of the increased burdens our transportation system places upon lower income communities. Transportation, therefore, continues to play a powerful role in creating societal inequities. Echoing the sentiments of many scholars of environmental justice, Forkenbrock writes that the "growing awareness of the pivotal role played by the transportation sector in the quality of life for low-income populations and minority populations has led environmental justice advocates to strongly emphasize that sector."(Forkenbrock 1999).

<u>The Proposed Solution</u>

The provision of multiple, integrated transportation options is a tool many cities and municipalities are using to empower struggling communities and improve the quality of life for all Americans. The improvement of nonmotorized and transit infrastructure will provide more equitable access to employment, education, recreational, and cultural opportunities for those people who do not or cannot drive, or are burdened by the cost of driving, a private automobile.

In 1990, the federal government, responding to the extremely high rates of automobile use, began, through increased funding and provision of research, encouraging states to increase levels of bicycling, walking, and transit use. Numerous design strategies and guides have emerged in the ensuing 18 years that provide extensive information regarding successful multi-modal transportation design. Research of the factors that influence individuals' modal choice has paralleled the production of these design guides. Analysis of these design strategies, existing scholarly research, and successful case studies will inform the design of a successful multi-modal transportation system that addresses issues of social justice. For this thesis, the Hancock Corridor in Athens, GA provides an appropriate location for illustrating the design of such a system.

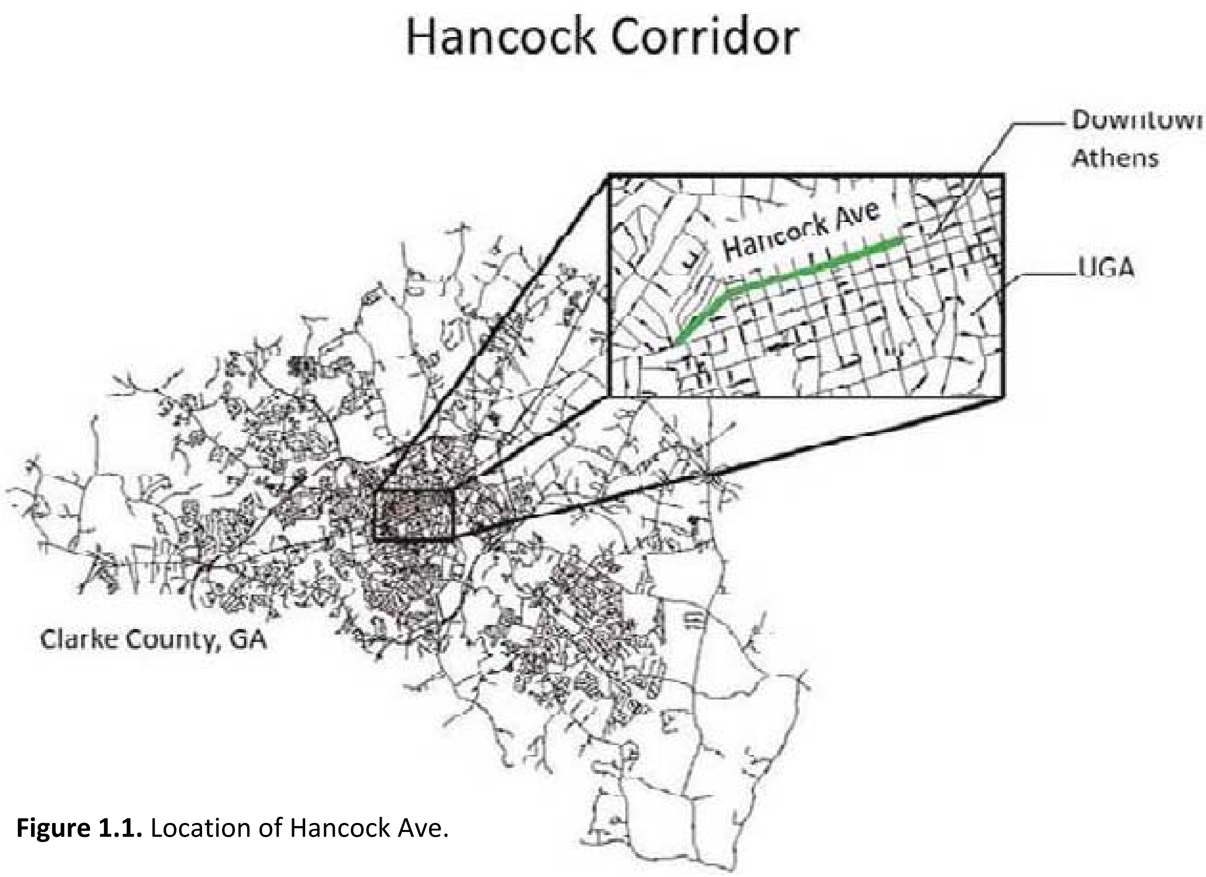

Figure 1.1. Location of Hancock Ave.

The community surrounding the Hancock Corridor is an historically African-American, low to moderate income neighborhood, located on the west side of Athens, GA. Developed prior to the advent of the automobile, this area is characterized by narrow streets laid out, primarily, in a grid pattern. Numerous historic homes exist within the area, and many residents have lived in this neighborhood for decades. The corridor lies within close proximity of the city's urban core, as well as numerous other cultural, educational, and commercial centers. Three major roadways, Prince Ave, Broad St, and Baxter St, transect this area from east to west, as well as Milledge Ave, an historic yet heavily used corridor, running north to south. Despite its rich history and pedestrian-scaled design, the Hancock Corridor is plagued by high levels of crime, low education and literacy rates, and high poverty rates. Transportation planning is one of the multiple factors that contribute to this situation, but also stands as a promising tool with which to address the distressed condition of this area.

Figure 1.2. View looking west down Hancock Ave.

The Hancock Corridor provides a valuable opportunity to apply lessons learned from existing design guides, scholarly research, and case studies to the retrofitting of an older, centrally located, urban neighborhood. Specifically, well designed pedestrian, cycling, and transit facilities can expect great success, due the human-scaled environment, close proximity of commercial centers, and demonstrated need of residents. The goal of this design is to demonstrate the positive impact multi-modal transportation planning can have on a marginalized community, and support the argument that an equitable and successful transportation system will involve a network of transportation options that are safe, affordable, comfortable, and accessible to the broadest spectrum of society.

CHAPTER II

TRANSPORTATION JUSTICE: CONTEXT

Transportation History: National

Before the advent of the private automobile, Americans travelled by foot, horse, railroad, and streetcar. Typically smaller and more compact than those we live in today, cities were based on a grid system, which provided a high degree of connectivity and pedestrian access to daily needs. As cars gained widespread popularity in the middle of the 20th century, the Federal Government's transportation planning strategies made a significant shift toward the promotion of private automobile use, and the built environment of the United States gradually conformed to this mode of travel. The Federal-Aid Highway Act of 1956 was an early landmark of the era of auto-centric, federal transportation planning. The largest public works project at the time, this act allocated $25 billion for the construction of 41,000 miles of interstate highway over a twenty year period (Weingroff 1996). Fueled by low gas prices, increased car and home ownership, and suburban development, the design and construction of transportation networks revolved around increasing the safety, comfort, and efficiency of vehicles (U.S. Department of Transportation).

The Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991 marked a major change in government transportation funding and planning. Responding to increased environmental concerns; growing traffic congestion; and high numbers of traffic-related injuries and deaths, particularly among cyclists and pedestrians, the government set forth to improve transportation options and decrease Americans' use of, and dependence upon, private automobiles. This act granted state governments flexibility in the use of federal transportation funds, and encouraged the integration of different modes, as well as consideration of the effects of transportation systems upon the health and welfare of the human and natural environments. Under this act, States could use almost all transportation funds for mass transit, pedestrian, or bicycle projects. The Surface Transportation Program (STP), the largest federal transportation grant, could be used for any legitimate transportation purpose, and states were required to invest 10% in "enhancements" such as bicycle and pedestrian facilities, historic preservation, billboard control, or stormwater management. An additional 10% was devoted to safety projects. States could also transfer up to 100% of federal highway system funds into the STP program for use in non-highway projects. (Statistics 1991).

The Transportation Equity Act for the 21st Century (TEA-21), passed in 1998, and The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA), passed in 2005, retained the same basic structure and flexibility as ISTEA, with federally provided funds reaching $286.4 billion. SAFETEA, which remains in effect today, also increased funding for biking and walking programs such as Safe Routes to School, the Recreational Trail Program, and The Congestion Mitigation and Air Quality Program. (Federal Highway Administration 2005).

While the Federal Government can; through funding, research, and support; encourage improvements in multi-modal transportation options, it is up to the states and Metropolitan Planning Organizations to build such facilities. The amount of money and flexibility in use evident in these transportation acts suggests that there is adequate funding available for the improvement of multi-modal transportation infrastructure and the promotion of underutilized travel modes. However, despite these opportunities, states consistently devote over 95% of transportation funds to planning for the automobile. Furthermore, zoning policies that ensure an abundance of free parking, low fuel taxes, and an expansive highway system provide powerful support for private car use.[1]

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[1] The United States has the lowest fuel taxes in the world. Current rates are approximately one-third of inflation-adjusted 1960's rates, four times lower than Japan's rates, and eight times lower than rates in the United Kingdom (Taylor 2006).

The effects of this auto-centric planning are clearly reflected in people's choice of transportation modes. Since the 1960's, private car use has increased significantly, while rates of transit use and walking have plummeted. 91.7% of US households own one car, and 58.5% own two or more. The rate of car ownership in the United States is the highest in the world, and 50% higher than most western European countries. (Taylor 2006; Pucher Summer 2003).

Transportation History: Local

Transportation planning in Athens, Georgia has, in general, followed national trends. Home to Georgia's first state-supported university, which was chartered in 1785, the city of Athens was incorporated in 1806, and grew around the travel patterns of pedestrians, horses, and streetcars, as well as the social, cultural, and economic forces of the University of Georgia and a thriving textile industry. After the turn of the century, the city's population grew dramatically, doubling in size between 1900 and 1940.(Thomas 2004). The Athens Transit System (ATS) was founded in 1976, and carried approximately 900 passengers per day on 16 coaches. Today, ATS operates 16 bus routes serving 44 square miles, while the University of Georgia (UGA) provides its own bus system. (System) Athens also offers several private taxi companies, sidewalks in many areas, and a limited, but growing, network of bicycle lanes.

Transportation options in Athens are both limited and disconnected, and community members and government officials alike acknowledge the importance of improving the city's multi-modal options. Local advocacy group BikeAthens provides a strong voice for non-motorized transportation options. In 2006, the construction of the city's award winning multi-modal center, located on the east side of downtown, visibly expressed the city's interest in providing a well-balanced transportation system (Magazine 2008).

The Athens-Clarke County (ACC) Planning Department, in conjunction with the Georgia Department of Transportation (GADOT), is responsible for carrying out the transportation planning mandated by federal legislation. The ACC Planning Department works with representatives from

Madison and Oconee counties, UGA, and GADOT, under the auspices of the Madison-Athens-Clarke-Oconee Regional Transportation Study (MACORTS), to form transportation policies and develop long range plans. MACORTS recognizes the area's shortcomings in providing transportation options, and has adopted a 2030 transportation plan that emphasizes the need for improvements in these areas. (County 2004)

Results

Auto-centric planning, at both the local and national scales, has had both positive and negative effects. Our road and highway systems provide car-owning citizens with extremely high levels of mobility and access, and have helped fuel the cultural and economic growth of this country. Black and Nijkamp, in their multi-disciplinary study of sustainable transportation, write that "transport and communication are the most visible manifestation of a modern network economy. Bridging distances – whether physically or virtually – reflects economic progress and a modern way of life" (Black and Nijkamp 2002). While autos provide an unparalleled way to quickly and comfortably transport individuals, this vehicle of progress comes with great costs. While car travel increases the distance and speed with which Americans can move, it also has profound effects on our environment, physical health, communities, and economy.

Auto-centric planning policies have produced extreme levels of physical, institutional, and psychological car-dependence in the United States, as evidenced by the high rates of car ownership and vehicle miles travelled. In 2006, only 8.8% of households did not own a vehicle. In that same year, 87% of people travelled to work in a private vehicle, while only 5% utilized transit, 3% walked, 0.5% cycled, and 4.5% either worked at home or used other modes. (U. S. Department of Transportation 2007). These high levels of vehicle ownership and use suggest that, without a vehicle, people cannot safely and easily access social, cultural, educational, and economic opportunities.

Black and Nijkamp argue that auto-centric transportation planning has created a social and psychological dependence on cars as well as negative associations with alternative forms of travel. (Black and Nijkamp 2002). The Pedestrian and Bicycle Information Center lists personal, social, and perceptual barriers; physical barriers; and institutional and organizational barriers to walking, cycling, and transit use. These barriers range from finding alternative modes boring, unsafe, slow, and uncomfortable; to a lack of quality facilities; sprawling land use patterns; and difficulty justifying funding for alternative transportation facilities. (Pedestrian and Bicycle Information Center). Due to the far reaching effects of our country's transportation history, moving away from auto dependence will require more than federal funds and spending flexibility. A multi-disciplinary approach incorporating the knowledge, skills, and abilities of social and physical scientists, designers, and engineers is critical to understanding and tackling the problems created by auto dependency.

Impacts

Though our nation's roadways endeavor to create connections, they often pose significant barriers to pedestrian activity, street life, recreation, physical and environmental health, and community interactions. Additionally, investing money in auto-oriented infrastructure, rather than alternative transit modes, limits the mobility of those unable to afford a vehicle and its associated parking, insurance, fuel, and maintenance costs. The following sections discuss the negative effects of exclusive auto-centric planning, as well as addressing the argument made by numerous scholars, that these effects are compounded in marginalized communities.

- **Environmental**

The medical, planning, environmental, and science fields are among the many disciplines researching the negative environmental impacts of high rates of automobile use. These impacts include high levels of air and noise pollution, large amounts of impermeable surface area, water pollution, and sprawling land use patterns.

In 2007, transportation emissions accounted for 54% of carbon monoxide, 36% of nitrous oxides and 22% of volatile organic compounds released in the United States (U. S. Department of Transportation 2007). The EPA states that, though progress has been made in reducing car's emissions, the dramatic increase in the number of cars on the road, vehicle miles travelled, and the reduced effectiveness of emission control systems over time has hampered efforts to reduce ozone levels. According to the U.S. Environmental Protection Agency,

> Unless we dramatically reduce the amount of pollution vehicles emit in actual use, or drastically cut back on the amount we drive, smog-free air will continue to elude many cities…The only way to ensure healthy air is to markedly reduce our use of cars or switch to fuels that are inherently cleaner than conventional gasoline (U. S. Environmental Protection Agency 1993).

As local, national, and international governing bodies come to see environmental issues, particularly those surrounding global warming, as primary concerns, attention must be paid to the role vehicles play in the production of ozone and the degradation of air quality.

Vehicles, and the large amount of impervious surface devoted to them, contribute to water pollution, lowering drinking water quality and compromising aquatic habitat. Tires, brake wear, and exhaust release heavy metals, including copper, cadmium, zinc, and mercury. Vehicles are estimated to leak upwards of 250 million gallons of motor oil each year, while individuals improperly dispose of approximately 180 million gallons of oil per year. (Burrington 1998). These pollutants quickly find their way along paved surfaces, gutters, and pipes, and into our water bodies. A study of the Lower San Francisco Bay watershed found vehicles responsible for the release of 2.97 million gallons of oil, and 50% of the copper, cadmium, and zinc polluting this water body, creating pollution levels that have significantly reduced the quantity of aquatic life (Burrington 1998; Martin 1999).

Noise is a less frequently discussed auto-produced pollutant, though its negative impacts on people and wildlife are well documented. According to the USDOT, increased traffic volumes, speeds, and number of trucks in the flow of traffic cause high noise levels (U. S. Department of Transportation 1980). A 1998 Conservation Law Forum report on the community effects of transportation, states that,

> from a spot 16 yards away, a car going 56 miles per hour makes 10 times as much noise as it would travelling 31 mph…A study of traffic calming measures used in several German towns found that when average vehicle speeds on residential streets were reduced from 25 mph to 12 mph, traffic noise dropped by 14 decibels – to less than one-tenth its initial level" (Burrington 1998).

Traffic noise is a documented concern among U.S. citizens. According to the U.S. Census, 30% of Americans complained of traffic noise, 11% stated that it was bothersome, and 40% of that group wanted to change their place of residence to escape the noise. (Goines 2007). High noise levels are not merely an irritant, but a physical and mental health threat. The World Health Organization (WHO) lists seven health effects of noise pollution on humans: hearing impairment, interference with spoken communication, sleep disturbances, cardiovascular disturbances, disturbances in mental health, impaired task performance, and negative social behavior and annoyance reactions (Goines 2007). In 1993, this organization changed its community noise guidelines to account for the effects of outdoor noises, such as traffic, and called for measures to reduce these levels (Whitelegg 1997).

Finally, increased car mobility fuels our sprawling land use patterns. Empowered by an extensive highway system and comfortable vehicles capable of travelling at high rates of speed, citizens can live far from urban employment centers. This car culture has produced auto-scaled, rather than human-scaled development, including multi-lane roadways, expansive parking facilities, and super-sized stores. The consequences of rapid, low-density development are well documented, and include threats to natural ecosystems, over-use of natural resources, depression of inner-city areas, and the loss of scenic beauty.

- **Public Health and Safety**

In addition to the health effects of breathing polluted air, scholars draw direct correlations between high levels of auto use and obesity. In 2004, 66.3% of US adults were overweight or obese, and

32.2% were obese.[2] In 2007, Georgia's obesity rate was the 7th highest in the country, and twice as high as in 1985(Prevention). The Surgeon General reports that the consequences of obesity include health risks and economic costs stemming from health care demands and lost wages (Services 2001). The Center for Disease Control (CDC) states that behavior and environment play a major role in the obesity epidemic, and cite these two factors as those with the greatest potential for preventing and treating obesity. Changes in the built environment, such as improved walking facilities, that make physical activity accessible and attractive, are among the CDC's recommended approaches to addressing the obesity epidemic. (Prevention).

The Active Living Movement aims to address public health issues by encouraging people, through policy and design, to incorporate physical activity into their daily routine. According to Active Living Research, a program funded by the Robert Wood Johnson Foundation, "rather than addressing obesity as an individual health problem, this new, transdisciplinary field of active living is focusing on how the built environment – including neighborhoods, transportation systems, buildings, parks and open space – can promote more active lives" (Day 2006). Growing recognition of the role transportation choices can make in the quality of public health emphasizes the importance of taking a multi-disciplinary approach to overcoming auto dependence.

The automobile's threats to physical well being extend beyond obesity and air quality to the high death toll caused by traffic accidents each year. In 2006, roads designed to accommodate high rates of speed and the traffic generated by millions of auto-dependant citizens contributed to the 5,973,000 traffic accidents, 2,591,916 injuries, and 44,642 fatalities on U. S. roads (Statistics 2008). There is a clear correlation between high rates of speed and fatality rates, particularly among pedestrians and cyclists, whose fatality rate per km travelled is 11 times higher than those of car occupants (Pucher 2000).

[2] The Centers for Disease Control and Prevention define overweight as having a BMI of 25 – 29.9%, and obese as having a BMI ≥ 30%.

- **Quality of Life**

The physical dangers facing pedestrians and cyclists on American roads contributes to lower levels of play, socialization, and recreation in neighborhoods, particularly in those containing busy roads. A study conducted by Donald Appleyard, a Professor of Urban Design at the University of California, Berkeley and author of the book, Livable Streets, analyzed three residential streets in San Francisco – one with light traffic (2000 vehicles/day), one with moderate traffic (8000 vehicles/day) and one with heavy traffic (1600 vehicles/day). He found that, on the light-traffic street, people had three times as many friends and acquaintances nearby as did people on the heavy traffic street. People living on streets with heavy traffic adapted in various ways, including erecting fences, closing windows, spending more time in rooms in the back of their house, and forbidding children from playing in the street. (Burrington 1998). This study suggests that high levels of traffic degrade community life, and remove one of the most valuable crime fighting tools: eyes on the street.

The requirements of automobiles shape our landscape, as well as the patterns of our daily activities. Scholar Jane Kay, an author, journalist, and architecture critic for *The Nation*, asks,

> How can you mold, shape, make habitable the buckshot disarray of all those malls, mini malls, strip malls, corporate malls, housing malls? How can there be any urban design manifesto when motion dominates and development is promiscuous. When architecture is designed for automotive movement, for the whir of the road, for isolation not community, spread not core, the road undermines the built environment… In the end the auto age has spawned a world where the pedestrian is scorned and public space has dissolved, eradicating stable surroundings where people congregate. Sculpted public space becomes secondary to space shaped for motion.(Kay 1997)

Roads account for a large percentage of our public space, and design that accommodates the vast space and access requirements of vehicles transforms opportunities for community life into lifeless, asphalt spaces where pedestrians, cyclists, and transit riders are secondary citizens.

- **Economic**

For most citizens, the economic costs of auto-dependency rival the environmental, health, and social costs in importance and palpable impact on daily lives. In 2005, U.S. households spent an average of $8,344 on transportation, 24% more than they spent in 1995, making travel the second highest expenditure after housing. Travel by private automobiles imposes internal and external costs on individuals and society at large. In his study of the quantifiable benefits of nonmotorized transportation, Todd Litman, the founder and executive director of the Victoria Transport Policy Institute, defines transportation affordability as “people’s ability to purchase access to important services and activities.” Increasing transportation affordability by improving transportation options and accessibility, he argues, expands opportunities and is “equivalent to an increase in income.”(Litman 2004).

The costs of automobile travel extend beyond an individual’s household budget. The public costs of this form of travel include road construction; health costs related to air and water pollution, obesity and traffic accidents; waste disposal; and time lost to traffic congestion. The rising costs of automobile travel will place an increasingly large burden on individuals and society. A 2007 *Atlanta Journal Constitution* article reported that, when both transportation and housing costs are considered, Atlanta is the second most expensive major city for families earning between $20,000 and $50,000 (Litman 2004). Reports such as these could decrease the appeal of living in cities with few transportation options and long commute times, thus threatening these cities’ economic growth rates.

Transportation Justice

While our auto-dominated society places environmental, health, safety, and economic burdens on all citizens, there is considerable evidence that these burdens are magnified in marginalized communities. In their study of the ways in which urban design influences travel behavior, Boarnet and Crane state that professionals involved in the massive transportation infrastructure planning and construction project that occurred during the 20th century were:

> Physical, not social, engineers. They saw their task as building street and highway capacity to meet certain precisely specified vehicle flow and circulation objectives. They rarely sought to change urban form to influence travel patterns…For many years, with the exception of plans by Olmsted and a few others, the only link between urban design and automobile transportation was

> the neighborhoods, often low income, that were divided and paved over to accommodate new freeways (Boarnet and Crane 2001).

In the process of designing for maximum car mobility, transportation design and policies have produced numerous negative by-products, including the creation and aggravation of physical and social divides between people of different racial and socio-economic groups.

Clear documentation of the magnified negative environmental, social, and financial effects of auto-centric planning on lower-income and ethnic communities supports the argument that transportation inequity exists in the United States. Based solely upon rates of car ownership, auto-centric planning favors wealthier, mostly Caucasian households. Households with incomes less than $25,000 are 9 times more likely than wealthier households not to own a car (walkinginfo.org). Only 7% of white households do not own a car, while 24% of African American, 17% of Latino, and 13% of Asian households do not (Bullard 2007). These statistics suggest that low-income and minority households living in an auto-centric society are more likely to face challenges accessing urban resources.

Public health and safety concerns are also greater among marginalized populations. Obesity rates are significantly higher among low-income, Black, Latino, and poorly educated populations. For example, 49.7% of African-American women are obese, and rates of obesity-related illnesses, such as diabetes and cardio-vascular diseases are significantly higher among African-Americans. 73% of Mexican-American adults are overweight, 33% are obese, and rates of Type II diabetes are twice as high among this population than the general U.S. population. (Day 2006). These facts may be explained by a variety of biological, cultural, and economic factors, but scholars such as Day suggest that the physical environment in which these populations tend to live discourages an active lifestyle. Lower-income and minority households generally live in urban areas. Day argues that attributes of this environment, such as “insufficient parks, high crime rates and fears for safety, lack of jobs to walk to, the absence of nearby stores with healthy food choices, high traffic volumes, and residential overcrowding that limits opportunities for exercise at home,” discourage these populations from engaging in physical activity.

Building on research performed by other scholars in the field, Day suggests that safety from traffic and crime are two of the primary reasons marginalized communities in urban areas avoid walking and biking in their neighborhoods. (Day 2006)

Failing to provide safe, nonmotorized transportation infrastructure forces people who do not drive to take undue risks while walking or biking, and these risks are reflected in the high rates of pedestrian and cycling injuries and fatalities among marginalized populations. African Americans comprise 12% of the population and account for 20% of pedestrian and 18.1% of cycling fatalities, while Latinos comprise 12.5% of the population and account for 13.5% of pedestrian and 16% of cycling deaths (walkinginfo.org ; Bullard, Johnson et al. 2004).

Crowded, high speed roads have adverse effects on the quality of life, as well as the health and safety, of marginalized communities. Typically, lower-income individuals are unable to move away from major roads, and thus suffer disproportionately from the negative social, environmental, and aesthetic effects of our transportation system.

In addition to creating physical divides and health problems among marginalized populations, auto-centric planning places undue financial burdens on lower-income households who invest a disproportionate amount of their income in private car ownership, or place those without cars at a severe disadvantage (Pucher Summer 2003). A 2001 Bureau of Labor Statistics Consumer Expenditures Survey found that households earning less than $13,910 per year spent 40.2% of their income on transportation, while those earning over $71,898 spent 13.1% (Project 2003). Todd Litman, who has performed numerous studies on the costs of transportation, reports that, “low-income residents of automobile-dependent communities tend to spend much more of their income on transport than residents of communities with more diverse, multi-modal transport systems” (Litman 2007).

A lack of transportation options can inhibit employment opportunities. Over the last 30 years, a significant number of businesses have relocated to suburbs. Between 1979 and 1999, the percent of office space located in suburbs increased from 26% to 42%. Robert Bullard, a professor and prolific scholar of transportation justice, argues that, due to the movement of businesses away from central cities, and the higher percentage of Blacks living in cities, "more than 50 percent of Blacks would have to relocate to achieve an even distribution of Blacks relative to jobs; the comparable figure for whites are 20 to 24 percentage points lower…Getting to many job-rich suburbs without a car is next to impossible." (Bullard 2007)

In many U.S. cities, auto-centric planning makes walking, cycling, or riding transit to a destination challenging, if not dangerous. Based on previous scholarship, it is reasonable to conclude that owning a car is a primary means, in the U.S., to access opportunities. Those who choose, or have no choice but to use, alternative modes of transportation, therefore, face undue hardships. Furthermore, research shows that low-income and minority communities are more likely to experience these hardships. Urry argues that "a civil society of automobility transforms public spaces into public roads, in which to a significant extent the hybrids of pedestrians and cyclists are no longer part of that public" (Urry 2000). It is the responsibility of landscape architects, therefore, to send a different message to the public when designing transportation infrastructure. Through changes in road design and detailing, landscape architects can contribute to the creation of a more equitable transportation system, in which all residents have acceptable means of accessing the amenities of urban society.

The best approach to addressing transportation injustice is to provide a wide range of transportation options. Instead of building roads that divide neighborhoods and endanger public and environmental health, transportation can be used to enliven and uplift communities. Increasing transportation options, which simultaneously increases transportation affordability, can expand opportunities available to all people while decreasing the percentage of a household's income devoted to transportation.

CHAPTER III

DESIGN STANDARDS

> Possibilities for adding to convenience, intensity and cheer in cities, while simultaneously hampering automobiles, are limitless. Today, we automatically, if sometimes regretfully, rule out most amenities – to say nothing of pure functional necessities like easy and frequent pedestrian crossings – because these are in conflict with the voracious and insatiable needs of automobiles. This conflict is real. There is no need to invent tactics artificially. (Jacobs 1961)

Design and Human Behavior

The design of our nation's roadways clearly defines how we should move through the built environment. Though we have an extensive network of roads, city planners, scholars, and citizens recognize the lack of mobility for individuals not travelling in automobiles. In the United States, the large majority of our roads are designed with the needs of automobiles in mind. While pedestrians, cyclists, and transit riders *can* use these roads, it is generally unsafe, undesirable, and inefficient to do so. Addressing the power of design in the built environment, Donald Appleyard writes, "unlike buildings, with their defined activity areas and controlled entrances, the street is open to all. Its detailed design, however, can subtly favor one group over another"(Patton 2007). Designing for private car mobility, therefore, treats those travelling by other modes as secondary citizens, and discourages individuals from engagement in more economically, environmentally, and socially sustainable forms of transport.

Transportation research demonstrates the power of the built environment to influence travel behavior. Dill and Car analyzed the transportation data of 43 major cities gathered during the 2000 census, and found a significant correlation between the percentage of people bicycle commuting and the quality of bicycle infrastructure (Dill 2003). A similar study of active commuting in St. Paul and Minneapolis, MN found that distance to retail and bicycle facilities were significant predictors of levels of cycling and walking (Krizek 2006). Finally, research performed by Handy, et al., in Northern California found a causal relationship between “walkable” neighborhoods and levels of walking (Handy 2006). Clearly, design decisions can affect not only the safety of all roadway users, but also influence individuals’ modal choice.[1]

Changing the design of roadways will require a multi-pronged approach, including policy changes, increased and appropriately allocated funding, and the application of new design standards. Furthermore, landscape architects can play a significant role in improving our nation’s transportation infrastructure through the application of theories of placemaking. This thesis will focus on the role design can play in improving multi-modal options and the contribution landscape architects can make to the design of transportation infrastructure.

Susan Handy, professor of environmental science and policy at U.C. Davis, argues that traditional transportation planning focused on increasing mobility, rather than improving accessibility:

> Planning efforts that focus on enhancing accessibility have very different consequences than planning efforts that focus on enhancing mobility. To plan for mobility is to focus on the means without direct concern for the ends: can people move around with relative ease?..The planning process traditionally started with a projection of future traffic volumes that was followed by a determination of the capacity needed to accommodate those volumes at acceptable levels-of-service…To plan for accessibility, in contrast, is to focus on the ends rather than the means and to focus on the traveler rather than the system: do people have access to the activities that they need or want to participate in?

The focus on planning for mobility, she argues, has decreased accessibility, primarily by fueling low-density development. Planning for mobility typically involves building more roads. Planning for accessibility, in contrast, involves strategies such as infill development, improving street connectivity, constructing multi-modal transportation infrastructure, and discouraging auto use through pricing strategies and road restrictions. (Handy 2002).

Road design that prioritizes accessibility over mobility must focus on the needs of the traveler, and how to meet those needs. This shift in thinking requires designers to consider the safety, aesthetic,

[1] For additional information of the influence of urban design on travel behavior, see Boarnet, M. G. and R. Crane (2001). Travel by design : the influence of urban form on travel. Oxford ; New York, Oxford University Press.

and social factors surrounding transportation systems, and revise road design standards to support these priorities. Considerable literature exist on the subject of multi-modal transportation design, and, within this literature, there is a general consensus that future transportation planning should increase user safety, maximize use of existing infrastructure, and integrate the various modes of transportation. While a range of transportation options exist, the following discussion will focus on applying these three priorities to pedestrians, cyclists, and transit riders.

<u>Existing Design Standards</u>

There exists a wealth of information regarding multi-modal transportation design. Federal, state and local agencies, as well as non-profit organizations and scholars, are engaged in the discussion and production of design standards. The American Association of State and Highway Transportation Officials (AASHTO) is a nonprofit association of highway and transportation design professionals representing the 50 states. This organization publishes design standards that are widely accepted throughout the field. The Institute of Transportation Engineers (ITE), an international association of transportation professional, provides technical support and design advice to its members(Engineers 2009). At the federal level, the Federal Highway and Federal Transit Administrations provide research and recommendations to state and local planning agencies. The ISTEA required that all states develop a long-range bicycle and pedestrian transportation plan.

As of 2003, 29 states had achieved this goal, providing numerous state-produced resources.(Wilkinson 2003) Government and non-governmental sources frequently refer to the transportation plans and design guidelines of Oregon, Florida, and Washington State, as excellent examples of multi-modal transportation planning. Locally, Portland, OR and Boulder, CO are cited for their thoroughly researched and implemented design standards. Non-profit organizations, such as the Victoria Transportation Policy Institute (VTPI), a Canadian research organization located in Victoria, British Columbia, as well the Pedestrian and Bicycling Information Center, provide design guides that are not specific to particular locales. Finally, scholarly research provides testing and analysis of various design strategies, and evidence as to which are most effective. The latter two sources frequently draw on examples from European cities, where walking, bicycling, and transit are more commonly used forms of transportation. Many of these standards are presented in both comprehensive and mode-specific designers' guidebooks. This thesis draws on the information provided by *Timesaver Standards for Urban Design*, which addresses a broad spectrum of travel modes, as well as Untermann's *Accommodating the Pedestrian*, which focus specifically on those traveling by foot.

Implementation

While variations do exist within the multitudes of design standards, AASHTO's publications have led to great uniformity among state and local plans, particularly regarding pedestrian infrastructure. Vast differences exist, however, in the implementation of these standards. The most successful examples of multimodal transportation design identify the similarities and differences between the three modes of travel, and design roads and facilities that meet the needs of the different road users, while managing potential conflicts caused by their differences. Jason Patton, bicycle and pedestrian planner for the city of Oakland writes that,

> Despite their different sizes, weights, and speeds, pedestrians, bicyclists, bus-riders, and drivers coexist in the city through choreographed yet often-strained interactions. The social consequences of misnegotiations include unpleasantness, inconvenience, annoyance, injury, and death. The differences between pedestrians and drivers, for example, are managed in the design of the built environment with material forms that support walking or driving, respectfully. The differentiation between streets and sidewalks attempts to manage conflicts by spatially separating the two modes. Similarly, traffic signals manage conflicts in time. Walking and driving each follow a distinct rationality, with different rhythms and concerns, that create fundamental conflicts over how streets should be designed. …street design that accommodates multiple transportation modes is thus a balancing act of tradeoffs and imperfect solutions. But in US cities throughout most of the 20th century, a simpler solution was found to the complexity of heterogeneous traffic: planning, designing, and building homogeneous transportation infrastructure to accommodate the private automobile. (Patton 2007)

While there are some design approaches, such as traffic calming, that benefit all modes of travel, other strategies may favor individual modes, and the merits of such strategies must be weighed against their costs to other travelers prior to implementation. A review of existing literature reveals the basic needs of these different modes, and design solutions that meet those needs.

Pedestrian Needs

Regardless of our mode of transportation, we are all, at some point, pedestrians, and the primary need of pedestrians is safety from crime and traffic. Untermann writes that pedestrians are the most maneuverable, but slowest and most vulnerable street users. (Untermann). Responding to Maslow’s theory of human motivation, which states that people are motivated by a variety of needs, Alfonzo creates a hierarchy of pedestrian needs. She argues that safety, feasibility, and accessibility are the primary needs of pedestrians. Only after theses needs are met, will factors such as comfort, sociability, and aesthetics influence the decision to walk. (Alfonzo 2005).

Based on this conclusion, as well as other research indicating the influence of safety and accessibility on an individual’s decision to walk, continuous pedestrian infrastructure, dense and mixed land use, and direct walking routes will directly contribute to increased walking rates. In existing neighborhoods, infill development and the addition of public facilities such as parks and bus stops can positively influence a person’s decision to walk. Once these primary needs are met, designers can address other needs, including weather protection, facility maintenance, provision of street furnishings and other amenities, as well as the creation of a lively, stimulating, and attractive pedestrian environment.(FHWA-PD-92-041 ; Untermann)

Cyclist Needs

Cyclists and pedestrians share many needs, but there are also important differences between these two non-motorized modes. Surveys of modal choice indicate low rates of cycling across the economic and racial spectrum. This untapped modal option, however, is a highly efficient form of transportation, and is considered a primary mode in many European and Asian countries. The dominance of cycling in such places suggests that appropriate infrastructure and encouragement could cause many Americans to consider cycling as a viable transportation option.

Currently, the vast majority of U.S. cyclists are recreational road bikers. The question that arises for designers, then, is not simply how to increase cycling rates, but how to make cycling a feasible replacement for routine auto trips. Like pedestrians, safety is of primary importance to cyclists, particularly safety from car traffic and from obstacles in the road. In contrast to pedestrians, cyclists can move at a much higher rates of speed, on average 10 mph versus 3 mph, typically share the roadway with vehicles, and are subject to the same traffic laws as vehicles. While cyclists can move faster and travel farther than pedestrians, they also benefit from having nearby destinations, direct routes of travel, streets amenities, and visually appealing environments. Additionally, end of trip facilities, including secure bicycle parking, are of great importance to cyclists.(FHWA-PD-92-041 ; Untermann)

<u>Transit Needs</u>

Improving the safety and use of the non-motorized modes of walking and cycling is critical to increasing transit use. Transit systems must be safe and easy to access by all modes, and thoroughly integrated into the pedestrian, bicycle, and auto networks. Transit system must provide direct routes to major destinations, and provide legible information detailing routes and timing schedules. Additionally, transit stops should be safe from traffic and crime, provide protection from environmental elements, be easy to locate, and provide amenities ranging from basic seating at less frequently used stops, to mini multi-modal stations at more heavily used stops.

<u>Traffic Calming</u>

Traffic calming is a transportation design technique that increases the safety of all roadway users. Traffic calming uses street design, rather than legal enforcement, to cause drivers to travel at the desired rate of speed. Typically, vehicles travel faster on straight, wide roads with long sight lines. By breaking roads into segments and introducing curves and narrowings, traffic calming aims to reestablish the hierarchy of streets, and communicates to drivers that the road is a shared space, rather than the exclusive domain of the automobile. [2]

Strategies for traffic calming are relatively consistent throughout design standards. *Time Saver Standards for Urban Design* divides these measures into four categories: vertical measures, narrowings, lateral shifts and deflections, and programming of traffic calming measures (Watson, Plattus et al. 2003). Vertical measures involve changing the levels and textures of the road's surface. Flat and rounded speed humps (fig 3.1), as well as longer, raised road sections (speed tables, fig. 3.2)) through intersections are common vertical measures. Flat-topped speed humps can also serve as crosswalks, as they increase the visibility of the pedestrian (fig 3.1). Changes in paving texture and color inform drivers that they should adjust their speed, and are most effective when used in conjunction with other measures (fig 3.3). (Untermann ; Transportation 1995; Watson, Plattus et al. 2003)

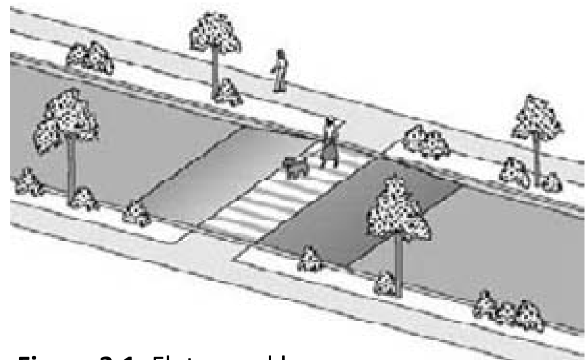


Figure 3.1. Flat speed hump. (Transportation 1995)

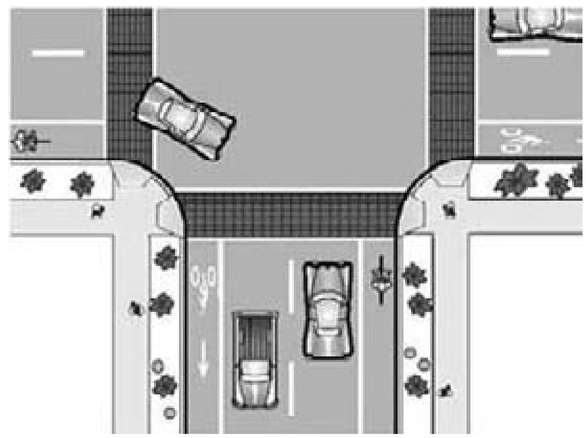


Figure 3.2. Raised intersection. (Transportation 1995)

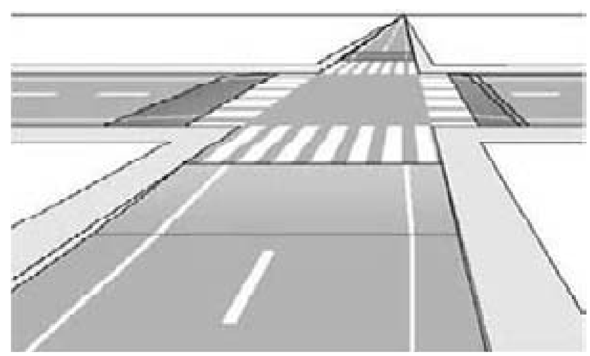


Figure 3.3. Colored and textured crosswalks. (Transportation 1995)

[2] For additional information on traffic calming techniques and benefits, see Newman, P. and J. R. Kenworthy (1999). Sustainability and cities : overcoming automobile dependence. Washington, D.C., Island Press.

Narrower streets effectively slow auto speeds, and can be accomplished by physically narrowing traffic lanes or roadway widths, or by creating the illusion of a narrower road (fig 3.4). Roads can be narrowed through curb extensions, the installation of raised medians, or by devoting a portion of existing lane widths to on street parking and/or bike lanes. Placing vertical elements, such as trees, along the side of the road creates the illusion of a narrower roadway without requiring physical changes to the road itself. (Untermann ; Transportation 1995; Watson, Plattus et al. 2003)

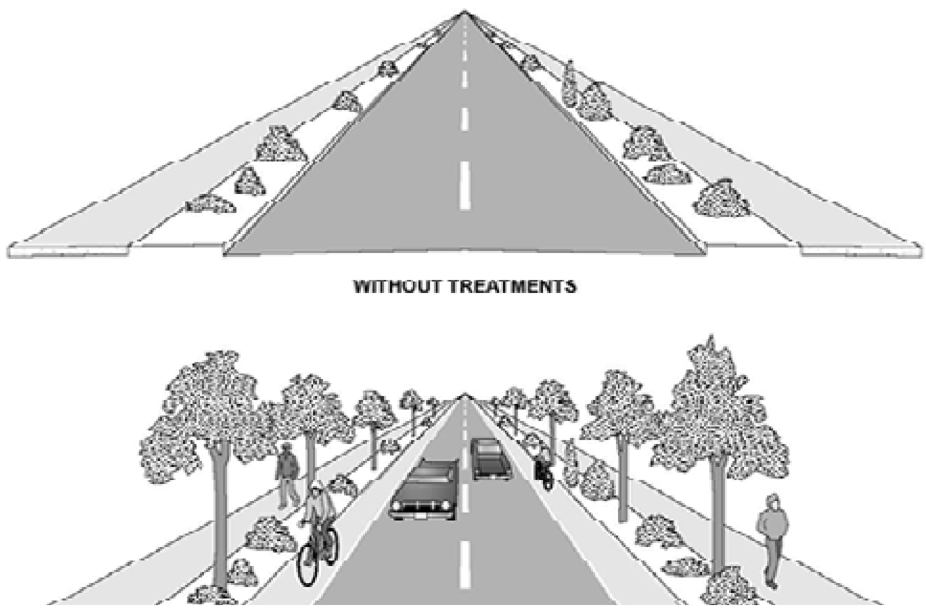
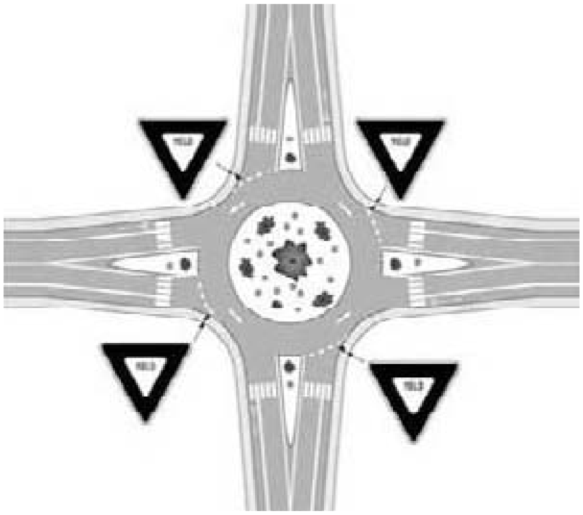


Figure 3.4. Roadway narrowing.(Transportation 1995)

Lateral shifts and deflections encourage reduced speeds by introducing the curves into the roadway and limiting drivers' sight distance. Design elements that accomplish this traffic calming strategy include chicanes, traffic circles or roundabouts, and neighborhood entranceways (figs 3.5 & 3.6). (Untermann ; Transportation 1995; Watson, Plattus et al. 2003)



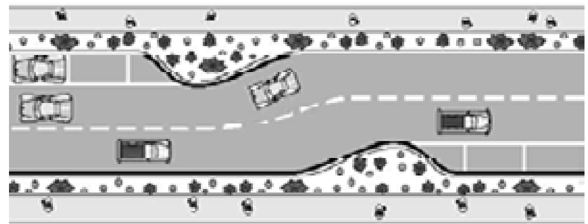


Figure 3.6. Chicanes.(Transportation 1995)

Figure 3.5. Roundabout.(Transportation 1995)

Thoughtful programming of traffic calming measures largely determines their effectiveness. Traffic calming must be an area-wide approach, rather than limited to one street. The previously discussed elements should be placed approximately 75 – 100 yards apart; if used in excess, these measures will become annoying and drivers may begin to ignore them.[3] (Untermann ; Transportation 1995; Watson, Plattus et al. 2003)

Pedestrians Design

Continuous sidewalks running along both sides of the roadway are the most important element of a pedestrian transportation system. Recommended street layout that prioritizes pedestrian safety and comfort includes a 6" curb area immediately adjacent to the road, a 3-5' buffer area, a 6' wide sidewalk, and a 2' wide shy distance.[4] Wider sidewalks may be needed in areas of high foot traffic, on bridges, and at transit stops. The buffer area should be used for signage, trees, and street furnishings; the sidewalk area should be free of all such obstacles. The shy area provides space for store doors and awnings; when sidewalks abut open areas, such as in residential areas, this space is not needed.

[3] For additional information on traffic calming techniques, see Untermann, R. Accomodating the Pedestrian.; Transportation, O. D. o. (1995).; Oregon Bicycle and Pedestrian Plan. O. D. o. Transportation. Salem, Oregon Department of Transportation.; Watson, D., A. J. Plattus, et al. (2003). Time-saver standards for urban design. New York, McGraw-Hill.

[4] The shy distance is the space between pedestrians and fixed objects such as awnings, doors, walls, and fences.

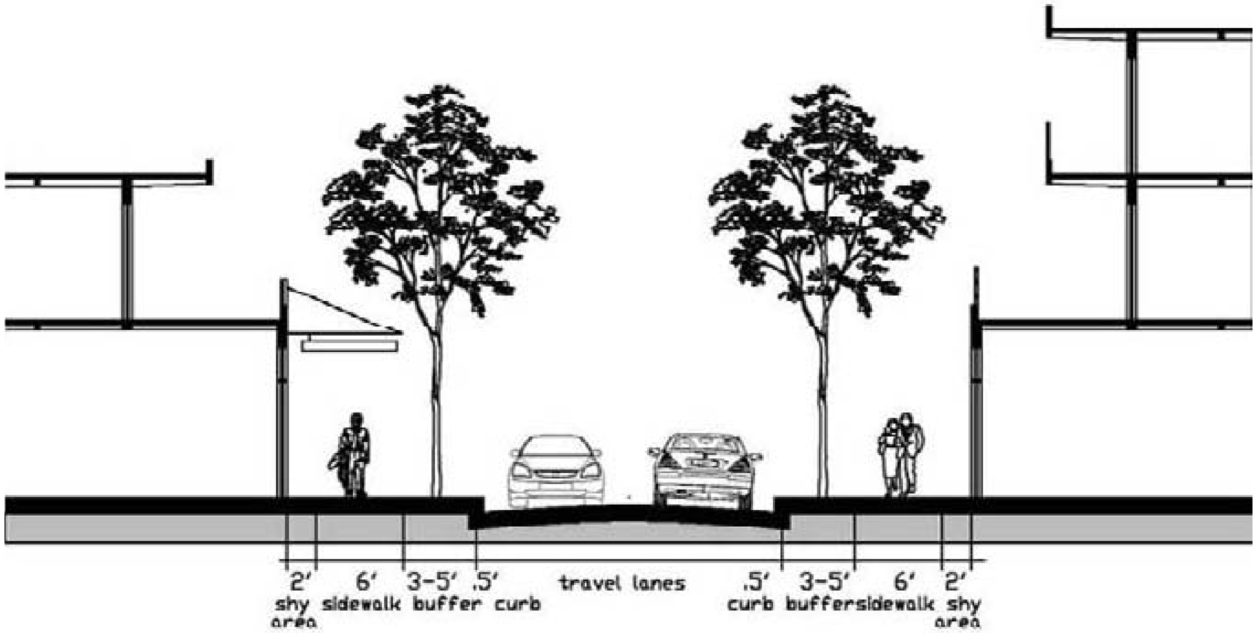


Figure 3.7. Recommended street layout.

The majority of pedestrian accidents occur during street crossings. Improved pedestrian visibility, reduced crossing distance, and frequent road crossings significantly increase pedestrian safety. Roadway elements that increase pedestrian visibility and decrease the distance the pedestrian must travel include: reduced corner radii at intersections; curb and mid-block extensions, or bulb-outs (fig. 3.8); striped and/or raised crosswalks (minimum 3' width, see fig. 3.1); and mid-crossing refuges (fig. 3.9). At skewed and multiple intersections, it may be necessary to remove sight obstacles that prevent drivers from seeing pedestrians, realigning streets

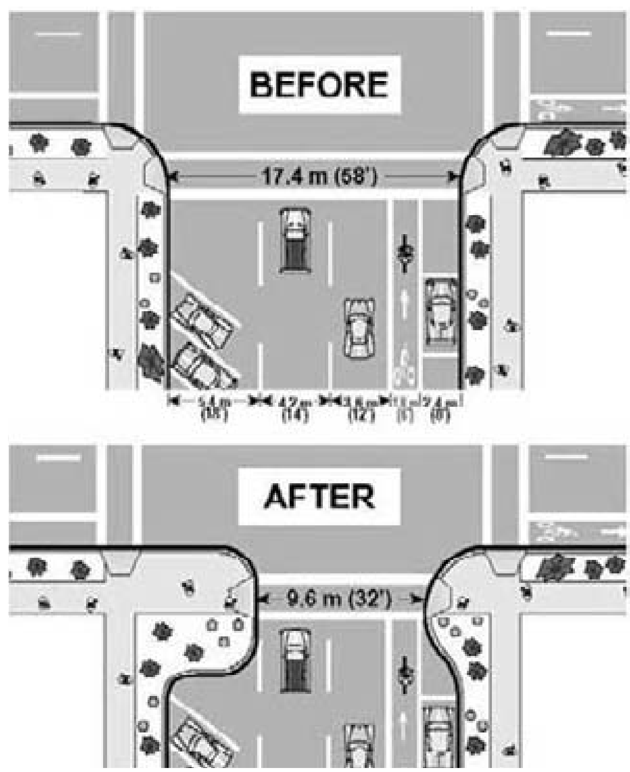


Figure 3.8. Curb extensions.(Transportation 1995)

to create right angles at intersections, or closing some streets. Pedestrian crossing signals also alert drivers of the presence of pedestrians, and ensure adequate time for pedestrians to cross. Illuminated crossings and signage are additional ways to increase the visibility of pedestrians and communicate their rights as roadway users.

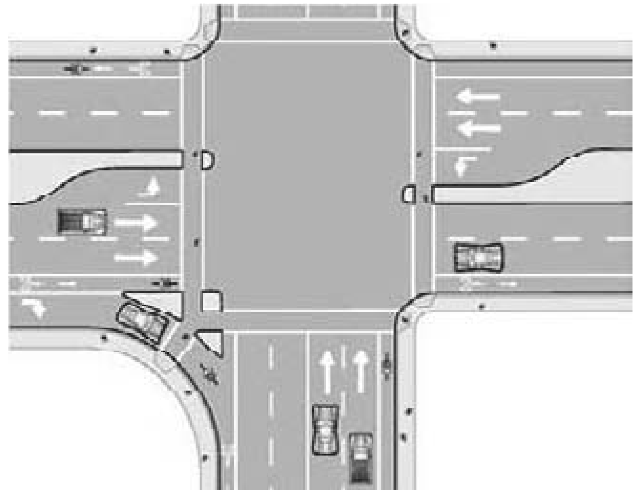


Figure 3.9. Mid block refuges.(Transportation 1995)

Frequent Crossings

Pedestrians are the slowest roadway travelers, and prefer to take the most direct routes possible, even if this means crossing the road in undesignated areas. Providing frequent crossings, particularly in areas with multiple origins and destinations, and at all transit stops, will reduce the frequency of unplanned crossings. Additionally, traffic light timing can provide more breaks in the flow of traffic, providing increased opportunities for road crossings.

Buffer Zone

The buffer area between traffic lanes and pedestrian zones enhances the pedestrian's safety and experience. Trees provide an excellent buffer, in addition to providing shade, creating the illusion of a narrower roadway, and enhancing natural beauty. Street furnishings, such as benches, lights, public art, and signage, as well as additional landscaping, contribute to the functionality of the buffer zone. When there is not enough space available to provide a designated buffer area, or when a larger buffer is desired, on street parking and bicycle lanes may serve as buffers.

Handicapped Accessibility

Sidewalk facilities must be designed for access, and adhere to ADA guidelines. Design for handicapped access includes maintaining a minimum sidewalk width of 3', with 5' x 5' passing areas at 200' intervals, maximum ramp grades of 5%, a maximum sidewalk grade of 1:12, and a maximum 2%

cross-slope. Crosswalks should be provided at expected locations; audible crossing signals and textured surfaces at crosswalk curb-cuts indicate crossings to visually impaired travelers. Frequent maintenance is needed to keep sidewalks in good condition, and free of debris that can obstruct all sidewalk users.[5]

Bicycle Design

Considerable debate exists regarding the most appropriate form of bicycle infrastructure. While shared road usage is the most common way of accommodating cyclists, some planners argue for the use of off-street bike paths. The first significant move towards bicycle transportation planning began in the 1970s, as recreational cycling became a popular sport. Between 1970 and 1973, the purchase of bicycles doubled, and the government responded to this growing interest with the construction of bicycle paths. However, some of the more vocal cycling advocates argued against these off road bike paths. John Forester is a leader of this lobby, arguing that cyclists should share the road with cars because it allows cyclists to move at higher rates of speed and forces cyclists and auto drivers to learn to accommodate and expect each others' presence on the road. Off road bikeways, he argues, encourage dangerous behavior by both cyclists and cars. Supporters of integrated cycling facilities prefer on road use oriented toward commuters and high speed recreational cyclists, and the use of striping, signage, and the education of drivers and cyclists to improve safety.

John Epperson, a senior transportation planner in Miami, FL., disagrees with Forester, arguing that,

> bicycle planning must return to an emphasis on specialized bicycle facilities…only specialized facilities separated from the flow of motor traffic can accommodate the needs and wishes of those who bicycle because it is the only feasible method for them to increase their personal mobility. Safe and comfortable bicycle transportation will be achievable only when the overall transportation system can accommodate cyclists of all abilities and strengths." (Epperson Fall 1995)

[5] For additional information on traffic calming techniques, see Untermann, R. Accomodating the Pedestrian.; Transportation, O. D. o. (1995).; Oregon Bicycle and Pedestrian Plan. O. D. o. Transportation. Salem, Oregon Department of Transportation.; Watson, D., A. J. Plattus, et al. (2003). Time-saver standards for urban design. New York, McGraw-Hill.; Transportation, W. S. D. o. (2008). Design Manual. D. o. Transportation. Olympia.

Epperson's position reflects the views of those supporting segregated bicycle facilities, where cyclists are removed from city streets and accommodated on mixed-use paths oriented towards inexperienced and slower recreational cyclists.

Untermann summarizes the views of many planners and scholars by recommending the best of both integrated and segregated approaches:

> With the most immediate effort being spent to make existing road systems accessible, pleasant and safe for bicyclists…The best solutions involve a combination of improving rider predictability by educating bicyclists and motorists, concentrating bicyclists into lanes to make them more visible, and realigning the worst intersections…the cause of most car/bicycle accidents is lack of cyclist predictability.

Untermann argues for the type of bicycle planning used in cities with high rates of bicycle use: opening all streets to bicycles, with the construction of some completely separate, longer distance routes, and the use of on-road improvements that increase the space available for bikes, and the safety and quality of the cyclist's experience. (Untermann).

Bikeway Types

AASHTO defines four types of bikeways. The speed and quantity of traffic, as well as the width of the roadway, determine the type of bikeway designation appropriate for a given situation. A bikeway indicates simply a shared roadway. A bicycle route differs in that the shared roadway is signed for bicycles. These two types of bikeways require lane widths of 14' – 15', and physical road improvements including bicycle-safe drainage grates, repair of large road cracks and potholes, and removal of any tree limbs, signs, or other obstacles extending into the roadway. One type of bicycle route, also known as a bicycle boulevard, gives preferential treatment to cyclists. This is appropriate on direct, continuous, neighborhood roads. Strategies for creating a bicycle boulevard include turning stop signs toward intersecting streets, making the street one-way for cars and two-way for bicycles, and installing entrance islands or traffic diverters at intersections to reduce the amount of auto traffic on the bike route. (Untermann ; Watson, Plattus et al. 2003)

A third type of bikeway is a bike lane; a portion of the roadway, 5' - 6' in width, that is delineated by an 8" wide stripe and reserved for bicycles only or shared bicycle - transit bus use (fig 3.10). At intersections, the bicycle lanes typically stop at the same point as traffic lanes; at difficult intersections, such as those with skewed angles or multiple roads, dashed lines through the intersection can provide additional guidance. At intersections with right turn lanes, the bicycle lanes should be striped where cars cross to enter the right turn lane, and the bicycle lanes should continue to the left of the right turn lane. Directional arrows and bicycle symbols should be painted after each intersection, or on longer stretches of road without intersections, avoiding places where vehicles are expected to cross the bicycle lane. Typically, little signage is needed for bike lanes, but is recommended when the bike lane is ending, at railroad crossings, or if cyclists are required to walk their bikes. (Untermann ; Watson, Plattus et al. 2003)

Figure 3.10. Bicycle lanes and markings. (Transportation 1995)

Finally, on a bicycle path, cyclists are physically removed from the road on a hard and graded surface that is typically open to all forms of non-motorized travel. Bicycle paths should be at least 10' wide, and include routing signs if they do not follow the street route. Bicycle paths frequently follow old railroad tracks or utility lines, and are typically more appropriate for recreational uses. They may also be considered as an alternative to other bikeways in areas of intense auto activity. (Untermann ; Watson, Plattus et al. 2003).

End of Trip

Providing end of trip facilities, particularly ample, secure bicycle parking, is an essential component of bicycle infrastructure. Over 1.5 million bikes are stolen each year in U.S. Fear of theft is a major factor discouraging bicycle use, yet it is a design feature that is frequently overlooked (Pedestrian and Bicycle Information Center). People who do bike will lock their bikes in safe and convenient spots, and if a bike rack does not fulfill these needs, they will park their bike in a place that does. Providing a functional rack will keep bikes away from pedestrian and auto traffic and prevent damage to site furnishings, such as parking meters, benches, railings, and light posts, that often serve as replacement bike racks.

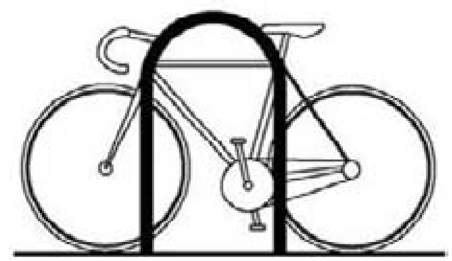


Figure 3.11. Inverted U rack.

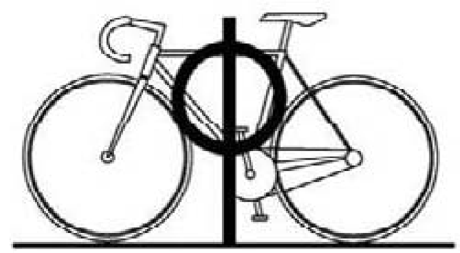


Figure 3.12. Post and Loop rack.

A bicycle rack is defined as one or more rack elements joined to a common mounting surface. The rack element is the portion of the rack that supports the bicycle. The rack element should support the frame of the bicycle in two places, prevent the bicycle from tipping over, allow the frame and one wheel to be locked with a U or cable lock, allow front-in and back-in parking, and withstand cutting and manipulation by common hand tools. The most commonly used bicycle racks are class II racks, which are intended for short term use. Class I parking is designed for all-day or multi-day parking, is significantly more expensive, and provides a higher level of security. This type can be found in some U.S. cities such as Portland, OR and Boulder, CO, but are far more common in European cities, where higher levels of cycling encourage increased investment in bicycle facilities. Recommended class II rack elements include the inverted U and the Post and Loop, figs. 3.11 and 3.12. Creatively designed racks can also provide functional bicycle parking and enliven the public space. Rack elements should be securely mounted, and spaced 30” apart to provide for easy access. Multiple bicycle racks should be separated by 48” wide aisles, the width needed for one person to walk one bike, and rows should be 72” deep (fig. 3.13). High use areas should have multiple entrances, and the rack area should be sheltered.(Pedestrian and Bicycle Information Center ; City of Portland 1996; Institute 2008)

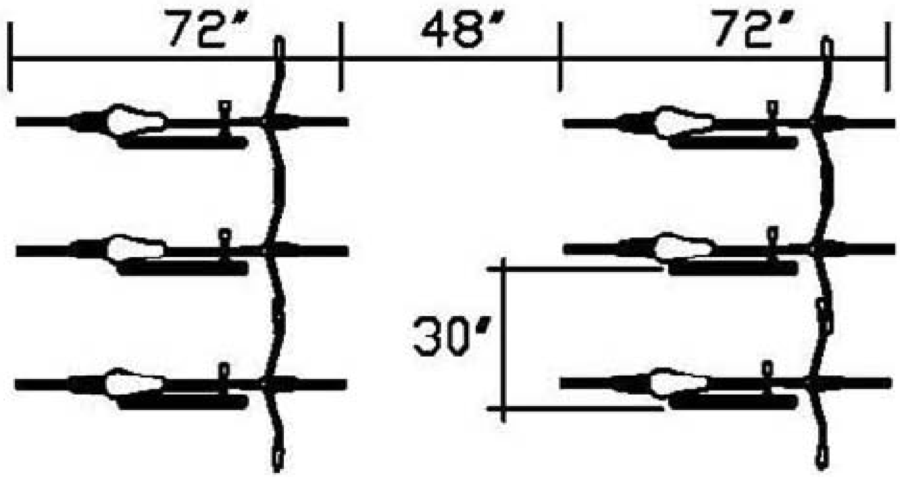


Figure 3.13. Bicycle parking area layout.

When locating the rack area, designers should designate a site that does not pose a hazard to pedestrians, keeps cyclists away from automobile traffic, and that can be easily identified by approaching cyclists. The preferred spot for a rack area is immediately adjacent to the building entrance; if this is not possible, the parking area should be closer than the nearest car parking space. To ensure the safety of the rack area, it should be well-lit and placed in a high traffic area. It is best to have multiple, smaller racks serving individual buildings than one, large rack area serving multiple buildings, as this will increase the convenience level of the parking facility. (Pedestrian and Bicycle Information Center ; City of Portland 1996; Institute 2008) Additional end of trip facilities can include restrooms, showers, and changing areas; these are typically provided by employers or other private establishments.[6]

Transit Design

Public transit is the most feasible alternative to the private automobile for people travelling longer distances, and is the most commonly used form of alternative transportation used in the U.S. Increased ridership, however, depends upon the integration of transit with other modes, and improved reliability, efficiency, convenience, and knowledge of the transit system. In Athens, GA, buses serves public transit needs. The design of bus infrastructure includes consideration of bus stop spacing and placement, bus stop accessibility, the stop itself, and the on-road bus route. The Transit Cooperative Research Program (TCRP), sponsored by the Federal Transit Administration, publishes detailed design guidelines for bus infrastructure. Numerous other state and local agencies have adopted and developed these standards. A notable example is the bus stop design guidelines prepared by Omnitrans, the transportation board serving the County of San Bernardino, CA, and the 15 cities within this county. The following design standards draw from these guidelines.

Bus Stop Location

Proper bus spacing and placement affect ridership, safety, and cost. When selecting the location of a bus stop, designers should consider the potential ridership produced by surrounding land uses; spacing of the stop along the route; the safety of riders and other roadway users; existing infrastructure, such as sidewalks; available space to accommodate the stop; and the effect of the stop on traffic flows.

Land use is the primary determinant of bus stop spacing along a route; in higher density areas, such as shopping centers, large educational centers, major employment areas, and areas with dense residential development, stops should be approximately 1000’ apart. In areas with lower density levels,

[6] For additional information on bicycle design, see Untermann, R. Accomodating the Pedestrian.; Transportation, O. D. o. (1995). Oregon Bicycle and Pedestrian Plan. O. D. o. Transportation. Salem, Oregon Department of Transportation.; Watson, D., A. J. Plattus, et al. (2003). Time-saver standards for urban design. New York, McGraw-Hill.; Transportation, W. S. D. o. (2008). Design Manual. D. o. Transportation. Olympia.

spacing should range from 0.25 miles - 0.5 miles, with spacing increasing as density decreases. (Institute 1996; Associates 2006)

Typically, bus stops are located at intersections, which takes advantage of pedestrian activity on both sides of the street and facilitates route connections. At major trip generators, or other unique circumstances, stops may be located mid-block. Additional factors, such as effects on neighboring land uses, available space, access, and traffic flows, can influence bus stop placement. When locating a bus stop at an intersection, the preferred placement is on the far side (after crossing) of the intersection. The near side (before crossing) of the intersection, or mid-block locations should be considered if the far side is unavailable, will cause increased danger to the pedestrian or other roadway users, or will obstruct the flow of traffic. (Institute 1996; Associates 2006)

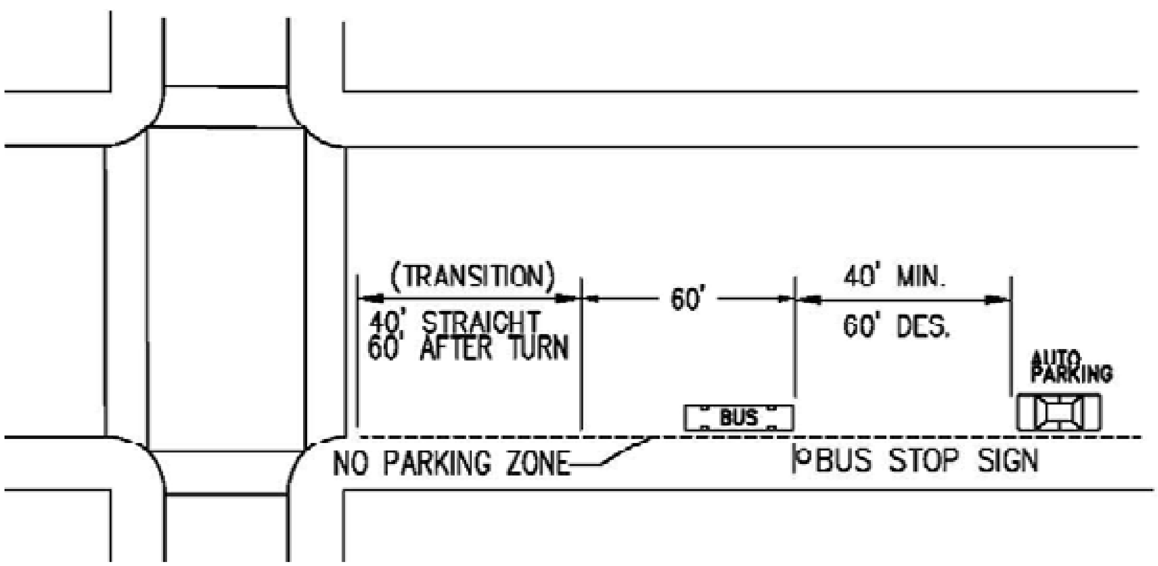


Figure 3.14. Far side bus stop placement. (Associates 2006)

<u>Handicapped Access</u>

Safe, ADA-compliant access should either exist or be created when designing a bus stop. Placing a bus stop where high quality, ADA accessible sidewalks already exist is a cost effective approach to bus stop design. At a minimum, a sidewalk should extend from the stop to the nearest intersection or existing sidewalk, with an 8' x 5' landing pad at bus entrances and exits. A preferred alternative is to provide a continuous 8’ wide sidewalk along the entire bus stop. Additionally, ADA curb ramps must exist at surrounding corners or intersections so that wheelchairs may access the bus. (Institute 1996; Associates 2006(Kirschibaum 2001))

Safety

As in all roadway design, safety is a critical consideration in bus stop placement and design. According to the TCRP, “in the transit environment [safety] includes an individual’s relationship to buses and general traffic, and the bus’ relationship to other vehicles…pedestrians, bus passengers, buses, and private vehicles can all be involved in concerns for safety at or near a bus stop” (Institute 1996). Bus stops should not create conflicts between buses and other roadway users. There should be adequate sight distance from adjacent intersections and driveways, as well as adequate visibility and space for the bus to re-enter the traffic stream. If possible, the stop should be located near protected intersection crossings, and in open, visible, and well-lit areas that increase rider safety. (Institute 1996; Associates 2006)

Bus Stop

The bus stop itself must provide adequate space for the bus to leave, park, and then re-enter traffic, as well as signage and other amenities that create a welcoming, comfortable, and informative waiting area for passengers. The decision to provide a pull-out area depends on a number of factors, including the degree to which stopping a bus in a travel lane will delay traffic, the safety of loading and unloading passengers, and available space. Pull out lanes should be at least 80’ long, with an additional 60’ allotted for the bus to reenter traffic. (Institute 1996; Associates 2006)

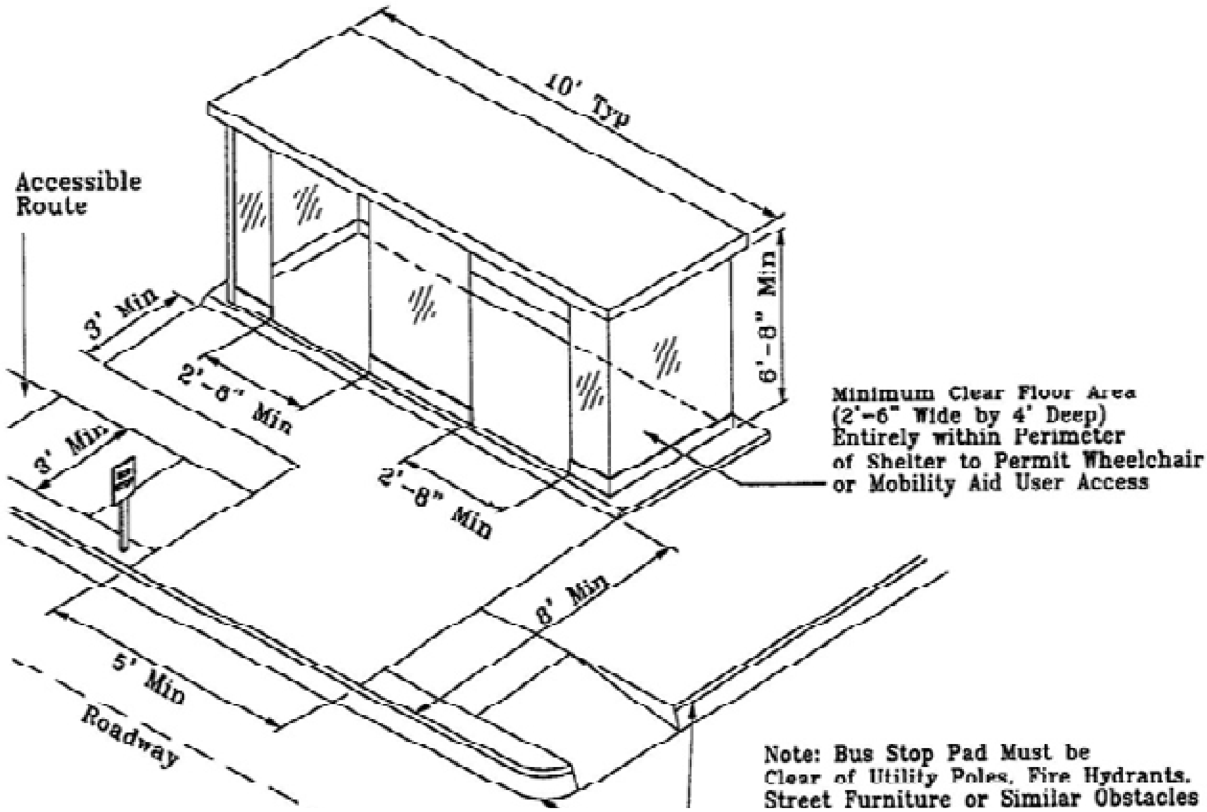


Figure 3.15. ADA accessible bus shelter. (Associates 2006)

In addition to the requisite sidewalk and landing pad, bus stops must provide, at a minimum, a securely mounted header sign indicating which route serves the stop, a telephone number to call for additional information, adequate drainage, and paved connections if the stop is located at a bus transfer area. Additional amenities should be considered based on ridership, rider interest, and equal distribution among communities. Desirable amenities include benches, shelters, lighting, bicycle parking, trash receptacles, landscaping, and additional and/or real-time bus and fare information. All amenities should be clear of the sidewalk, ensuring safe and continuous access onto buses and through the bus stop zone. (Institute 1996; Associates 2006)

<u>Bus Lanes</u>

Finally, consideration must be given to the location of the bus on the road. Typically, buses share travel lanes with automobiles. However, priority lanes, which can be shared with bicycles, may be desirable in certain circumstances, and could increase ridership. Priority lanes can be located curbside, in the median, or flowing against traffic. Curbside lanes are difficult to keep clear, due to illegal parking or use by vehicles turning right, but provide riders with easier access to sidewalks. Median lanes are easier to keep free of traffic, but necessitate additional median infrastructure to provide safe waiting areas for passengers, and require additional road crossings by passengers. Contraflow lanes can improve routing options for buses, and are usually located curbside. Drawbacks to contraflow lanes include complicated intersections and the need for additional infrastructure, such as traffic signals. (Administration)

Well designed bus facilities should attract riders, maintain high levels of safety and access for all road users, and not impede the flow of traffic. Decisions regarding bus stop location and amenities must be made based on ridership, safety, and funding. Because public transit can provide affordable, high-speed transportation over longer distances, but are dependent upon driver, pedestrian, and cyclist access, bus stops should be viewed as mini multi-modal transit stops designed to facilitate transitions between the various transportation modes.[7]

Conclusion

Design standards can streamline multi-modal transportation design, and provide a well-researched and tested basis from which to implement context-appropriate design solutions. Numerous cities have implemented multi-modal transportation plans based on design standards similar to those discussed here. Several case studies follow, demonstrating the ways in which these design standards were implemented, and the results of multi-modal transportation planning.

[7] For additional information on the design of bus infrastructure, see Administration, F. T. "Bus Lanes." Retrieved 1/22/09, 2009, from http://www.fta.dot.gov/assistance/technology/research_4358.html.; Institute, T. T. (1996). TCRP Report 19: Guidelines for the Location and Design of Bus Stops. Transit Cooperative Research Program. T. R. Board. Washington, DC, The Federal Transit Administration.; Kirschibaum, J. B., Peter W. Axelson, Patricia E. Longmuir, Kathleen M. Misapgel, Julie A. Stein, Denise A. Yamada (2001). Designing Sidewalks and Trails for Access, Part II of II: Best Practices Design Guide, US Department of Transportation, Federal Highway Administration.; Associates, D. (2006). Bus Stop Design Guidelines, Omnitrans.; Transportation, W. S. D. o. (2008). Design Manual. D. o. Transportation. Olympia.

CHAPTER IV

CASE STUDIES

Case studies from lower-income neighborhoods in Portland, OR and Baltimore, MD provide examples of ways in which designers and planners are incorporating multi-modal transportation design into community revitalization efforts. While each of the following four case studies involve relatively new planning actions, the long term success of which cannot, yet, be definitively judged, they suggest a process by which to approach community revitalization through transportation improvements, and ideas for ways to uplift communities through multi-modal transportation infrastructure while avoiding resident dislocation and community gentrification.

Case Study I: Portland

Portland's multi-modal transportation infrastructure is one of the most extensive in the U.S. Noted particularly for its success in increasing cycling and walking rates, Portland values its reputation as a leader in multi-modal transportation planning and design, and continues, despite severe budget constraints, to implement strategies that aim to decrease levels of auto use and auto-dependence and create a lively, pedestrian and bicycle-oriented environment. These efforts have made Portland a highly desirable place to live, and, as an increasing number of upper and middle-class people flock to Portland's vibrant, urban neighborhoods, property values rise. In the historically working-class community of Albina, also known as the Interstate Corridor, city officials are involved in continuing revitalization efforts that aim to improve the physical and economic landscape of this community while avoiding the increased property values found in surrounding neighborhoods.

Background to Transportation Planning in Portland

Statistics support Portland's reputation as a one of the few U.S. cities that has had notable success in encouraging citizens to replace auto trips with other transportation modes. Between 1975 and 1995, the number of cyclists on the Hawthorne Bridge, which spans the Willamette River, rose from 200 to 2000 (City of Portland 1996). Portland's transit system, TriMet, carries more people than any other US transit system of comparable size (City of Portland 2004). In 2007, Portland had the highest percentage of bicycle commuters among large U.S. cities, with 3.5% of workers biking to work, compared to a national average of 0.4% (Bureau 2007).

The benefits of lower levels of car use radiate throughout the city. According to a 1998 report from the Center for Livable Communities, the installation of 70 traffic circles and 300 speed bumps contributed to a 50% drop in reported traffic accidents. The light rail system doubled the patronage of the bus system it replaced. Finally, improved transit access to the downtown area has led to urban revitalization efforts, and a 50% increase in downtown jobs with no accompanying increase in car commuting to this area. (Newman and Kenworthy 1999)

A number of decisions contributed to Portland's success in discouraging urban sprawl and creating a vibrant, human-scaled, urban environment that promotes the use of multiple modes of transportation. In 1974, Portland decided to stop construction of the Mt. Hood Freeway and opt, instead, for the construction of a light rail line. This event marked the end of freeway construction in the city and the beginning of the city government's integrated approach to land use and transportation planning. In the same year, Portland adopted 14 statewide planning goals that included a focus on developing housing within existing urban areas and serving this development with multiple modes of transportation. (Development) As the integration of land use and transportation planning progressed, increased emphasis was placed on pedestrian and transit oriented development within existing urban areas.

Today, Portland's commitment to responsible land use and multi-modal transportation planning continues. The state of Oregon's and the city of Portland's comprehensive and strategic plans, in regards to transportation, focus on promoting cycling and walking as forms of transportation, rather than recreation, and on improving cycling and pedestrian infrastructure on existing urban street systems where people are more likely to make short trips and where there are greater congestion problems. Transit is promoted as a viable alternative for longer trips. Additionally, this plan emphasizes the importance of maximizing the use of existing infrastructure. (Transportation 1995) Portland's goal is to provide its citizens with high quality transportation options that support neighborhood livability, economic growth, environmental health, and reduced automobile dependence. The Portland Department of Transportation views transportation as a key part of the city's identity, knitting communities together and creating a unique sense of place.(Planning 1980; City of Portland 2004)

Portland's strategies for accomplishing transportation goals include street classification systems, integration of transportation modes, and collaboration with other government departments and community groups. While there are separate design guides for each travel mode, they all strive to support other each other, with a particular focus on the integration of non-motorized modes with transit. Working with other government and citizen groups helps the transportation department support economic development, environmental protection, and community building projects. Portland's, and Oregon's, transportation plans, strategies, and design guidelines indicate a recognition of the relevance of transportation to all other elements of city life, and how having a "balanced, equitable, and efficient transportation system that provides a range of transportation choices" can improve overall quality of life, environmental health, and economic growth.(City of Portland 2004)

The Albina Community: Background

While Portland has achieved many successes in terms of managing sprawl and reducing auto-dependence, the city is not without problems. Due, largely, to its vibrant, urban neighborhoods and progressive planning strategies, many people want to live in Portland, and the problems of gentrification and displacement, which are commonly found in such highly desirable places, also exist in Portland. These two phenomena are clearly seen within the Albina community Northeast Portland.

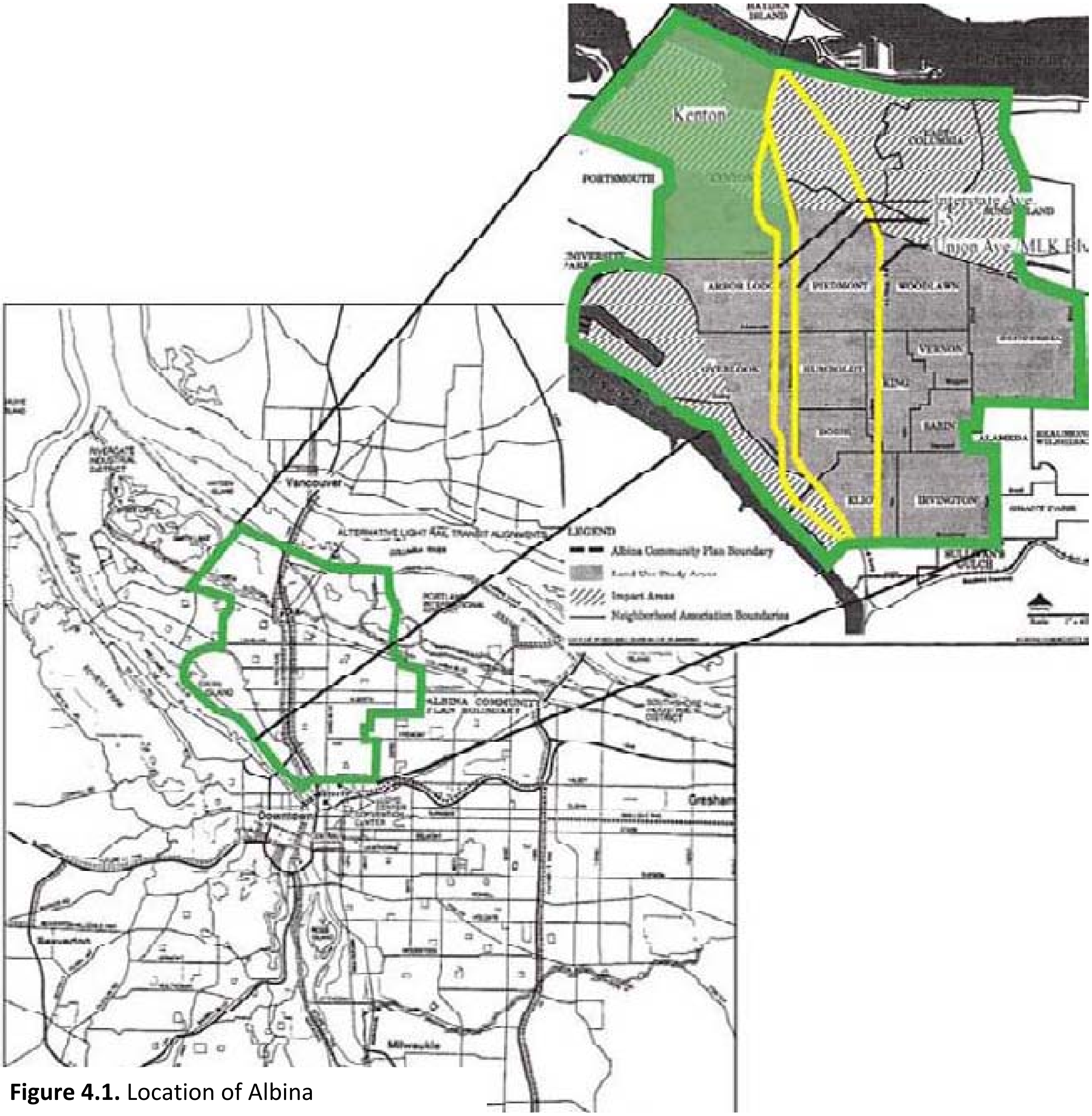


Figure 4.1. Location of Albina

Portland's Albina community has a rich history. Originally inhabited by Native Americans, white settlement and economic development began in the 1840's, as the area's rivers became important ferry routes. In 1874, residential development began, and the City of Albina was incorporated in 1887 and consolidated with Portland in 1891. By the late 1800's, Albina, the western terminus of the Union Pacific Railroad, was growing rapidly as a railroad town, as well as attracting other industries. The extension of utilities, streetcar lines, bridges, and ferry service accompanied dramatic population growth, as did the construction of inexpensive workforce housing. After WWI, increased auto use led to the construction of Interstate Avenue, and drew traffic away from Union Avenue (today named Martin Luther King Blvd.), the Albina neighborhood's major commercial strip. Businesses soon moved to Interstate Avenue, but traffic on that thoroughfare quickly declined when I-5 opened in 1964. Construction of this interstate required the demolition of a number of Albina's commercial buildings. (Workshop 1990)

Albina is composed of 13 distinct neighborhoods. The majority of these neighborhoods were originally billed as upper-class, streetcar suburbs, with a few, such as Kenton, serving as company towns. The Vanport area of Kenton was the site of the United States' largest wartime housing project. 40,000 people lived in 9942 densely built housing units, and turnover rates reached 100% per year. As job opportunities attracted migrants from across the country, the black population of Portland grew from 2,565 in 1940 to 15,000 in 1946, and racial conflict and discriminatory real estate practices forced the majority of this population into Vanport city. After the war, as workers lost their jobs, wealthier residents moved away from the area, leaving only the poorest families. In 1948, a large flood destroyed almost all of Vanport's housing stock, and former residents moved to Albina city. While the Albina corridor includes several other ethnic niches that contribute to the areas diverse architecture and culture, it remains, primarily, an African American community. (Workshop 1990)

Albina's Decline and Early Revitalization Efforts

Racial conflicts of the 1950's and 60's, and major construction projects continuing into the 70's, dramatically affected the Albina Corridor's close-knit African American community. There were a number of violent racial incidents within the community, and large construction projects, including the Memorial Coliseum in the 1950's, the construction of I-5 in the 1960's, and the Emanuel Hospital Urban

Renewal Project in the 1970's, ripped holes in this African-American community, destroying local businesses and homes, and planting the seeds for neighborhood deterioration, and subsequent gentrification and displacement.[1](Workshop 1990)

The rapidly declining condition of the Albina Community made this area the focus of several government urban renewal efforts. The Albina Neighborhood Improvement Plan of the 1960s concluded that the area was an urban blight, and used funding from the federal government's Model Cities program to demolish almost 800 homes and businesses and construct new housing units. In an area already plagued by high levels of unemployment, black home ownership and property values fell and crime rates rose dramatically. In an effort to make their voices heard, the citizens of the area began to organize, laying the groundwork for ongoing citizen participation in government projects. Subsequent revitalization efforts included transportation improvements, with a particular focus on the revitalization of Union Avenue, the area's former commercial core.

Traffic calming and streetscape improvements aimed to reduce traffic accidents and revive Union Ave as a central commercial district. As urban renewal efforts continued, and the city invested increasing amounts of money into neighborhood improvements, the Albina area became an attractive, in-town location, and rising housing costs displaced many residents. In 1960, 4 out of 5 black Portlanders lived In Albina; by the 1990's, less than one third of black Portlanders remained in the neighborhood. (Workshop 1990; Josh 2008; Project 2008)

Gibson writes that,

Portland provides an interesting case study of a Black community that found itself suddenly in

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[1] In reference to the Albina Community, Gibson defines gentrification as "reinvestment in housing and commercial buildings, as well as infrastructural amenities...It includes the movement of higher-income residents into a neighborhood and often involves racial transition. It requires financial investment in the built environment until property values are comparable to those of other neighborhoods, and it is an institutional, rather than individual-scale."Gibson, K. (2007). "Bleeding Albina: A History of Community Disinvestment, 1940-2001." Transforming Anthropology **15**(1): 3-25.

> the path of urban redevelopment for ‘higher and better use’ after years of disinvestment. The occupation of prime central city land in a region with an urban growth boundary and in a city aggressively seeking to capture population growth, coupled with an economic boom, resulted in very rapid gentrification and racial transition in the 1990s.(Gibson 2007)

The result of these earlier urban renewal efforts is a corridor characterized by a mix of wealthier, revitalized neighborhoods and impoverished, lower-income zones, and a citizenry that is wary of further government intervention.(Buerger 2007)

<u>Current Revitalization Strategies: The Interstate Corridor Urban Renewal Plan</u>

In an effort to right past mistakes, and address the continuing needs of the Albina area, Portland has begun its largest urban renewal effort within this 3710 acres area, which is now referred to as the Interstate Corridor. Investment in a light rail project recently constructed in the neighborhood spurred the latest revitalization plan. This renewal plan is unique from past plans in that it focuses on providing benefits to existing residents and avoiding the “intense block-busting developments” of past plans, has earned the support of community members, and provides an example of possible ways to apply Portland’s well developed transportation planning and design techniques in a lower income community, while avoiding the gentrification and displacement that often accompanies the improvement of public amenities. (Wollner 2003)

The Interstate Corridor Urban Renewal Plan (URP) includes several guiding principles, including “thorough and ongoing community involvement…focusing particularly on segments of the community not typically involved in this type of project;” providing primary benefits to current residents, including protection from gentrification and displacement; maximizing investments in the light rail; and focusing renewal funds on areas bearing the greatest impact from I-5 and light rail construction.(Commission) The URP consists of seven topic areas; transportation is one of these topic areas, as well as an important element of the other six.

Elements of the transportation plan that set it apart from past urban renewal efforts include a focus on providing transportation to suburban and industrial job sites (currently, transit access within the neighborhoods is adequate, but primarily serves the central city); intense coordination with other urban renewal goals; high levels of community involvement; concentrating funds on areas bearing the heaviest load from light rail construction; and maximizing the effectiveness of existing infrastructure. Due to limited funding, the transportation commission recommends two separate actions: a lower cost, short tem Interstate Corridor Transportation Safety Program that addresses "traffic impacts due to light rail or cut-through traffic and pedestrian and bicycle safety improvements;" and larger scale, more complex projects that require additional time and funding to complete.(City of Portland 2001)

As stated previously, two primary goals of the URP, and the transportation plan in particular, are providing economic benefits to current residents of the Interstate Corridor and addressing the blight caused by I-5. "With relatively high unemployment rates, job retention and expansion is essential in accomplishing the Interstate Corridor Urban Renewal Area (URA) goals of existing residents benefiting from the revitalization in this corridor." (City of Portland 2001) Strategies for attracting and retaining businesses include improved freight access to industrial areas and streetscape improvements, such as sidewalk amenities, that will attract businesses and shoppers. Strategies for improving traffic and pollution problems emanating from the I-5 include traffic calming strategies and the creation of a more "balanced transportation system" through improvement of bicycle and pedestrian infrastructure that focuses on connections to the light rail and area amenities.(City of Portland 2001)

<u>The Russell Street Improvement Plan</u>

The Russell Street improvement plan is one element of the URP that clearly demonstrates the use of Portland transportation design standards to meet urban renewal goals. Russell Street is a major east-west corridor in the renewal area, providing connections to the light rail station, the lower Albina industrial area, the hospital, and a major residential area. Historically, Russell Street served as the main street and primary streetcar line of Albina. While the final design addresses Russell Street in particular, the project was viewed in its larger context, allowing designers to "develop solutions to pedestrian and traffic issues on streets connected to the project area."

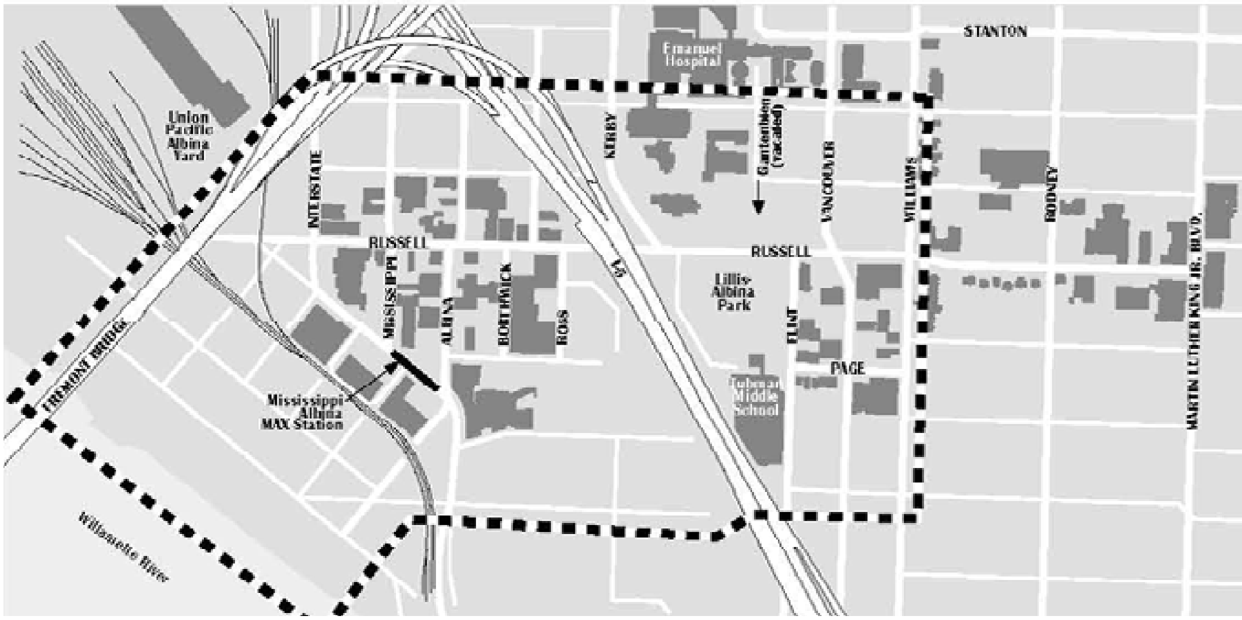


Figure 4.2. Russell St. context area. (City of Portland 2003)

The project's stated objectives are to "identify barriers to pedestrian and bicycle access to light rail stations…design priority access routes for pedestrian and bicycle travel…create a streetscape design plan for" two intersecting streets, "identify streetscape improvements to create attractive, safe, convenient pedestrian and bicycle access to light rail and to support planned uses…provide connections to" residential areas, and "enhance the pedestrian environment around the light rail station."(City of Portland 2001)

The design process included a great deal of community input, including a charrette that generated a concept for the final design. The adopted concept was "A Ribbon with Places," which was based on the idea of "a continuous element, or ribbon, that would help to guide people from one end of the project to the other. (fig. 4.3)" The theme adopted to guide the design was: "historic, cultural and ethnic identities that have contributed to the area will be expressed artistically all along the street. The unique mix of industrial, commercial, and institutional uses would be recognized as the 'places.'"

Figure 4.3. Russell St. design concept: A Ribbon with Places. (City of Portland 2003)

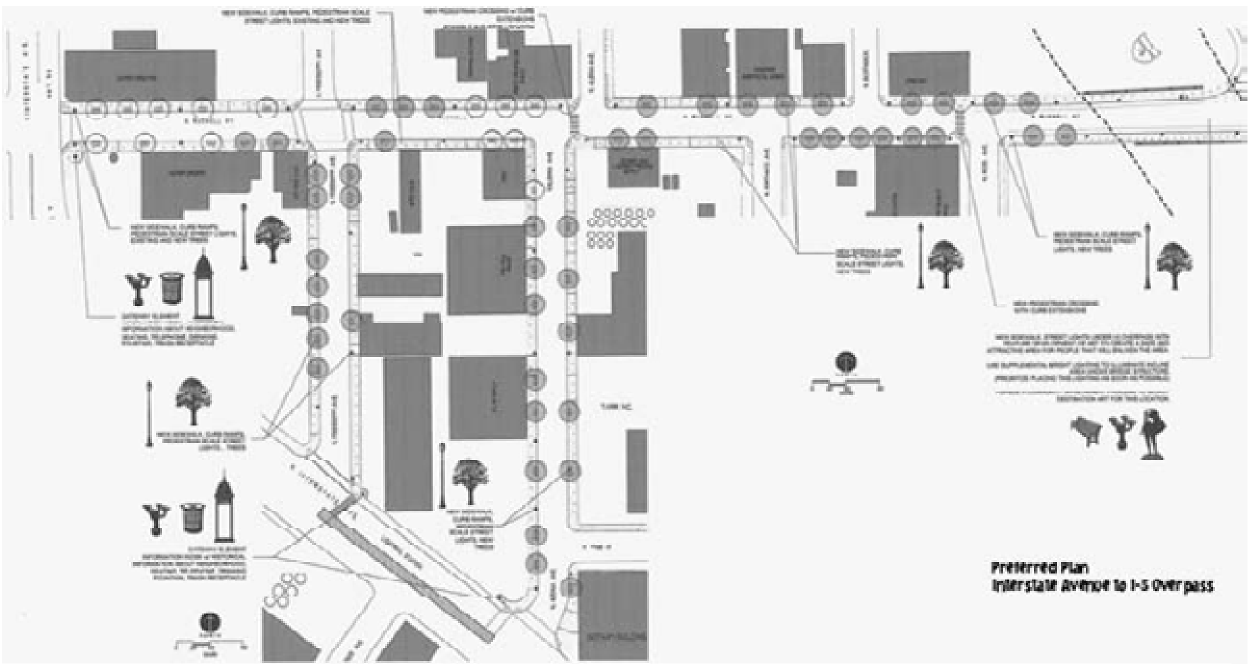


Figure 4.4. Preferred Plan: Interstate Avenue to I-5 Overpass. (City of Portland 2003)

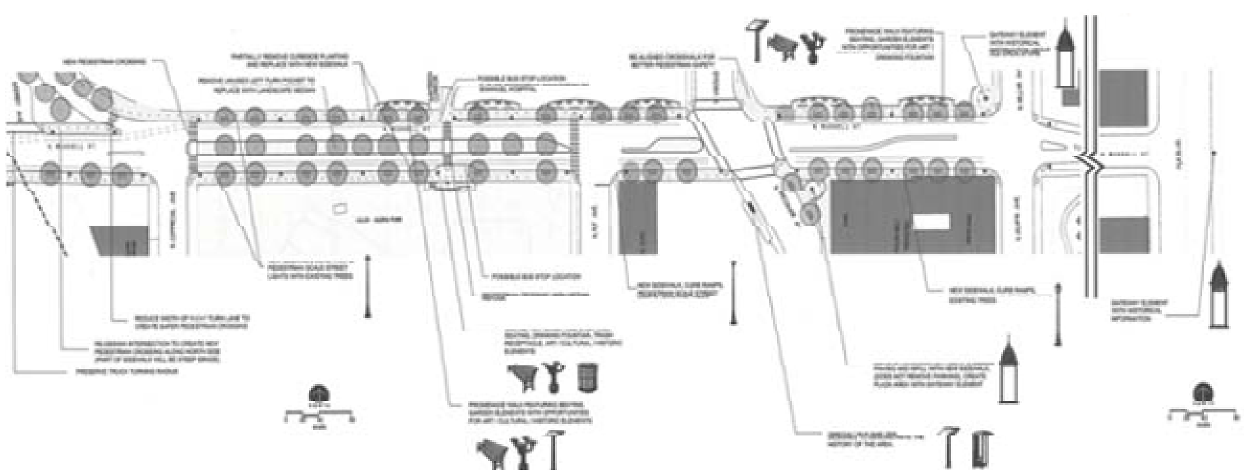


Figure 4.5. Preferred Plan: I-5 Overpass to Martin Luther King Jr Blvd. (City of Portland 2003)

Throughout the design process, the transportation team participated in on-site evaluation of particular problem areas, the presentation of design solutions to the community, and the adoption of the plan that best addressed community concerns and received high levels of community support. The final design (fig. 4.4 & 4.5) included diamond shaped pavement markers, representing the ribbon concept, placed at 12’ intervals along the entire sidewalk; extensive use of public art; the installation of numerous traffic calming devices and street crossing improvements; and the construction of new, context-sensitive transit shelters. Following several community evaluation workshops, the design team selected nine issues within the Russell Street Corridor to design in greater detail. Several issues that are representative of the project as a whole are discussed below.(City of Portland 2003)

N. Mississippi and N. Albina Avenues: Streetscape Improvements

One area of interest was N. Mississippi and N. Albina Avenues, where community input was used to decide what level of streetscape improvements were needed, resulting in sidewalk improvements and the addition of street trees and other landscaping (fig 4.6). (City of Portland 2003).

Figure 4.6. N. Mississippi Ave streetscape improvements. (City of Portland 2003)

Russell St and N. Kirby: Realignment of a Skewed Intersection

A second area of interest was the skewed intersection and break in the sidewalk at Russell Street and N. Kerby Avenue. Many participants supported the realignment of the road, but terrain and proximity to the interstate structure prevented any major roadwork. A compromise was reached with a minor road realignment and the installation of a continuous sidewalk on the north side of the street. Designers also included a large pedestrian refuge that narrowed the lane widths and shortened the crossing distance, and a marked crosswalk on the more gently sloping south side of the intersection fig 4.7). (City of Portland 2003)

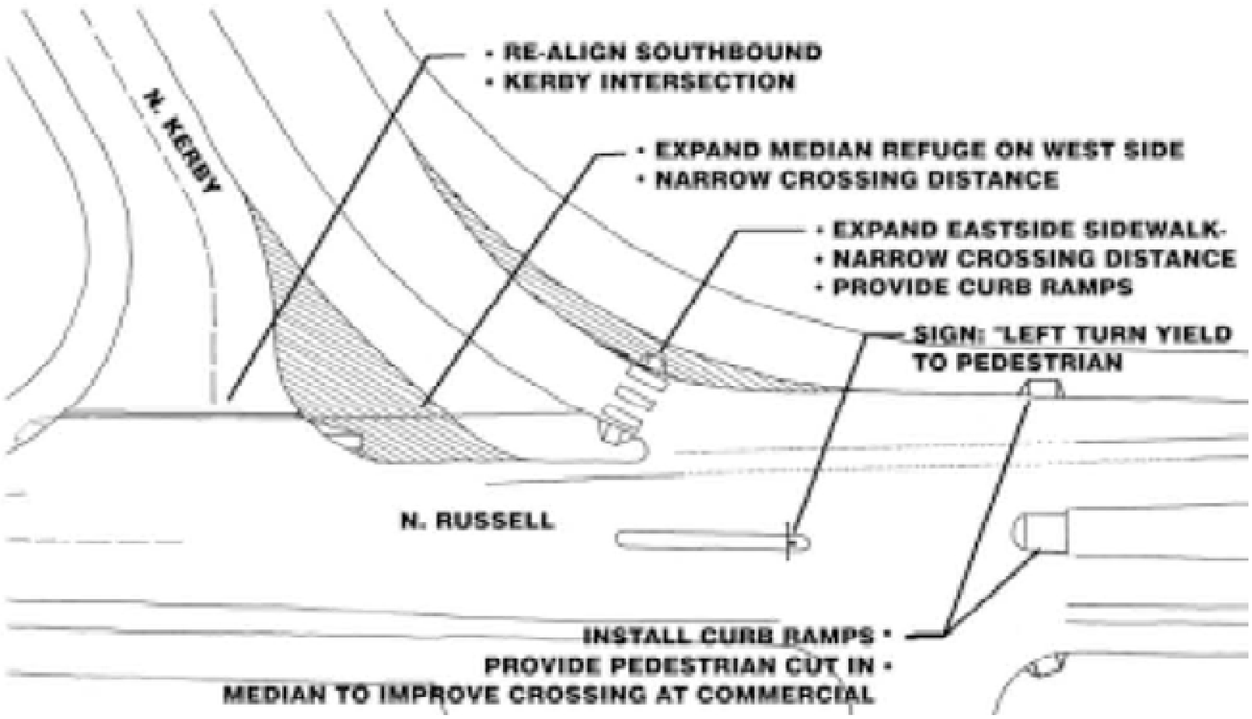


Figure 4.7. Russell St. and N. Kerby Ave. realignment (City of Portland 2003)

Intersection Enhancements

Several intersections and road crossings were of concern to area residents, and each received improvements that maximized pedestrian safety. At the Russell Street – N. Vancouver intersection three curb extensions and the realignment of one existing crosswalk were used to increase pedestrian safety (fig. 4.8). At a difficult road crossing leading to a neighborhood park, the community strongly supported a design that included curb extensions, a marked crosswalk, an enhanced pedestrian connection to a neighboring school campus, and a new stairway and entryway leading to the park (fig 4.9). (City of Portland 2003)

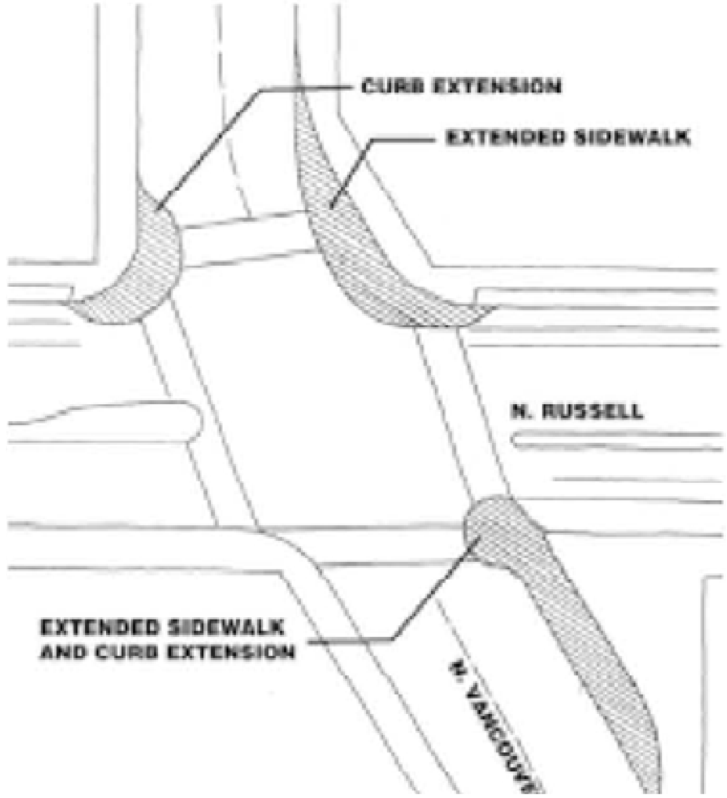
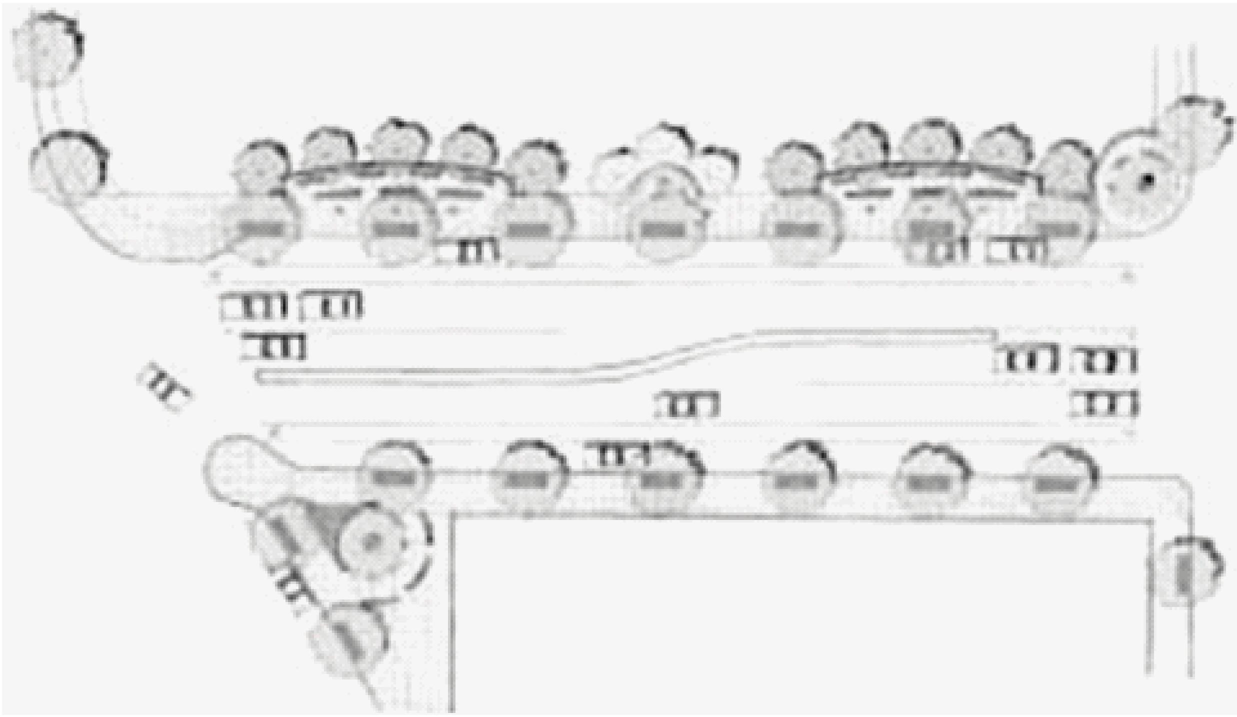


Figure 4.8. N. Russell and N. Vancouver intersection enhancement (City of Portland 2003)

Figure 4.9. Enhanced pedestrian crossing and park entrance: before and after. (City of Portland 2003)

The Promenade

The section of Russell Street between N. Vancouver and N. Williams Avenues included a vacant parcel on the north side of the right of way. After gaining permission to encroach upon this property, the



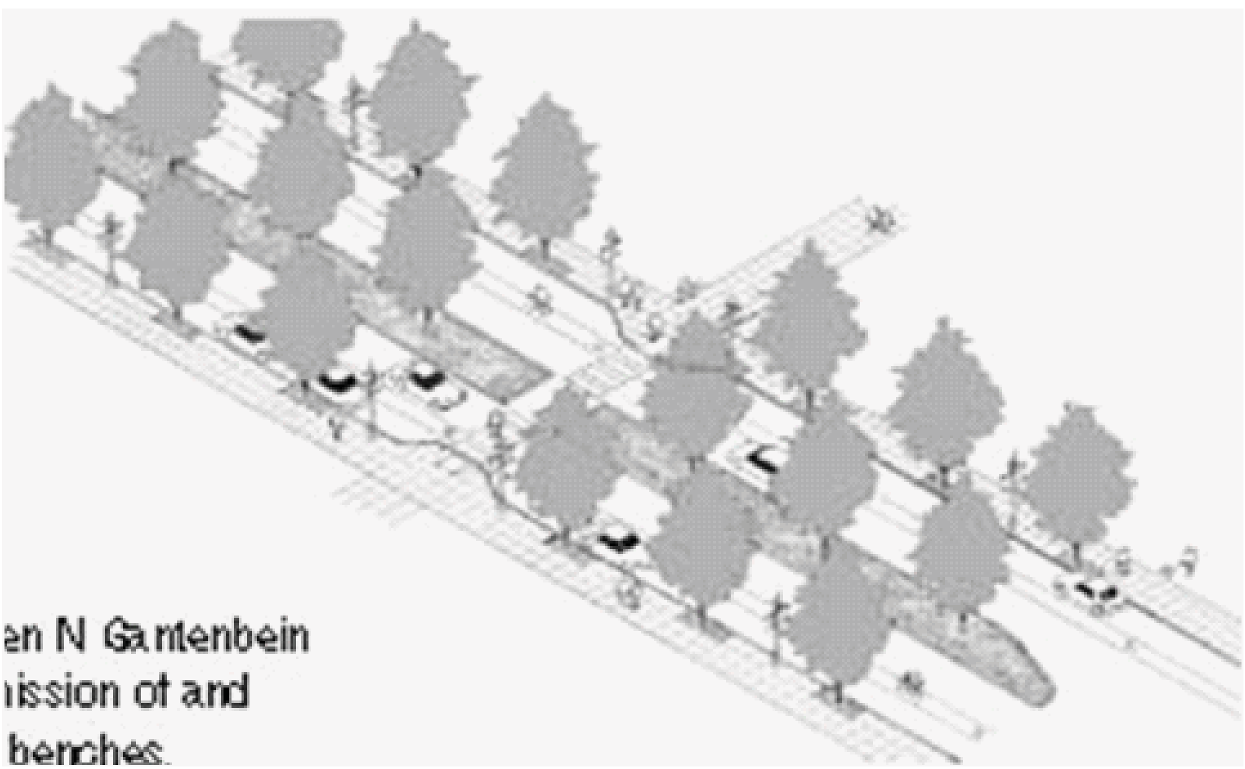


Figure 4.10. The Promenade: plan and axonometric views. (City of Portland 2003)

design team adopted a community member's idea to create a "promenade" along the north side of the street. This promenade includes significantly wider sidewalks and extensive amenities, such as seating, water fountains, and landscaping (fig 4.10). Due to community interest, the design team agreed to extend the promenade outside of the project boundaries until it met with MLK Jr. Blvd. (City of Portland 2003)

Ribbon of Places

In each improvement area, the design team incorporated elements of the Ribbon with Places concept. This included the addition of sidewalks, street trees, and streetlights along the entire street, as well as the diamond shaped sidewalk markers (fig. 4.11). The "Places" included the historic district between N. Interstate and N. Albina, which was designated with a gateway element; the MAX station, which also earned gateways and signage; the I-5 underpass, where lighting and art are used to enliven the area and create a destination, rather than an haven for criminal activity; the Gantenbein Crossing, where the new park entrance and enhanced pedestrian crossings were installed; and the Promenade, which features extensive streetscape elements and special transit shelters that have community and historic information.(City of Portland 2003)

Figure 4.11. Sidewalk markers. (City of Portland 2003)

While it is too soon to evaluate the effects of the Russell Street renewal project, it provides a valuable example of an effort to improve transportation and quality of life without encouraging gentrification and displacement.

Case Study II: Baltimore

There are numerous efforts underway to upgrade and modernize the City of Baltimore's aging transportation infrastructure. Currently, Baltimore has several transit options, including a bus system, a light rail, and the regional MARC train, but these systems are not integrated, do not serve large portions of the city, and are not well served by safe pedestrian and bicycle routes. Though traffic congestion is problematic in Baltimore, unsafe road conditions and inadequate infrastructure discourage residents from replacing auto trips with more sustainable modes of travel.

Baltimore's Department of Transportation aims to "provide the City of Baltimore with a comprehensive and modern transportation system that integrates all modes of travel and provides mobility and accessibility in a convenient, safe and cost-effective manner." City leaders recognize the critical role that transportation plays in the economic health of the city, and have a created a transportation plan, including a bicycle master plan, that aims to create "a balanced transportation system" that emphasizes a cohesiveness between different modes of travel and that supports the goals of other urban renewal and community programs.(City of Baltimore)

The City of Baltimore struggles with high levels of poverty, particularly in its inner-city neighborhoods, and transportation equity is of concern to both government officials and citizen groups. The Baltimore metropolitan area provides a website devoted to this issue, explaining that

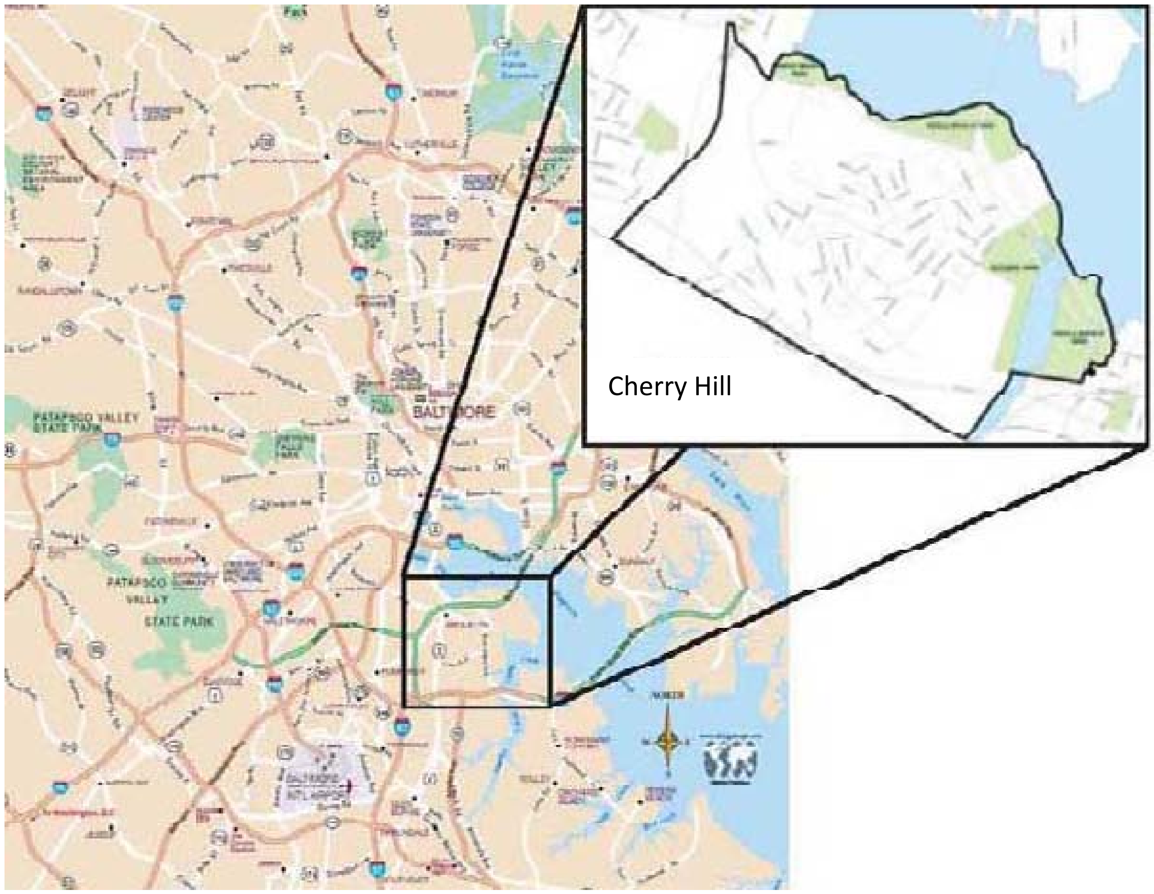
> the concept of transportation equity seeks to ensure that the needs of all communities, particularly low-income and minority communities, are addressed in transportation policy and the transportation planning process. Additionally, transportation investments should work to ensure that both the benefits and impacts are distributed equally.

Poor transportation options, and the negative effects of heavy levels of automobile traffic, can negatively affect Baltimore residents' quality of life and economic success; "access to transportation determines where people can live, work, shop, learn, and socialize. It influences the kinds of opportunities each of us has."(Council 2008)

Baltimore has an overall plan for improving transportation equity within its metropolitan area. The city's lower-income communities are primarily concentrated in the urban core, an area well served by transit. Baltimore's approach to achieving transportation equity, therefore, is to fill service gaps in the connections between economically challenged communities and potential employment centers. To determine the gaps in the system, "the 19 employment centers [providing 10,000+ jobs and 1,000 low wage jobs] were ranked from highest priority to lowest, based on transit need first, and potential number of low wage jobs second". Using this ranking system, the city determined the transit routes that would provide greatest access for lower-income people to job opportunities. The result is an emphasis on providing more direct and frequent reverse-commute routes, offering extended hours of service to suburban areas, as well as smaller urban areas and other sites offering a high concentration of lower wage jobs.(Council 2008)

In addition to an aging and inadequate transportation system, Baltimore also has numerous urban neighborhoods that are rich in history and community involvement, yet are plagued by chronic unemployment, low levels of education, and crime. Working with community groups and outside professionals, city officials have created master plans for a large number of these communities, and transportation plays a critical role in achieving the goals outlined in these plans. The master plans for the Cherry Hill, Barclay-Midway-Old Goucher, and Monument-McElderry-Fayette areas demonstrate the ways in which this city is applying widely accepted multi-modal transportation design standards to the physical and economic improvement efforts underway in marginalized communities. While these plans do not offer significant detail on recommended and/or implemented designs, their planning approach and recommendations reveal well-researched strategies that use transportation planning to address a range of issues faced by marginalized communities.

<u>Cherry Hill</u>



Baltimore Metropolitan Area

Figure 4.12. Location of Cherry Hill within the Baltimore Metropolitan Area.

Located in southern Baltimore, the Cherry Hill community fronts the Middle Branch of the Patapsco River. Baltimore City annexed the area in 1918, and industry soon took hold along the shoreline. In 1923, the area was zoned for industrial use. As WW II approached, the abundance of industrial jobs drew thousands of workers to the area, leading to an acute housing shortage. The Housing Authority of Baltimore and the US War Housing Administration responded with the construction of 600 housing units for African American war workers. After the war, these units were converted to low-income housing. Over the next 30 years, the city continued adding units until this primarily African American housing project became one of the largest in the country. (Baltimore City 2008)

While Cherry Hill has been the home of a vibrant African American community, producing many of the city's African American business, religious, and social leaders, the area has faced increasing challenges. The demolition of a large number of public housing units contributed to the declining population, high school graduation rates are extremely low, the median household income is well below the city average, many homes stand vacant, and housing values are consistently lower than citywide values. (Baltimore City 2008)

In conjunction with the Cherry Hill Community Coalition (CHCC), the city's planning department developed a master plan for the area. This plan addresses a range of issues, including economic development, historic preservation, housing, health and safety, education, youth and civic engagement, and transportation. Themes running throughout this plan include job creation for existing residents, upgrading community infrastructure, beautification initiatives, transportation oriented development that emphasizes mixed uses and affordable housing, and improving transportation both within and into and out of the neighborhood.(Baltimore City 2008)

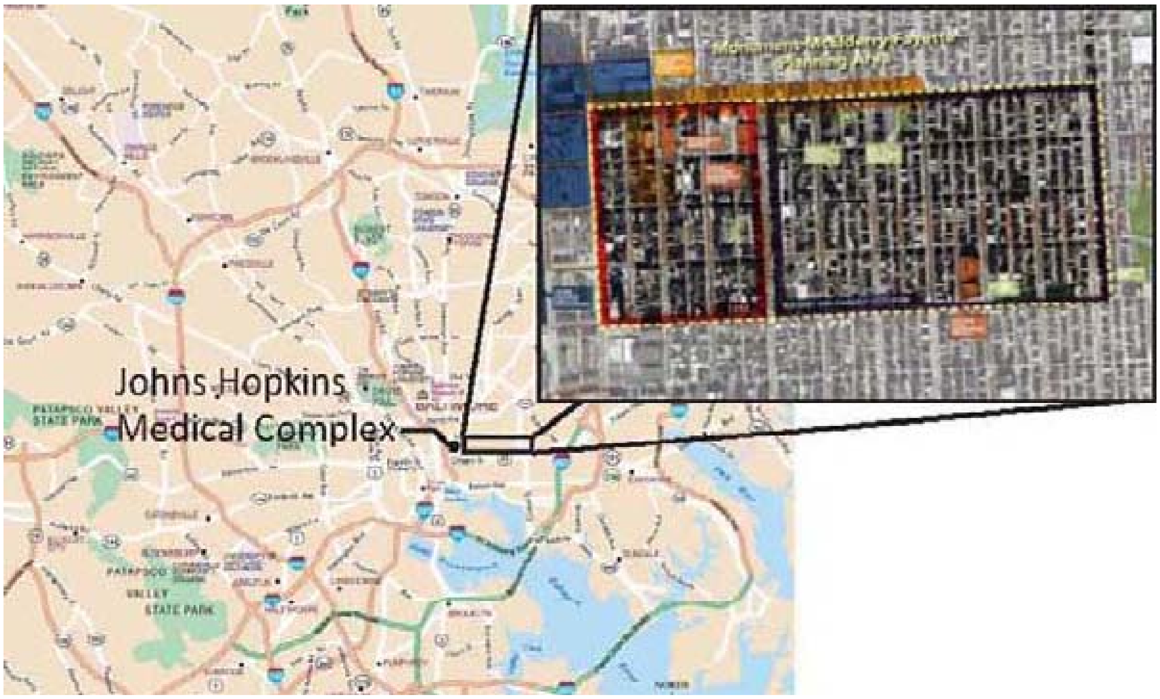
A large percentage of Cherry Hill residents do not own an automobile and depend upon other transportation options for their mobility (Baltimore City 2008). Prior to the construction of the city's light rail in the 1990s, the area was well served by buses (Council). The rail line, however, diverted funding from the bus system, leading to a decline in service levels that were not adequately replaced by the light rail. A US EPA environmental justice in transportation project survey of Cherry Hill residents revealed additional transportation-related concerns, including unacceptable levels of air and noise pollution emanating from the busy bus yard located in the community; inadequate bus service; poorly maintained bus stops, shelters, and sidewalks; poor ADA access to transit; and employment challenges caused by unreliable bus service. This same project found that Cherry Hill residents cannot access major employment areas in east and northeast Baltimore in under an hour of travel time, and that overall access to jobs by transit-dependent residents has declined.(Robinson 2008)

The transportation portion of the Cherry Hill Master Plan seeks to address these issues, and others that came to light during community meetings. Measures the plan calls for include improved connections between local buses and the light rail station, as well improved connection of pedestrian and bicycle networks with transit and recreational trails, and with downtown. The light rail, bus, and shuttle services are poorly coordinated; for example, bus service begins at 5am, while the light rail does not open until 6am. The plan calls for improved scheduling and coordination. Additionally, adequate ADA access is critical to providing handicapped individuals with equal transportation opportunities. Because a large percentage of neighborhood residents rely upon public transportation to get to work, 24 hour service is recommended. (Baltimore City 2008)

In addition to improving transit scheduling and integration of modes, physical improvements are needed to improve safety and access. The plan recommends additional bus routes and bus stops, as well as a shuttle bus to provide access to underserved areas. To address issues of safety and comfort, the plan recommends additional lighting, shelters, emergency call buttons, benches, and traffic calming measures. (Baltimore City 2008)

While the design standards Baltimore will use to implement the changes needed in the Cherry Hill neighborhood are not unique, drawing largely from AASHTO recommendations, the city has, through detailed community analysis, determined the role transportation can play in improving the quality of life of Cherry Hill residents. Key discoveries in this plan include the realization that adequate transit must provide access to major job centers, which are increasingly located in suburban areas, increased hours of service, improved access to and coordination between transportation options, and greatly increased security measures.

Monument-McElderry-Fayette



Baltimore Metropolitan Area

Figure 4.13. Location of Monument-McElderry-Fayette neighborhoods community within the Baltimore Metropolitan Area.

The Monument-McElderry-Fayette (MMF) neighborhoods comprise another Baltimore area cited for urban revitalization efforts. Like the Cherry Hill Master Plan, the MMF Area Development Plan grew out of extensive community involvement, and aims to benefit current residents while also attracting new businesses and residents. This plan addresses a range of issues, including housing, education, youth activities, employment, and health and recreation. The transportation portion of the plan addresses residents concerns about streets and intersections that affect neighborhood livability, as well as parking needs.(City of Baltimore 2005)

The MMF area was originally developed to house factory workers, but now, neighboring Johns Hopkins is the major economic driver of the area’s economy. In recent years, the population of the area has grown smaller and become more predominantly African American. The area is quite poor, with 36%

of households living below the poverty line. Education rates are lower, and unemployment rates higher, than the city average. (City of Baltimore 2005)

The physical condition of the neighborhood reflects the challenges of its residents. Vacant lots and minimal street trees typify the residential zones. There are several major roads traversing the area, and residents are concerned about speeding and dangerous intersections. Commercial areas are struggling, and local business owners cite a lack of parking, sanitation problems, and safety issues as reasons more people do not shop in the area. The area is well served by the city bus, which is important to the 64% of households that do not own a vehicle and 35% of households that rely on public transportation to travel to work. (City of Baltimore 2005)

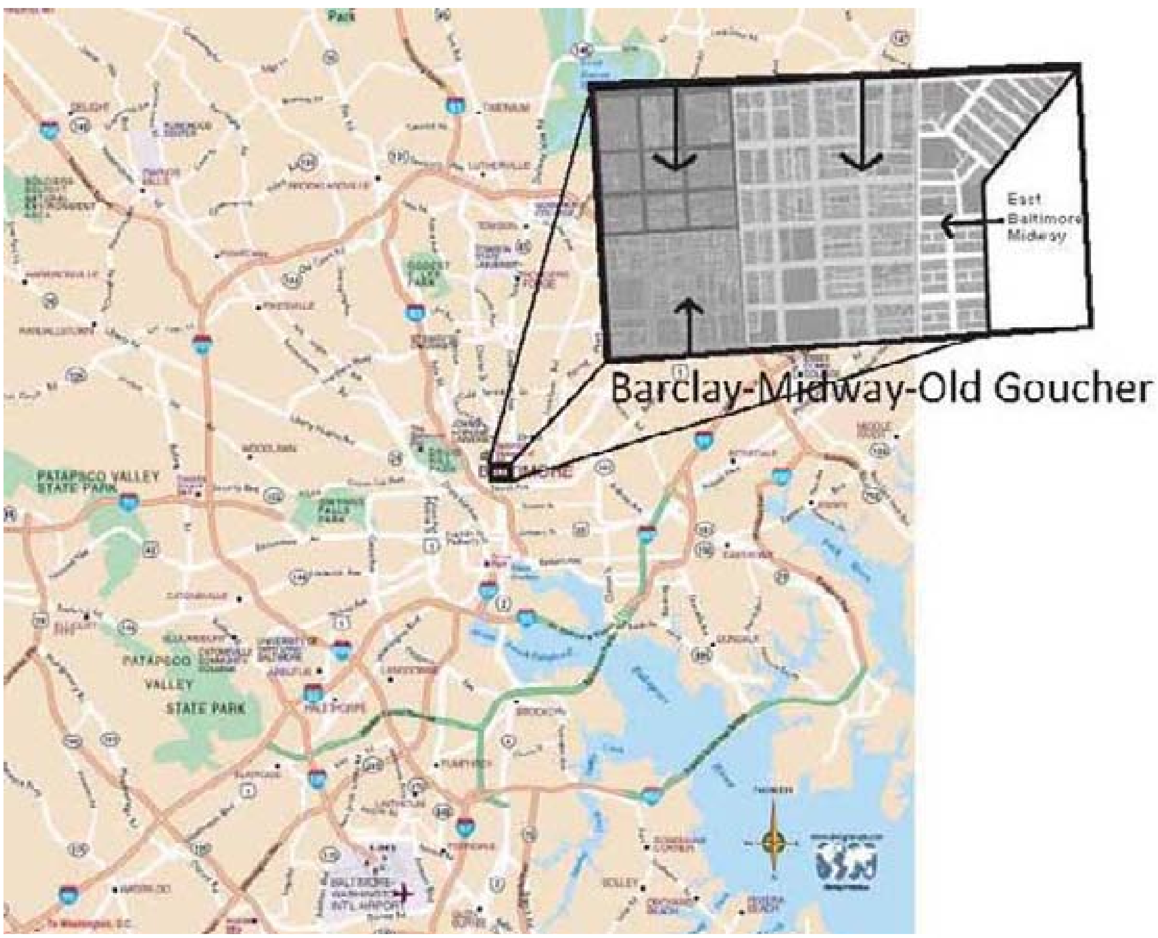
After assessing the condition of the neighborhood, and considering community concerns and desires, the planning team established the long term vision of "a strong, mixed-income residential community of both renters and homeowners living on safe, tree-lined streets, enjoying nearby parks, easily fulfilling many of their shopping needs locally…, and with access to good jobs and services." Clearly, capitalizing on the area's street grid, the existence of some less-heavily travelled and wider streets, and the importance of transportation options to current residents, are critical to accomplishing the plan's goals. (City of Baltimore 2005)

The primary emphasis of this area's plan, in regards to the transportation environment, is increasing the number of street trees and improving pedestrian and bicycle connections to the area's ample transit options and nearby parks, schools, and commercial areas. The plan designates an east-west and two north-south streets as primary bicycle and pedestrian corridors, and gives priority to these in terms of street trees and other amenities. Bicycle parking at commercial and other destinations, as well as in residential areas, is recommended. Other transportation improvements include traffic calming devices, enhanced pedestrian crossings, particularly over the major east-west thoroughfares, and discouraging through-traffic from entering pedestrian streets. (City of Baltimore 2005)

Like the Cherry Hill Plan, the MMF plan calls for transportation improvements that will benefit an economically struggling community. In the MMF area, an enhanced pedestrian environment will enrich the safety and quality of life of individuals highly dependent upon walking to work or transit stops. Likewise, minimizing the impact of busy through roads on residential communities must accompany any traffic calming or bicycle and pedestrian enhancements that occur on these major arteries.

<u>Barclay-Midway-Old Goucher</u>

The Barclay-Midway-Old Goucher area is located in central Baltimore. Development of this area began along York and Falls Roads, the primary links to Baltimore, and mixed-use development gradually



Baltimore Metropolitan Area

Figure 4.14. Location of Barclay-Midway-Old Goucher area within the Baltimore Metropolitan Area.

encompassed the space between these two thoroughfares. World War II-era jobs brought many workers to these neighborhoods, resulting in the division of the area's stylish rowhouses into smaller apartments. In the middle of the 20^{th} century, suburbanization drew many residents away from downtown neighborhoods such as Barclay-Midway-Old Goucher, and, by the 1990's, demolition of homes and vacancy rates occurred at an increasingly high rate. Today, there is renewed interest in urban living in Baltimore, focusing attention of developers and residents on neighborhoods such as these.(City of Baltimore 2005)

The result of this interest is a small area plan for this group of neighborhoods. The plan is informed by community members, as well as a detailed analysis of existing conditions, and an inventory of the strengths and weaknesses of the area. The vision of this plan is "to have a mixed income area that has a thriving commercial area, as well as housing options for all whether it is singe family, multi family, home ownership and/or rental…The strategies and recommendations in this plan are a result of analyzing existing conditions, focusing on overcoming challenges and building on strengths…In many ways this planning area represents a microcosm of the broader City. Just as there are many challenges, there are a tremendous number of assets in the area. The assets are the building blocks of the plan." (City of Baltimore 2005)

The challenges and constraints in the area include high vacancy rates, a shrinking population and deteriorating housing market, few economic or recreational opportunities, significant crime and drug problems, and high concentrations of subsidized housing. Assets include the area's proximity to the city; transit options; employment centers; neighboring cultural, historic, and commercial areas; many city-owned parcels; and an involved community that expresses its commitment to the future of the area through involvement in the numerous area schools, churches, and non-profits. (City of Baltimore 2005)

Today, the area's profile is quite diverse, but an analysis of economic and demographic data reveals important trends. In general, income levels, home ownership rates, degree of racial diversity, and educational levels are higher on the west side of the area, and decline towards the east. For example, overall population growth is dropping, but west side areas have actually seen an increase in population in recent years. Similarly, most households earn between $12,000 and $26,000 per year, but wages are significantly higher on the west side of the area. In general, the west side is considered a desirable place to live, while the east side struggles with rising vacancy rates, higher levels of crime, and depressed commercial areas. Due to these trends, the study concludes that “it was clear that the only major issue was not enhancing the physical infrastructure, but there are income distribution, poverty deconcentration, and quality of life challenges that need to be addressed while seeking to sustain and build upon the tremendous assets.” (City of Baltimore 2005)

The major assets of the area include a growing housing market in some areas; dense, mixed use development centered around transit; and successful commercial corridors. While the plan does not strive to replicate west side attributes on the east side, it strives to capitalize upon the existing vitality of the area in order to “uplift [east-side] neighborhoods so that the entire plan is healthy.”The plan’s strategy for creating a “healthy” group of neighborhoods relies heavily upon the transportation network, and recognizes that the area’s roads are not only circulation routes, but significant public spaces that can enhance residential and commercial life. Transportation enhancements, therefore, run through the entirety of the plan. (City of Baltimore 2005)

Recommendations for improving commercial activity, which will bring income into the neighborhood and provide job opportunities for residents, focus on the area’s proximity to transit, as well as the need to create more pedestrian friendly environments. While the southwestern half of the area is served by the city bus, light-rail, and subway systems, as well as the regional MARC and Amtrak trains, the remainder of the area depends upon the city bus system. The major transfer point for buses on the east side is on Greenmount Avenue, a “struggling commercial corridor with many vacant houses on surrounding streets.” The plan makes specific recommendations for each corner of this intersection.

These recommendations includes creating land uses that will cater to the needs of bus riders, reorienting some business entrances to enhance the appearance and safety of bus stops, as well as overall improvements to the pedestrian environment on Greenmount and the streets and blocks abutting it. (City of Baltimore 2005)

The plan lays out strategies to enhance both neighborhood and commercial life, stating that commercial "corridors are the very same corridors which are the gateways and spines that link the various neighborhoods together; in essence making them neighborhood streets also. For this reason, both the corridors and neighborhood streets should not only be safe and functional for automobile traffic, but for pedestrians and bicyclists." A mapping exercise reveals the abundance of amenities located within walking and biking distance of residential areas, leading to the conclusion that walking and biking is a viable transportation alternative for many residents (fig 4.15). Strategies for accomplishing needed street improvements include streetscape enhancements of the major corridors; delineation of pedestrian spaces on residential streets through sidewalk improvements and trees; improved lighting; enhancing the appearance of street-fronting properties and buildings; installing traffic calming devices; installing bus pull-ins at the Greenmount Avenue transfer stop; and adding bicycle lanes where space permits. (City of Baltimore 2005)

A unique and interesting aspect of this plan is its approach to placemaking: "providing the density, housing opportunities and infrastructure is the first step in creating livable neighborhood spaces. The second step, an equally important step, is providing good design and connections to get people on the street to activate the spaces." The plan lists five principles used to analyze and make recommendations for placemaking strategies in the areas: spatial organization, circulation and nodes, exits and building approaches, places of refuge, and the use of building materials. Because spatial organization "impacts the circulation and movement throughout the neighborhood," roads,

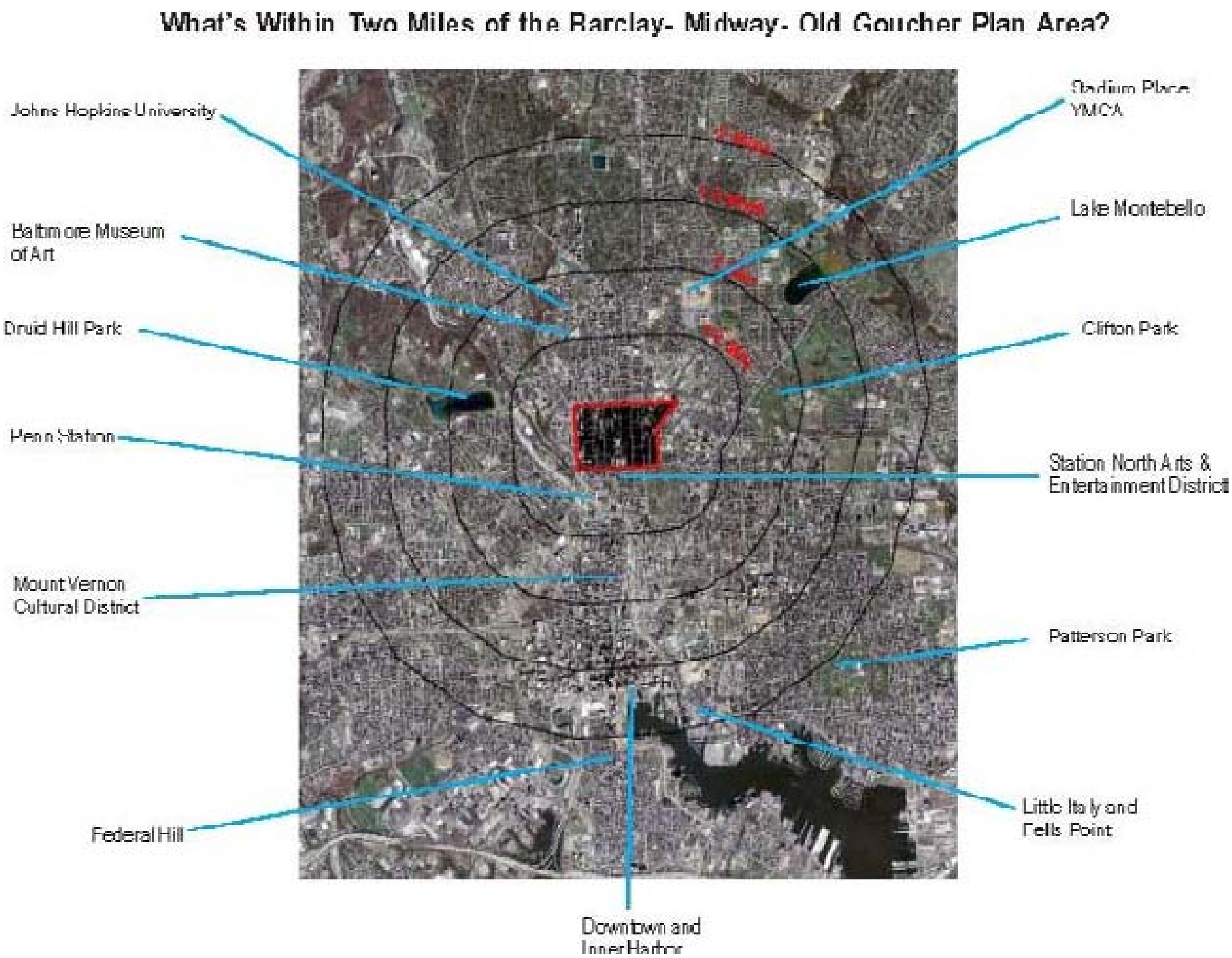


Figure 4.15. Amenities within a two-mile radius of the Barclay-Midway-Old Goucher residential areas. (City of Baltimore 2005)

paths, landscaping, and other outdoor spaces should be used to delineate public from private space. The application of the circulation and nodes principle will be based upon the area's grid pattern, which will not change, but should be made interesting in order to draw people into the public arena. In addition, lighting and materials should be employed to delineate pedestrian from vehicular space. Similarly, nodes can provide focal points and stimulate movement throughout the area.

Concern exists that providing "places of refuge" will lead to loitering and crime, but the plan argues that resting places with seating and other pedestrian amenities are critical to bringing residents

Figure 4.16. “Places of Refuge”. (City of Baltimore 2005)

Figure 4.17. Unique bus shelter. (City of Baltimore 2005)

into the neighborhood. The plan, therefore, states that proximity to commercial and other community centers, seasonal changes, the needs of nearby residents, and the desired activity of the location should be considered before adding benches, seatwalls, or other places of refuge. Finally, the plan addresses the importance of detail and material choices; providing an interesting bus shelter or using unique building materials can create visual interest, increase use of a public amenity, and add vitality to a neighborhood.

While the Barclay-Midway-Old Goucher plan shares certain aspects of the Cherry Hill and MMF plans, namely its attempts to improve transit access to employment outside the area as well as increase economic opportunities within the neighborhood, its approach to placemaking is unique. In this plan, designers employ elements such as site furnishings and hardscape and plant materials to organize the public space, and delineate zones for the different roadway users. By doing this, they improve safety for pedestrians and cyclists, while simultaneously creating a more attractive streetscape.

Conclusion

The Hancock Corridor shares many characteristics displayed in the preceding case studies, and several important lessons, drawn from these case studies, can be applied to the design of a multi-modal transportation system within the Hancock area. Table 4.1 displays relevant findings common to two or more of the case studies.

Table 4.1. Relevant findings.

	1	2	3	4	5	6	7	8	9	10	11	12	13
Albina	x	x	x	x	x	x	x	x	x	x	x	x	x
Cherry Hill	x	x	x	x	x	x	x	x		x	x	x	
Barclay-Midway-Old Goucher	x	x	x	x	x	x	x	x	x	x	x	x	
Monument-McElderry-Fayette	x	x	x	x	x	x	x	x	x	x	x	x	x

Key:
1. Provide benefits to existing residents
2. Improve transit scheduling/coordination/routing
3. Improve access to suburban job sites
4. Improve nonmotorized access to transit/neighborhood destinations
5. Community involvement
6. Coordinate transportation improvements with other renewal goals
7. Maximize effectiveness of existing infrastructure
8. Streetscape enhancements/beautification
9. Intersection realignments/enhanced crossings
10. Safety improvements
11. Enhance access to/roadside appeal of neighborhood businesses
12. Traffic calming
13. Placemaking/contextually sensitive design

Four significant themes emerge from this analysis. First, all plans strive to meet the specific economic needs of area residents. Strategies for accomplishing this included both scheduling and routing changes, focusing specifically on providing access to the growing number of suburban jobs and providing extended hours of service, as well as ensuring access to transit stops and the integration of nonmotorized modes with transit. Second, each plan, to varying degrees, involved community residents in the planning process. This allowed the design team to pinpoint areas that are of concern to the community, and generate context-sensitive design solutions. Thirdly, the designs significantly improved the aesthetics of the streetscape in an effort to make it a more enjoyable and lively public space. Finally, all of these plans emphasized the tremendous role safety plays in improving resident quality of life and encouraging residents to engage in alternative forms of transportation. By coordinating initiatives to improve the economic and educational situation of residents with physical roadway improvements, these four case studies provide guidance in the effort to design a transportation system for the Hancock Corridor that provides more equitable access to opportunities for area residents, while minimizing the chances of neighborhood gentrification.

CHAPTER V

DESIGN APPLICATION

Based on the information presented in the previous chapters, this thesis argues that multimodal transportation design that prioritizes the needs of existing residents, emphasizes significant improvements in safety and contextually-sensitive aesthetic enhancements, and grows from the community's input and history can play a vital role in the revitalization of lower income neighborhoods. This chapter applies established design standards and lessons learned from case studies to a design application and associated recommendations for multimodal transportation infrastructure along Hancock Avenue in Athens, GA. This design builds upon the Hancock corridor's rich history, its pedestrian-friendly layout and architecture, and its central location within the city of Athens to transform an arterial road into a lively, safe, community place that increases opportunities for the area's residents.

History

In the early 1800's, Hancock Avenue was one of the narrow, east-west streets serving the small community of Athens, Georgia. During the 1800's, development in Athens centered around the university, as well as the cotton factories located along the Oconee River. In the late 1800's, responding to vigorous population growth, Hancock Avenue extended westward, traversing through several of the city's African American communities. A hand drawn, 1874 map (fig. 5.1) shows Hancock Avenue continuing the downtown grid pattern westward for several blocks, then veering southward to conform to the agricultural land located around Brooklyn creek, and occupying the present-day location of Glenhaven Avenue and The Plaza. At the time this map was drawn, Atlanta Highway had not

Figure 5.1. 1874 map of Athens, GA

been built, and Hancock provided a continuous connection from downtown to the outlying Brooklyn district.

Thanks partly to the city's efficient transportation system, which featured rail lines and street cars, the city enjoyed a growing economy that employed a wide range of professional workers and unskilled laborers (Reap 1985). Due to segregated housing patterns, the Hancock Corridor became the home of a vibrant and diverse African American community that included doctors, lawyers, educators, trades people, and unskilled laborers(Savage 1994). The growing density of this area fueled the development of neighborhood stores, schools, and other facilities. Among the more significant landmarks in this area were the Knox School and St. Mary's hospital. Established in 1868 by the Freedmen's Bureau and located on the corner of Reese and Pope Streets, The Knox School was the first school for African Americans in Athens. In 1907, two doctors converted a home on the NW corner of Milledge and Hancock into St. Mary's hospital, a state of the art medical facility offering the first clinical x-ray machine and ambulance in Athens. (Reap 1985; Thomas 1992).

The University of Georgia provided the economic foundation for Athens, and continues to be the area's largest employer. However, the city's industrial base was also quite strong, and the development of the Athena and Paradise Valley industrial parks along the northern boundary of the city

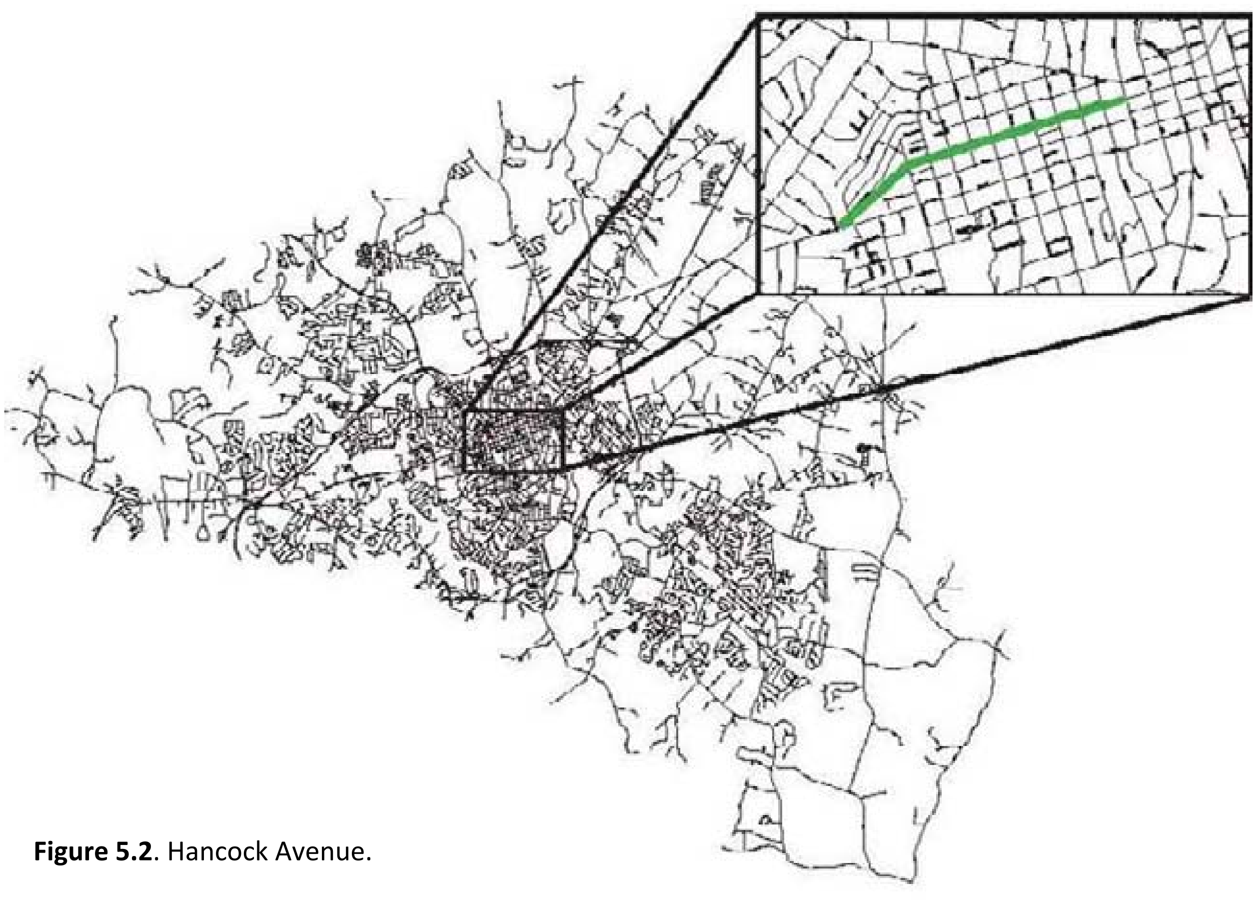


Figure 5.2. Hancock Avenue.

led many companies to build their plants in Athens. Suburban development, fueled by the increasing popularity of the private automobile, accompanied this economic growth. As the city extended westward, Athens' first shopping center opened on Alps Road, followed quickly by a string of developments along Athens Highway and the construction of the Georgia Square Mall. (Reap 1985; Thomas 1992) Fig 5.2 shows a map of present day Athens Clarke County (ACC), and the location of Hancock Avenue within the city.

One negative result of this impressive growth was the destruction of several historic buildings, including the demolition of the entire Lickskillet District which occupied the area surrounding the present day Lyndon House, a few blocks north of downtown. These losses prompted the organization of several historic preservation organizations in the city, and this increased awareness of the benefits of historic preservation has led to the protection of many of the city's culturally and architecturally significant neighborhoods. (Reap 1985) Two of these historic districts are located within the Hancock Corridor: the Reese Street Historic District, and the West Hancock Historic District. These two neighborhoods "document the residential patterns and the commercial and institutional development of the black community in Athens from the late 19^{th} century through the early 20^{th} century…[and are] the only two black districts identified to date in Athens" (Savage 1994) The patterns include the location of these communities - Athens' African American neighborhoods are typically located in the bottomlands, where property values are lower – and the smaller-scaled homes located on narrow lots. One of the most significant benefits of the historic designation of these areas, in regards to transportation, is the preservation of the area's unique, human-scaled, community-oriented architecture (Thomas 1992; Savage 1994; Reap 2009).

Challenges

While the Hancock Corridor is blessed with a rich history, the area displays many characteristics that are commonly found in low income and minority communities. Following the 1991 closure of a police satellite office located within the corridor, a 1995 Athens Observer article reported that "the Hancock area leads the county in crime"(Stenger 1995). While significant improvements have been made in improving the safety of the area, "social, economic and demographic conditions consistent with distressed communities including pervasive poverty, entrenched unemployment, marginal economy, low education achievement, lack of affordable housing and a high rate of crime" continue to plague the corridor (University of Georgia 1996).

The Athens Land Trust, a local nonprofit working to provide affordable housing opportunities for low-income Athenians, reports that the Hancock area faces increased real-estate pressure from investors and students attracted by the area's proximity to UGA and downtown: "many families who have lived in this neighborhood for generations are low to moderate income and cannot financially compete with investors and students. The property taxes in this neighborhood have increased tremendously and forced families to move elsewhere." (Trust)

Demographics

A large portion of the Hancock Corridor lies within U.S. Census tracts 6 and 9 (fig. 5.23). These two tracts are also the target of a major ACC urban neighborhood revitalization effort. The 2000 Census Data for these tracts provides insight into the current challenges facing the area, and provides background information that will inform future transportation improvement plans.

- **Economics:**

Poverty is an enduring issue in Athens. With over 28.3% of the population living below the poverty line, ACC has the 5th highest poverty rate for counties with populations over 100,000. Figs. 5.3 & 5.4 display higher poverty rates among individuals and households within the Hancock Corridor. While students, who are often without income, can influence statistics such as these, a study performed by Partners for a Prosperous Athens indicate that students comprise less than 50% of the population of this corridor, and that census blocks with student populations greater than 50% have poverty rates lower than those found within the Hancock Corridor. (Athens ; Census 2000)

The economic situation within the Hancock Corridor follows the same trends as the poverty rates. In 2007, weekly wages in ACC were 16% lower than the state of Georgia average. The average 2004 unemployment rate, however, was 3.4% in ACC, compared to 4.6% in Georgia. This suggests that there is not a lack of employment opportunities in ACC, but, rather, a shortage of adequately paying jobs. (Athens) The prevalence of low-wage jobs is pronounced in the study area, where 86% of residents have low to moderate incomes, with the median household income falling within the poverty range (figs. 5.5) (Census 2000) Lower than average skill levels (fig. 5.6) among workers within the study area certainly contribute to these figures. (Skills 2000)

- **Education**

Lower levels of education within the corridor contribute to the lower skill levels of this area's workers, as well as the lower income levels. As figs. 5.7 and 5.8 show, high school and college graduation rates are significantly lower within the study area, despite the fact that ACC's college graduation rates are higher than the Georgia average.

- **Housing**

Low rates of home ownership and high vacancy rates can contribute to neighborhood and community degeneration. It can also indicate the inability of residents to retain ownership of their homes. Figs.5.9, 5.10, and 5.11 show higher than average vacancy rates and lower home ownership rates within the study area. The three public housing units, as well as student rentals, affect these rates.

- **Race**

As previously discussed, the Hancock Corridor is historically and currently a predominantly African American community. Over 60% of the area's 5695 residents are minorities, the large majority of which are African American (figs. 5.12 – 5.13) (Census 2000).

- **Additional Demographic Information**

Several other trends provide important information relevant to transportation planning within the Hancock Corridor. The corridor has larger than average family and household sizes; elderly, disabled and veteran populations; and a higher overall population density than the county as a whole (fig. 5.14-5.19).

- **Transportation**

Transportation data indicates a higher than average use of public transportation and longer travel time to work among corridor residents, as well as lower levels of vehicle ownership (figs. 5.20-5.21). Table 5.1, below, compares the travel patterns of residents of the Hancock Corridor to those of all ACC residents.

Table 5.1. Travel to work.

Travel To Work	ACC	Hancock Corridor
Drove alone	75.10%	N/A
Carpooled	14.40%	25.8-33%
Public transportation (incl. taxis)	2.40%	4.5-7.6%
Walk	4.30%	N/A
Other	1.60%	N/A
Work at home	2.30%	N/A

Few ACC residents drive out of the county for work, only 19.1%, as compared to 41.5% in the state, indicating that the majority of employment opportunities are located within the county and should, therefore, be readily accessible by transit, walking, or cycling. Finally, there is a higher rate of motor vehicle crashes in ACC; between 2000 and 2006, there were 306.7 crashes per 100 million vehicle miles traveled in the state, and 551.6 in ACC.(Census 2000) These statistics indicated a pressing need to improve the safety of the city’s roadways.

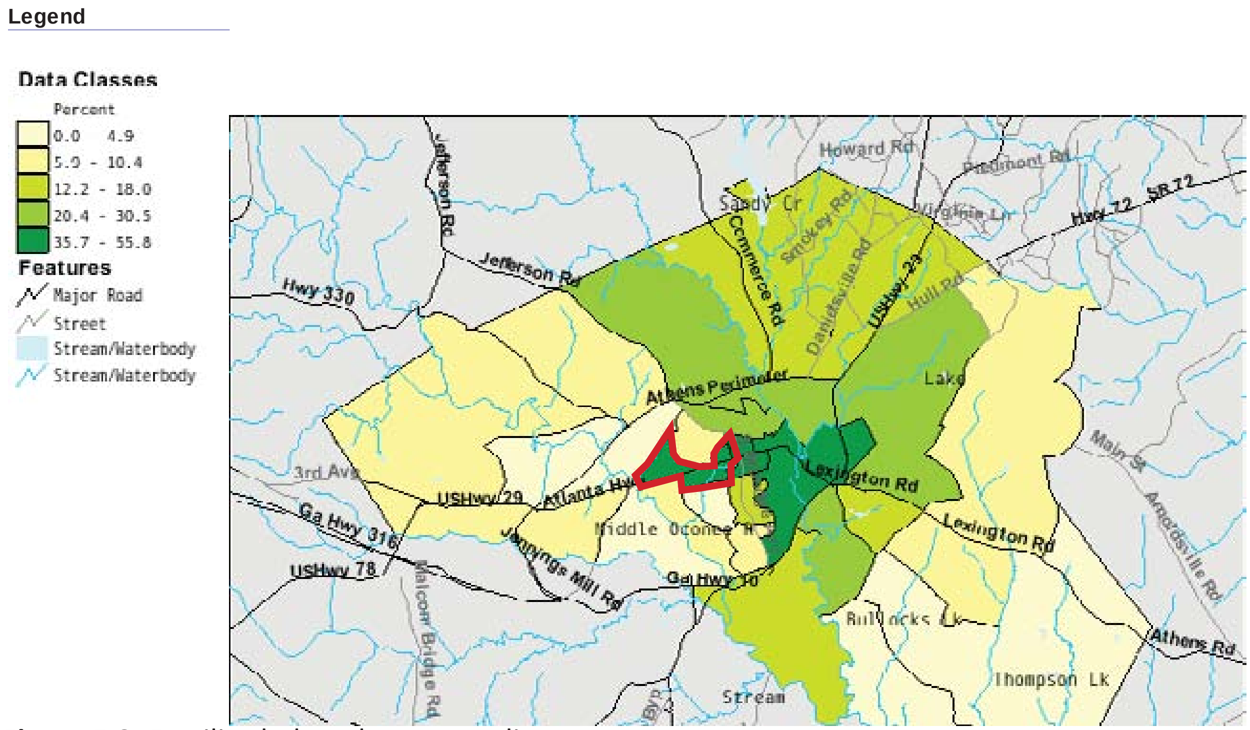


Figure 5.3. Families below the poverty line.
ACC: 14.8%. Hancock Corridor: 35.7-55.8%
(Census 2000)

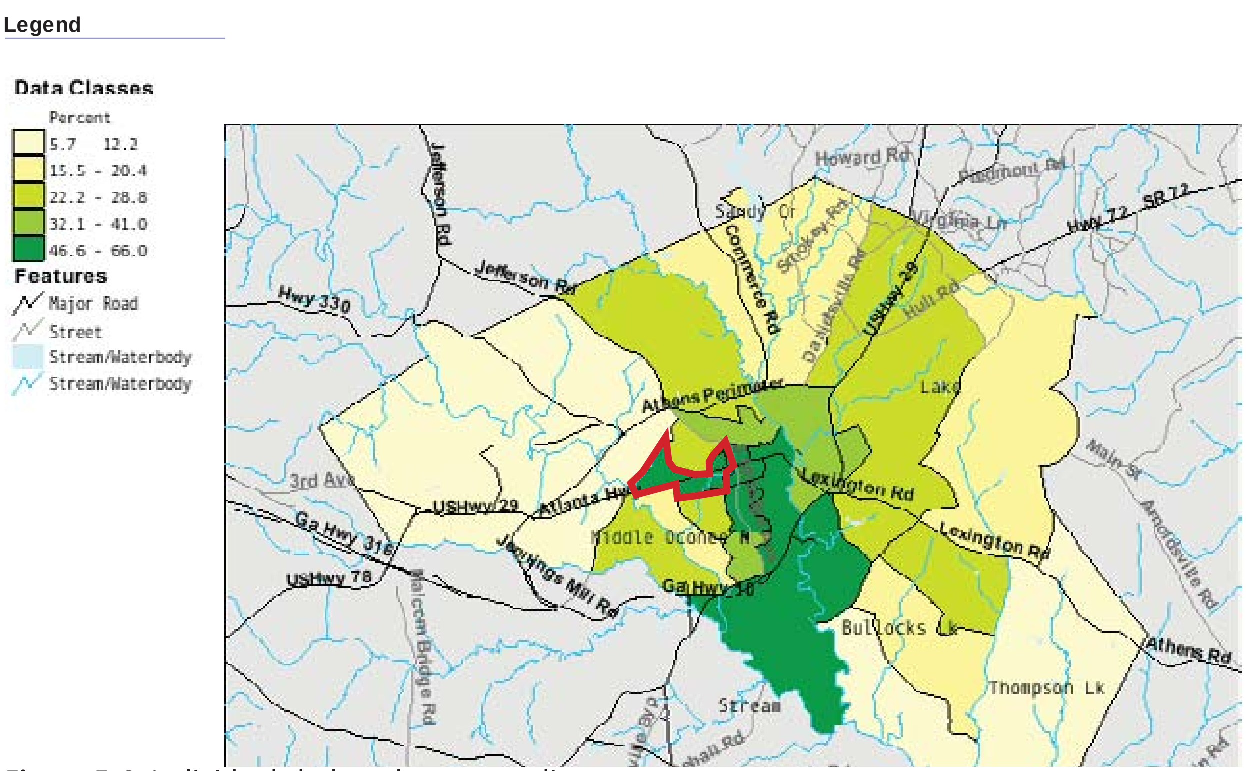


Figure 5.4. Individuals below the poverty line.
ACC: 28.3%. Hancock Corridor: 46.6-66%
(Census 2000)

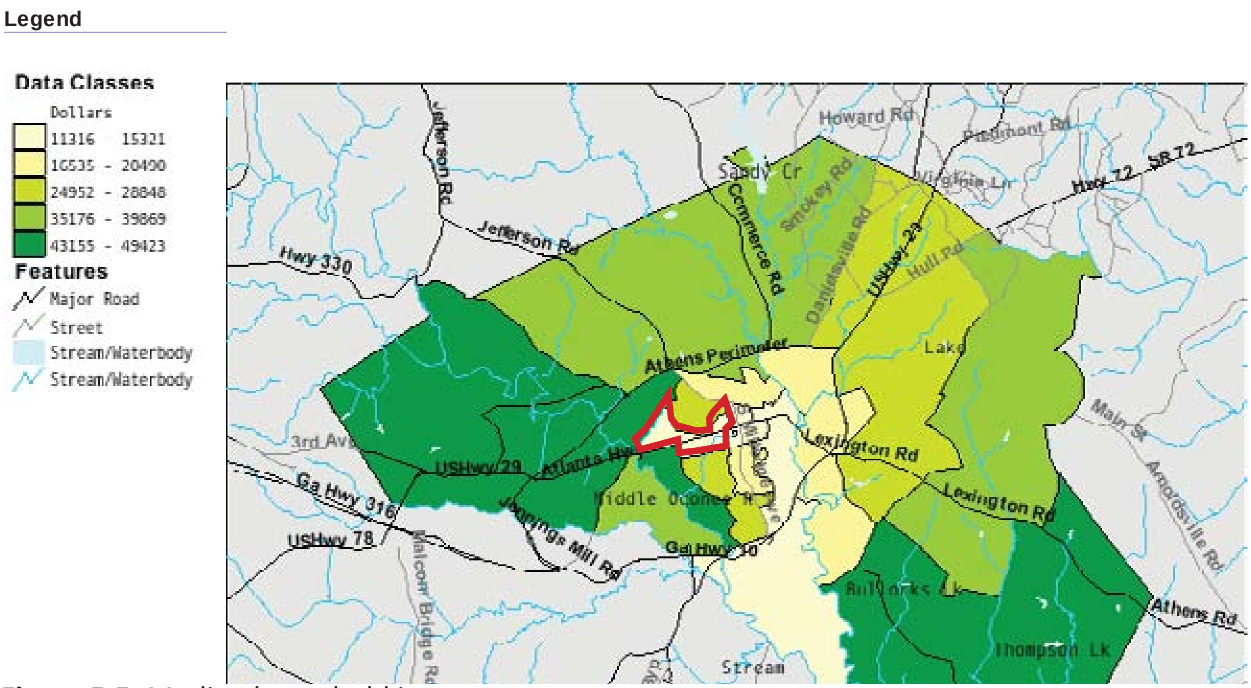


Figure 5.5. Median household income.
ACC: $41,992. Hancock Corridor: $11,316 - $15,321
(Census 2000)

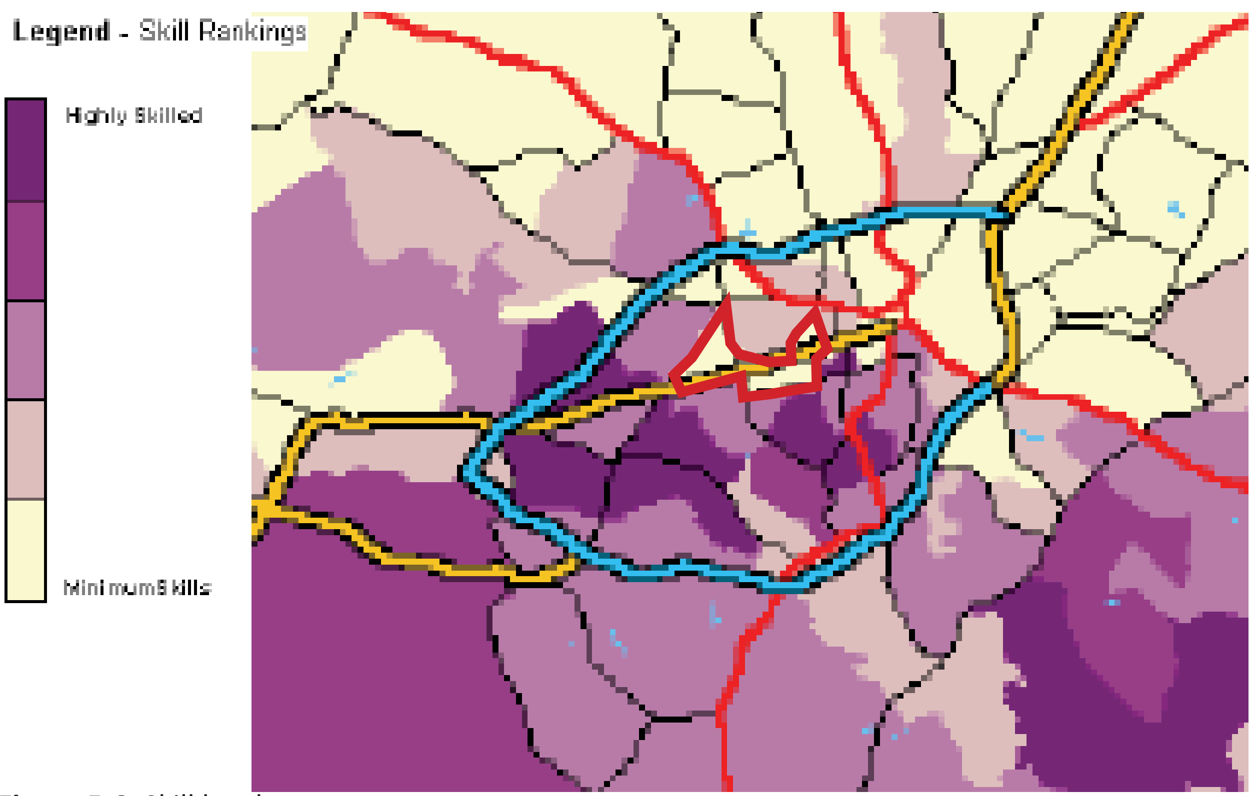


Figure 5.6. Skill levels.
(Skills 2000)

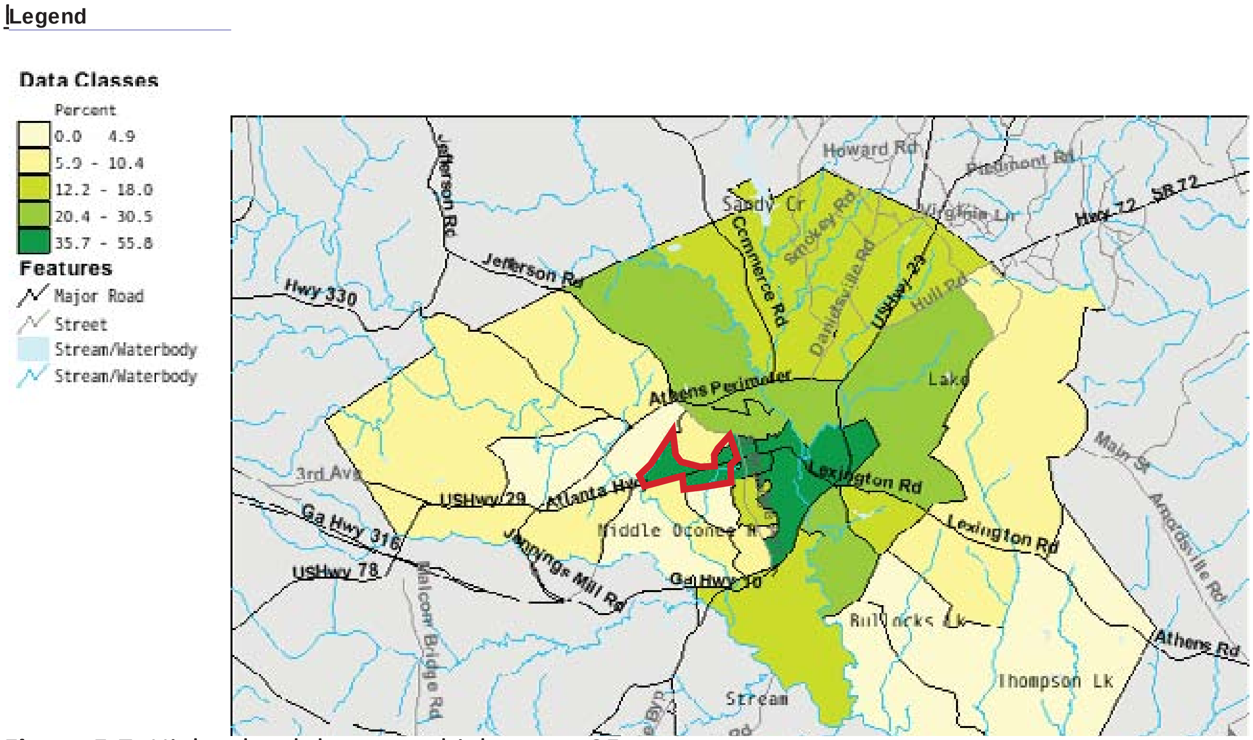


Figure 5.7. High school degree or higher, age 25 yrs+
Georgia: 78.6%. ACC: 81%. Hancock Corridor: 53.7% - 65.8%
(Census 2000)

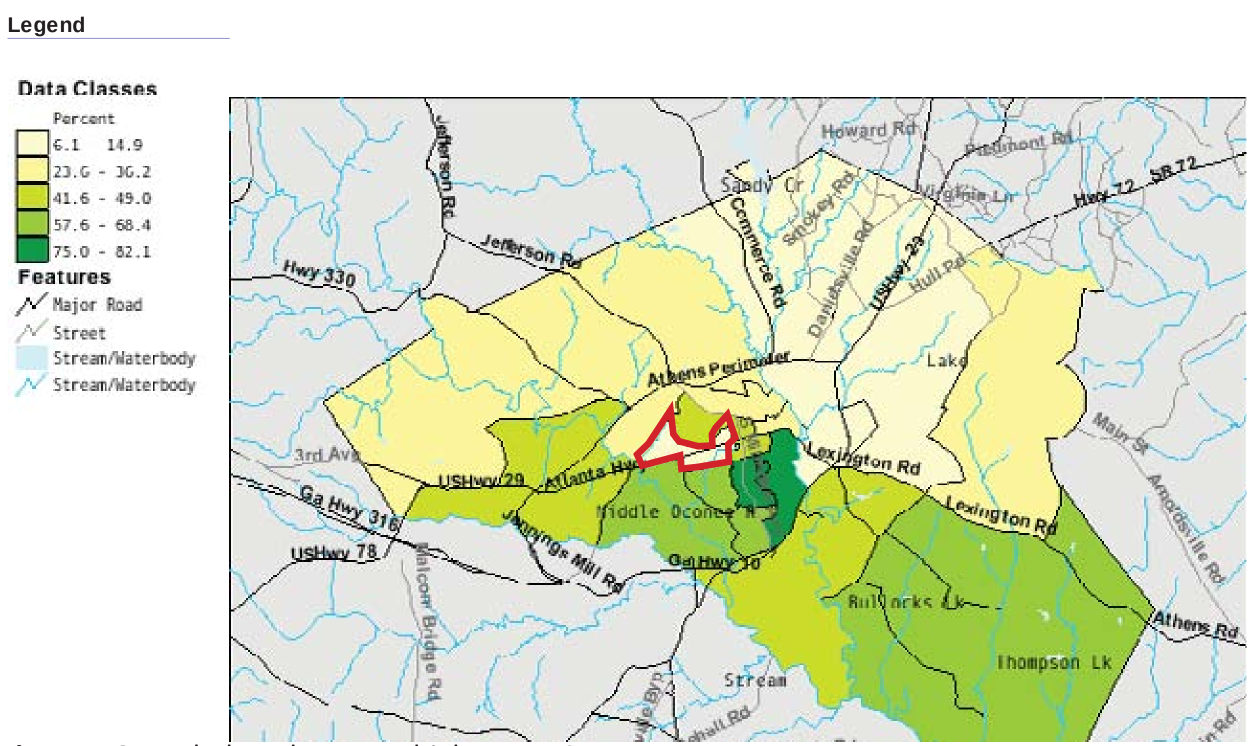


Figure 5.8. Bachelors degree or higher, age 25 yrs+
Georgia: 24.3%. ACC: 39.8%. Hancock Corridor: 6.1% - 14.9%
(Census 2000)

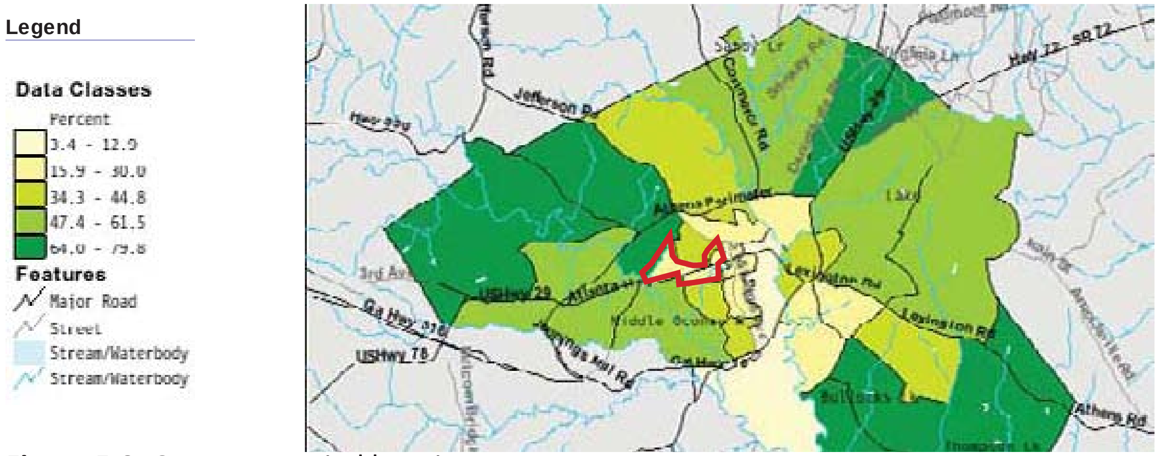


Figure 5.9. Owner occupied housing
ACC: 42%. Hancock Corridor: 15.9% - 30%
(Census 2000)

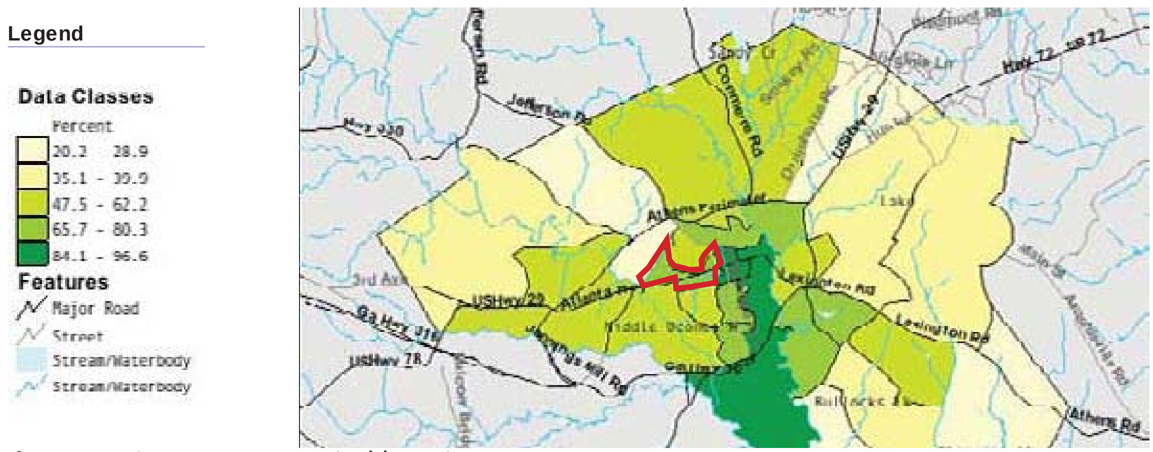


Figure 5.10. Renter occupied housing
ACC: 58%. Hancock Corridor: 65.7% - 80.3%
(Census 2000)

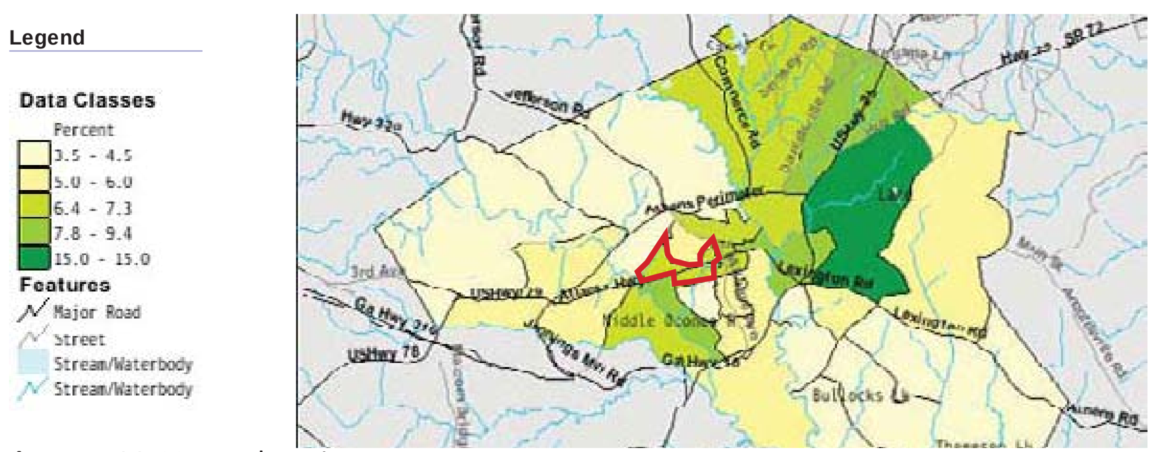


Figure 5.11. Vacant housing
ACC: 5.7%. Hancock Corridor: 6.4% - 7.3%
(Census 2000)

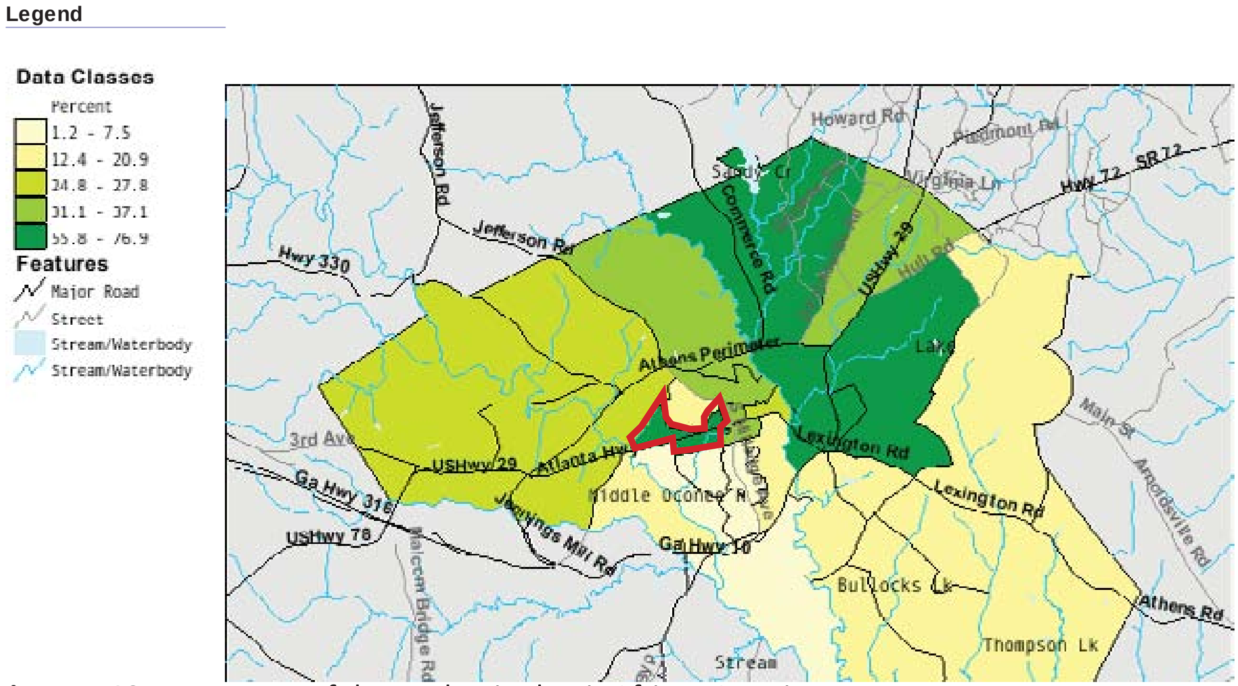


Figure 5.12. Percentage of the popluatin that is African American.
ACC: 27.3%. Hancock Corridor: 55.8% - 76.9%
(Census 2000)

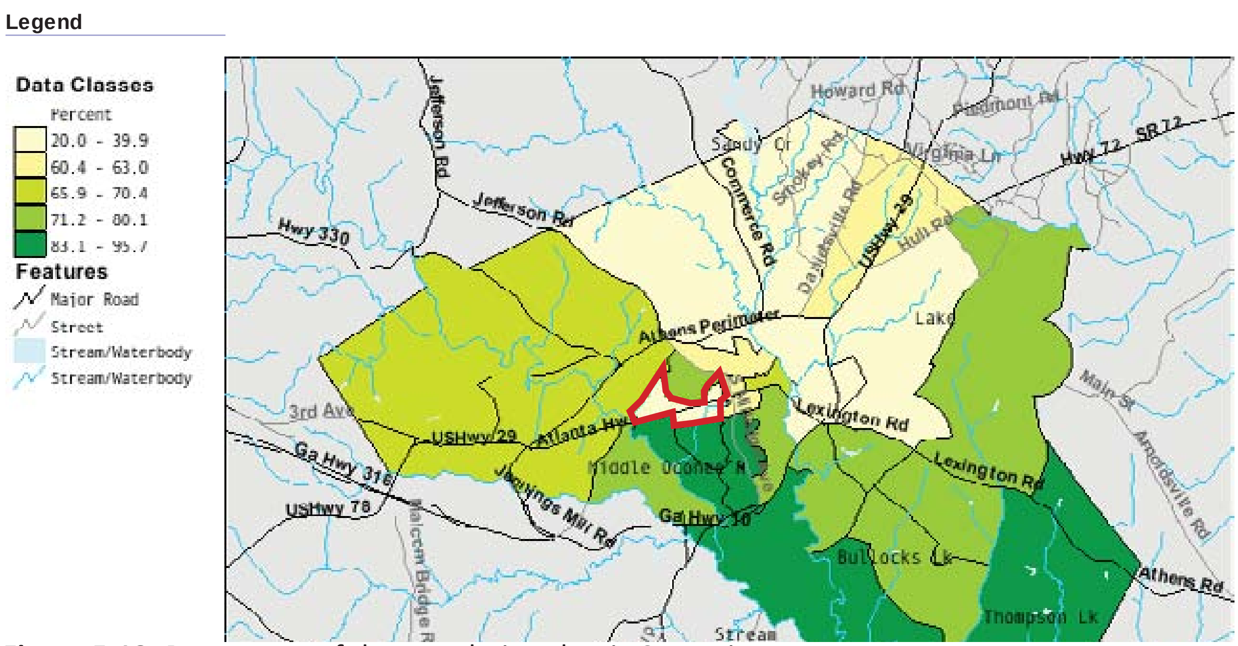


Figure 5.13. Percentage of the population that is Caucasian
ACC: 64.9%. Hancock Corridor: 20% - 39.9%
(Census 2000)

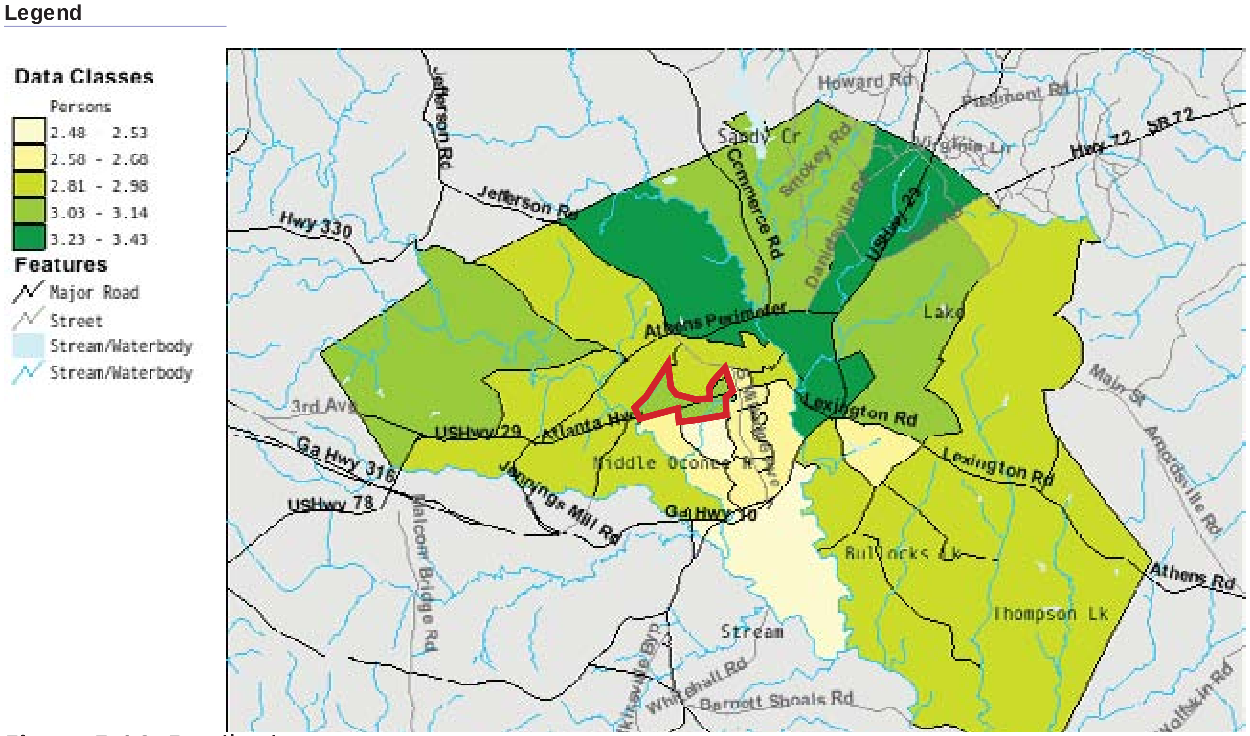


Figure 5.14. Family size.
ACC: 2.95 People. Hancock Corridor: 3.03 - 3.14 People.
(Census 2000)

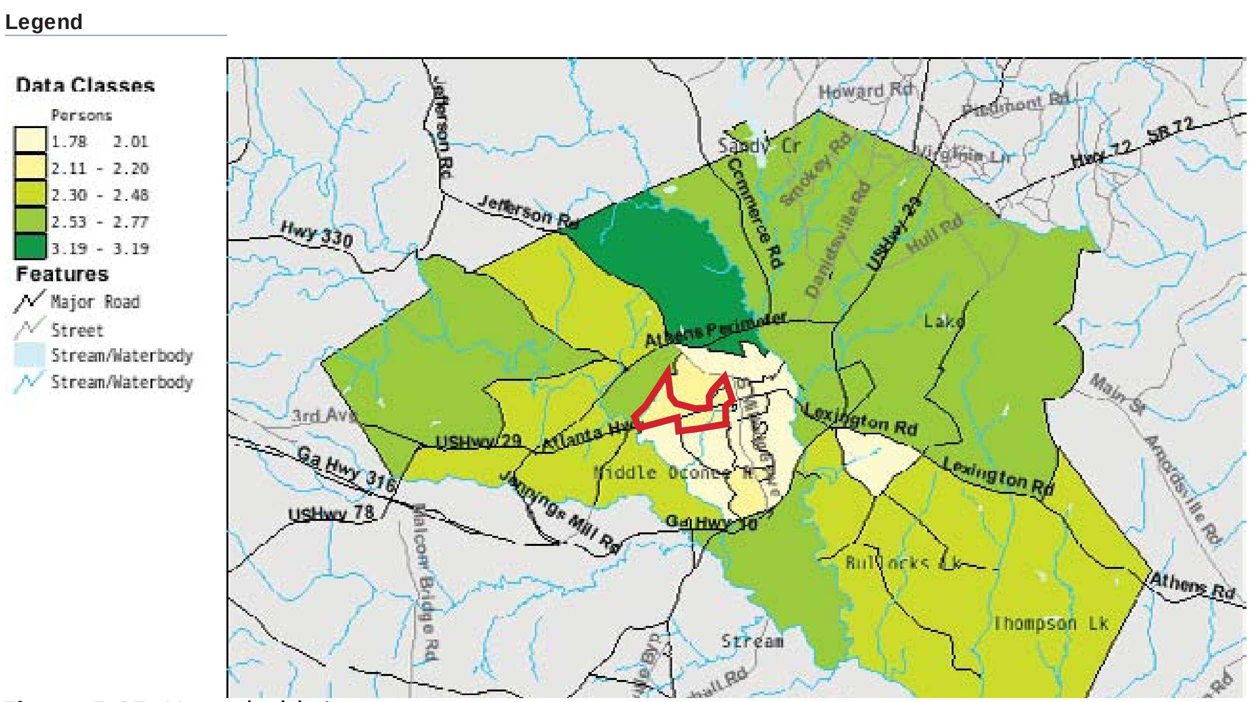


Figure 5.15. Household size.
ACC: 2.35 People. Hancock Corridor: 2.11 - 2.3 People.
(Census 2000)

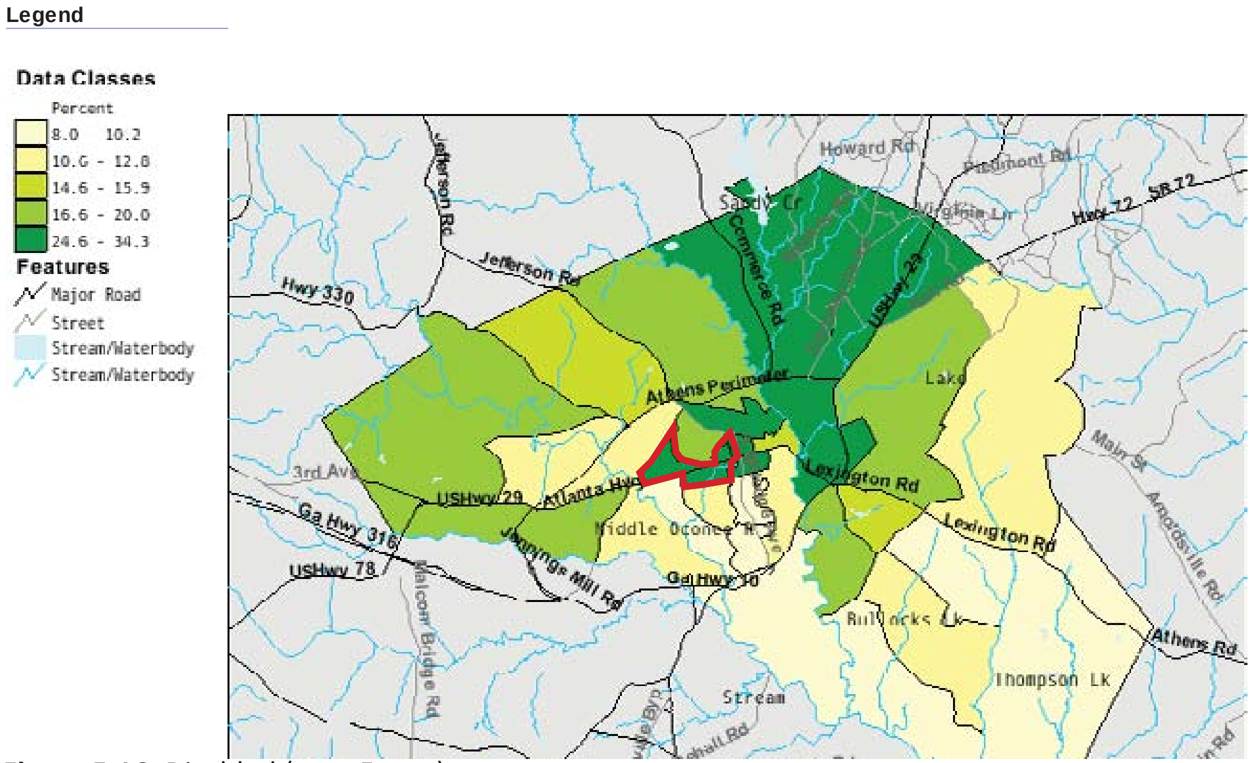


Figure 5.16. Disabled (ages 5 yrs+).
ACC: 16.1%. Hancock Corridor: 24.6% - 34.3%
(Census 2000)

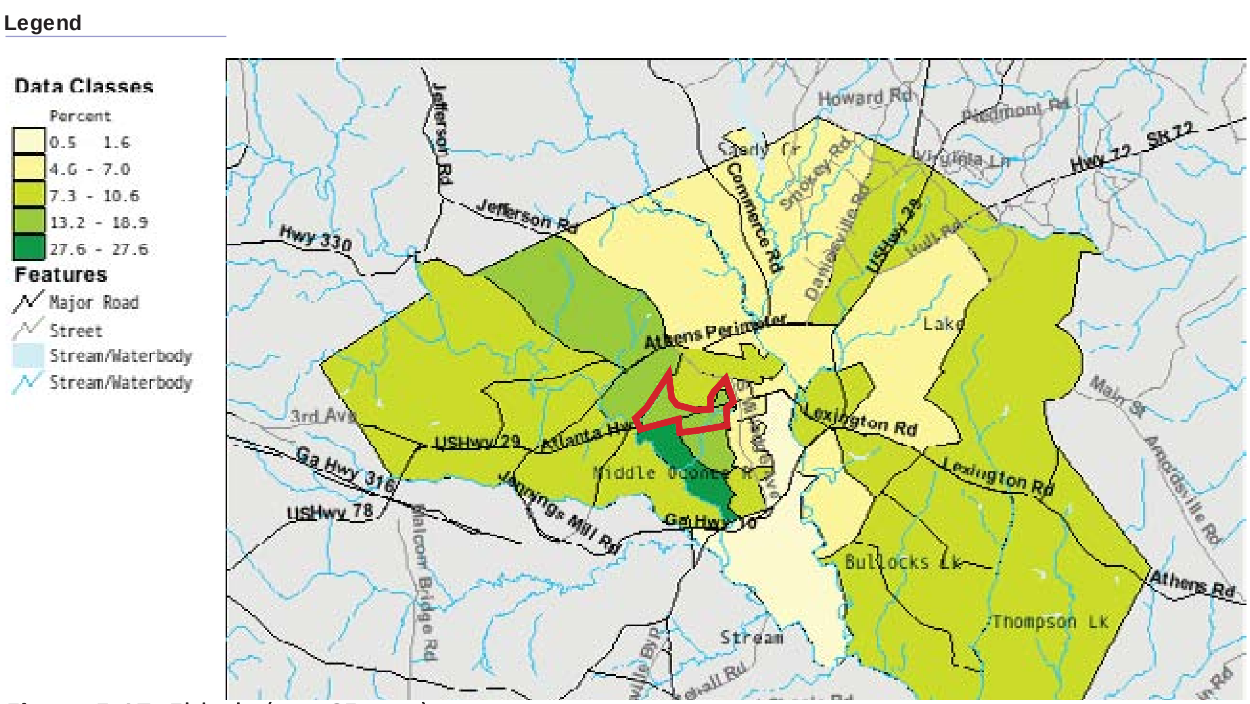


Figure 5.17. Elderly (age 65 yrs+).
ACC: 8.1%. Hancock Corridor: 13.2% - 18.9%
(Census 2000)

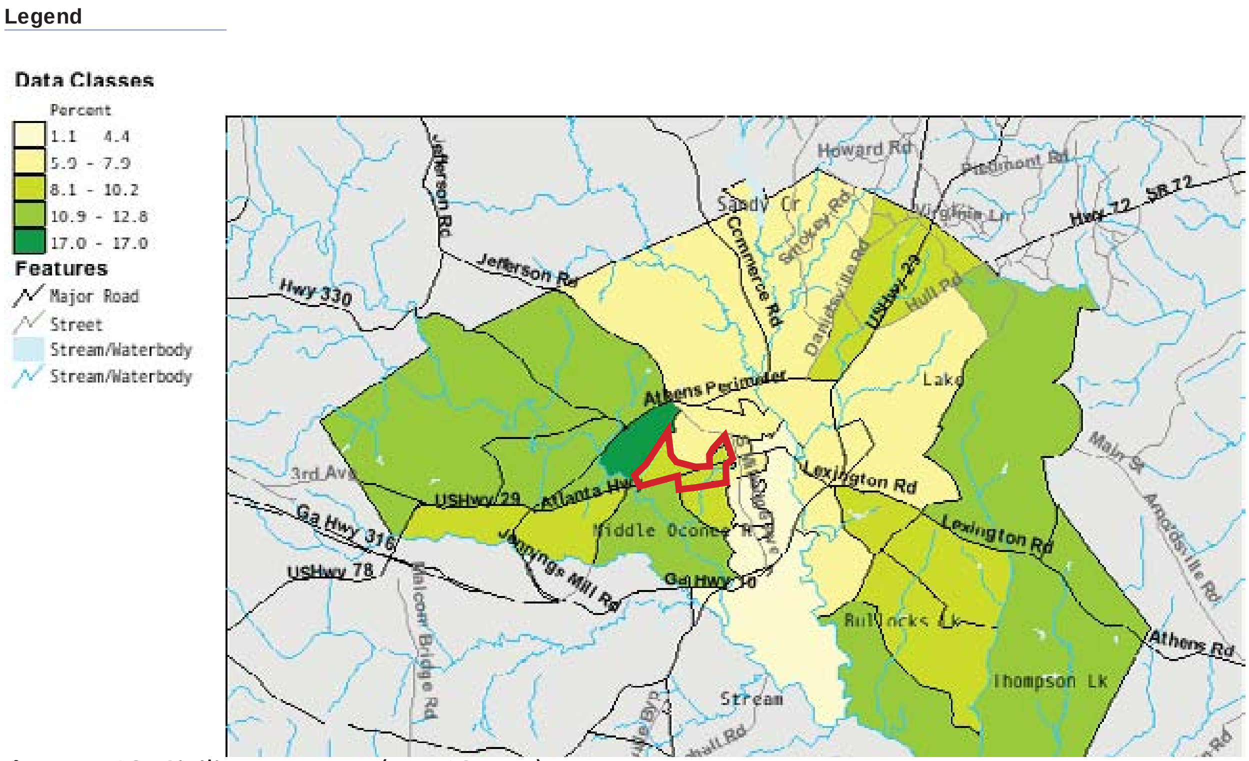


Figure 5.18. Civilian veterans (age 18 yrs+).
ACC: 7.8%. Hancock Corridor: 8.1% - 10.2%
(Census 2000)

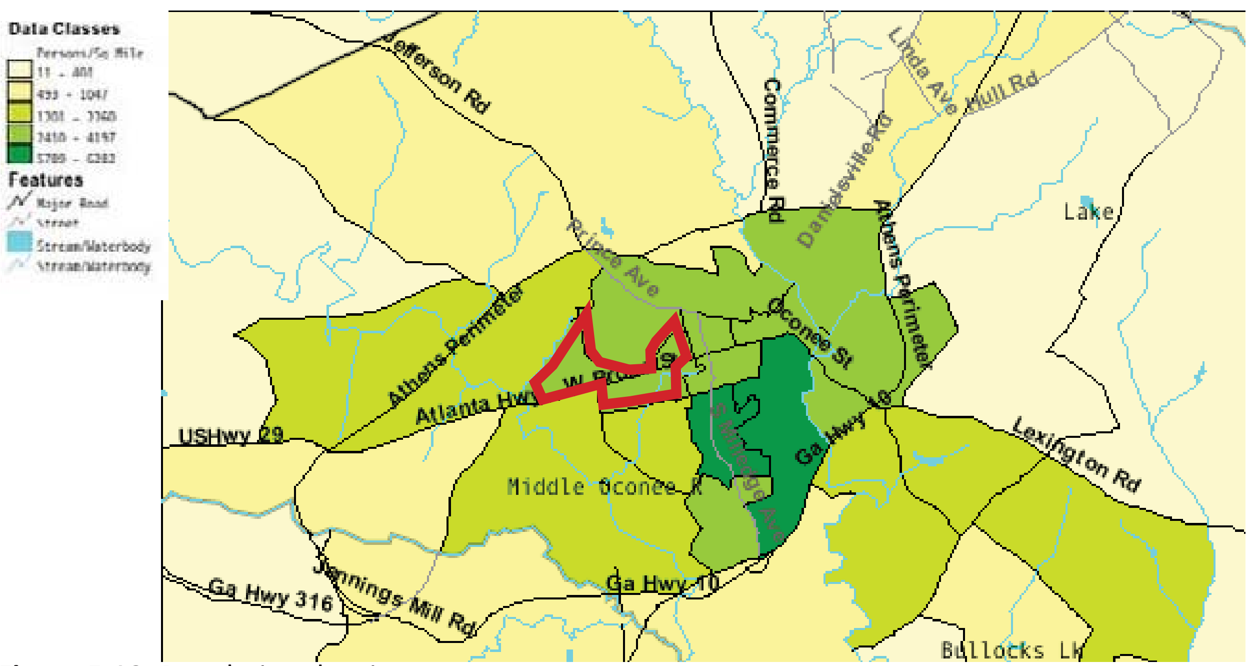


Figure 5.19. Population density.
(2007; people per square-mile)
ACC: 944.3. Hancock Corridor: 2410 - 6282.
(Census 2000)

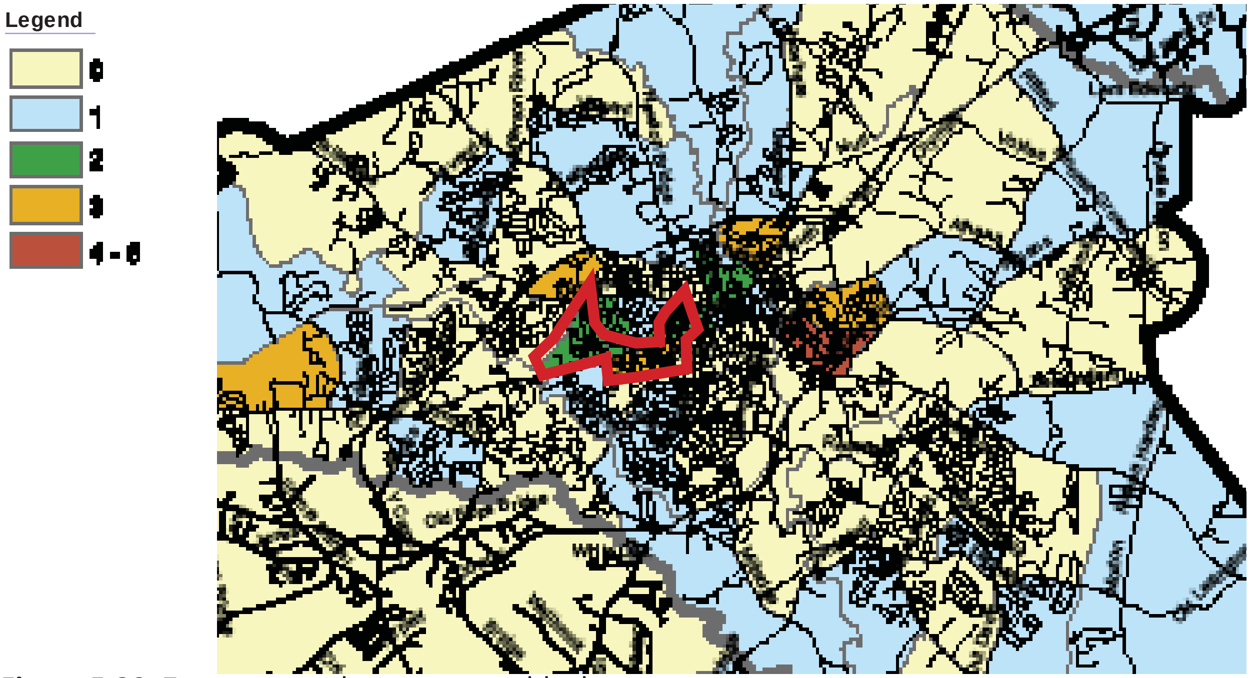


Figure 5.20. Zero-cars per by county per block group
Percentage compared to total population of the county
(County 2004)

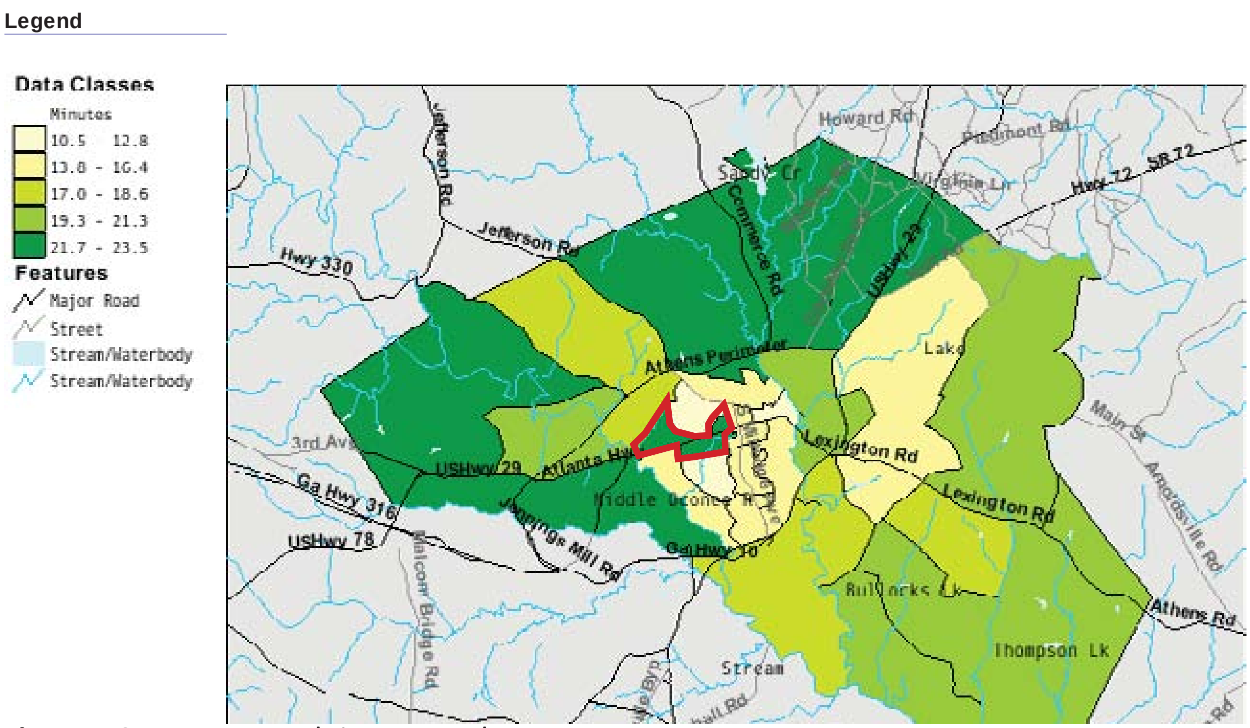


Figure 5.21. Mean travel time to work
ACC: 18.6 minutes. Hancock Corridor: 21.7 - 23.5 minutes.
(Census 2000)

Assets

Despite these struggles, the Hancock corridor boasts many assets that can contribute to the revitalization of the area. Surrounded by commercial districts that include amenities such as grocery, convenience, drug, and clothing stores; restaurants; government services; financial institutions; and day care, many daily needs are within close reach of area residents. There are several schools within a one mile radius of the corridor, including UGA and Clarke Central High School, as well as Bishop Park, which offers a range of recreational opportunities, and a new park currently under construction at the corner of Reese and Pope St. Furthermore, the area is laid out, primarily, in a dense grid pattern, offering a high degree of connectivity to various destinations. Finally, the historic character of the area, which is largely intact, contributes to the area's unique character and human-scaled, aesthetically appealing environment. Fig. 5.22 shows the location of neighborhood assets located within a ¼ mile, ½ mile and 1 miles radius of Hancock Ave.[1]

[1] The information included in this assessments survey was gathered during site surveys, research of telephone directories, and University of Georgia, H. R. C. (1996). Hancock Corridor Assessment Report. H. E. D. Department. Athens.

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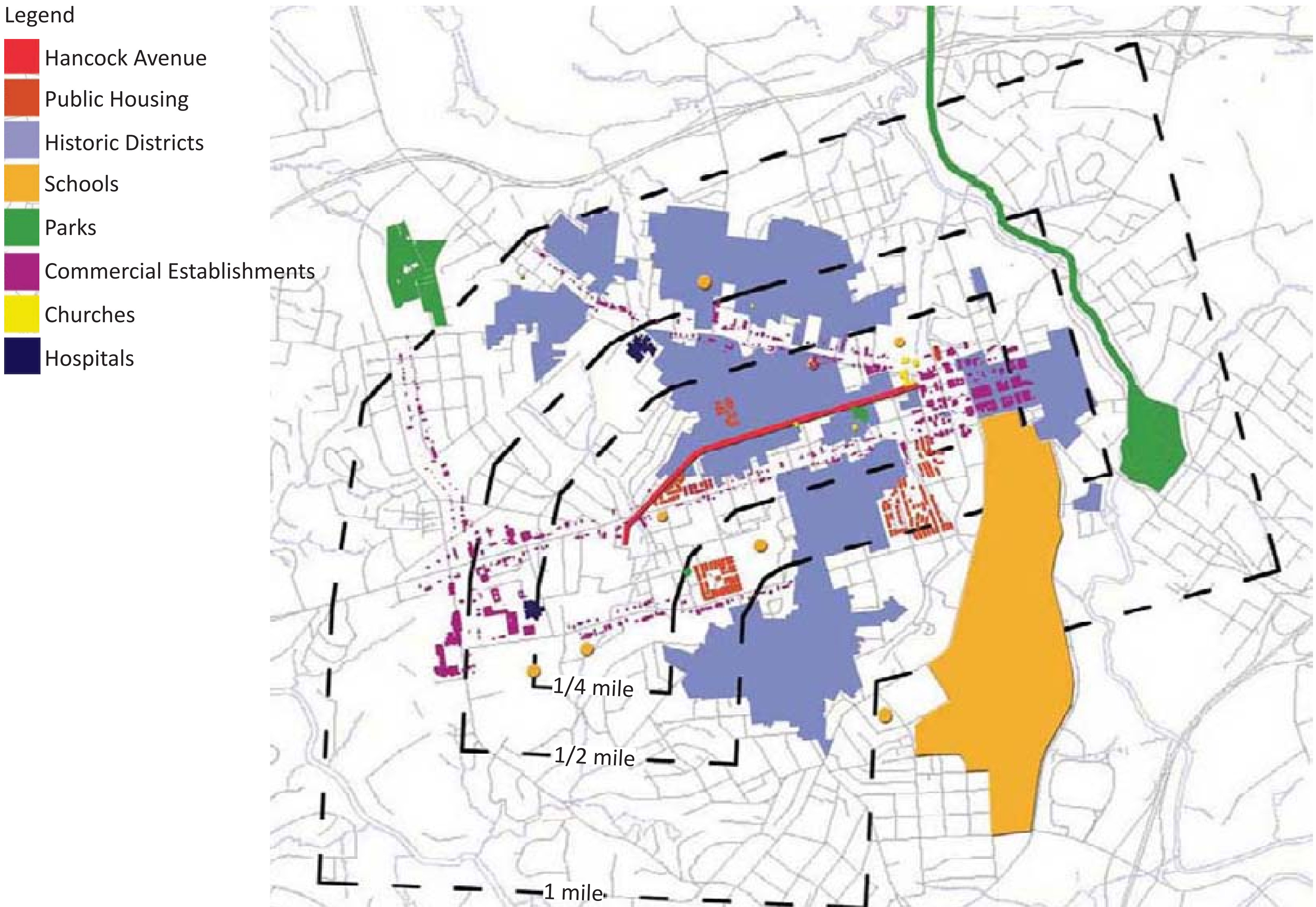

Figure 5.22. Neighborhood assets within 1/4, 1/2, and 1 mile of Hancock Avenue

Hancock Neighborhood Revitalization

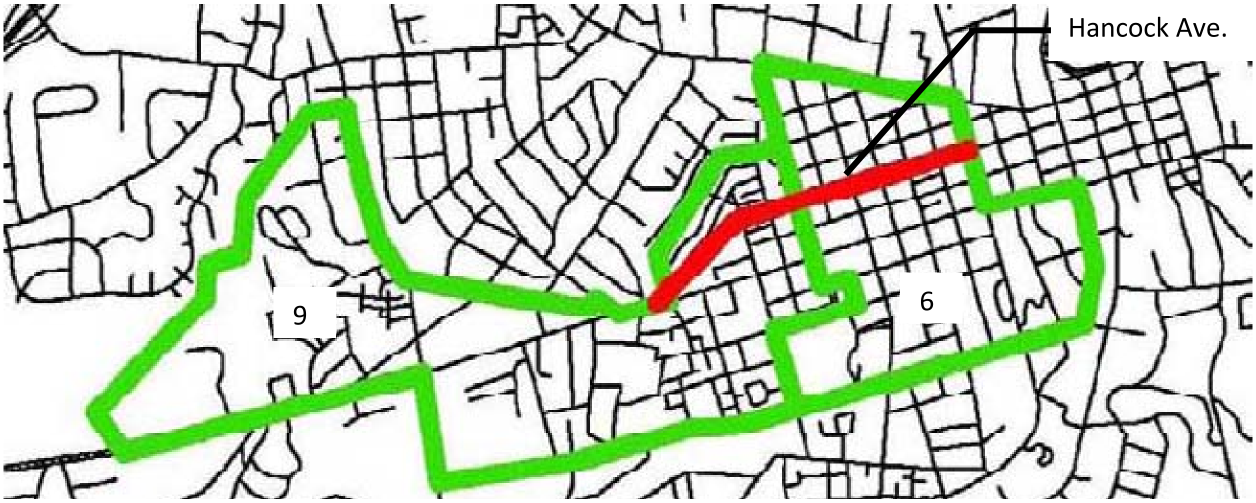

Figure 5.23. Census blocks 6 & 9.

Recognizing the depressed condition of the Hancock Corridor, the ACC Department of Human and Economic Development (HED) designated census blocks 6 and 9 as one of the city's two target neighborhood revitalization areas. HED is responsible for administering the county's Housing and Urban Development (HUD) funded Community Development Block Grant and Home Investment Partnerships Program (HOME), with the goal of addressing issues of unemployment, poor housing conditions, crime, and juvenile delinquency. According to the ACC website, "HED strives to develop viable neighborhoods by providing decent housing, a suitable living environment, and expanding economic opportunities for low-to-moderate income families." (County) HED recognizes the need for a broad approach to community revitalization, and promotes citizen participation, collaboration with other organizations, and the provision of economic opportunities for residents.

The strategic plan for the Hancock Neighborhood Revitalization Area (HNRA) sets numerous goals; those related to transportation include the improvement and addition of sidewalks and alternative transportation routes; increased street and pedestrian lighting; the construction of pedestrian safety devices (traffic calming devices, warning signals, crosswalks, etc); and the creation of public infrastructure that attracts businesses that can provide jobs to neighborhood residents, and increases public safety, residential desirability, and overall quality of life. Furthermore, the infrastructure should directly support other city affordable housing, economic development, or neighborhood revitalization initiatives. (County 2008) Like the plans in Portland and Baltimore, this plan focuses on providing benefits to current residents, and making an effort to avoid gentrification and displacement.

Transportation Planning: MACORTS

Responsibility for enacting such transportation improvements, as well as addressing issues of transportation injustice, lies with city and county planning organizations. As discussed in Chapter II, MACORTS is responsible for developing ACC's transportation policies and long range plans. MACORTS 2030 Long Range Plan addresses transit, highways, bicycle, and pedestrian infrastructure.

In developing the plan, MACORTS solicited public input through informational meetings and "wish lists" from the counties within the MACORTS boundary. Concerns and recommendations raised by the 377 people who participated in these input sessions included:

- decreasing the number of automobiles on the road;
- adding additional bicycle and pedestrian facilities, traffic calming devices, street trees, and landscaping;
- improving speed limit enforcement, traffic signal timing, lighting, safety, transit services and handicapped access;
- requests for both more and less parking;
- lower speed limits;
- incentives for car pooling;
- corrections to dangerous intersections, particularly along Prince Avenue; and
- enforcement of pedestrian and cyclist rights. (County 2004)

The abundance of support for nonmotorized options, including offers to pay higher taxes to increase transportation options, as well as numerous statements indicating a relatively advanced knowledge of multimodal planning techniques suggests that these input sessions were dominated by wealthier and/or well educated Athens residents and, particularly, members and supporters of groups such as BikeAthens. While these suggestions are extremely helpful in identifying potential transportation improvements, they should not be taken as representative of the entire community.[2]

This input, combined with the results of the MACORTS Travel Demand Model, led to the contents of the final plan. This long range plan identifies the following seven planning factors:

- Planning Factor #1: "Support the economic vitality of the United States, the States and metropolitan areas, especially by enabling global competitiveness, productivity, and efficiency"
- Planning Factor #2: "increase the safety and security of the transportation system for motorized and nonmotorized users"
- Planning Factor #3: "Increase the accessibility and mobility options available to people and freight"
- Planning Factor #4: "Promote and enhance the environment, promote energy conservation and improve quality of life"
- Planning Factor #5: "Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight"
- Planning Factor #6: "Promote efficient system management and operation"
- Planning Factor #7: "Emphasize the preservation of the existing transportation system."

In developing the plan, MACORTS considered socio-economic trends, using data from the 2000 census, and the current and future conditions (both physical and use/congestion) of the area's highways, bridges, and roads. Their final recommendations address public transportation; transportation enhancement projects, which include pedestrian, bicycle, and intermodal facilities; freight and goods movement; and financial resources. (County 2004)

Public Transportation

Currently, the Athens Transit System (ATS) operates 23 buses on 16 routes, with weekday service between 6:15 am and 7pm, and limited Saturday service from 7:30 am – 7pm (fig. 5.24). Additionally, ATS operates a paratransit service, The Lift, which provides door-to-door service within a one mile radius of fixed routes; as well as The Link, a demand response circulator, which provides morning and evening connections to fixed routes from outlying areas of the county. MACORTS' long

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[2] A complete list of comments can be found at: http://www.athensclarkecounty.com/macorts/2030%20Long%20Range%20Transportation%20Plan.pdf pp. 207-261

range plan does not identify specific projects or changes to be made to the transit system, but delegates this responsibility to the ATS. It does, however, set goals of adding park and ride facilities, a Countywide Demand Response Service for handicapped individuals, and, as population growth continues, a regional bus service extending to surrounding counties. The plan also discusses facilities improvements, including the recently completed Multimodal Transportation Center and the Bus Stop Improvement Program. While sufficient funding does not currently exist to fully implement the Bus Stop Improvement Program, the goal is to inventory existing bus stops and add appropriate amenities. (County 2004)

Transportation Enhancements

The transportation enhancements portion of MACORTS's plan emphasizes the need to incorporate sidewalks into all new development and road widening projects, and provides factors that the individual counties, which are responsible for implementing sidewalk projects, can use to prioritize sidewalk request projects. The factors to consider are:

- "traffic volume
- proximity of traffic signals and posted speed of roadway
- right-of-way that would be required for project
- roadway profile (surrounding terrain, bridges, etc.)
- functional classification of roadway
- evidence of existing pedestrian traffic
- segment fill gap in sidewalk system
- provides new sidewalk where none exists
- area adjacent to transit route
- adjacent land-use and zoning designation
- located within school region."

Sidewalk design should conform to the ACC standards, which are based upon the extensive information provided by GDOT and AASHTO standards. The MACORTS plan identifies several potential sidewalk projects, and states that ACC should complete a county-wide Sidewalk Master Plan.[3] (County 2004)

[3] Planned sidewalk improvements within the Hancock Corridor are: sidewalk construction on the north side of Hancock Avenue from Glenhaven Ave to Milledge Ave; on the east side of Billups St from Hancock Ave to Indale Et., on Glenhaven St from Hancock to Billings, on Indale St from The Plaza to Rock Springs, and on The Plaza from Hill St. to Hancock Ave.

The transportation enhancements portion of the plan also addresses bicycle infrastructure. MACORTS states that "there is great potential for bicycles as a transportation mode in the MACORTS area," and that, because of the numerous environmental and health benefits of cycling, as well as the minimal space required by bicycles, this mode should be encouraged. Furthermore, MACORTS feels that census data, which indicates that only 444 people in Clarke County rode bicycles to work, underestimates bicycle usage in the area.

Topography, this plan argues, is the primary challenge facing transportation planners, as well as fully integrating bicycles with other transit modes, particularly in reference to conflicts between cyclists and automobiles. MACORTS bicycle recommendations include the ACC area, which already has a bicycle master plan for the area within a 3mile radius of the central business district, as well as surrounding counties. There is discussion of expansion plans for the North Oconee River Greenway, which will primarily serve recreational needs, as well as recommended bicycle route additions and improvements. As with pedestrian design, MACORTS recommends using the design standards laid out by GDOT and AASHTO, a well as specific recommendations made by ACC.[4]

> The goal of MACORTS is to develop a bicycle system that increases accessibility throughout the MACORTS area [by creating] a safe environment for bicyclists and pedestrians …through a city and county system of bicycle routes, lanes or paths [that] should serve by connecting the major traffic generators…Development of a MACORTS-wide system for bicyclists will be supplemented by the existing system of neighborhood streets.

This plan found that the major destinations of cyclists were the central business district, UGA, and the public schools. There are numerous recently completed bicycle projects, as well as others planned and/or underway. [5] Finally, the plan addresses the transitions between bikes and other modes,

[4] For the specific ACC standards, refer to: http://www.athensclarkecounty.com/macorts/2030%20Long%20Range%20Transportation%20Plan.pdf p. 170-171.

[5] Planned bicycle improvements within the Hancock Corridor include striped bike lanes, road resurfacing and the removal of on-street parking.

recommending the addition of bicycle racks to all buses and the installation of more bicycle storage/parking facilities in the downtown area. (County 2004)

Transportation Planning: ATS

In response to MACORTS' call for a transit development plan, the Athens Transit System produced its own long range plan, the objectives of which are to evaluate the current transit system through an analysis of data and user input, identify the changes needed to make the transit system more effective and ways to implement these changes, and make recommendations to MACORTS so that these changes can be incorporated into their long range plan. (County 2005)

The ATS Development Plan defines several goals that will support its mission of providing effective public transit to the citizens of Athens Clarke County. These goals are to:

1) "Provide transportation to educational, cultural, medical, shopping and other resource centers for community members, with special attention to those who do not have access to other modes of transportation."
2) "Provide solutions to help manage transportation corridors within ACC that have a deficient level of service."
3) "Reduce the need for parking facilities within the Central Business District and the UGA campus therefore allowing maximum utilization of land for more productive purposes."
4) "Operate in a cost effective manner."
5) "Continue to foster the ATS and UGA Transit services interface in order to achieve community goals." (County 2005)

The plan begins with an evaluation of the condition of ATS and the existing needs within the ACC area. Using much of the demographic information presented in earlier chapters, ATS identifies the areas in greatest need of transit service and those containing the largest blocks of potential transit riders. Secondly, ATS identifies major trip destinations, such as employers, shopping centers, schools, and medical facilities. ATS also accounts for future land uses, predicting an increase in employment opportunities extending from the north side of ACC to the Madison County line and along the US 29/78 corridor heading west from Athens. In an effort to gather community input, ATS surveyed employers, conducted stakeholder interviews, public forums, and mail intercept surveys. Major themes resulting

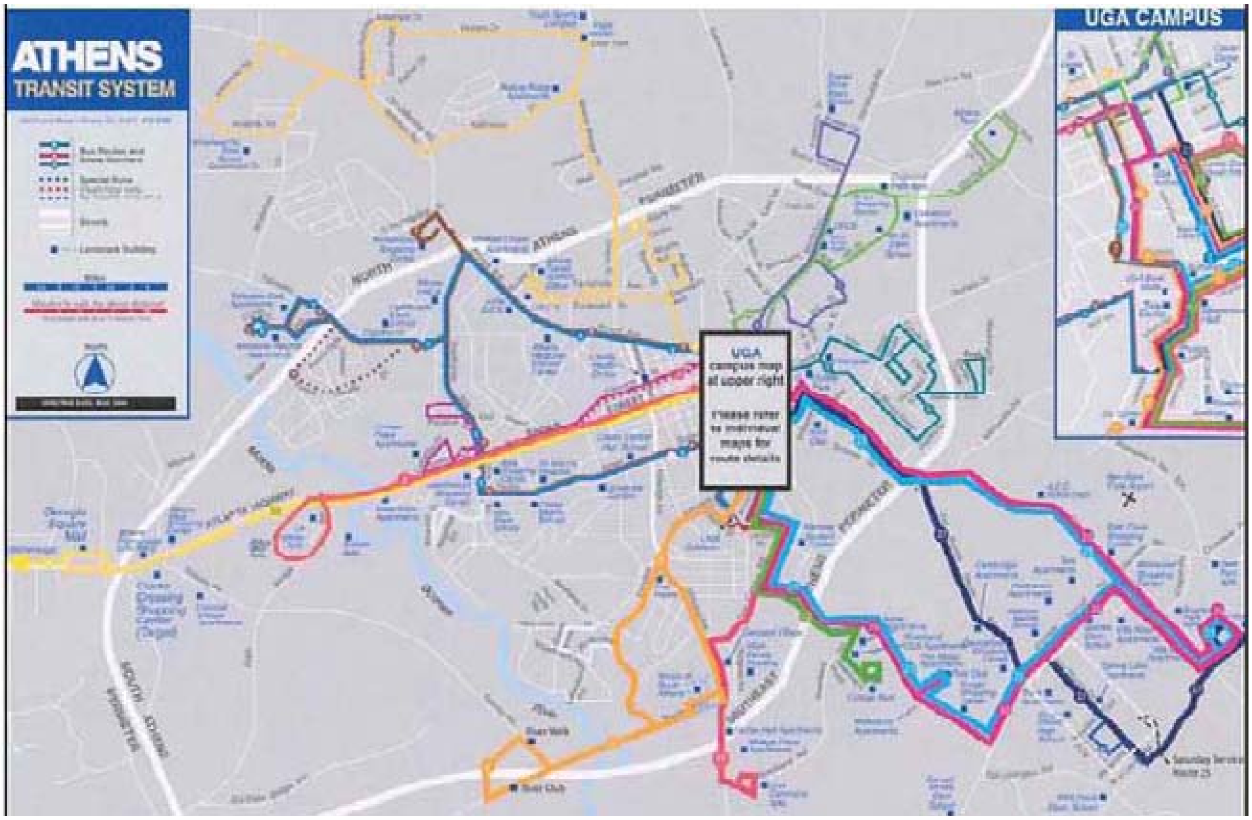

Figure 5.24. Current ATS route map. (County 2008)

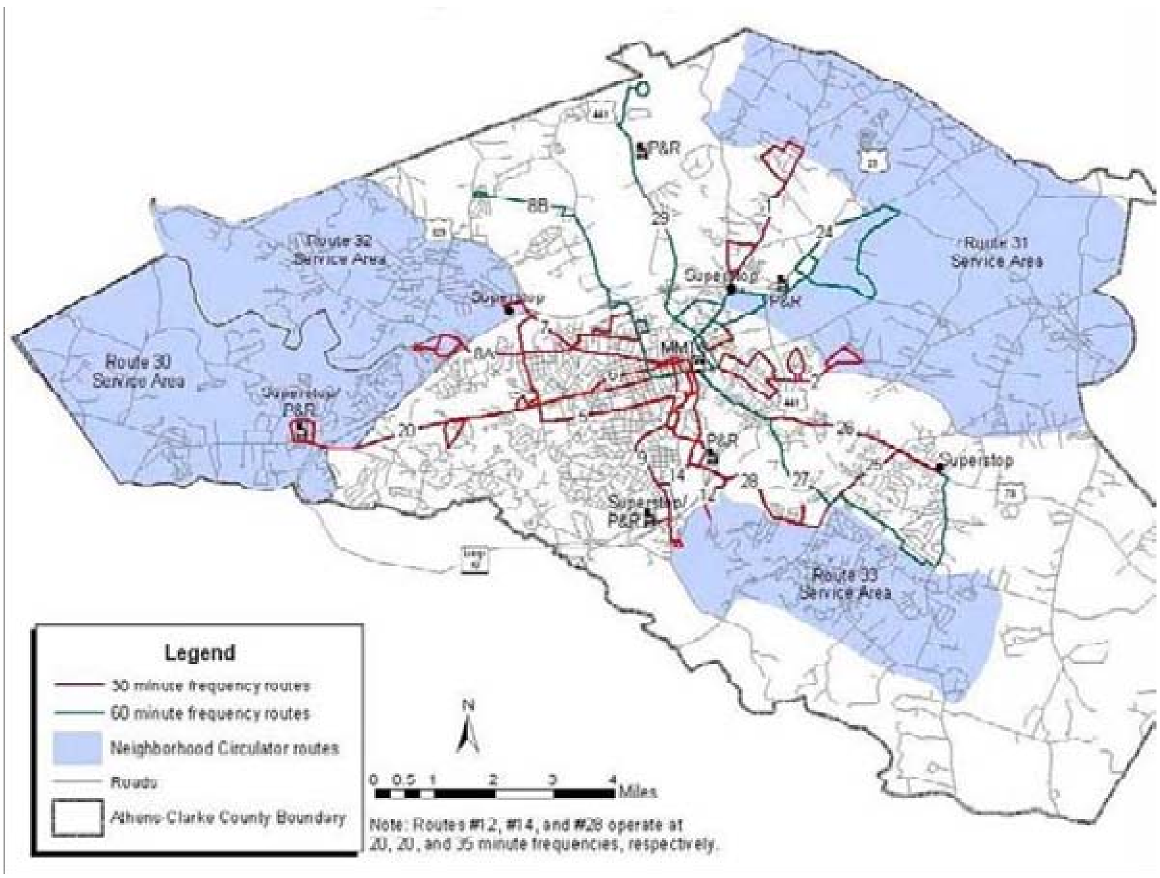

Figure 5.25. Proposed ATS weekday service. (County 2004)

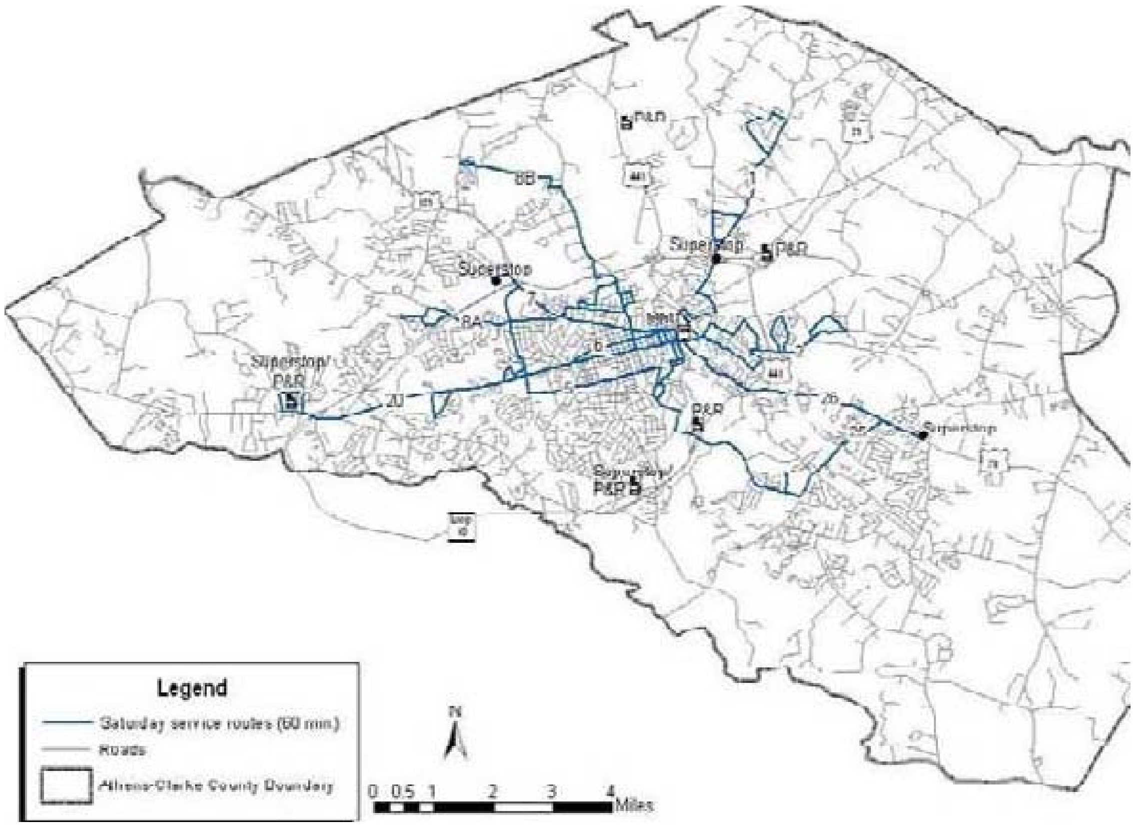

Figure 5.26. Proposed ATS Saturday service. (County 2004)

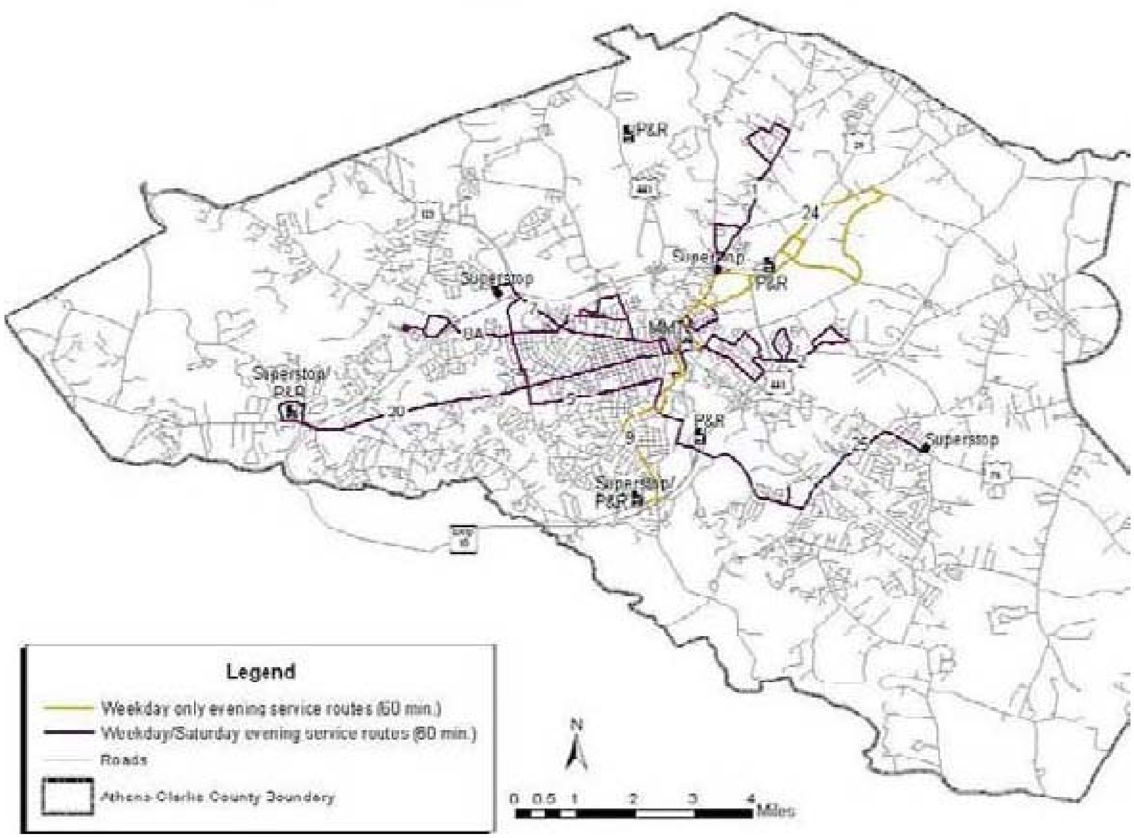

Figure 5.27. Proposed ATS evening service. (County 2004)

from this process include support for increased hours of service, weekend service, and expanded route coverage. (County 2005)

The transit concept plan that grew out of the evaluation and public input process is based on "a three-tiered public transportation system that reflects more frequent, core fixed route service, neighborhood circulator service using smaller vehicles and a demand response network in the lower density areas." Key elements of this plan include:

- increasing frequency on routes servicing ACC's major, most congested corridors
- providing evening service on select routes,
- providing early Saturday service on routes providing accessibility to jobs,
- extending coverage of the ATS system (figs. 25-27)
- realigning some routes to provide more direct connections and decreased travel times.

Additionally, efforts will be made to provide more amenities at bus stops, ensure that all new bus stops meet ADA requirements and have a sign, provide shelters at stops with 50 or more boardings per day, and provide benches at bus stops with 10 or more boardings per day. (County 2005)

Analysis of ACC Transportation Plans

In general, Athens' transportation plans include an emphasis on improving pedestrian and bicycle infrastructure, but the greatest improvements will be seen in transit service. Figure 5.28 shows the locations of ACC's 50 largest employers. The largest concentration of jobs are within the central business district, in the industrial areas located in NE Athens along Hwy 72, at the Pilgrim's Pride chicken plants on Oneta St, and along Athens Highway. Transportation improvements that aim to benefit the lower income population of the Hancock Corridor, therefore, should focus efforts on increasing multi-modal transportation access to these areas, as well as improving access to locally owned, neighborhood businesses. By reducing employee's dependence on private automobiles, transportation planning will allow commuters to invest a larger amount of their income into home ownership and other household needs.

While many sites are not currently well served by transit, long range plans do address this issue. Attention must be paid, however, to the frequency and efficiency of service, looking specifically at factors such as the number of transfers needed to reach a destination and ADA, bicycle, and pedestrian access to bus stops. Also, it is important to note that ACC recognizes growing capacity issues on many of their roads, including some, such as Milledge and Lumpkin, where "it will be very difficult to add [auto] capacity to… due to the historic character of the properties along this corridor, as well as community opinion that these routes are important in shaping the community's image. Therefore, measures to decrease automobile traffic demand should be further explored such as constructing bicycle facilities and expanding mass transit usage." Any successful effort to increase modal options on these corridors must include consideration of connections along routes such as Hancock Avenue.

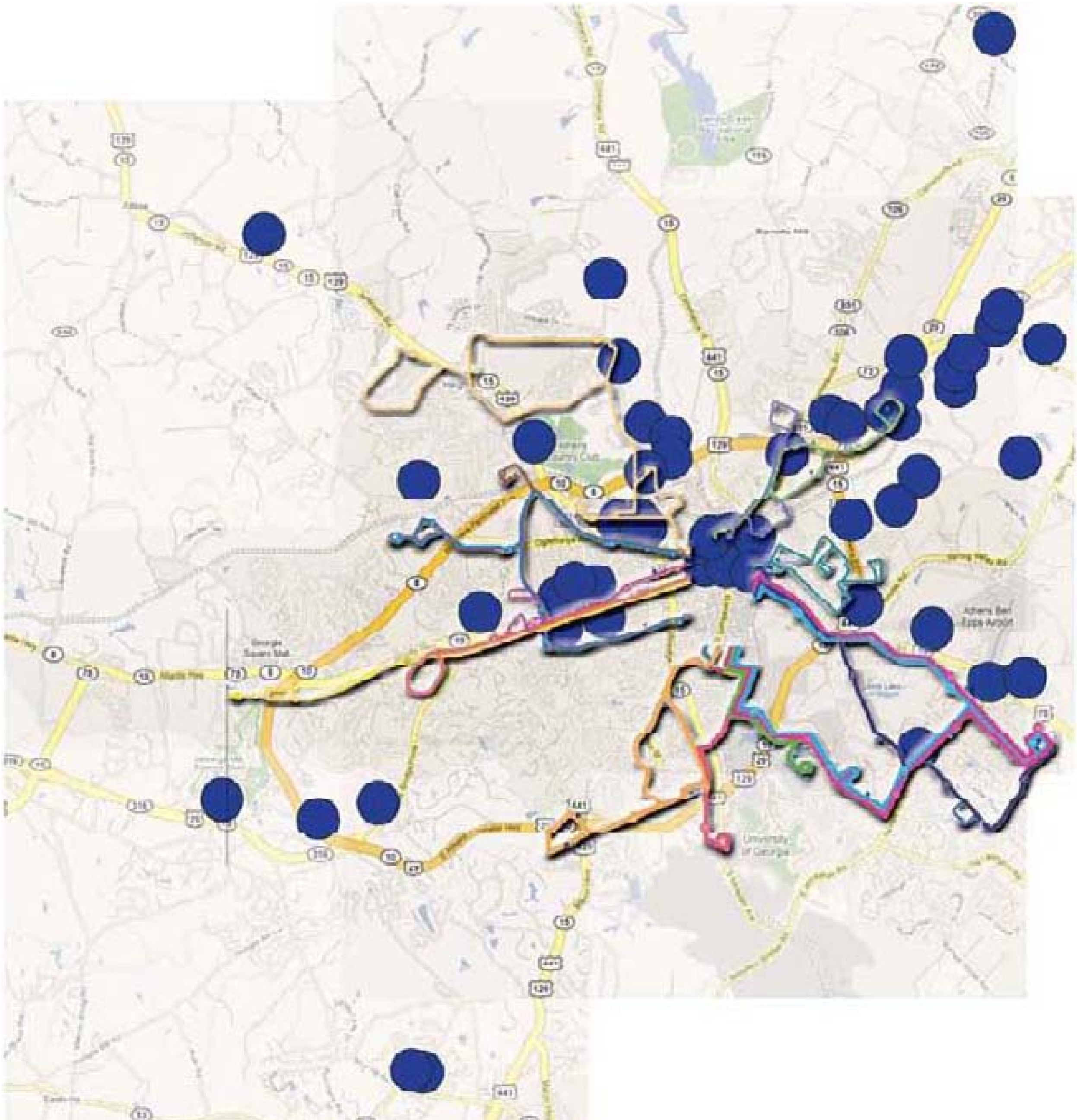

Figure 5.28. Locations of the 50 largest employers in ACC and existing ATS routes.

Partners for a Prosperous Athens (PPA), a local nonprofit working to fight poverty in ACC, acknowledges the critical role transportation can play in breaking the cycle of poverty, and provides recommendations that build upon those offered in ATS's development plan, and focus on the needs of Athens' lower income communities. These recommendations include 24 hour, 7 day a week service, as well as increased service of The Lift and The Link. PPA recommends an increase in the marketing of the routes and services ATS offers, and provision of more comprehensive route and scheduling information at bus stops. The multi-modal center should be made more accessible, particularly for elderly people and people with disabilities. Transit services should be made more affordable for people with low incomes. Because some low-income Athenians rely upon walking and biking for transportation, the infrastructure serving these modes should be made safer and more comprehensive. [6] (Athens)

[6] For more information on PPA's transportation recommendations, see: http://www.prosperousathens.org/committees/ht/images/H&T-%20Trans-%201-%20increase%20capacity%20of%20Athens%20Transit.pdf

Existing Conditions within the Hancock Corridor

When viewed in the context of the greater Athens-Clarke County area, the transportation infrastructure within the Hancock Corridor is not significantly worse than the rest of the city. The city bus serves the corridor, there is a continuous sidewalk along the south side of the road, and there is bicycle striping on a portion of the road. However, demographic data shows that the population within the corridor is in greater need of transportation options to the private automobile than the average Athenian. Because poverty levels are significantly higher and income levels lower within this area, owning a private vehicle is either an economic hardship that prevents investment in homeownership, education, or other basic needs, or a financial impossibility. Additionally, the higher than average percentage of handicapped residents, lower levels of car ownership, and lower levels of employment and academic achievement suggest that increasing access to opportunities would contribute to the revitalization of this area. Furthermore, Hancock Avenue is classified as an arterial road, the same classification given to wider roads serving commercial corridors, such as Milledge Avenue, Prince Avenue, and Broad Street, suggesting that the residents living along this corridor suffer from the ill effects of high levels of through traffic (County 2008).

Figure 5.29. View looking east on Hancock

As stated previously, the Hancock Corridor possesses numerous assets that can contribute to increased use of alternative modes of transportation. The street grid, with short blocks and pedestrian scaled architecture, as well as the proximity of several commercial areas, schools, hospitals, and employment centers, lends itself to walking and cycling. Two bus routes serve this corridor, and several other routes, travelling along Prince Avenue, Milledge Avenue, and Broad Street, are within walking distance of the corridor's residents. The area's high population density justifies the city's financial investment in transit infrastructure in the neighborhood. Finally, interest within the Athens community, both from nonprofit organizations such as Bike Athens and Partners for a Prosperous Athens, as well as government agencies, in improving transportation options, suggest that proposals for a more equitable transportation system will be given due consideration and support.

There are also a number of obstacles that must be overcome in the design of a successful multi-modal transportation. Among these challenges are the corridor's topography and the narrow right-of-way. The R.O.W. within the corridor is 40', which is significantly smaller than roadways in surrounding neighborhoods. For example, primary roads in the Five Points area are 50', while, in the Boulevard neighborhood, Boulevard Avenue is 65', and crossroads are 45'. Wider neighborhood streets typically make walking and biking safer and more appealing, particularly in areas such as Five Points and Boulevard, where there are continuous, tree-lined buffers along the sidewalks. Because of the challenges posed by topography and narrow roads, retrofitting Hancock Avenue to accommodate pedestrians, cyclists, transit riders, and automobile drivers will require maximizing the available space and clearly delineating each mode's zone in order to minimize conflicts between users.

Figure 5.30. Hancock corridor homes.

The goal of this project is to design a transportation system that uses the assets of the corridor to overcome its challenges, and thereby contribute to the revitalization of the community while minimizing the chances of neighborhood gentrification and displacement of residents. This design will attempt to provide equal opportunities to people without cars and people who struggle to own them. Because Hancock is an important thoroughfare in Athens and local businesses are dependent upon suppliers and customers accessing their establishments, this design will attempt to reduce the negative environmental, economic, aesthetic, health, safety, and social impacts of cars without compromising access.

Based upon demographic data, community input gathered during ACC and MACORTS planning processes, personal observations, and evidence from case studies, a multi-modal transportation system that will most effectively meet the goals of this project must employ the following strategies. In order to increase opportunities, the transportation infrastructure must connect residents with employment, educational, cultural, and recreational centers during the times at which they desire to travel. Furthermore, these connections must be direct and efficient if they are to be seen as a viable alternative to the private automobile. Secondly, the transportation infrastructure must emphasize safety, both from crime and from automobile traffic. Finally, this design must be incorporate contextual design elements, responding to the area's culture and history, in order to generate a sense of place and create an environment that residents feel comfortable engaging in and calling home. The resulting design, as presented below, demonstrates the application of these strategies to the design of vehicle, bus, pedestrian, and bicycle infrastructure along Hancock Avenue.

General Recommendations/Overview

Fig. 5.31 provides a large-scale overview of the existing conditions along Hancock Avenue. Fig. 5.32 displays the recommended transportation improvements. To accommodate the needs of all

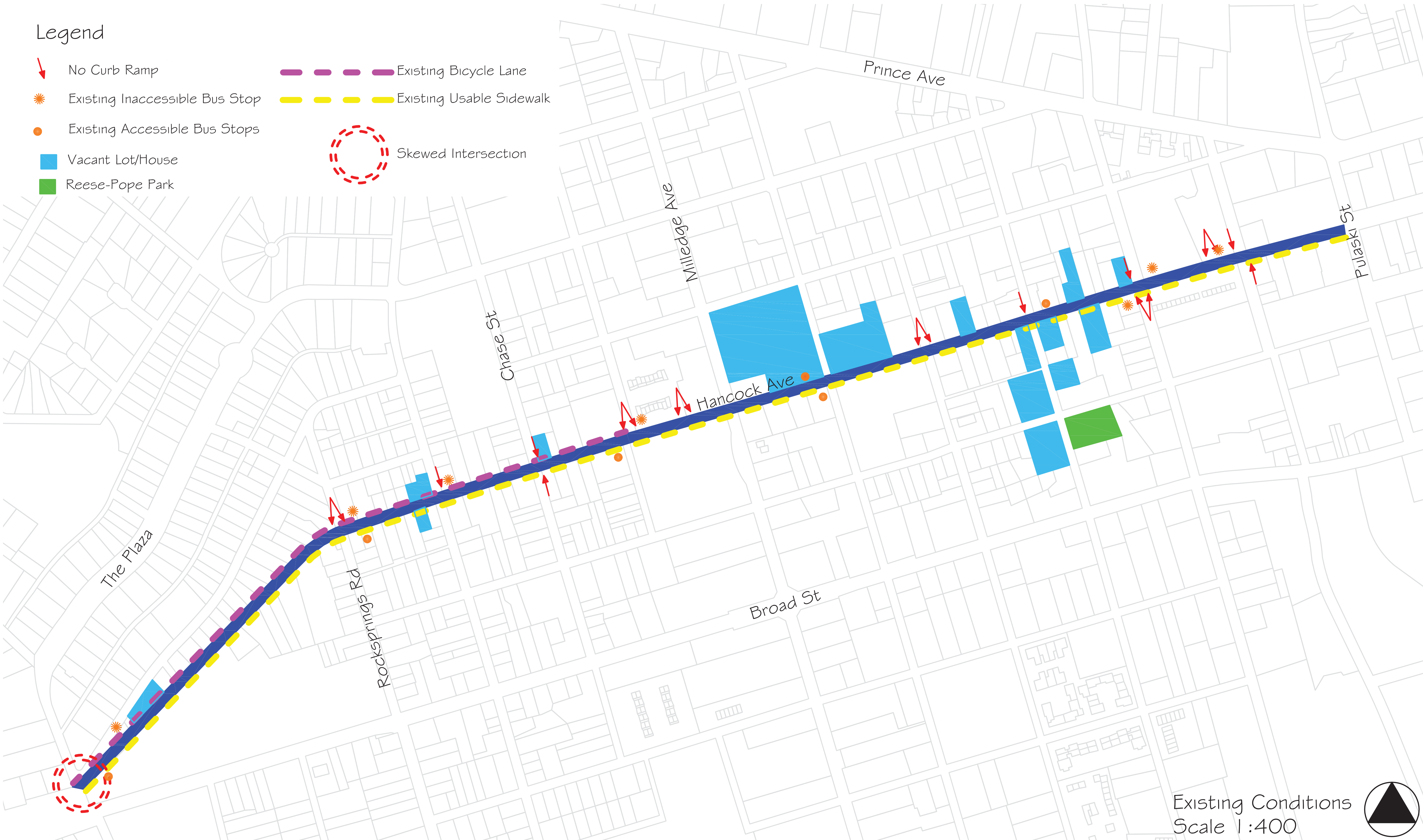

Fig. 5.31. Existing conditions

Fig. 5.32. Recommendations

roadway users, it is recommended that the 40's ROW along Hancock Avenue be apportioned as shown in Fig. 5.33.

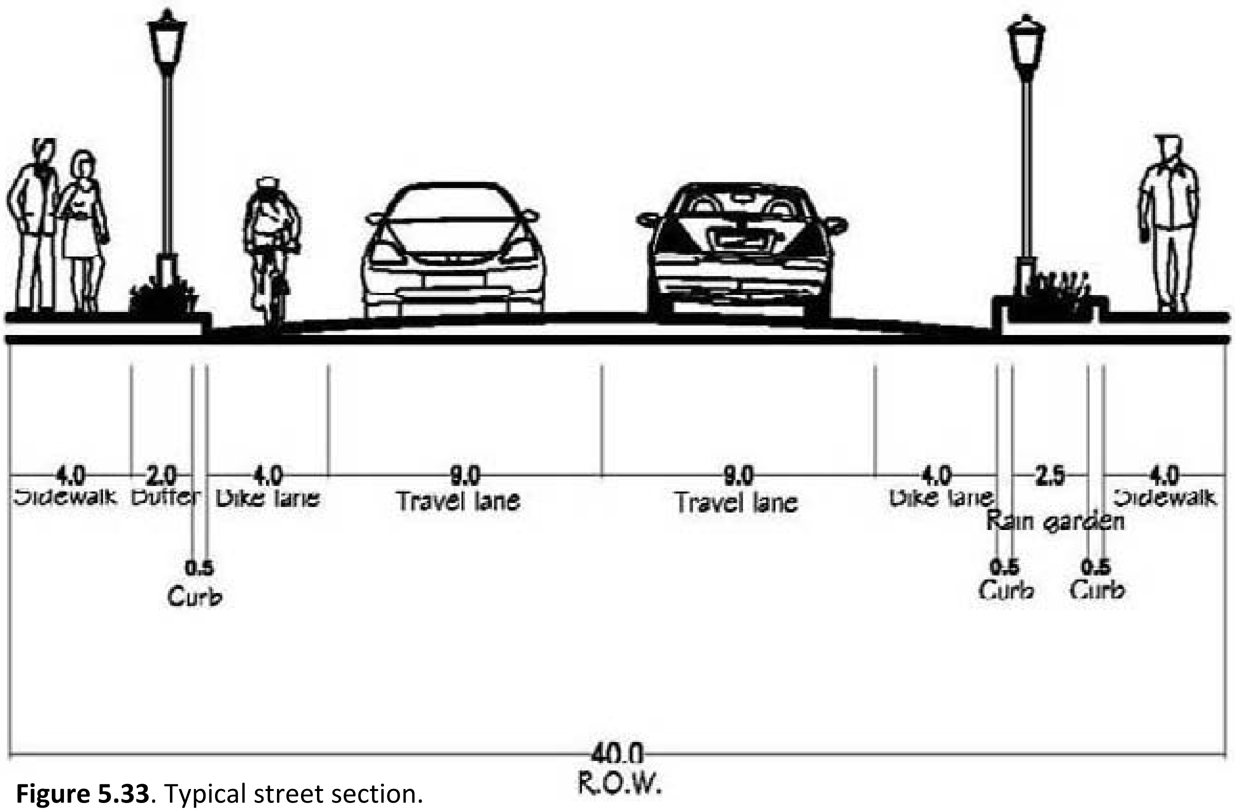

Figure 5.33. Typical street section.
N.T.S.

This section indicates continuous sidewalks along both sides of the road, and the addition of curb-cuts where needed. To provide for pedestrian safety, crosswalks will be provided at every intersection. To enhance the appearance of the streetscape, and increase pedestrian comfort, a 2' planting strip on the south side, and 2.5' rain gardens on the north side are included. A 4' wide bicycle lane, defined by white-colored porous concrete, is added along the entirety of the roadway. This lane provides a designated space for cyclists while providing an additional buffer between pedestrians and automobiles. While 9' travel lanes are narrower than what is commonly found throughout Athens, several cities, including Eugene, OR, Charlotte, NC, Middletown, DE, and Bucks County, PA have successfully reduced lane widths to this dimension(bikespokane ; Engineers ; StormwaterPA ; Gomberg 1998).[1] Because the paved road surface includes 4' bicycle lanes, the 9' travel lane should serve to slow traffic without creating an uncomfortable driving experience for motorists.

To increase safety, pedestrian-scaled street lights are placed at every intersection and bus stop, as well as areas surrounded by vacant lots and buildings. Bus stops are relocated to better serve riders and increase traveler safety, and each stop will include, at a minimum, ADA accessible loading areas, seating, signage, a public telephone, and a trash receptacle. In order to create a more environmentally sustainable thoroughfare, rain gardens along the north side of the road infiltrate stormwater, porous concrete bike lanes reduce impervious surface area, while the promotion of alternative transit modes, in general, will reduce the environmental effects of private automobile travel. Figures 5.54 - 5.69 provide enlarged, block by block views of the master plan.

Kit of Parts

In order to create a contextually-sensitive design, I identified patterns within this historic landscape, and used these to create a design vocabulary to use throughout the project. This vocabulary includes the reuse and/or replication of the herringbone-patterned brick sidewalk recently uncovered along portions of the north side of Hancock (fig. 5.34).

Stone walls are found throughout the neighborhoods surrounding Hancock Avenue, and these walls are replicated and put to use as seatwalls at bus stops and other resting areas, as well as a means to control erosion along steeper slopes surrounding the roadway. The seatwalls will be capped with a smooth, concrete sitting surface, stained to match the tones in the stone walls (fig 5.35).

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[1] In Eugene, OR, 9' travel lanes are used on a collector street that serves as a city bus route with an average daily traffic volume of 6,000-8.000, which is 1.5 – 2x the volume found along Hancock Ave (Gomberg, B. (1998). "Accomodating Bike Lanes on Narrow Streets." Retrieved 4/16/09, 2009, from http://www.bikeplan.com/narrow.htm.

Additionally, 9' travel lanes meet the U.S. Fire administration fire vehicle street requirement of an 18' – 20' street width StormwaterPA. Retrieved 4/16/09, 2009, from http://www.stormwaterpa.org/assets/media/BMP_manual/chapter_5/Chapter_5-7-1.pdf.

.

Creeks and hollows characterize the topography of this landscape, and these water flows are represented in the rain gardens running along the north side of the roadway. These raingardens create visible reminders of the natural waterways that shape the Hancock corridor's landscape (fig. 5.36.

Finally, historical markers, placed in the sidewalk at historic sites along Hancock, inform pedestrians of the historic importance of their community, the role its residents have played in shaping the city of Athens, and the opportunities educational, economic, and cultural opportunities available to them (fig 5.37).

Figure 5.34. Herringbone brick sidewalk: existing and proposed.

Figure 5.35. Stone walls: existing and proposed.

Figure 5.36. Waterways: existing and proposed.

Figure 5.37. Historical markers.

Design Details

- **Pedestrian**

Four foot wide sidewalks along both sides of Hancock Avenue will provide for safe pedestrian circulation throughout this corridor. The design indicates the continuation of theses sidewalks along cross streets, as allowed by right of ways and on-street parking needs, in order to provide a continuous network of pedestrian infrastructure to destinations along Prince Ave, Milledge, Broad St/Atlanta Hwy and the downtown area.

The herringbone-patterned brick sidewalk contrasts with the concrete sidewalks prevalent throughout Athens, and communicates to travelers that they are entering a new and unique community. The bricks are retained by concrete along the Pulaski-Newton block; when the corridor transitions from the commercial, downtown area, to the residential zone, the sidewalk is made up of bricks restrained by a metal liner. The brick pattern is stamped into the concrete crosswalks, eliminating the need for striping (fig 5.37). At the Broad St intersection, horizontal white striping on the existing asphalt is recommended, as this is no longer part of the residential zone. Continuing the pedestrian zone, while creating a break in the asphalt lane designated for automobiles, sends a highly visible signal that pedestrians in the crosswalk posses the right-of-way, a law often overlooked by Athens' motorists.

Currently, there are few ramps at the curb cuts along Hancock, making the sidewalk inaccessible to wheelchair users. In this design, concrete ramps that are aligned with the crosswalk are provided at every curb cut, and textured pads are recommended on each ramp. ADA access is further provided for with the placement of 5' wide passing zones at least every 200' (fig 5.38).

A 2' planting strip along the south side of Hancock, and raingardens along the north side, provide a sense of enclosure for travelers and create a buffer from automobile traffic (Figs. 5.39). Rocks, of the same type found in the seatwalls, are placed throughout the raingardens to create the sense of a stream. Along the steeper section of road between Pope and Milledge, check dams will ensure stormwater infiltration and create a cascading effect during heavier storms. Figures 5.41 and 5.42 detail the raingarden feature.

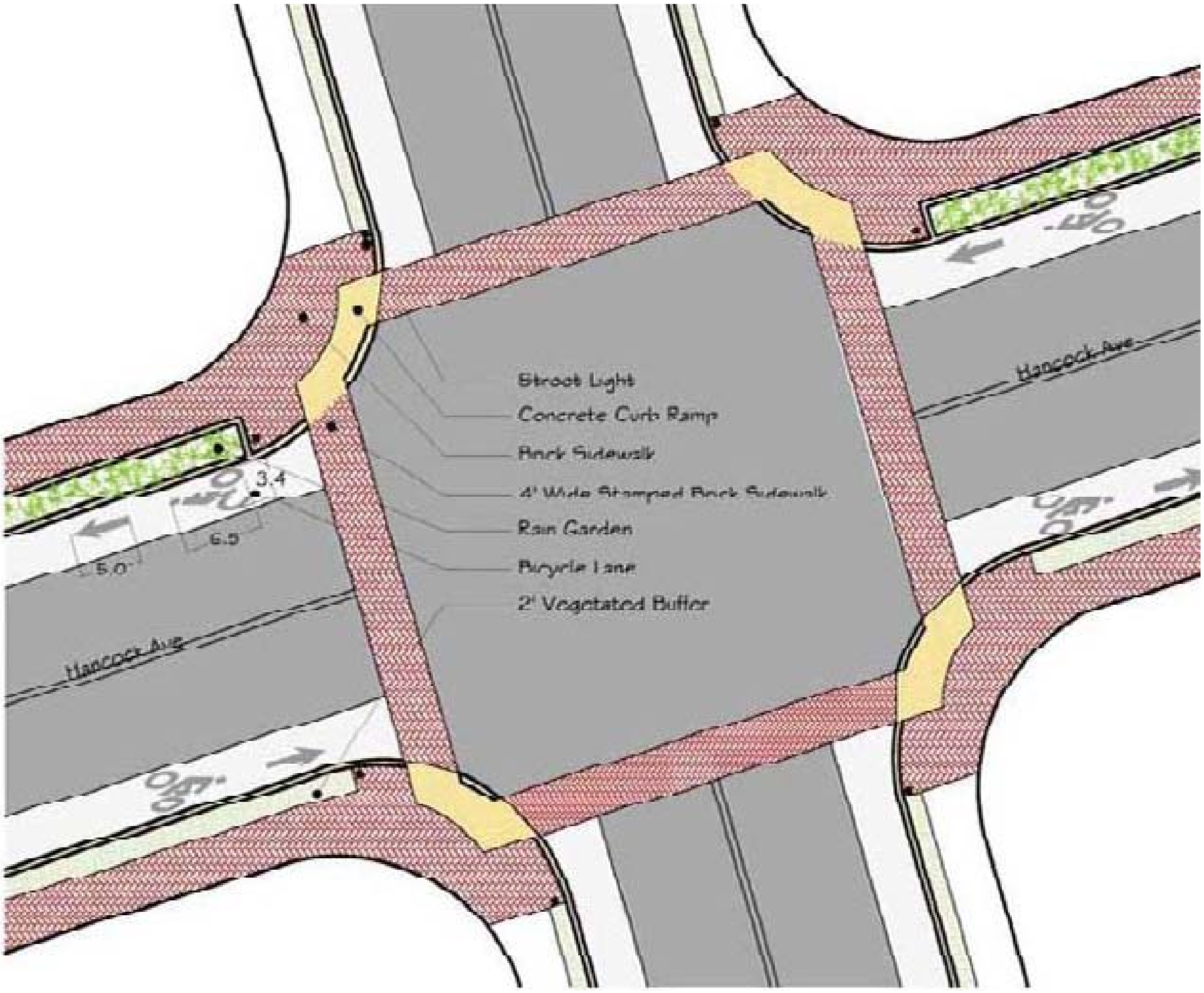

Figure 5.38. Hancock-Chase intersection.

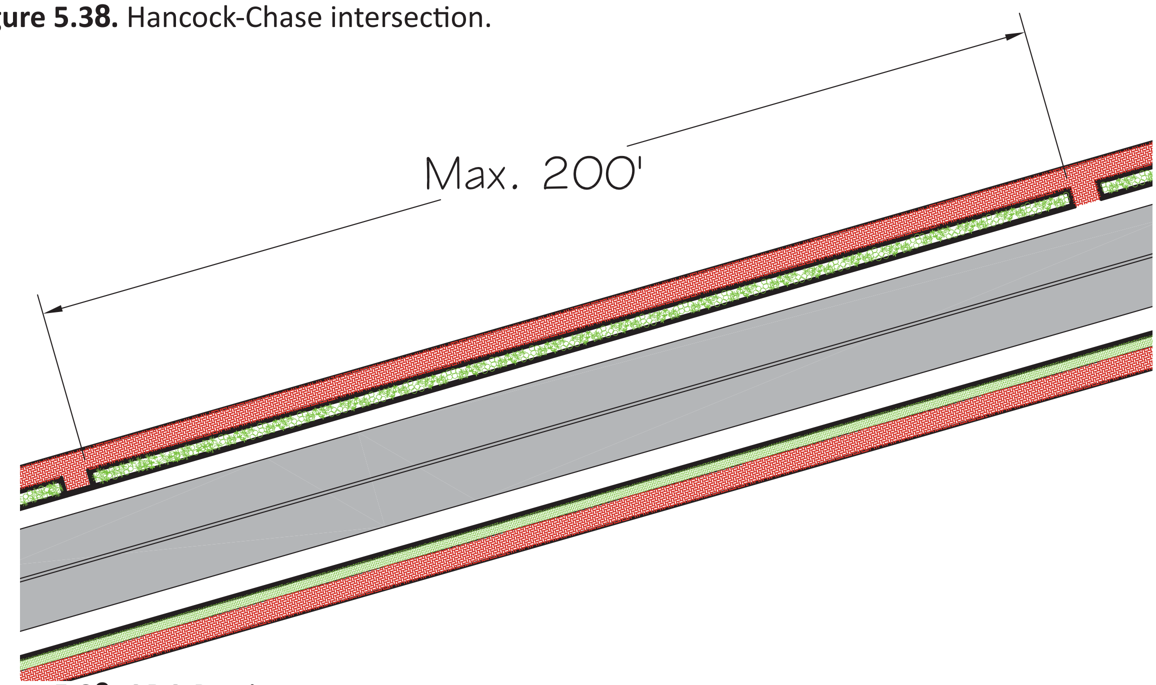

Figure 5.39. ADA Passing zone.

Figure 5.40. Rendering of Hancock Avenue streetscape.
View looking east from Pulaski.

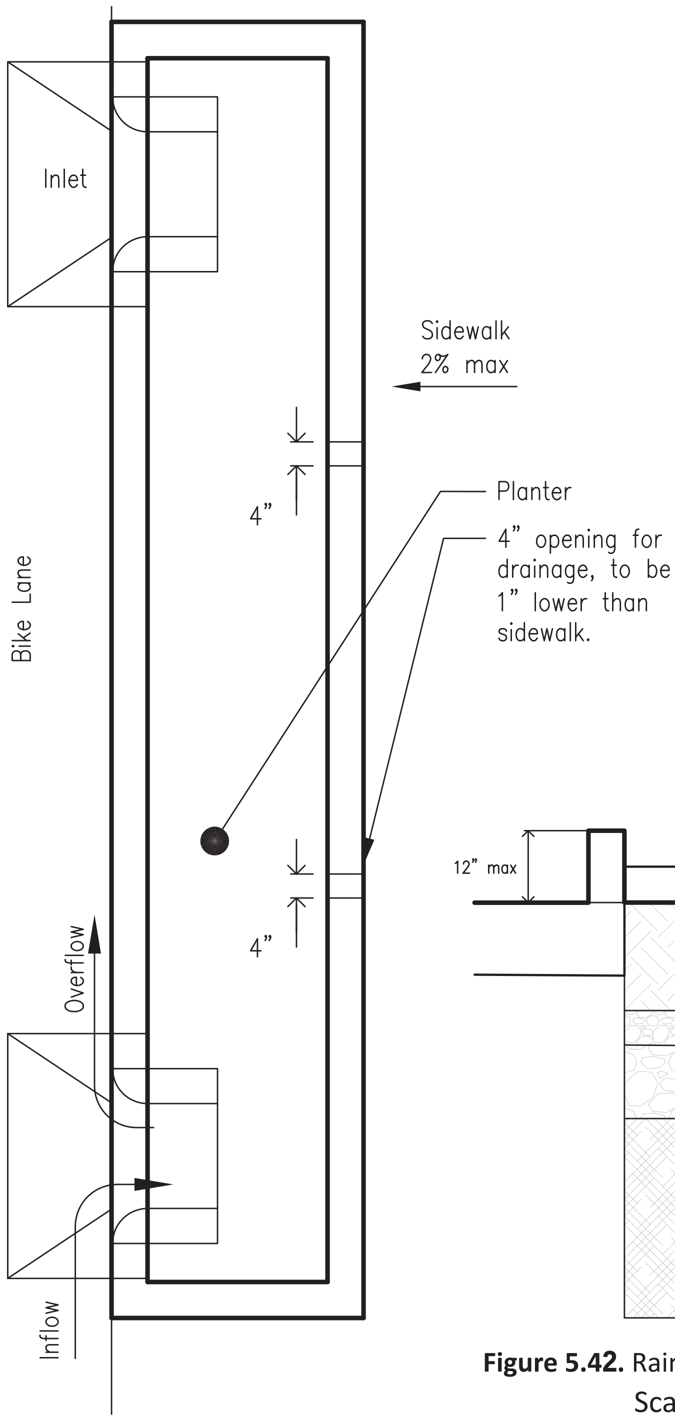

Figure 5.41. Raingarden details.
Scale 3/8" = 1'-0"

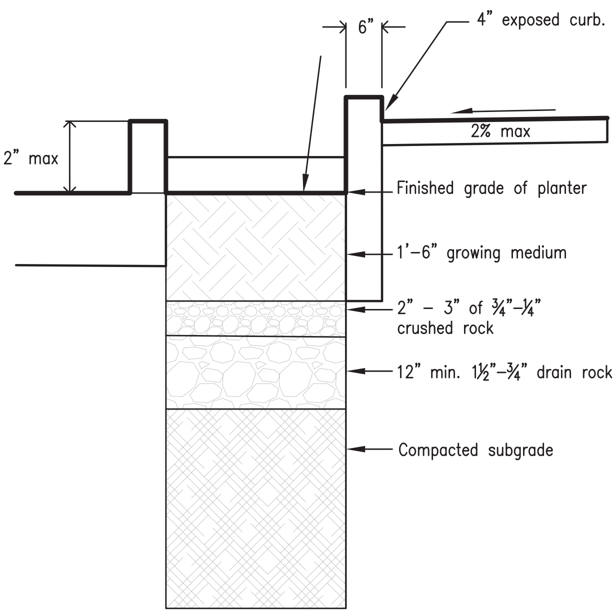

Figure 5.42. Raingarden section.
Scale 3/8" = 1'-0"

- **Bicycle**

The 4' bike lanes running along the entirety of the corridor are defined by white-tinted porous concrete. Road painting signaling these bike lanes are placed before and after every intersection (fig. 5.43). At the bus pull out lanes at the west end of the design site, the bicycle lane is defined by dashed, 8" wide painted lanes. Bicycle parking is found at the Broad Street intersection bus stop. Bike lanes are recommended along Chase Street and Rock Springs, in order to provide access to the Prince Avenue Corridor and Clarke Central High School. Additionally, it is recommended that The Plaza, a wide, low-traffic street that parallels Hancock, be converted to a bicycle boulevard. Along this thoroughfare, vehicle lanes will be placed along the outer portion of the roadway, while wide bicycle lanes are placed along the inside (fig 5.44). (Associates 2000) This will provide an alternative route of travel for less experienced and recreational cyclists that are not comfortable riding along Hancock.

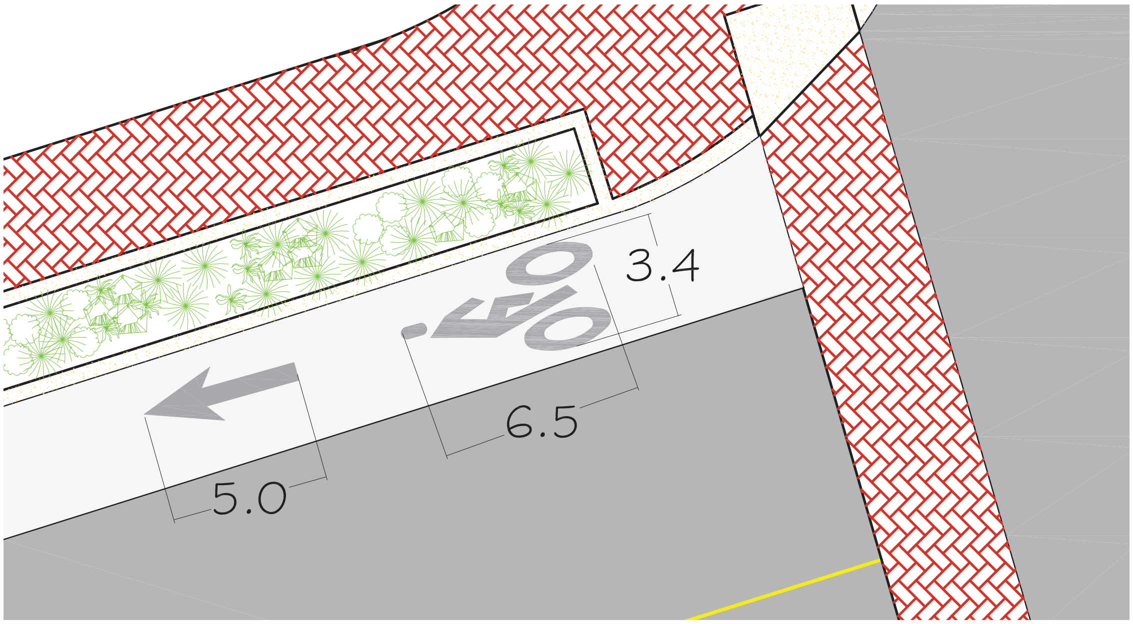

Figure 5.43. Bicycle lane markings.

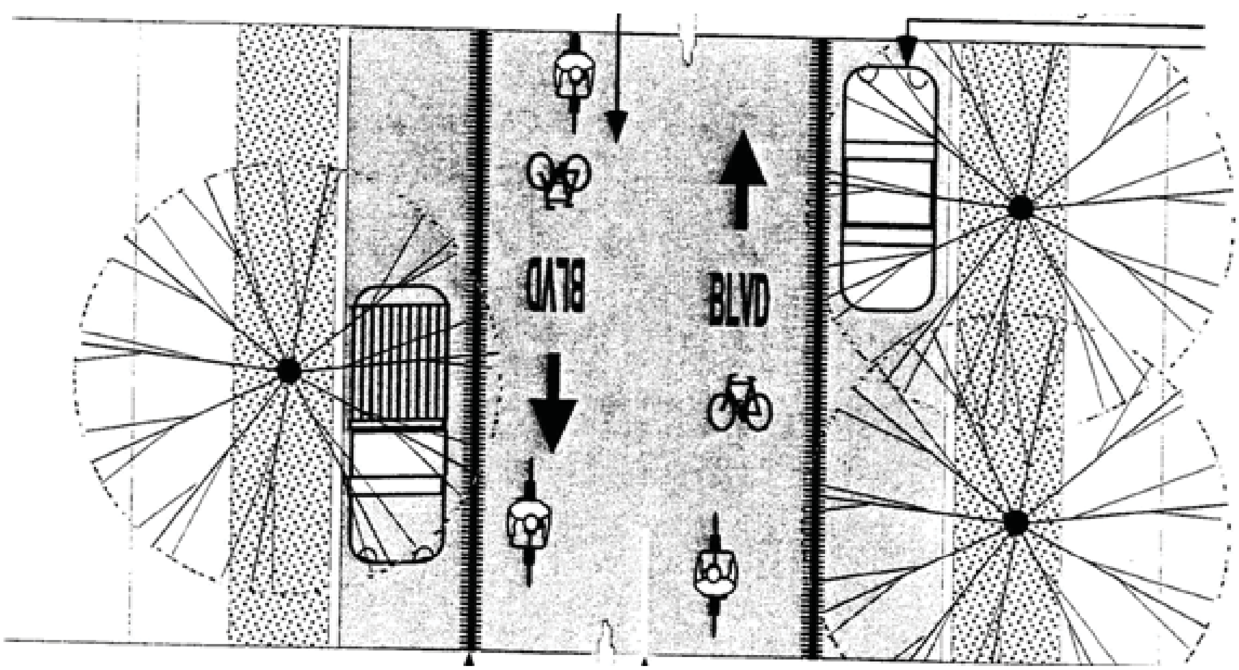

Figure 5.44. Bicycle boulevard. (Associates 2000)

- **Transit**

While bus routes serve the entirety of Hancock Avenue, bus stops are highly inadequate and are not ADA accessible, and bus stop locations are not optimal (Figs 5.45 & 5.46). This design includes, at a minimum, a 5' x 8' loading area at each stop, as well as seating, signage, a telephone, and a trash receptacle (fig. 5.47). Due to the narrow ROW and surrounding residential uses, there are several stops where the sidewalk must serve as a portion of the loading area. At stops, such as the one at the corner of Newton and Hancock, where there is not room to include a bench without obstructing pedestrian traffic, seatwalls are used to accommodate transit riders (fig 5.48).

Figure 5.45. Existing bus stop.

The Broad Street intersection stop serves a large public housing complex, and the many businesses along Broad St and Atlanta Highway. Additionally, future land use plans indicate that this area will transition to mixed use development, which will result in higher transit demand. Therefore, additional amenities, including a shelter and bicycle parking, are recommended at this stop.

Figure 5.46. Existing bus stop.

Amenities here will include shelters for riders, sheltered bicycle parking, and additional landscaping (figs 5.49 & 5.50). It is recommended that the shelter at this stop be transformed into a gateway for the Hancock corridor. A uniquely design shelter containing historic information about the Hancock area will inform residents and through travelers of the unique character of the place they are entering.

Bus stops are, typically, located at the far side of intersections. Exceptions to this are found three locations along the west-bound bus route. At the Hancock-Pope intersection, the bus stop is located on the near side, where the road is relatively flat and the stop is flanked by occupied buildings. The far side of this intersection slopes steeply uphill and is surrounded by vacant lots and buildings. At the Hancock-Rocksprings intersection, the bus stop is placed at the near side of the intersection where the popular Sheats Barber shop is located. The far side of this intersection is heavily shaded and surrounded by residential lots, and placing the stop at Sheats Barber Shop offers opportunities for collaboration with a successful local retail establishment that may be interested contributing to a more spacious bus stop and extensive bus stop amenities. Lastly, at the Broad St intersection, the bus stop is placed prior to the intersection of The Plaza, where Glenhaven was terminated. Here, a large parcel of land can provide adequate space for numerous bus stop amenities, a bus pullout lane, and additional landscaping.

All stops are placed, in accordance with AASHTO recommendations, a minimum of 40’ from the intersection. Because there is no on-street parking along Hancock, there is adequate space throughout the corridor for buses to reenter the flow of traffic. Bus pullout lanes are added at the Broad Street stop so that stopped buses do not impede the flow of traffic at this busy intersection (fig. 5.49).

The long range plans for Athens transit indicate longer service hours and additional Saturday service for some routes. Currently, the Hancock routes are not among those routes. It is recommended that the Hancock routes also provide extended hours of service because the residents of this corridor are typically engaged in lower skilled jobs that often require them to work during off-hours. Additionally, Saturday service does not serve the industrial area along Hwy 72. This area includes a large number of employers and should be included in Saturday routes. If extended service cannot be provided by the Hancock routes, signage at bus stops should indicate the most direct walking route to the Prince Avenue and Broad Street bus stops.

- **Safety**

Crime is a persistent problem within the Hancock Corridor, and safety concerns were expressed in community surveys and meetings conducted by ACC and MACORTS. There are numerous vacant buildings and lots along Hancock Avenue, and these detract from the safety of the area. Increasing the number of pedestrians and cyclists on Hancock will provide additional eyes on the street and significantly improve the safety of the area. Lighting is also used to improve the corridor's safety. Pedestrian scaled lamp posts are installed at all intersections and bus stops. Along the Church-Harris block, additional lighting is provided to increase the security of the area. A seatwall is installed along the north side of the road. This is a steeper section of road, and the seatwall will provide a resting stop for travelers, help retain the steep hillside of the vacant lot, and convert this dark section of road into a pedestrian niche. Should opportunities for improvements extend beyond Hancock's right of way, these vacant lots could provide an opportunity for the creation of pocket parks; small commercial establishments, particularly at the historic commercial node located at the Hancock-Pope intersection; mixed income housing; or other public amenities.

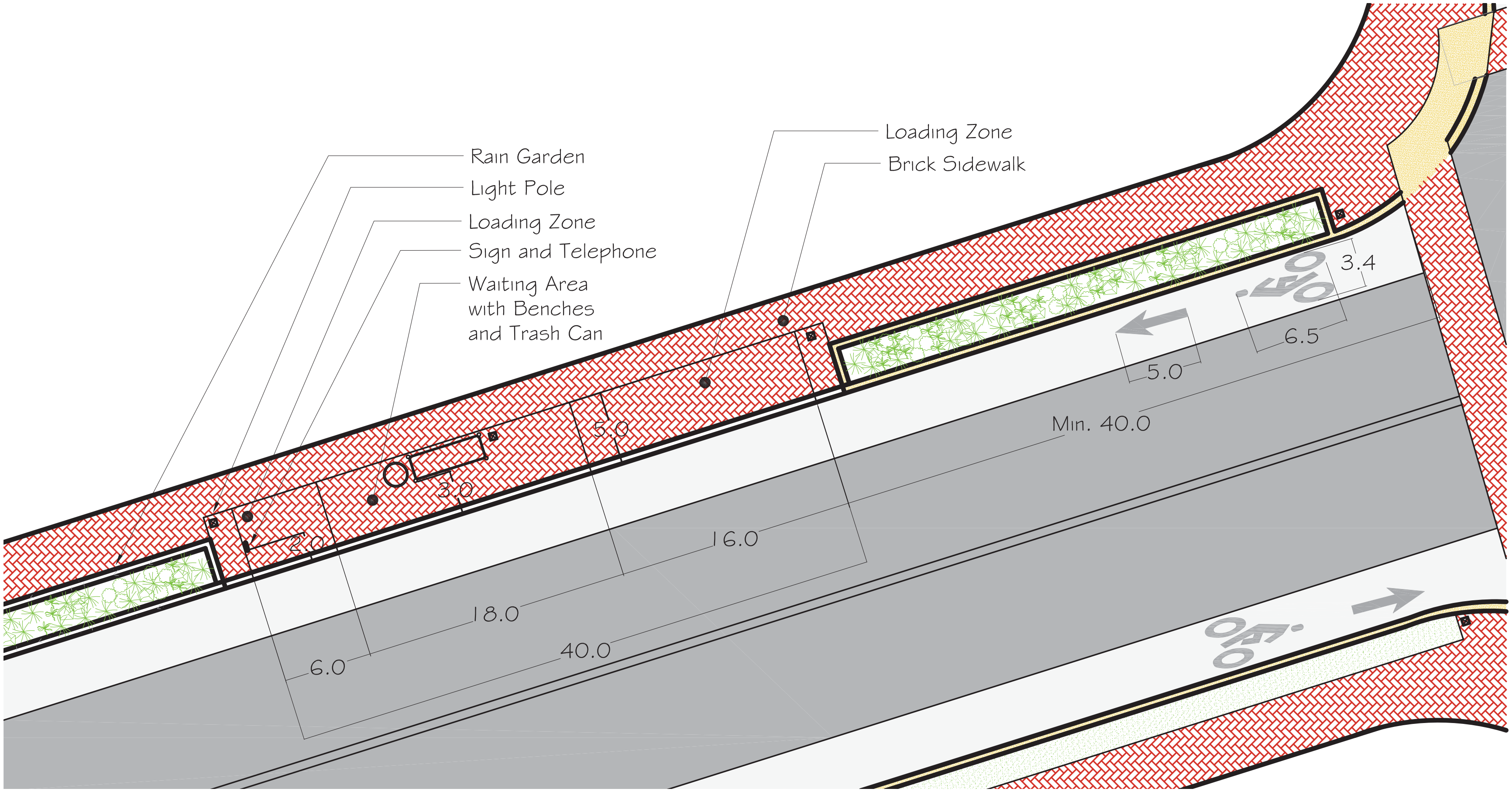

Fig. 5.47. Far side bus stop

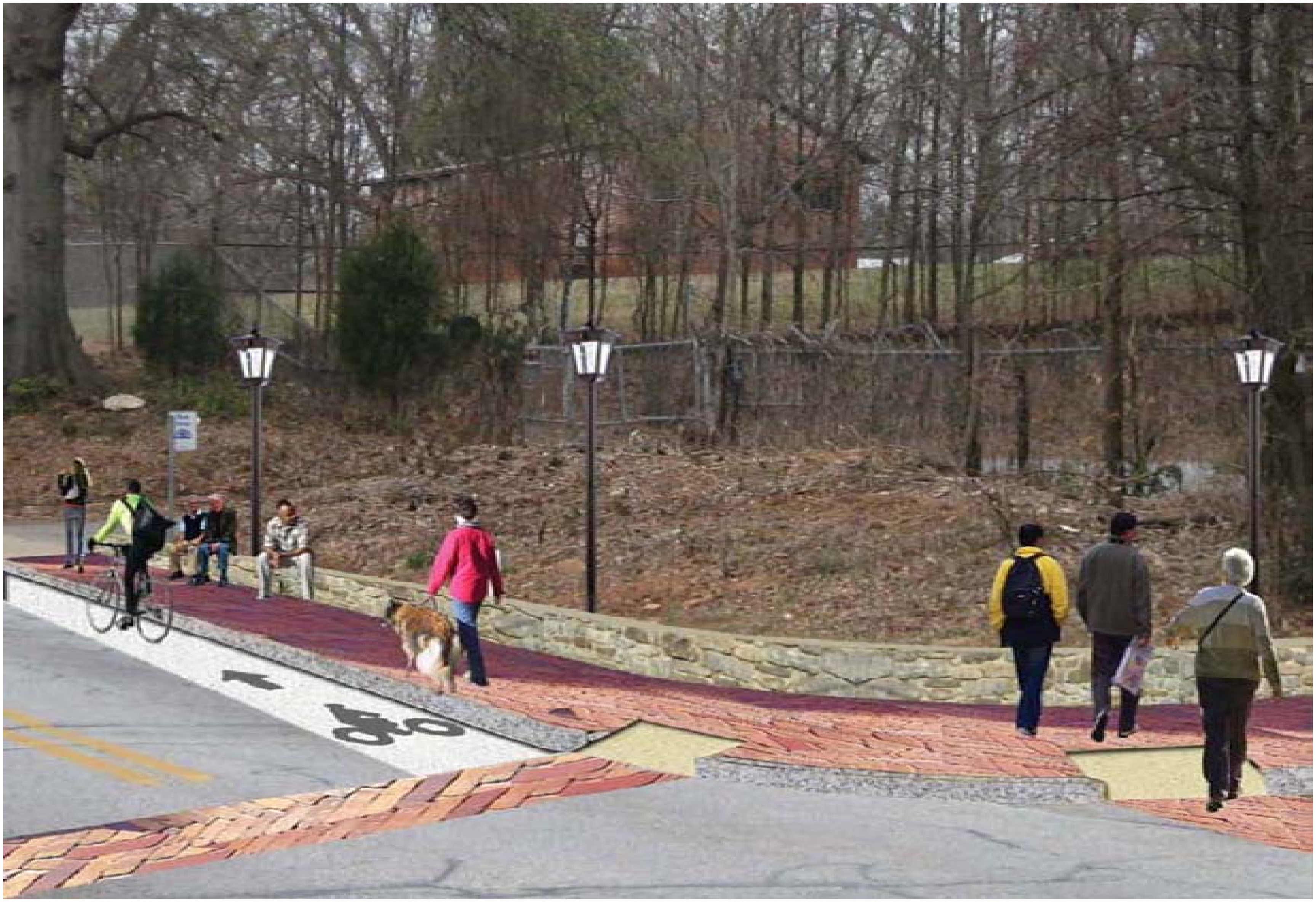

Fig. 5.48. Rendering of bus stop at Newton St. intersection.

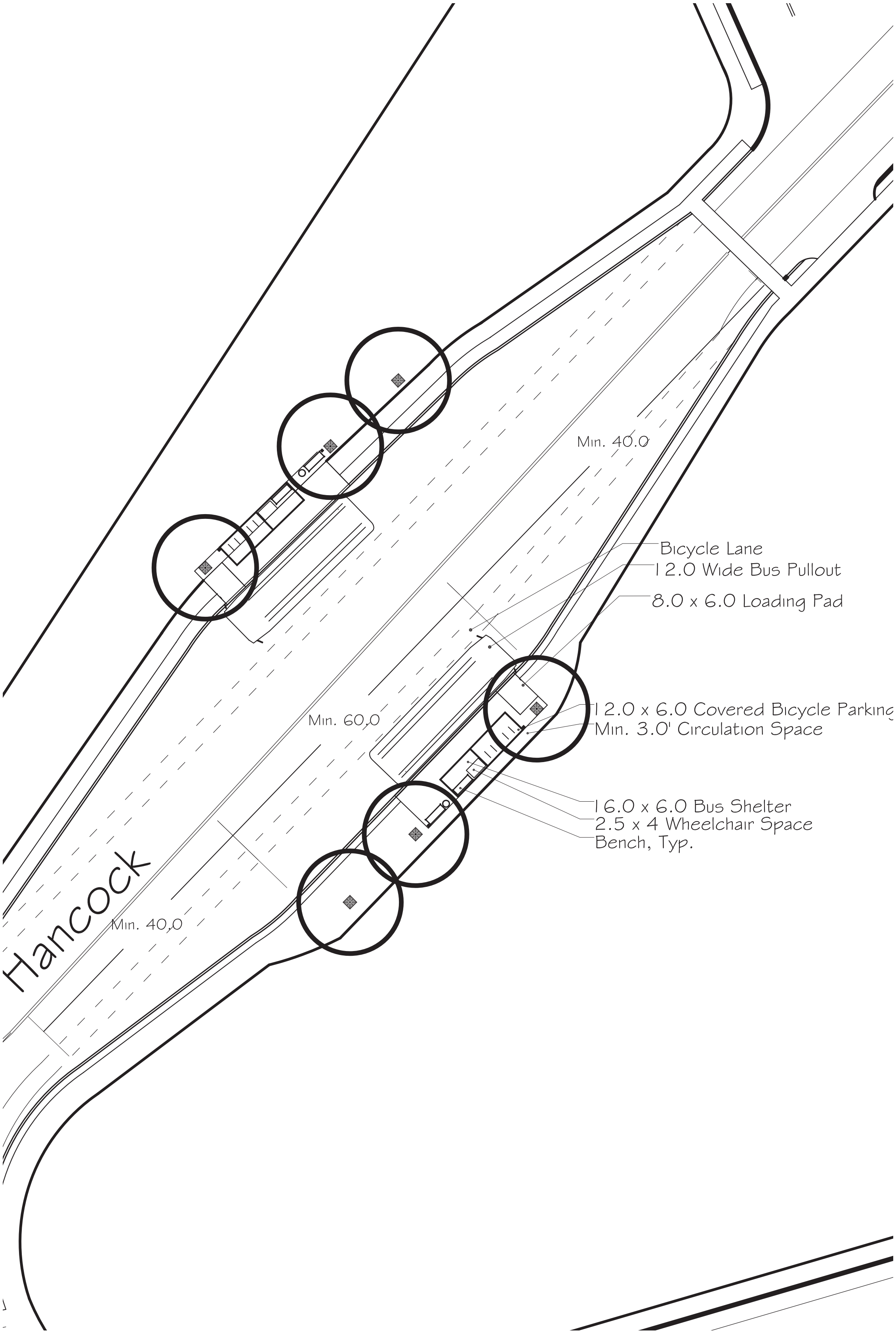

Fig. 5.49. Hancock intersection bus stop.

Fig. 5.50. Broad St. intersection bus stop: existing and proposed.

Hancock-Broad Intersection

The Hancock-Broad intersection is an excellent example of the numerous challenges that large, multi-street, skewed intersections can pose to all roadway users. Currently, three roads intersect Hancock in the final tenth of a mile leading to the Broad Street intersection. The major Glenhaven and Plaza intersections are at skewed angles. Prior to the main Glenhaven intersection, a cut through is provided that meets Hancock at a right angle. Upon meeting Broad Street, Hancock divides into a four-lane road with a large island dividing the two east-bound lanes. At this intersection, the lanes on the west side of the island meet Broad Streets at a skewed angle. While this angle allows turning vehicles to travel at a higher rate of speed, it creates a much longer crossing distance for pedestrians, and makes it difficult for drivers to see pedestrians, cyclists, and vehicles approaching the intersection from the west. The roadway width, at this point, is over 100’ wide, and there are no crosswalks or pedestrian crossing signals.(Fig. 5.51)

Fig 5.52. shows the proposed changes to this intersection. This resolution is based on AASHTO recommendations for dealing with multiple and skewed intersections (fig. 5.53) (Officials 2004). In this proposal, Glenhaven is terminated at the existing, uphill intersection which already meets Hancock at a right angle. An entryway island is installed at the Glenhaven intersection in order to narrow lane widths, slow traffic, and inform travelers that they are entering the historic Hancock Corridor and that the roadway configuration and associated travel behavior will change from what is existing on Atlanta Hwy/Broad St. At Broad Street, Hancock is realigned to meet at a right angle. The existing island is altered to divide east bound and west bound lanes, and provide a refuge for pedestrians and cyclists.

Currently, there is no existing infrastructure for cyclists at the Hancock-Broad intersection and on Atlanta Hwy/Broad St. A multi-use path is proposed along the south side of Atlanta Hwy. This will provide access to the commercial and employment resources located along this thoroughfare, as well as providing a connection to the bicycle lanes along the segment of Hancock running south of Atlanta Hwy that are proposed in ACC's bicycle master plan. To access this multi-use path, an 8' crosswalk exists across both Hancock and Atlanta Hwy, with 4' devoted to pedestrians and 4' to cyclists. The decision to remove cyclists from the roadway at this point is based upon the complexity of the intersection, the high rate of speed that vehicles on Atlanta Hwy travel, and the absence of a direct route from the portions of Hancock to the North and South of Atlanta Highway.

Fig. 5.51. Aerial image of existing Broad St-Hancock Ave intersection.

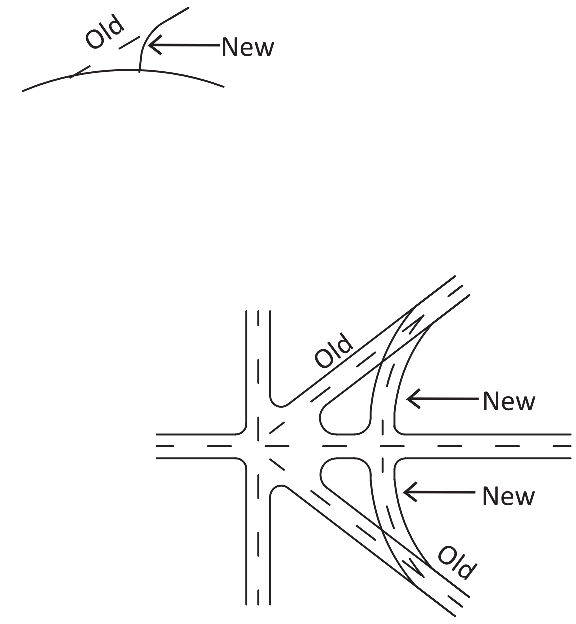

Fig. 5.53. AASHTO intersection realignment recommendations. (Officials 2004)

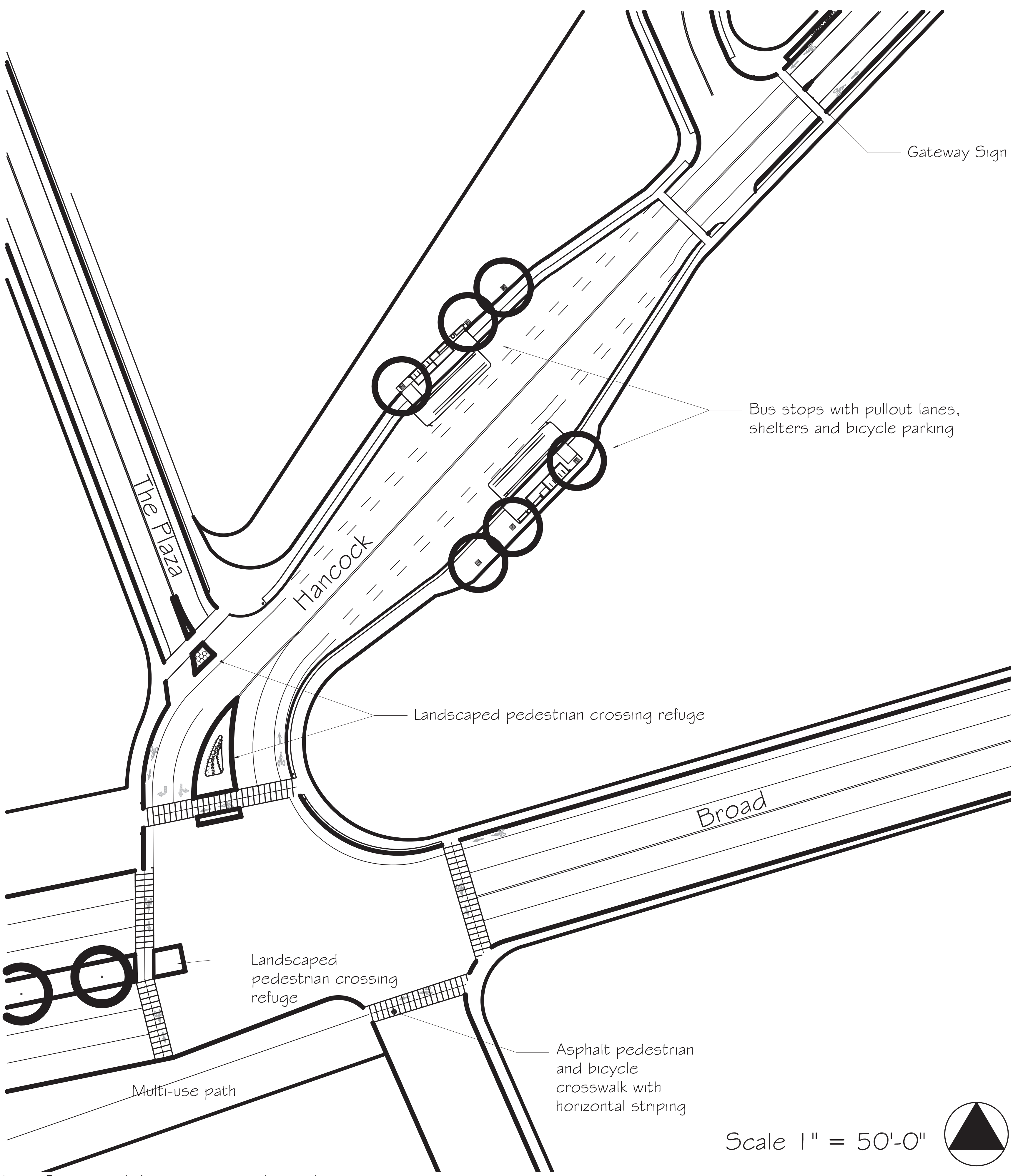

Fig. 5.52. Proposed changes to Hancock-Broad intersection.

Issue of Gentrification

While improvements in transportation options can vastly increase people's opportunities and quality of life, they can also lead to gentrification. Creating a more attractive, walkable, bikeable, and safer environment within the Hancock Corridor could easily lead to increased property values in the area. While keeping current residents in this highly desirable, in-town location will require a multi-pronged approach, including policy and funding initiatives focused on keeping current residents in the neighborhood, several design strategies, aim to avoid this situation. First, the focus of this design is on meeting the modal needs of current residents. Community input gathered during ACC and MACORTS planning sessions guided this strategy, as well as the analysis of the area's demographics. This design focuses on connecting residents with employment centers and neighborhood schools. This will improve residents' ability to increase their job skills and widen the range of job opportunities available to them, while reducing the percentage of their income that is invested in automobile travel. Proposals to extend bus service hours and Saturday service to include the Hancock area and the major employment center along Hwy 72, as well as the vastly improved bus stops, and access to bus stops, will enable residents to improve their economic situation. Improvements in sidewalk and bicycle infrastructure, particularly leading to Clarke Central High School, UGA, and the bus to Athens Tech, will increase students' independence and ability to travel to educational opportunities without a car. Making sidewalks and bus stops ADA accessible will enable the higher percentage of disabled and elderly people found in this area to access destinations within the city.

Secondly, the design improves access to, and the roadside appeal of, local businesses, such as those located around the Rocksprings-Hancock intersection, and the Hancock-Broad intersection, and will encourage increased patronage of these establishments, bringing income to the corridor.

Finally, this historically and culturally informed design strives to enhance the existing aesthetic of this community, rather than create a new place and new environment. By using materials and forms drawn from the historic landscape, and highlighting the area's rich history and importance within the context of greater Athens, the design responds to, and builds upon, the existing community fabric. The changes made along the Hancock Corridor are designed as part of this area's natural evolution: just as the future accomplishments of Hancock area residents can grow from those of past residents, so can the structural improvements of the corridor's transportation system grow from the wealth of materials and patterns already existing in the landscape.

Conclusion

The design proposal for the Hancock Corridor's multi-modal transportation infrastructure seeks to "link social justice with spatial justice" by providing equal opportunity for area residents through improved mobility and access (Lipsitz 2007). While the results of this design cannot be determined without implementation and long range evaluation, the process can be evaluated through a review of the negative effects caused by auto-centric transportation planning on residents of the Hancock Corridor.

Demographic data clearly indicates low income levels, higher levels of unemployment, and lower graduation rates among Hancock residents. Recommended improvements in transit scheduling that will provide access to jobs along Hwy 72 and during evening hours will increase opportunities to travel to work by bus. Furthermore, improved transportation options to educational institutions will allow residents to increase their skill levels and obtain higher-wage jobs. Currently, access to transit is severely compromised by the insufficient bus stops, lack of curb ramps, and a disconnected system of sidewalks and bicycle lanes. This design creates opportunities for all residents, including the handicapped, to access public transportation. Finally, by enhancing the transportation infrastructure serving local businesses and improving the streetscape around the small commercial nodes within the corridor, this design provides opportunities for increased patronage of existing businesses.

Due partly to automobile traffic, Athens does not meet new federal air quality standards (Aued 2009). This design can provide environmental benefits to all Athenians through the provision of improved alternatives to private automobile travel and improved water quality due to the stormwater runoff management provided by raingardens and porous paving. By reallocating roadway space to delineate zones for different users, rather than widening the existing paved area, this design increases the capacity of the existing roadway while decreasing the impervious surface area within the corridor. Noise pollution will decline along Hancock Ave, as the traffic calming strategies of neighborhood gateways and road narrowings will encourage through traffic to travel at a slower rate of speed. Finally, the raingardens and porous paving will reduce the incidents of erosion that are seen throughout this steeply sloped area.

Finally, the transportation improvements proposed will also improve recreational opportunities and contribute to the overall quality of life of area residents. The addition of ADA accessible sidewalks, continuous bike lanes, and improved safety will make the new neighborhood park more appealing, increase opportunities for children to travel independently to school, and transform the roadway into a public space as well as a place for travel. Following the recommendation of case studies and scholarly research, this design addresses the issue of safety. Highly visible crosswalks, improved lighting, and streetscape improvements that strive to draw people out of their homes and onto the public realm will create a more secure environment for all roadway users.

The obstacles encountered during the design of the Hancock Corridor's multimodal transportation system can provide valuable lessons for future community revitalization projects. Several challenges arose when attempting to apply design standards to the retrofit of narrow neighborhood roads. These standards provide an abundance of information on desired widths for travel lanes, bike lanes, buffer zones and sidewalks; however, these widths are, often, impossible to meet. In this design, the decision was made to begin with accessibility and safety, then address aesthetic, environmental, and social needs. To allow for ADA access on both sides of the road, the buffer zone and travel lanes are narrowed. While the buffer zone is no longer wide enough to accommodate street trees, taller grasses and perennials, as well as bike lanes, will provide a sense of safety and enclosure for pedestrians. The design also identifies city owned land that could be encroached upon to allow for larger bus stops. In some instances, cooperation with private landowners, who could have a vested interested in providing transit service, is recommended in order to create larger bus stops. The Hancock-Newton bus stop, for example, is placed on the property of a apartment complex, and the same is done on a publically owned piece of land at the Hancock-Pope intersection.

Any structural improvements in transportation infrastructure should occur in conjunction with routing and scheduling adjustments. While a designer can provide unprecedented access to a transit stop, if it does not take the rider where he needs to go, opportunities to improve access to areas outside of the neighborhood are lost. Similarly, land use and transportation planning must be coordinated. For example, the Reese-Pope neighborhood park will prove of little value to residents if the streets accessing the park are not accessible and safe.

Overcoming the aesthetic and safety issues posed by vacant, unmaintained, and unsightly neighboring structures and lots posed an additional challenge to this narrow, linear design. Because there was not adequate space to plant vegetated screens, an effort was made to define the edge in these areas, creating a distinct break between the public zone and the adjacent lot.

Lastly, on site evaluation of the roadway and surrounding community is critical to identifying needs, creating a design vocabulary, observing people's travel patterns, and identifying areas of opportunity. A significant shortfall of this design process was the absence of community input related to the specific project. While information gathered through previous surveys and meetings proved relevant to this design, far more community input should be obtained prior to finalizing and implementing any transportation design.

The Portland and Baltimore case studies utilized community charettes, neighborhood walks with residents, and surveys to identify residents' needs, areas of concern within the neighborhood, and to gain a sense of the community's character. Efforts to gain community input should aim to engage the community, to the greatest extent possible, in the design of their neighborhood roadways. The Federal Highway Administration provides a guide to residents interested making their community a more walkable place. This guide educates citizens in the elements that contribute to walkable communities, as well as ways to organize neighbors and collaborate with professionals and government agencies. (Sandr 2008)This guide could serve as a bridge between Hancock residents and design professionals, facilitatating communication between these two groups. Specific outreach efforts should incorporate group exercises, such as charettes, with individual surveys that contact all residents, including those uninvolved in a charette exercise. It is particularly important that these efforts identify specific areas of concern within the neighborhood, particularly areas that create safety issues; and residents' travel to work patterns.

Despite the obstacle created by a lack of community input, the history, materials, landscapes, and patterns found through research and observation speak to both the assets and needs of the Hancock Community. Forging connections with the past, through the use of an historically derived kit of parts, informs the design of multi-modal transportation infrastructure that creates connections between current residents and the opportunities existing both within and beyond their community.

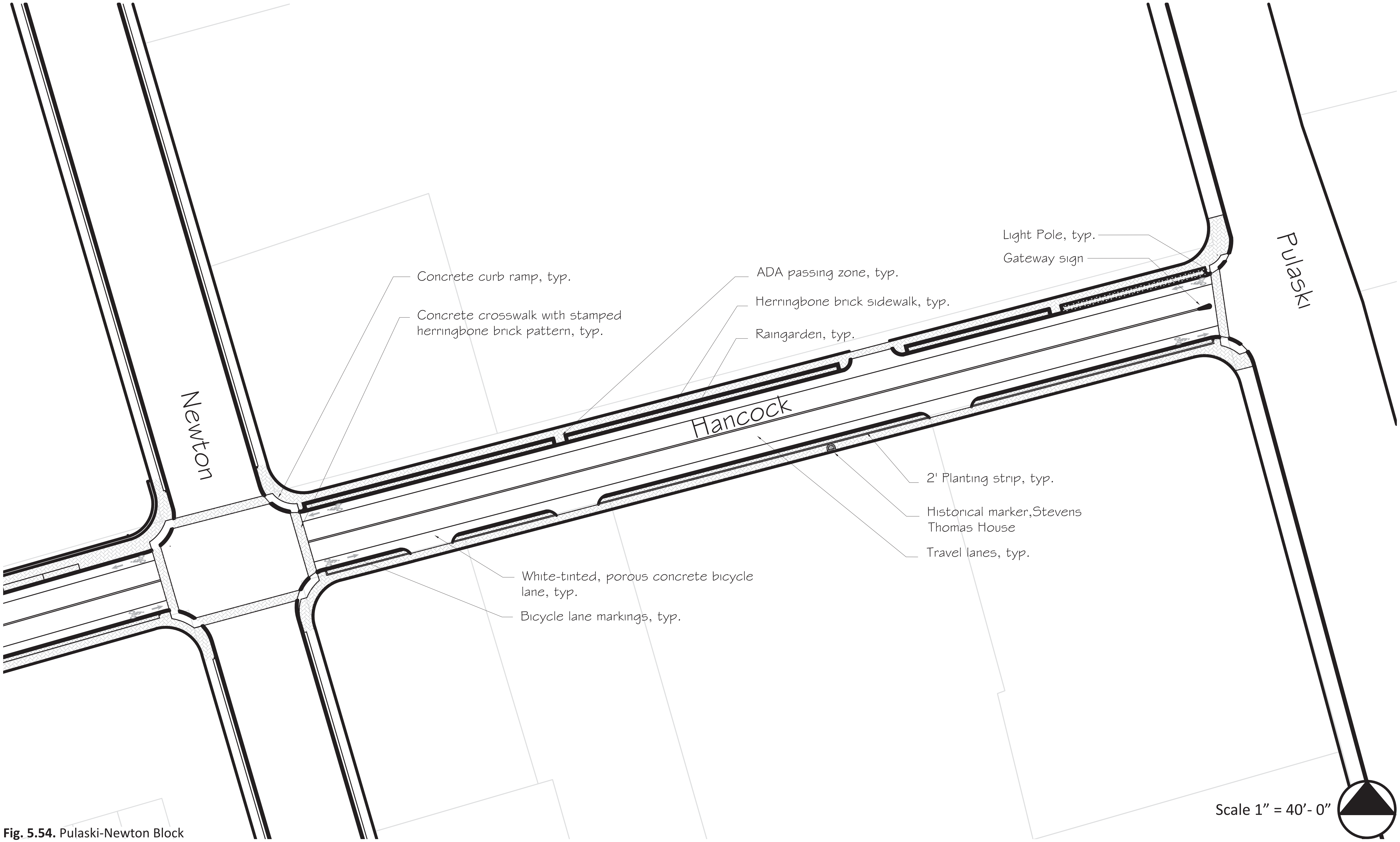

Fig. 5.54. Pulaski-Newton Block

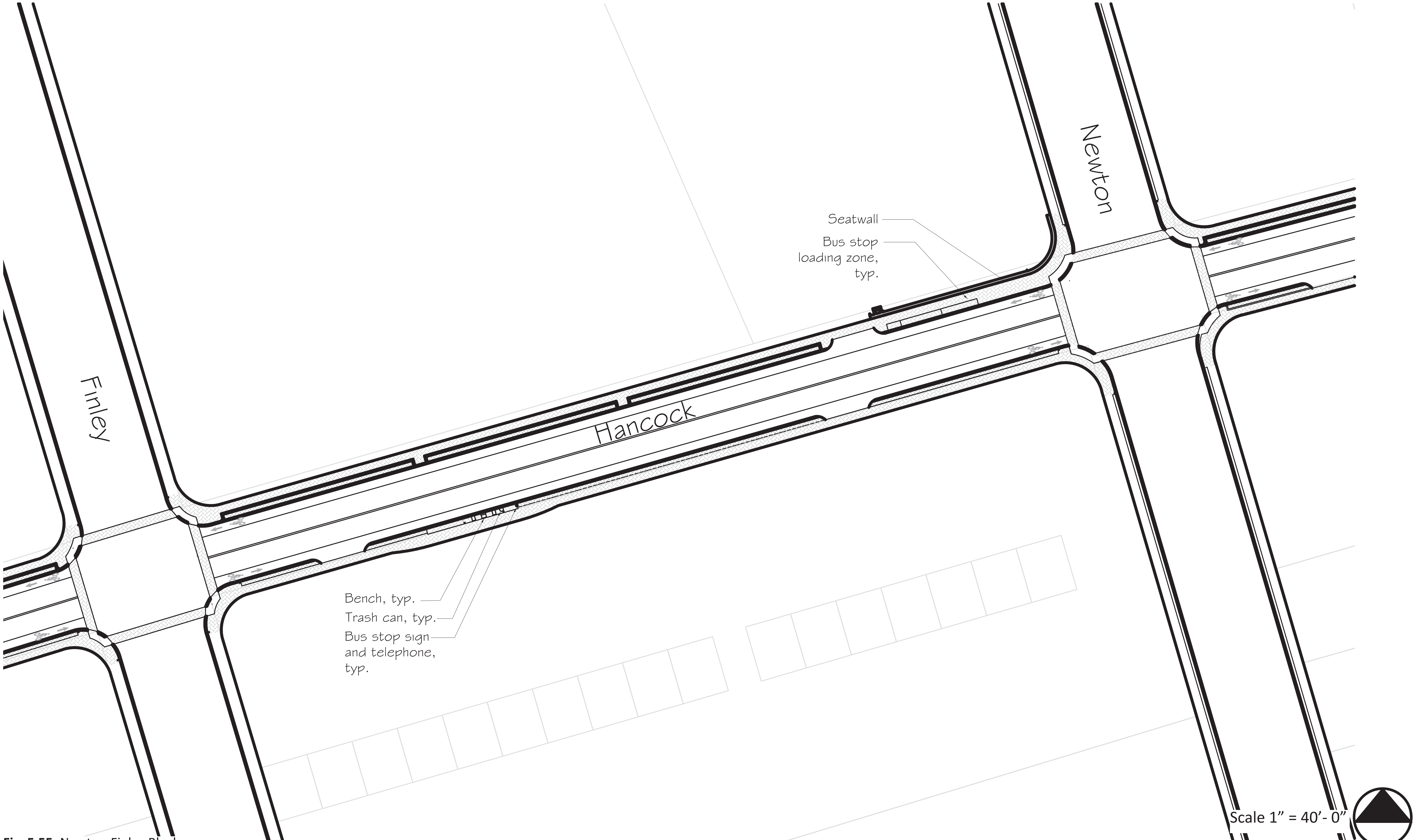

Fig. 5.55. Newton-Finley Block

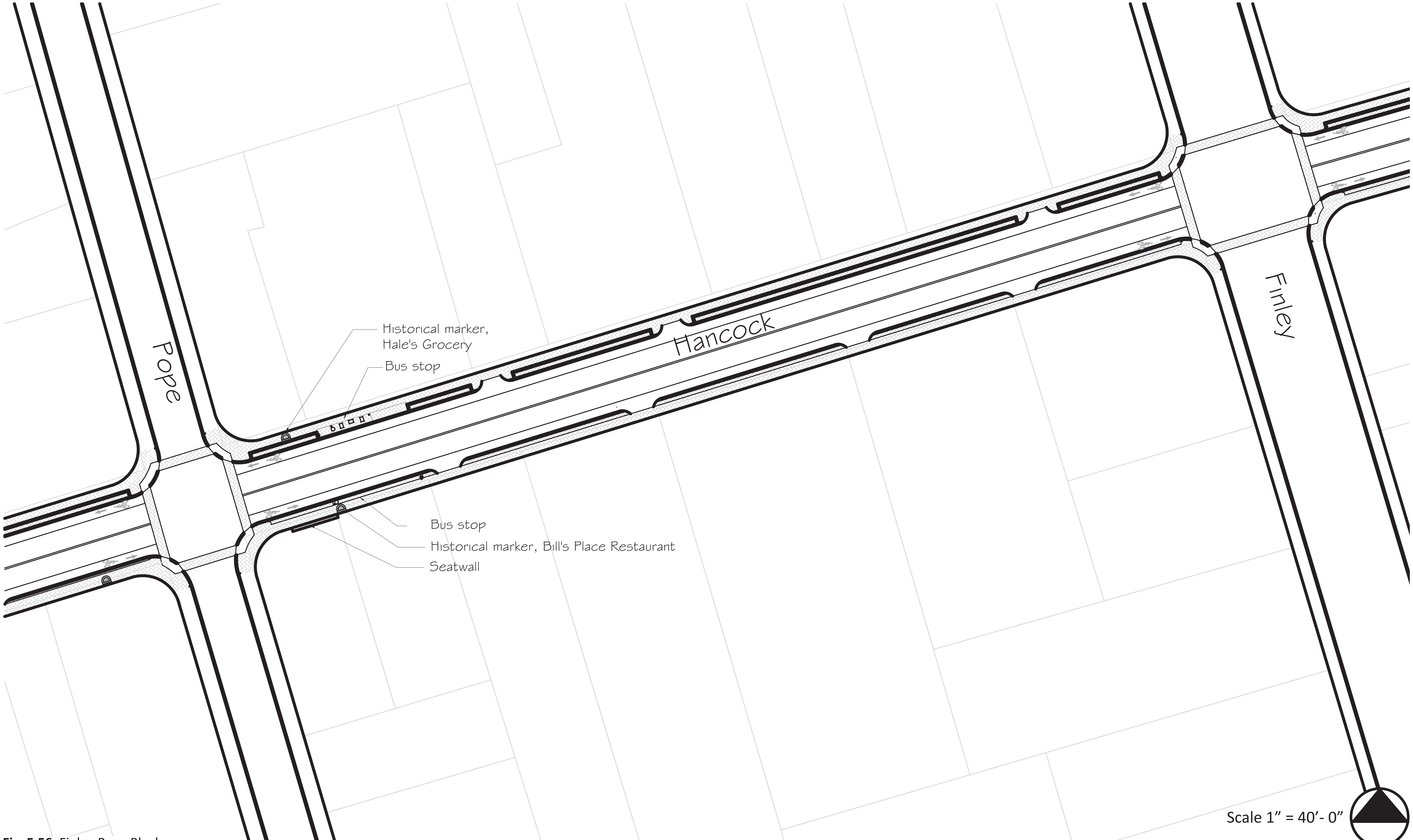

Fig. 5.56. Finley-Pope Block

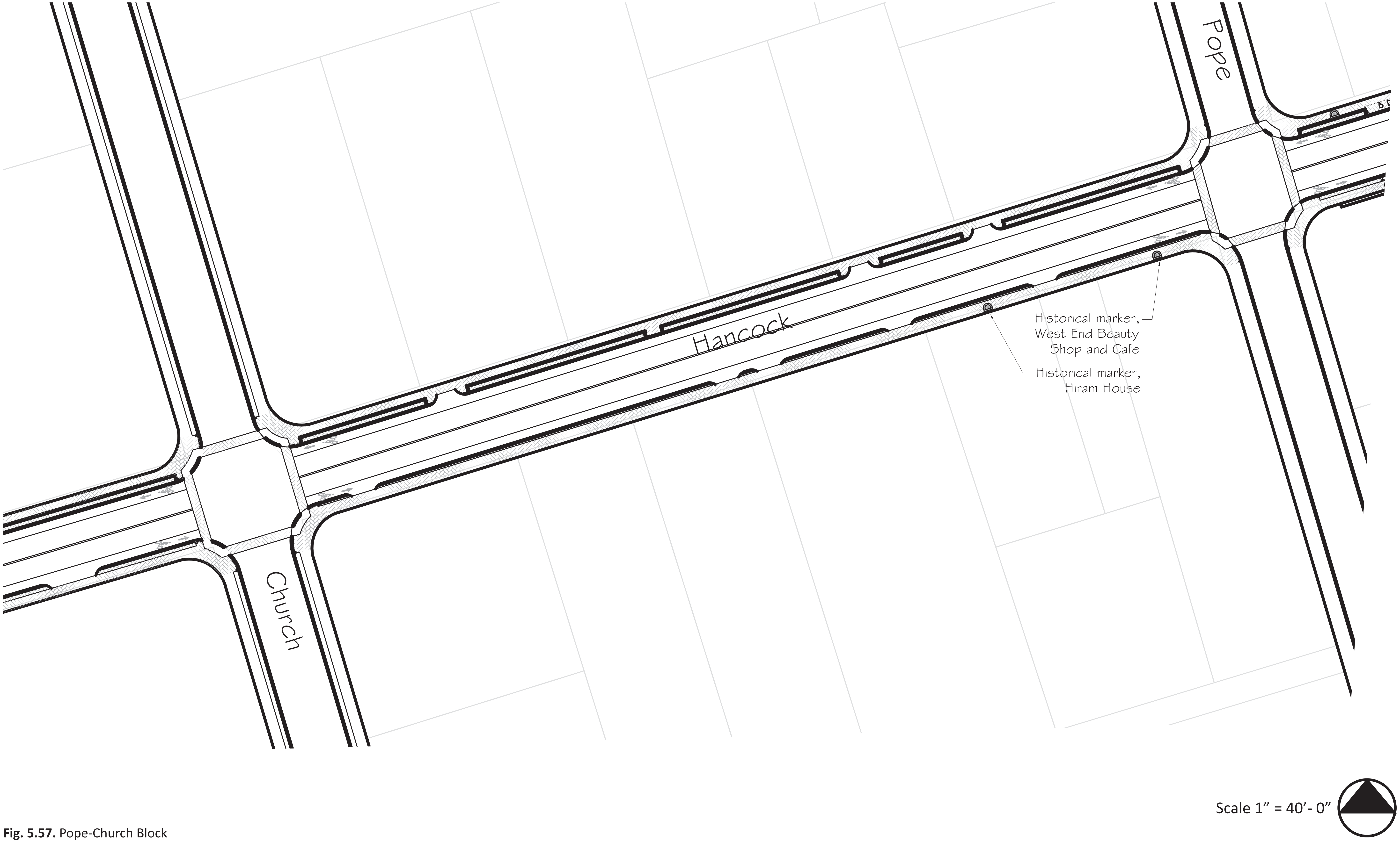

Fig. 5.57. Pope-Church Block

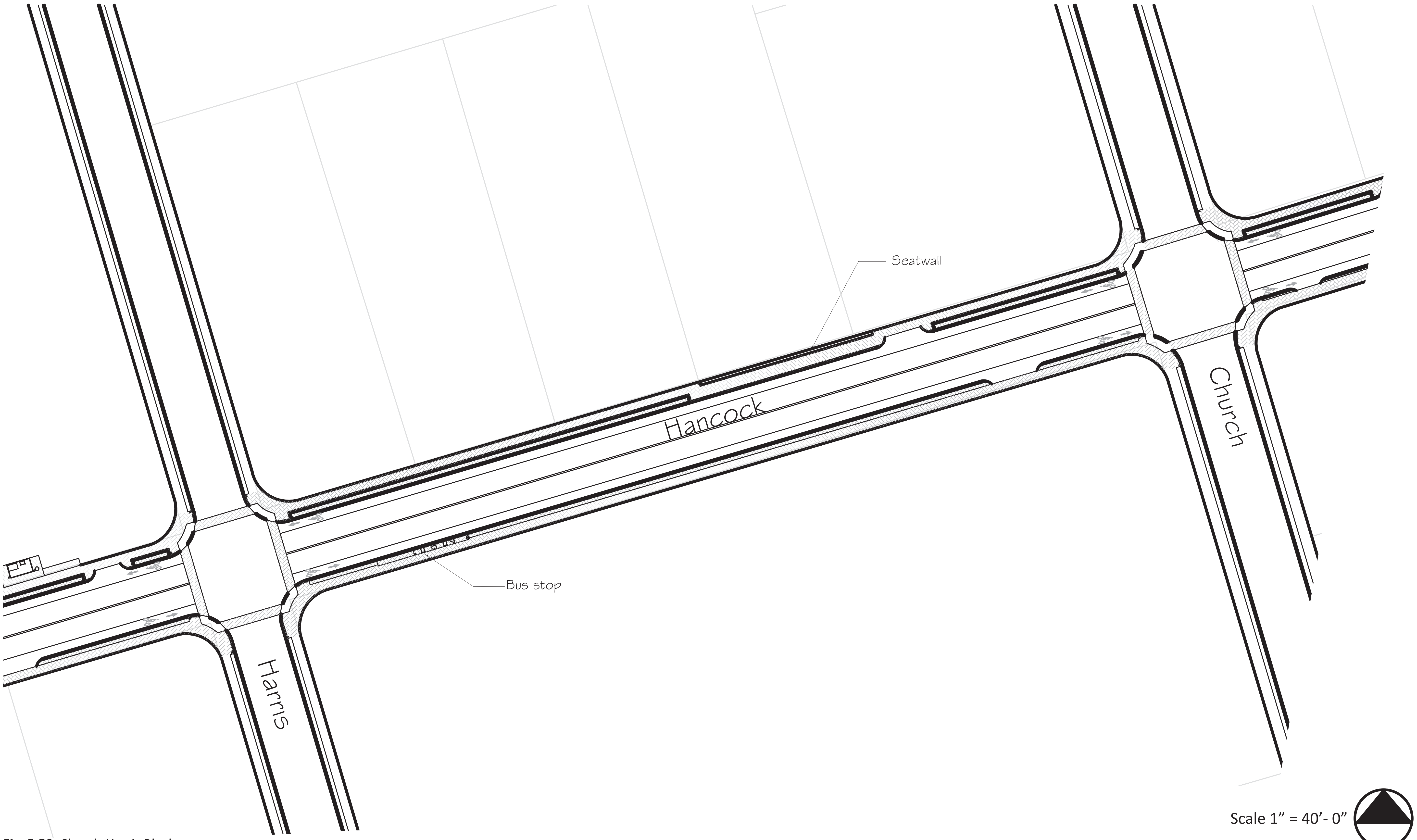

Fig. 5.58. Church-Harris Block

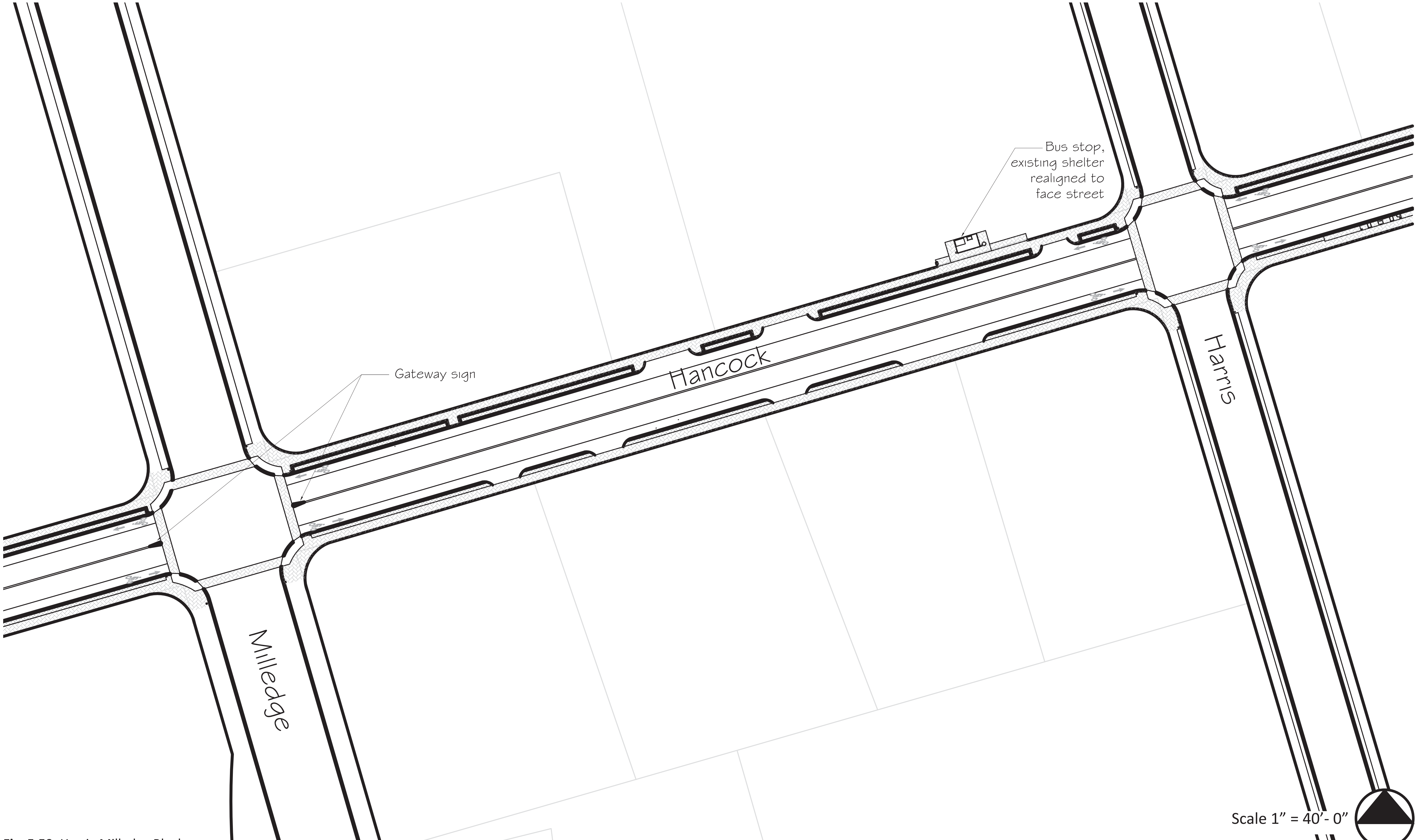

Fig. 5.59. Harris-Milledge Block

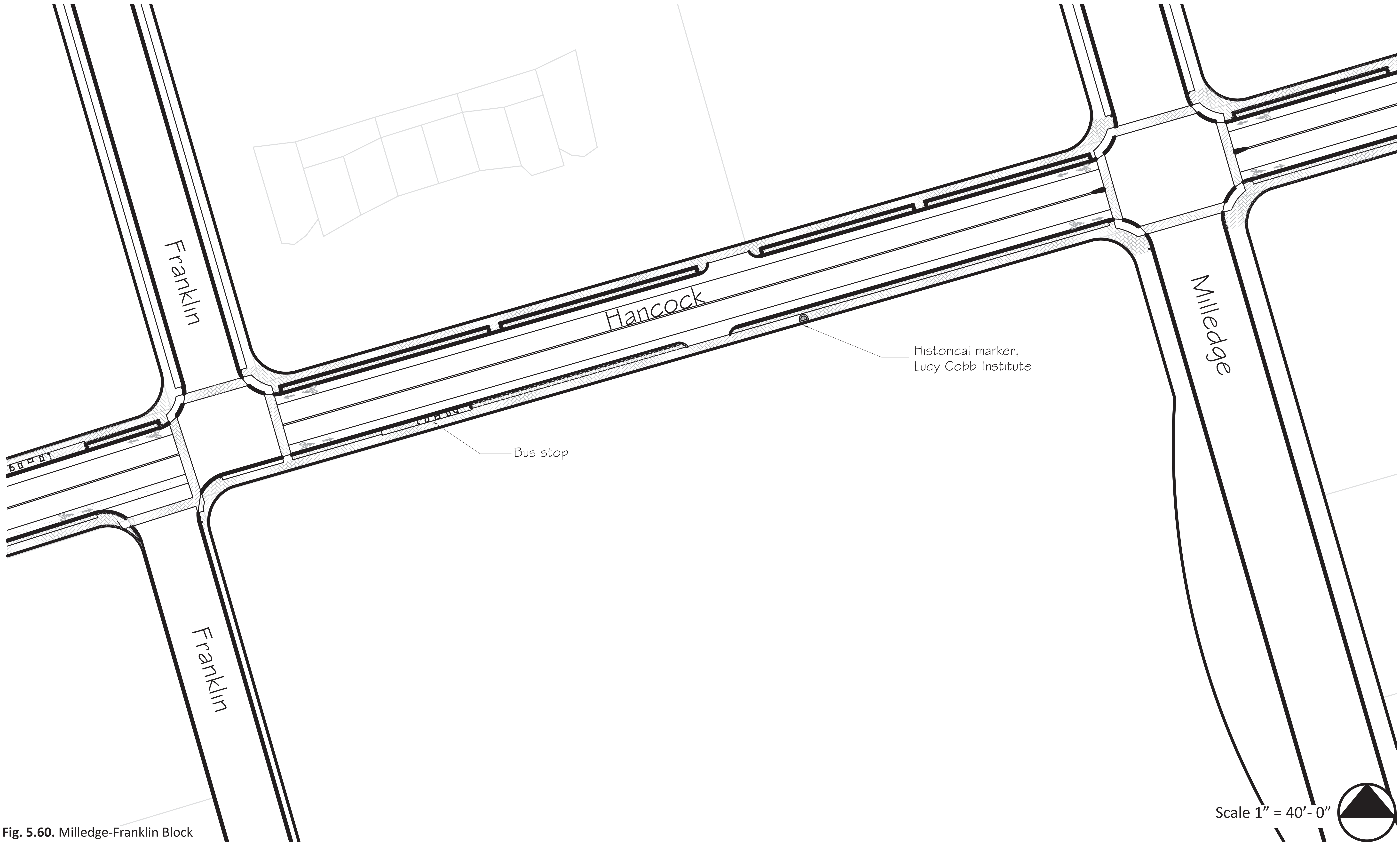

Fig. 5.60. Milledge-Franklin Block

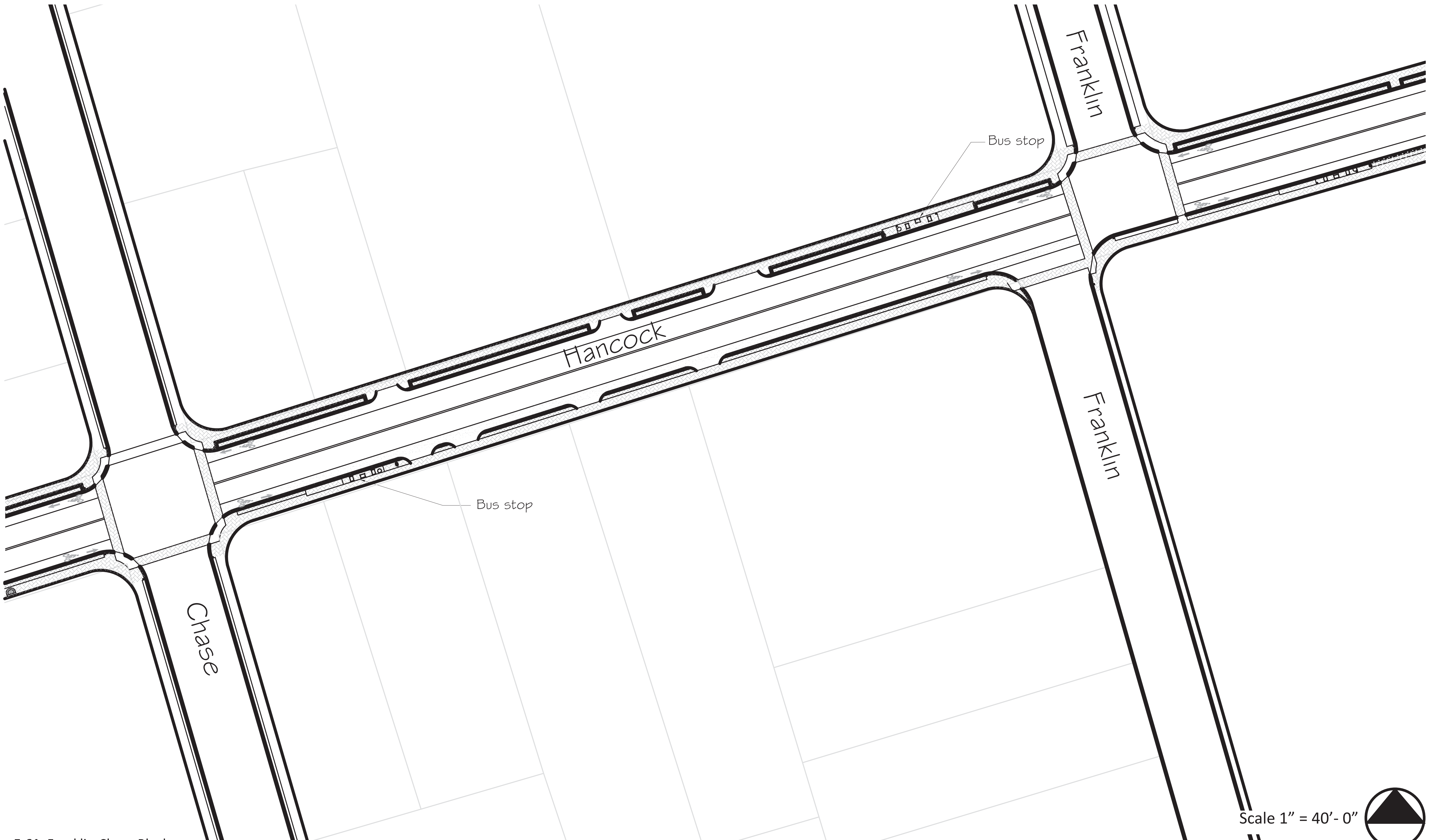

Fig. 5.61. Franklin-Chase Block

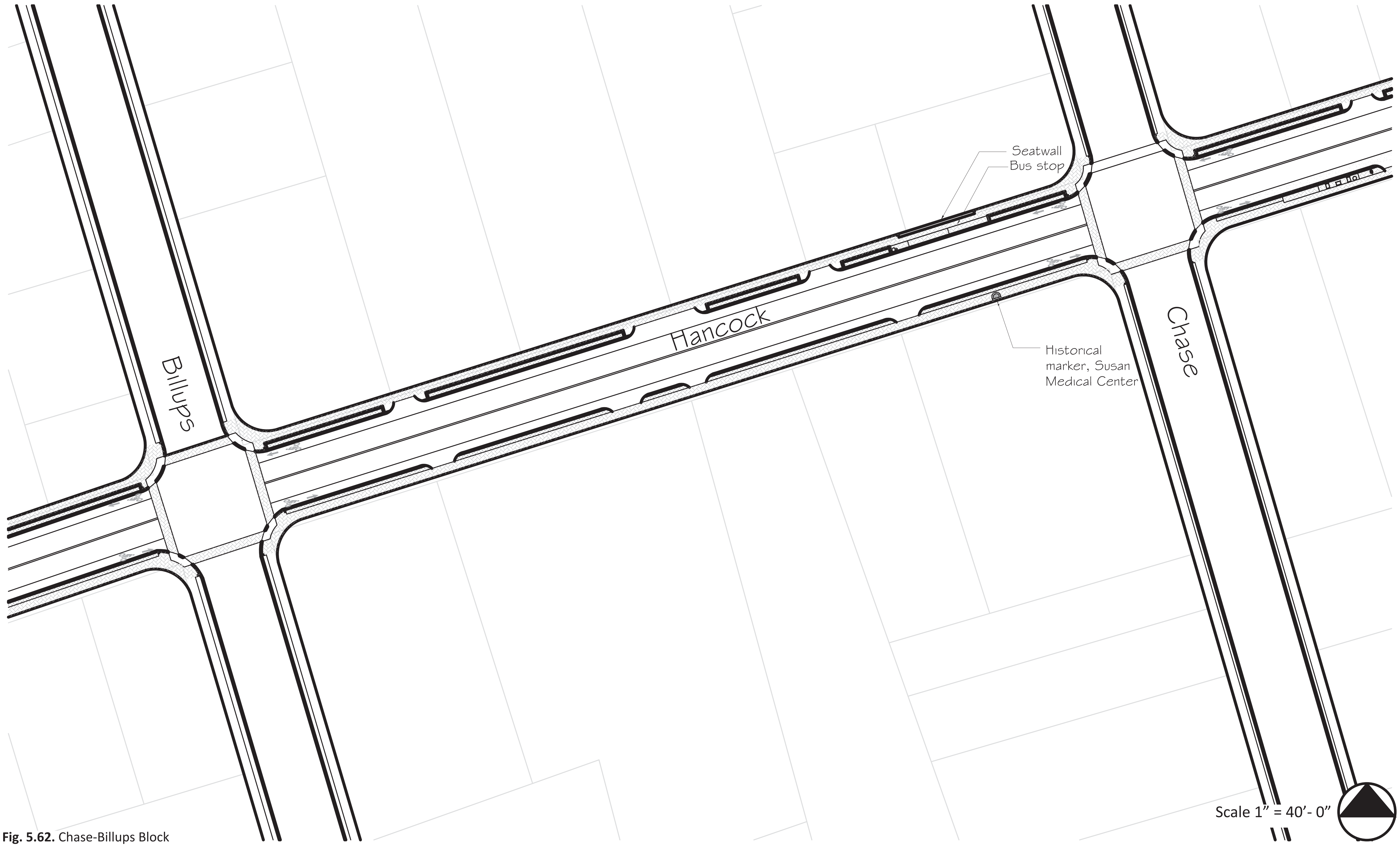

Fig. 5.62. Chase-Billups Block

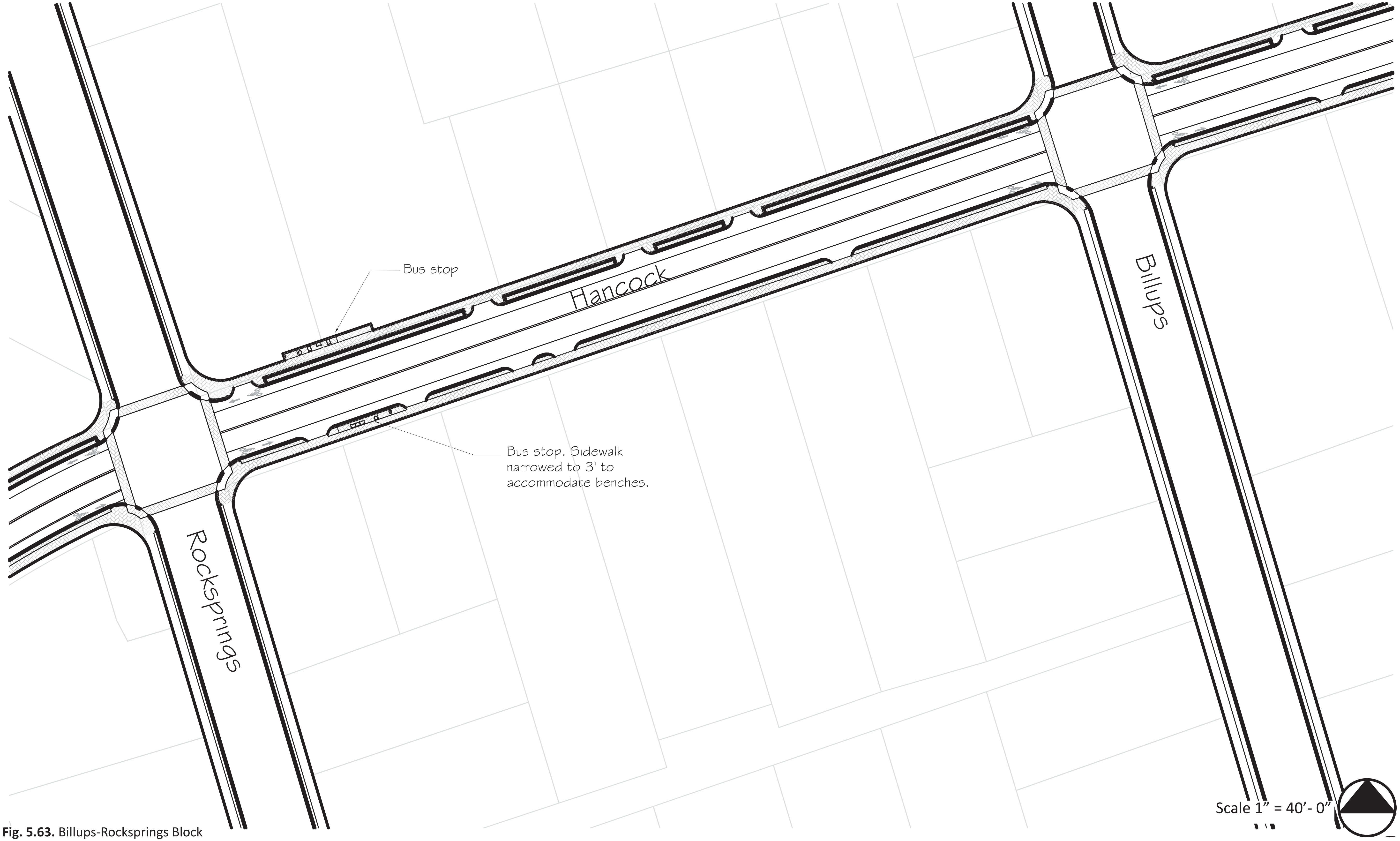

Fig. 5.63. Billups-Rocksprings Block

Fig. 5.64. Rocksprings-Broad Block, Segment 1

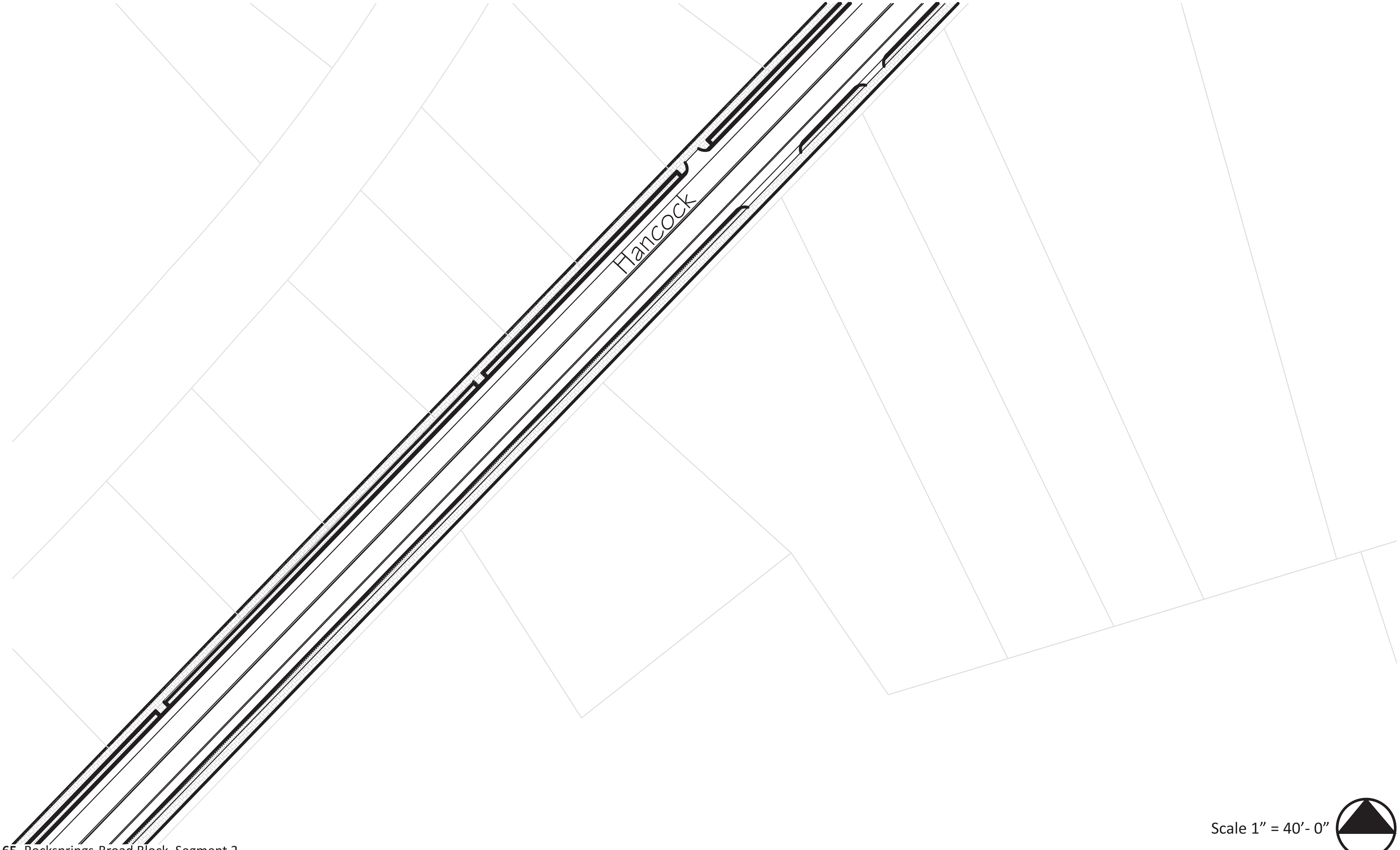

Fig. 5.65. Rocksprings-Broad Block, Segment 2

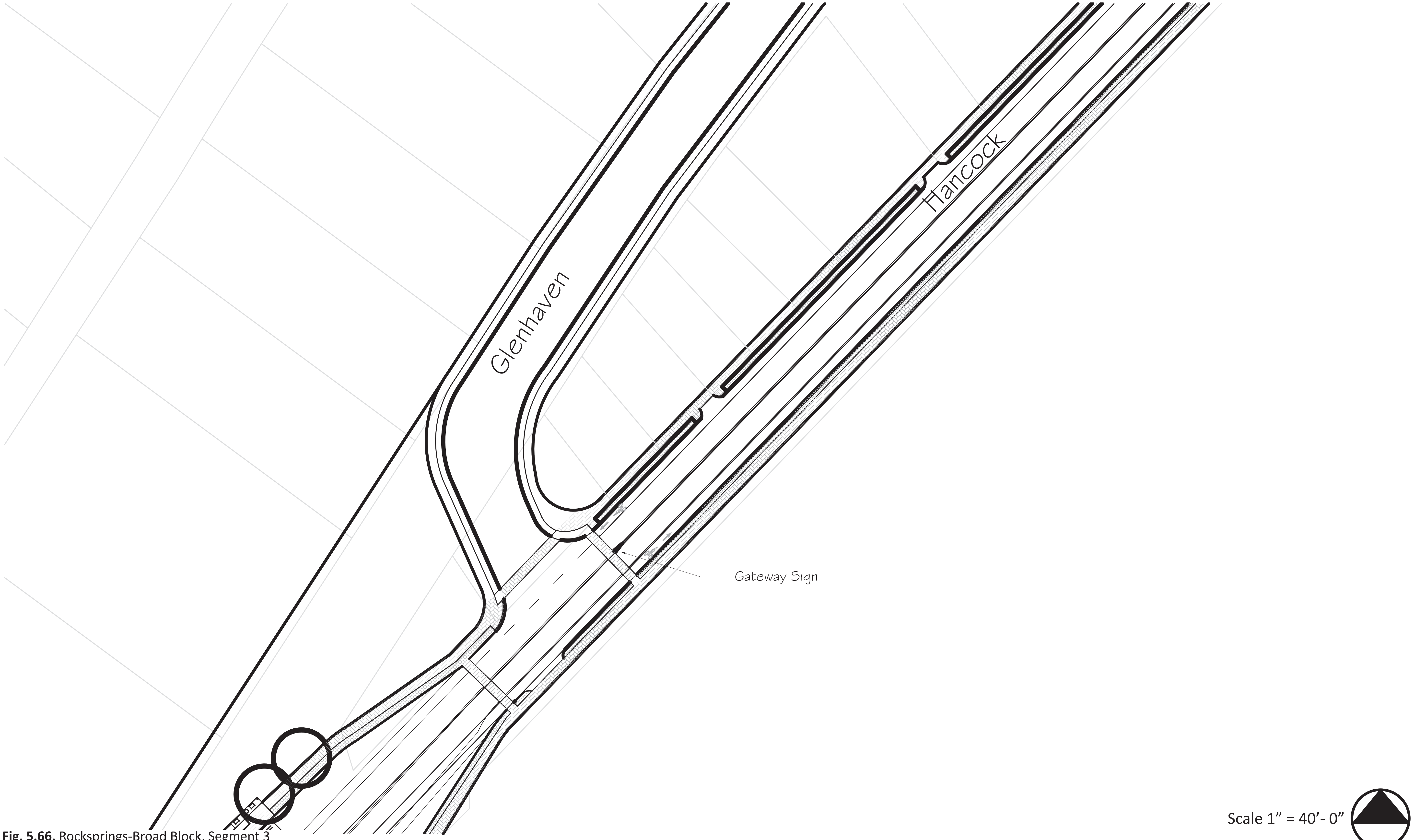

Fig. 5.66. Rocksprings-Broad Block, Segment 3

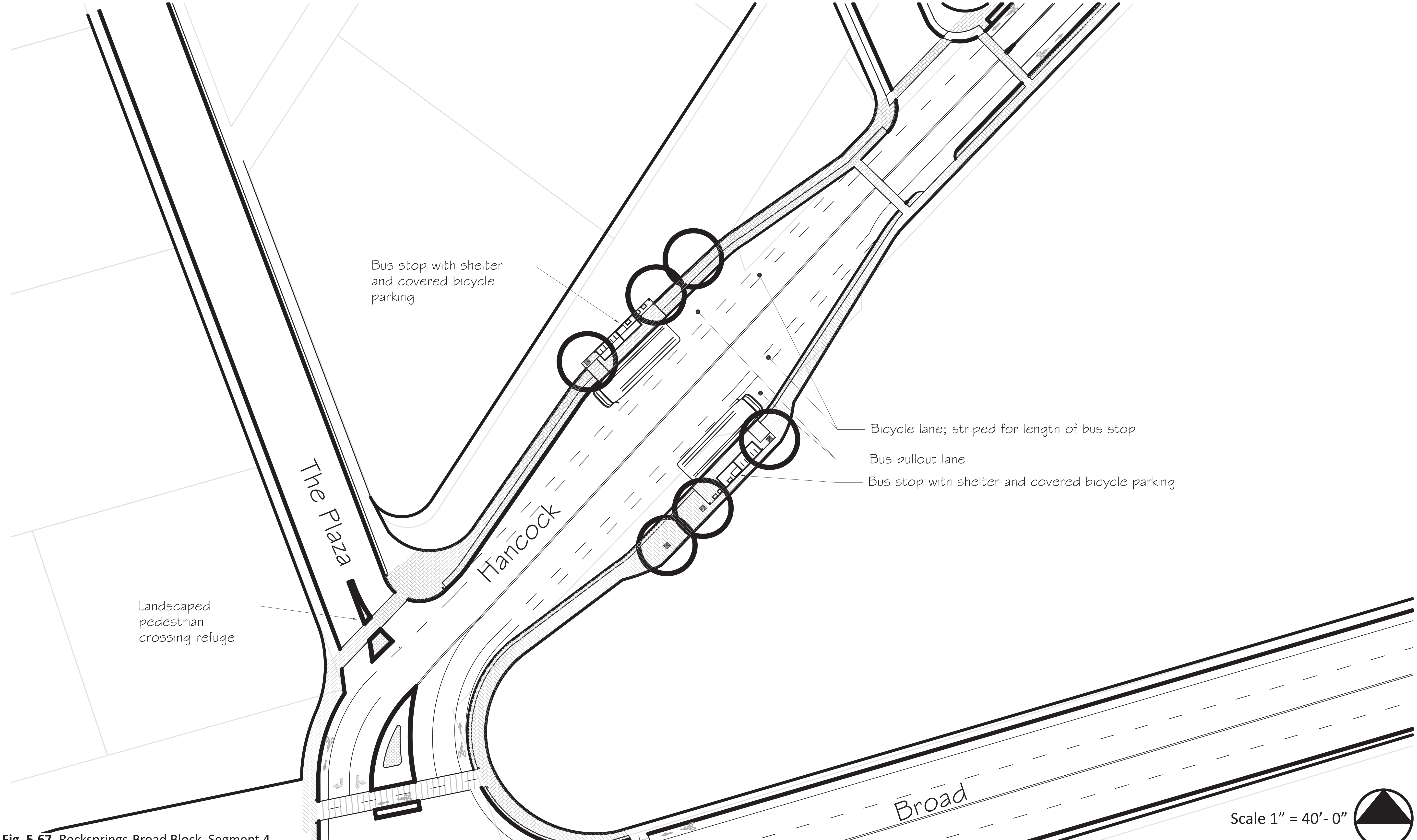

Fig. 5.67. Rocksprings-Broad Block, Segment 4

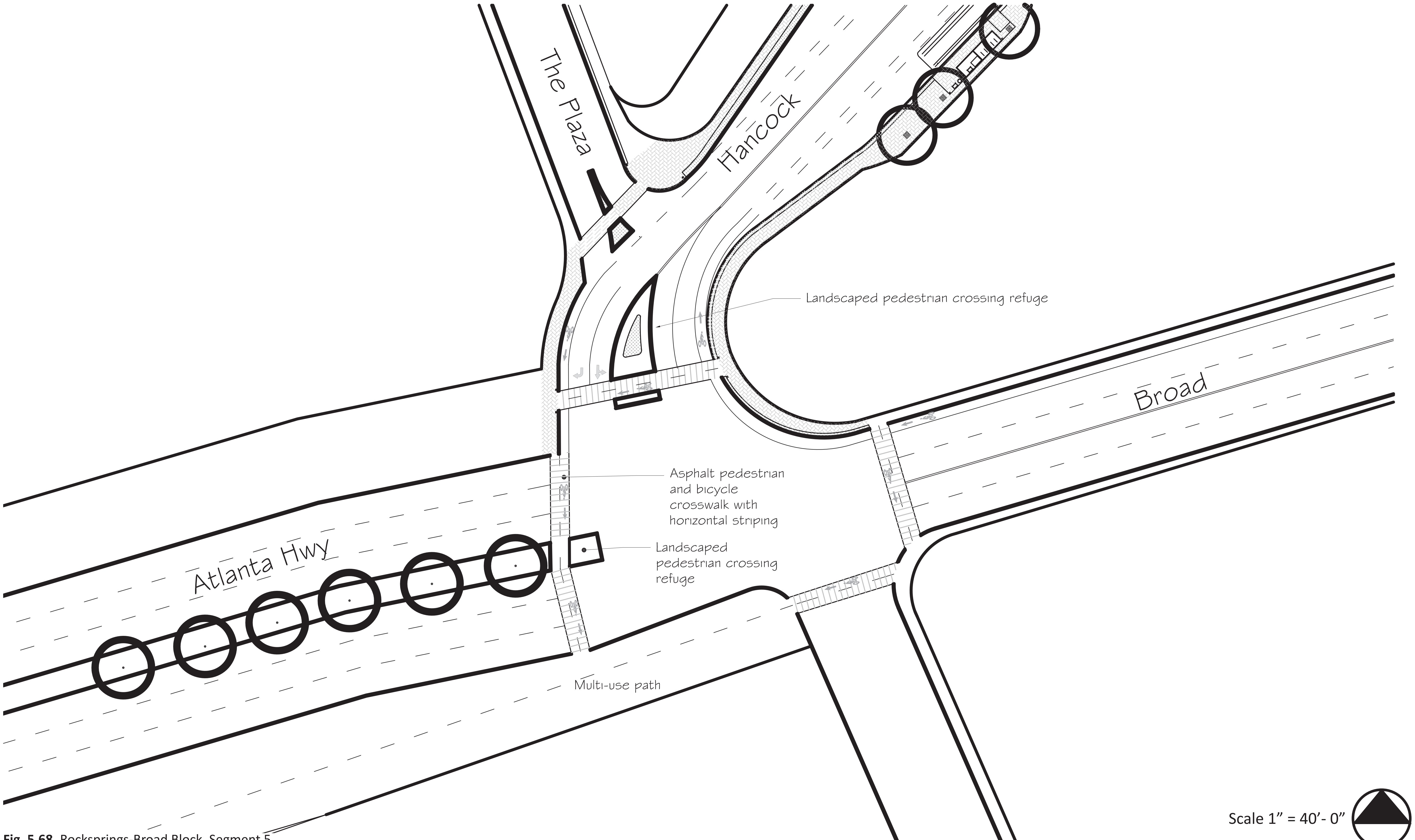

Fig. 5.68. Rocksprings-Broad Block, Segment 5

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