

BRINGING IT BACK:
UTILIZING FORM-BASED CODE TO REVITALIZE THE NORTH CENTRAL STREET
CORRIDOR, KNOXVILLE, TENNESSEE

by
REBEKAH JANE JUSTICE

(Under the Direction of S. Georgia Harrison)

The North Central Street Corridor was once the home to a vibrant streetcar line that provided transportation to several of the first streetcar suburbs in Knoxville. The once lively thoroughfare has since declined due to the pressures of the modern developing city including sprawl, suburbanization, and the rise in popularity of the automobile. This thesis seeks to explore the late nineteenth and early twentieth century urbanization patterns, evaluating their form, scale, and massing. Pairing these observations with principles of neotraditional design, design-based zoning code will be applied to guide the revitalization of the urban corridor. The resulting proposal for the redevelopment of the corridor will utilize form-based codes to direct the restructuring of form and character. By means of restoring urban form through form-based codes, this thesis will show that the North Central Street corridor has a unique opportunity for redevelopment.

INDEX WORDS: Knoxville, Urban Planning, New Urbanism, Design-based zoning, Form-based code

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TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS.....	iv
LIST OF FIGURES.....	vii
CHAPTER	
1 INTRODUCTION.....	1
2 HISTORY.....	4
Patterns of Urban Growth in American Cities.....	4
Development Patterns in the History of Knoxville.....	5
3 DESIGN-BASED ZONING: THE FORM-BASED CODE.....	21
Definition of Form-Based Codes.....	23
4 CASE STUDIES.....	31
Introduction	31
Columbia Pike – Arlington, Virginia.....	32
Heart of Peoria – Peoria, Illinois.....	39
5 APPLICATION TO NORTH CENTREL STREET CORRIDOR	49
Defining the Study Area.....	49
Overview of the Corridor Today: Current State and Characteristics.....	52
Redevelopment Propositions.....	55
Redevelopment Possibilities: A Form-based Code for the North Central Street Corridor.....	56

The Regulating Plan.....	57
Building Form Standards.....	62
Streetscape Standards.....	70
6 SUMMARY AND CONCLUSION	73
REFERENCES.....	76
APPENDICES.....	78

LIST OF FIGURES

	Page
Figure 1.1: Intersection of North Central Street and Broadway, view South.....	3
Figure 2.1: Old Gray Cemetery, Broadway, Knoxville.....	7
Figure 2.2: Patrick Sullivan’s Saloon, “the Bowery”, intersection of North Central Street and Jackson Avenue.....	8
Figure 2.3: Brookside Mills.....	9
Figure 2.4: Architectural styles in surrounding historic neighborhoods.....	10
Figure 2.5: Emory Place Historic Map.....	11
Figure 2.6: Emory Place.....	12
Figure 2.7: Knoxville High School, corner of Fifth Avenue and North Central Street	12
Figure 2.8: Intersection North Central Street and Broadway, view South.....	13
Figure 2.9: Location of Figure 2.8, Historic Map.....	13
Figure 2.10: Joy Theatre in Happy Hollow, North Central Street.....	14
Figure 2.11: Slot Commercial storefront located on North Central Street.....	14
Figure 2.12: Map of Knoxville, Tennessee 1919, showing development of roads.....	16
Figure 2.13: Revitalized slot commercial buildings in the Old City.....	18
Figure 2.14: Revitalized warehouses in the Jackson Avenue Warehouse District / Old City.....	19
Figure 3.1: The Transect, describing zones that allow for different types and intensities of development from urban to rural.....	24
Figure 3.2: Building types permissible in each zone of the Transect.....	26
Figure 3.3: Urban standards for Thompson Corridor. City of Ventura, California.....	26

Figure 3.4: Development standards and Character examples for mixed use building lot, Sarasota, Florida Code.....	27
Figure 3.5: Street types and frontages. SmartCode v 8.0.....	27
Figure 3.6: Street types. Knoxville South Waterfront.....	27
Figure 3.7: Street types. Sarasota, Florida.....	29
Figure 4.1: Graphic portrayal of allowed building height in the Town Center District of Columbia Pike.....	35
Figure 4.2: Illustrative plan for the Western Gateway District of Columbia Pike.....	36
Figure 4.3: Graphic portrayal of allowed building height in the Town Center District of Columbia Pike.....	36
Figure 4.4: Building Envelope Standards for Main Street Sites of Columbia Pike.....	37
Figure 4.5: Legend Map for Streetscape Standards for Columbia Pike Corridor.....	37
Figure 4.6: Streetscape Standards for Section B of Columbia Pike Corridor.....	38
Figure 4.7: A visualization of the possible transformation of alley to a viable urban experience in the Warehouse District.....	41
Figure 4.8: The Warehouse District possible change over time.....	43
Figure 4.9: Regulating Plan for Prospect Avenue.....	44
Figure 4.10: Building Envelope Standards for the Warehouse District.....	45
Figure 4.11: Prospect Corridor change over time.....	46
Figure 5.1: North Central Street Corridor – Study Area Map.....	50
Figure 5.2: North Central Street Corridor – Photo Key to Study Area Map.....	51

Figure 5.3: North Central Street Corridor Conceptual Diagram.....	53
Figure 5.4: Existing Forms to Interpret through Form-based Code.....	54
Figure 5.5: Existing Streetscape of North Central Street.....	55
Figure 5.6: Urban Corridor Zone Regulating Plan.....	58
Figure 5.7: Neighborhood Center Zone Regulating Plan.....	59
Figure 5.8: Neighborhood General Zone Regulating Plan.....	60
Figure 5.9: Building Form Standards: North Central Street Corridor.....	63
Figure 5.10: Detached Residential One.....	64
Figure 5.11: Detached Residential Two.....	65
Figure 5.12: Attached Residential.....	66
Figure 5.13: Commercial One.....	67
Figure 5.14: Commercial Two.....	68
Figure 5.15: Civic / Institutional.....	69
Figure 5.16: Street Section Legend Map.....	71
Figure 5.17: Streetscape Standards – North Central Street Corridor.....	72

CHAPTER 1

INTRODUCTION

The North Central Street Corridor is a unique area that retains some portions of its historic architectural forms and character, yet the corridor has become fragmented and lacks the coherent urban form that once made this area distinctive. A number of the buildings that created a unified sense of place for the area have been replaced by a discontinuous mix of commercial and industrial buildings that lack identity and connectivity to the urban core or to the surrounding residential neighborhoods. At present the corridor functions mainly as a local thoroughfare with little to offer in the way of commerce and lacks the identifying traits of the historic communities that surround the area.

The streetcar route that traveled from downtown along the North Central Street Corridor was once an energetic commercial district with distinctive architecture and urban form that supported the North Knoxville communities on varying service levels. Under influences of the Industrial Era, many Knoxvilleians outgrew the downtown and moved to the north of the city to areas that were cleaner, safer, and easily accessible to the public transportation services of the streetcar that followed this route.

This thesis will show that the North Central Street Corridor has a unique opportunity for redevelopment. With the recreation of a thriving mixed-use area to provide for the adjacent neighborhoods as well as the surrounding community, this area has the potential to serve as an extension of the downtown core. It will also be explained how more current development efforts utilizing form-based codes reflect historical land use patterns and provide for a successful

relationship between the land and its function. Several case studies will be referenced in order to demonstrate similar approaches to redevelopment.

The thesis will outline the history and concepts of form-based codes. Form-based coding is a method of regulating development to achieve specific and consistent urban forms. The codes were developed as part of the New Urbanist school of development, as an endeavor to overcome the dominance of circulation and movement over ideas of community, civic place, neighborhood, and aesthetics in development practices. The issues that are commonly associated with the distribution of urban functions into the rural suburbs create a considerable reconcentration of people and activity away from the city center (Duany et al., 1991, p. 7). The codes create a predictable public realm by controlling physical form primarily, and land uses secondarily. This method is in contrast to the focus of conventional zoning on the segregation of land-use types, permissible property uses, and the control of development intensity through simple numerical parameters. An exploration of the relationships between historical land use patterns and these development concepts will reveal their many similarities. Since their foundation, form-based codes have been applied to many types of projects, from the development of entirely new towns to applications in existing communities. A point of significance related to this study of form-based codes is their reflection of historic land use patterns in form, scale, and massing.

A schematic form-based code will be developed for the North Central Street Corridor from Jackson Avenue to Woodland Avenue following a proposed form-based code. The design will demonstrate how the form-based code can be utilized as an effective tool for redefining the corridor with a consistent architectural character, urban form, and streetscape design, with mixed use and consistent character redefined to reflect the historical significance of the North Central Street Corridor.



Figure 1.1: Intersection of North Central Street and Broadway, view South. (Knox MPC, 2007b)

CHAPTER 2

HISTORY

Patterns of Urban Growth in American Cities

In a few centuries of growth and development, American cities and towns have been through many transitions. One of the most influential time periods for American cities was created by the Industrial Revolution during the late 18th and early 19th centuries. This era produced major changes in manufacturing, transportation, and agriculture had profound effects on the socioeconomic and cultural conditions of cities. City form and function during this time period were to a great extent different than those of cities of the mid and later 20th century. The increase of development, jobs, and population that accompanied the Industrial Revolution made the city a destination for many.

The advancement and mechanization of industries had massive impact on many aspects of society, though not all were positive. Cities began to experience major influences from the immense population growth. The city's inability to accommodate the massive influx of people resulted in diminishing space for adequate living conditions. Sanitation was an issue in many parts of the city as proper sewage and other waste disposal needs increased. The increased use of coal as fuel for the industrial processes also began to negatively impact the city with deposits of coal dust and ash in the air and on the ground.

As the downtowns began to occupy a higher density of development, both residential and industrial, more space to accommodate the growing population and commerce was in demand. A better way of living was sought as an alternative to the cramped and polluted

circumstances of urban life. These afflictions began to influence city dwellers physically and socially. With these influences, growth began to take a shift and urbanization of the rural areas outlying the downtown began to take place with the development of streetcar and worker suburbs. A new opportunity for urbanization and growth expanded outward from the city, offering residents a new lifestyle. Corridors branched out of the cities and into these suburbs that boasted tree-lined streets with sidewalks, single family homes on larger lots, and improved public amenities - including clean water and neighborhood schools. Although not far from the core of the city, these suburbs were perceived as healthy and vibrant living opportunities. And that they were, providing for mixed use at varied densities, walkability, transportation via streetcars, and basic services such as water, street lighting, and fire protection for the welfare and safety of the people. These new neighborhoods were part of a movement that would impact the culture and development patterns of America for centuries to come. City dwellers were seeking a better way of life, and a better sense of community (Binford, 1984, p. 53). The city of Knoxville, Tennessee followed these trends in urbanization closely.

Development Patterns in the History of Knoxville

Like the great cities of Washington and Philadelphia, Knoxville is also a planned city. The city had a name, delineated lots, and a newspaper before the first house was constructed (Creekmore, 1976, p. 45). From the beginning, Knoxville was not to be just another frontier settlement, but a real city. This was to be achieved by the initial planning efforts and attention to architectural style and detail. In developing the downtown, the architectural styles of the city were as thoughtfully chosen and grand as those in any great city of the era.

Beginning with the 1783 "Land Grab Act", land was made available in the Knoxville area for settlement (Deaderick, 1976, pp. 2-3). The city of Knoxville was incorporated in 1786 and the Treaty of the Holston was signed by William Blount in 1791, allowing settlers into the area

and distinguishing between the land rights of the settlers and the Native Americans. During the same year, Charles McClung was commissioned to design plans for the new city. The city was bound on the south by the Tennessee River and on the east by First Creek. The land was divided into streets arranged on a grid with sixteen blocks and sixty-four lots, each lot being one-half acre. These lots were allocated by a lottery held in 1791. The Knoxville Gazette was in print by November of 1791, a sign of civilization and progress. The newspaper was the main source of communication for the lottery and advertising for the new merchants of the city (Creekmore, 1976, pp. 49-52). In 1792 Knoxville was designated the capitol of the Territory South of the Ohio River. The city also served as Tennessee's first capitol when the state was initially admitted into the Union in 1796, continuing until 1819 (Deaderick, 1976, p. 10).

Like many other cities in the 19th century, Knoxville experienced significant urbanization due to industrialization. The city had realized its geographic advantage by benefiting from the river access and establishing railroad connections. The introduction of the railroad in 1855 that resulted in the growth of industry had placed Knoxville as one of the largest manufacturing, industrial, and distribution centers in the South. The East Tennessee and Virginia and East Tennessee and Georgia railroad lines were among the first to establish service to Knoxville. Later combined to form the Southern Railroad, the railroad brought economic growth to the Appalachian town. The railroad was the key to the growth of Knoxville by overcoming the geographical obstacles that the city faced, and made it possible for the city to become the commercial hub for the Appalachian region, bringing goods for distribution to the area, as well as providing passenger service. The C.M. McClung Company located on Jackson Avenue assisted in moving Knoxville to fourth place in wholesaling in the entire South by 1885, and by 1896 they had advanced into third. Following the Victorian rural cemetery movement and the need for adequate burial space, Old Gray Cemetery was established in the mid 1800s. To the

north of downtown on Broadway adjacent to Emory Place, Old Gray Cemetery served as a recreation spot, providing a park setting for sanctuary from the city.

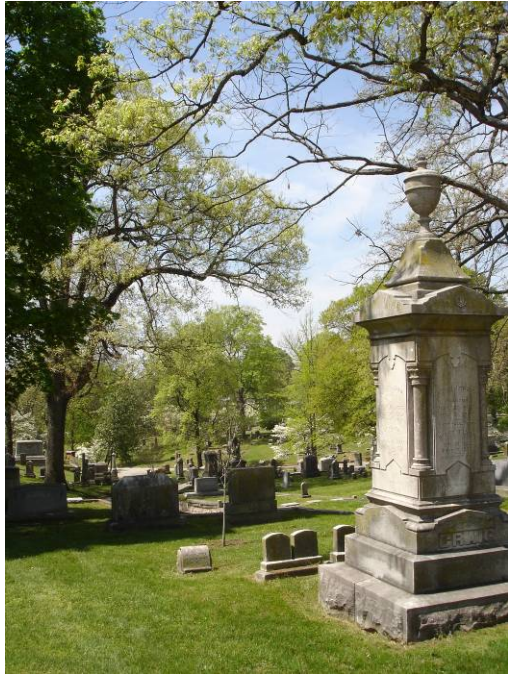


Figure 2.1: Old Gray Cemetery, Broadway, Knoxville. Photo by R.J. Justice.

The Southern Railroad Depot was erected between Jackson Avenue and Depot Avenue in the warehouse district, the area currently known as the Old City. Jackson Avenue was proclaimed one of the most important streets in town for commerce, second only to Gay Street. Major companies in the area including JFG coffee, C.M. McClung Company, John H. Daniel Tailors, and White Lily Flour continued to make their home in the warehouse district of the Old City for many years to come. In character the area was held in a lesser regard - the area at the intersection of Jackson Avenue and Central Street was known as “the Bowery” and was the location of a concentration of saloons and rowdy nightlife (Henderson, 1999). The boisterous spirit of the area was refined when in the election of 1907 Knoxville became the first city of its size to outlaw saloons.



Figure 2.2: Patrick Sullivan's Saloon, located at the intersection of North Central Street and Jackson Avenue formerly referred to as “the Bowery”, Photo by R.J. Justice

In the late 19th to 20th centuries, the city of Knoxville experienced profound growth and investment. The Knoxville Iron Company set the stage for manufacturing in Knoxville as the first significant manufacturing presence in Knoxville in 1868. Most of the industrial activity was concentrated to the north side of downtown, in the Jackson Avenue warehouse district, and to the north along Second Creek. In the 1880s, ninety-seven new factories were established, ranging from textile mills, furniture, processed iron, and quarried limestone. One of the largest textile mills was Brookside Mills located off of North Central Street, which paralleled Second Creek.

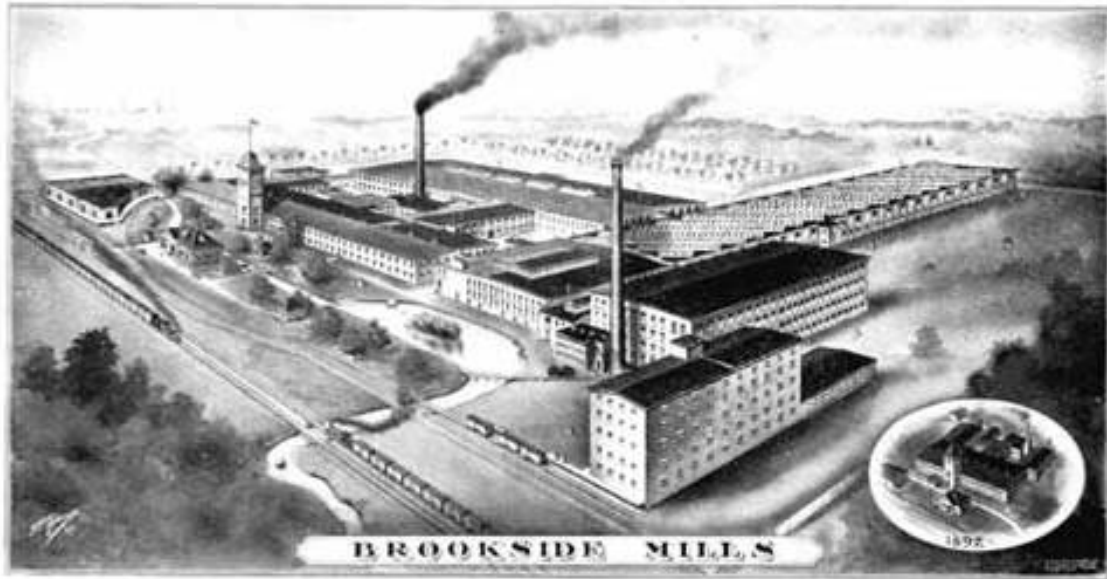


Figure 2.3: Brookside Mills. (Photo by C. Reeves, 2003)

The railroad had introduced the first major progression in land transportation in centuries for American cities. The railroad in Knoxville made a drastic impact on the lifestyles of its citizens in many aspects. With the intense growth and development of industry and population, adverse living conditions became prevalent in the core of the downtown, primarily due to overcrowding, lack of proper sanitation, lack of environmental control measures, and general organization of civil services. In response to this growth, the city began to urbanize with the development of streetcar and worker suburbs in the outlying areas of the city.

The introduction of the electric streetcar in 1890 facilitated the expansion of the city (Deaderick, 1976, p. 101). In the 1880s and 1890s, several streetcar and worker suburbs sprouted along the North Central Street Corridor- some built by private investors, other by the industrial entrepreneurs themselves (Wheeler, 2005). These suburbs allowed for better living conditions and were pedestrian-oriented offering close proximity to work, schools, churches, and basic goods and services. Most of the residents walked to and from their homes on

sidewalks to the streetcar stops. The suburbs offered amenities and a lifestyle that surpassed the declining urban conditions by far. Brookside Village (now Old North), Forth and Gill, Oakwood, Lincoln Park, and Mechanicsville were neighborhoods that offered opportunities for improved living conditions - each serviced by the streetcar. Great social diversity was prevalent in the new suburbs and was reflected in the architectural styles. From grand Victorian styles to modest shotgun homes, mixed classes settled harmoniously in the streetcar suburbs in what Wheeler calls “residential heterogeneity” (Wheeler, 2005). Walking was a key mode of transportation to and from the streetcar stops. The neighborhoods were laid out on a grid with alley systems for utility access, making the streets a safer and cleaner place to walk.



Figure 2.4: Architectural styles in surrounding historic neighborhoods. Photos by R.J. Justice

Commerce evolved along the North Central Street Corridor as well. As Knoxville stretched to the north, Central Market Place (now Emory Place) was established in 1889 as a market place and one of Knoxville's first public parks. Just north of the Old City and Jackson Avenue warehouse district, the marketplace was the location of several commercial services. The location of Knoxville's first post office, an upholstery and refinishing shop, tire company, pressing parlor, auto service, hauling and moving services, a barber and beauty shop, several drug stores, and a custom mattress store, and several streetcar lines terminated their routes there. Adjacent to Emory Place on the corner of Fifth Avenue and North Central Street, the Knoxville High School was erected in 1910. For more than forty years this was Knoxville's only high school.

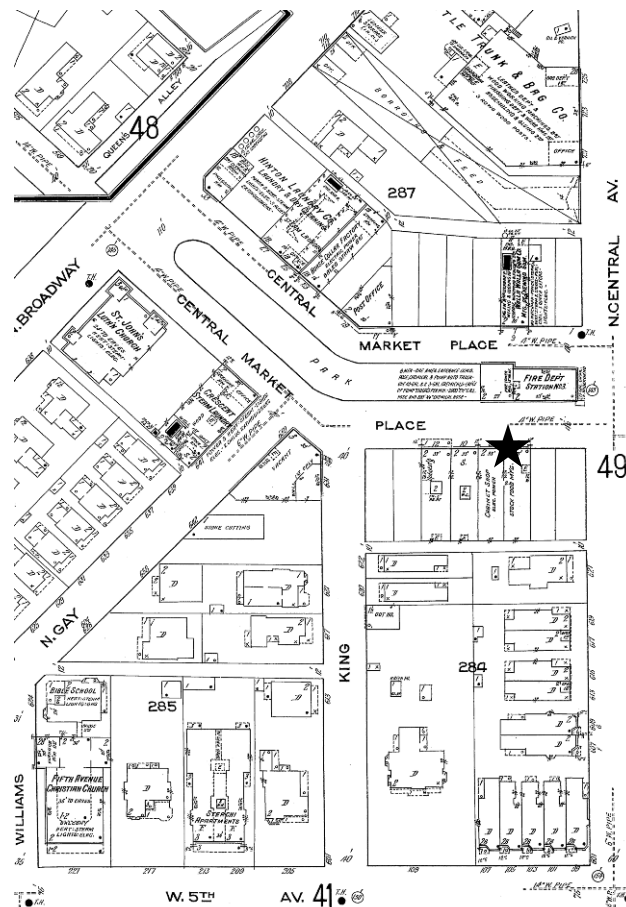


Figure 2.5: Emory Place Historic Map, Location of Figure 2.6. Sanborn map 41 and 49. (Sanborn, 1917-1924)



Figure 2.6: Emory Place. Photo by R.J. Justice.



Figure 2.7: Knoxville High School, corner of Fifth Avenue and North Central Street. Photo by R.J. Justice.

At the intersection of Broadway and North Central Street, just to the north of Emory Place, a remarkable testament to architectural form was created during this time period. With Flatiron style buildings to the north and south of the intersection and slot commercial buildings to the east and west, a profound urban form was achieved with a continuous street wall and unique architecture.



Figure 2.8: Intersection North Central Street and Broadway, view South. (Knox MPC, 2007a)

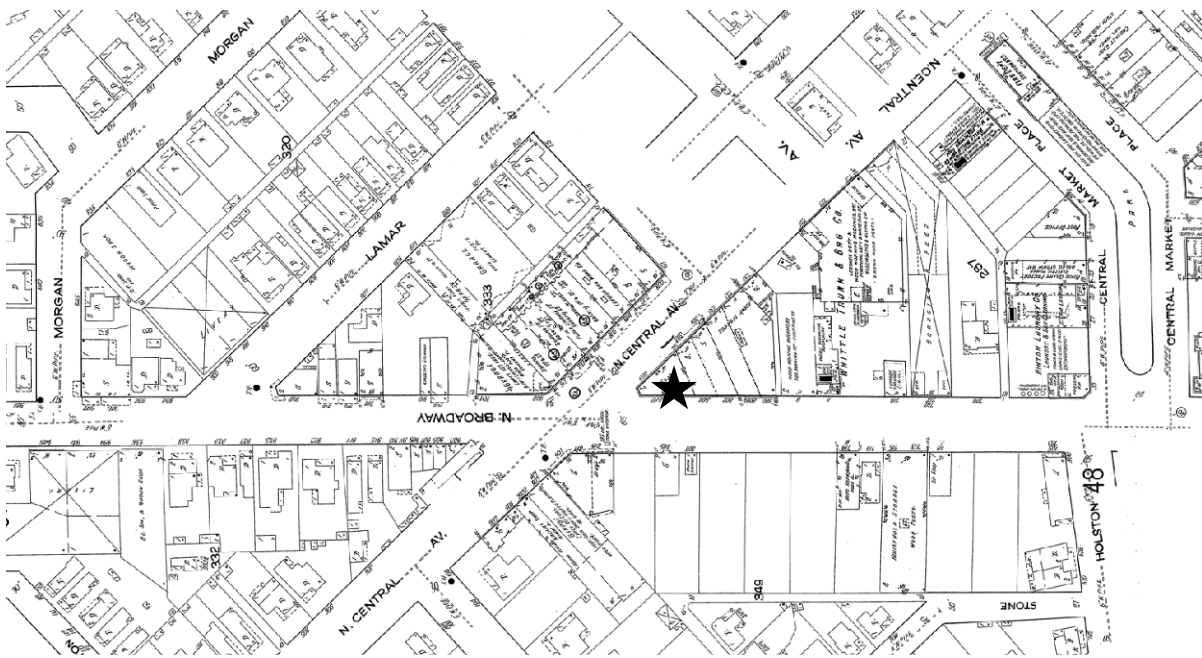


Figure 2.9: Location of Figure 2.8, Historic Map. Sanborn map 48- 49. (Sanborn, 1917-1924)

. Continuing northward along the North Central Street streetcar route was the vicinity known as Happy Hollow. Neighboring the Brookside Village community, this area provided the mill workers and residents with general stores, drug stores, soda shops, and a concentration of local bars.



Figure 2.10: Joy Theatre in Happy Hollow, North Central Street. (Knox MPC, 2007a)



Figure 2.11: Slot Commercial storefront located on North Central Street. (Isenhour, 1978)

Knoxville's streetcar system was said to be one of the most extensive and finest operated systems in the South according to Deaderick's *Heart of the Valley*. At the climax of its operation, the streetcar line branched out of the downtown in all directions, connecting downtown and the newly-formed suburbs. On average, most residents could find themselves at about two blocks from any car and a line running in increments of about ten minutes.

The first line was chartered in 1875. The first streetcars were drawn by mule(s), each car carrying eighteen passengers. In 1889, a city ordinance was passed allowing for the use of electricity to power the cars. The first electric street car was introduced in 1890 by the Knoxville Electric Street Railway Company. By 1897, Knoxville had developed approximately 26 miles of electric streetcar lines, all of which boasted "first class" equipment. By 1905, the Knoxville Traction Company had control of the streetcar organization. The final segment of growth for the streetcar system occurred in 1912 to 1913. During this time the line totaled fifty-three miles and directed one hundred and fifty eight cars. Patronage on the streetcar in the year of 1913 totaled 13,500,000.

The 1920s was the undisputed climax in the Knoxville streetcar system, as was the pattern in most cities country-wide. The growing popularity of the automobile and the issues of the Great Depression were among the circumstances leading to the demise of the streetcar. As streetcars were replaced with buses in the 1930s, the replacement was not due to a decline in patronage. The streetcar companies owned a right-of-way that paralleled the streets, and the city viewed this as an opportunity to widen the streets for automobiles, requiring that the railways be relocated to the center lanes at the expense of the owners. As a result, the rail companies would sometimes substitute electric buses instead of moving their streetcar rails. With increasing road alterations and the disappearance of rails and essential viaducts, the rail lines for streetcar travel had reduced to twenty-three miles by the late 1930s. Continued alterations and road improvements led to the last streetcar procession in 1947 when Gay Street, the most

important city street, was to be repaved without the replacement of the rails (Deaderick, 1976, pp. 215-232).

The automobile began to make an influence in the area around 1914. Dealers began to open showrooms; and most of the auto dealers in Knoxville were located along Central, Broadway, and Gay. The first Ford dealership was located on Central Street, along with many other automobile parts and service businesses. With the influence of the automobile, Knoxville was interconnected with most other major cities in the region by paved roads by the mid to late 1930s (Deaderick, 1976).

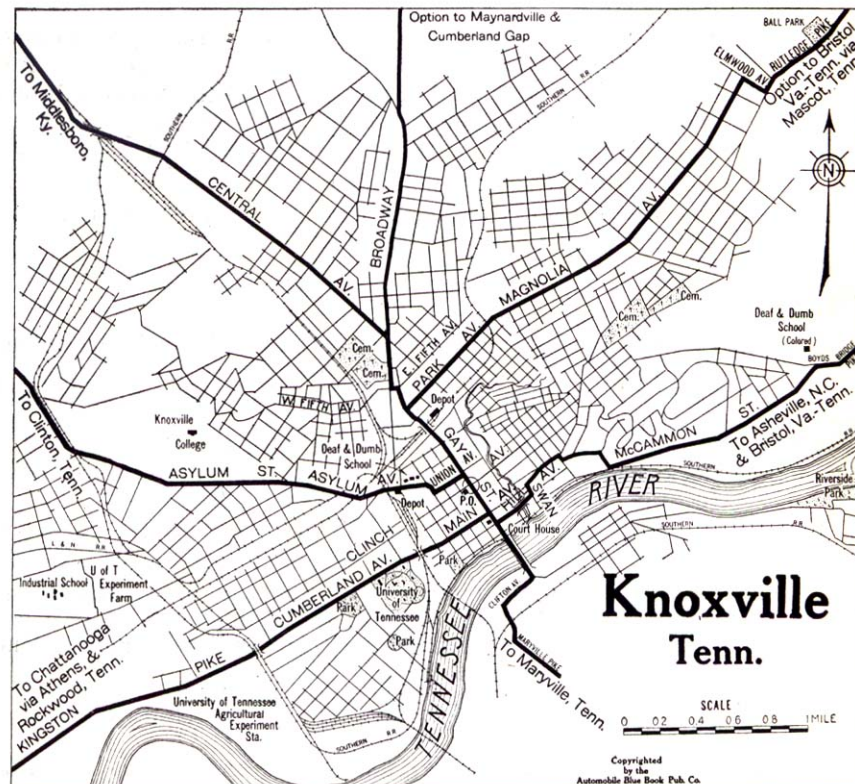


Figure 2.12: Map of Knoxville, Tennessee 1919, showing development of roads. Image from Univ. of Texas Library.

Also in the 1930s, approximately twenty textile and clothing mills operated in Knoxville, giving it the name of the “Underwear Capital of the World”. Most of the mills were located in the warehouse district along the edge of downtown on Jackson Avenue and along Second Creek which paralleled North Central Street. These industries struggled through the next several decades, when in the 1940s and 1950s the industries began to close in numbers, resulting in a loss of population and investment.

With the rising popularity of the automobile, the introduction of the highway, and suburban development, Knoxville’s urban areas began to suffer. Social and economic tensions began to move city development to the west of downtown, and the trend blossomed into the typical suburban development patterns of post World War II suburbanization. The Knoxville High School was closed in 1951 due to over-crowdedness. The adjacent park at Emory Place was abandoned in 1955 and the trees were cut down, making way for a parking lot. The shops at Happy Hollow began to close. These patterns of urban flight continued through the fifties and into the sixties. The railroad, which had initially driven the success of the city, began to decline after the introduction of the interstate highway system to the area in the 1960s. Regular passenger rail service to and from the area ceased in 1970. Unable to compete with foreign markets, mills and manufacturing businesses continued to close. The development of suburban shopping strips and malls led to a further flight from the center city leaving many of the downtown buildings vacant. The interstates sliced through downtown Knoxville and its urban neighborhoods, and imposed a footprint to which the city is still trying to adapt. The seventies continued to direct development and investment away from the urban core.

The eighties brought a resurgence of life back into the urban core, starting with the revitalization of the Old City and the gentrification of the Forth and Gill Neighborhood. Urban pioneers began investing in residential properties, starting with Forth and Gill and Old North, formally Brookside Village. The unique historic character of urban Knoxville was again

appreciated. The abandoned Old Gray Cemetery was revived and maintenance was scheduled. In the nineties, further interest was seen in the reinvestment and revitalization of the center city and its urban suburbs as residential and commercial rehabilitation projects grew. The twenty-first century has brought the city's attention full circle, back to the foundation and heritage of the city, its downtown and urban neighborhoods. Following a national trend, passionate reinvestment into the downtown and urban neighborhoods has enabled residential development to enliven Knoxville's urban core once again. As this concentration of urban interest breathes renewed life into the core of the city, historic patterns of urbanization have been recognized as having much to offer in terms of community and placemaking.



Figure 2.13: Revitalized slot commercial buildings in the Old City. Photo by R.J. Justice.



Figure 2.14: Revitalized warehouses in the Jackson Avenue Warehouse District / Old City.

Photo by R.J. Justice.

What has not happened in this area is equal in importance to what has occurred. The influences of suburbanization in the urban suburbs have left cities with corridors overridden with strip malls, franchise stores, and large street-front parking lots. Along North Central Street, however, it is a contrasting situation. Only by chance, North Central Street was bypassed by the total invasion of suburbanization development schemes into the city. Nearby Broadway suffered more of the suburban influence with the invasion of chain stores and lower density development patterns into what were once areas of greater density and compatible uses. Much of the automobile-oriented development is difficult to disengage, so this could prove to be an advantage for the North Central Street Corridor, by potentially lessening the various restraints to redevelopment.

The history of growth and development patterns in the city of Knoxville is similar to many cities of its scale. These patterns that are interpreted as successful and “placemaking” were logically created throughout the history of urbanization. The elements of the communities that were created from these development patterns are valued today, and there is hope that these livable communities can be emulated in modern-day Knoxville.

CHAPTER 3

DESIGN-BASED ZONING: THE FORM-BASED CODE

Although the revitalization of the North Central Corridor is multi-faceted, involving infrastructure, economics, politics, and social and environmental issues, the main focus of this study is *design* as a tool for revitalization. An innovative approach is needed to address and contest the issues of suburban sprawl and other undesirable development patterns that are faced by the urban areas of the modern city, such as the North Central Corridor. This approach can be initiated through the use of form-based codes, the design-based zoning approach developed by the New Urbanist school of thought.

New Urbanism developed out of the thoughtful reactions to the inferior types of developments and land use patterns produced under suburbanization and traditional zoning methods and regulations. A group of concerned architects and planners came to the realization that something had to be done in order to address the socially and environmentally destructive development patterns of suburban sprawl. This group coined the idea of New Urbanism as a “market-driven, community-responsive physical design at the scale of the region, the neighborhood, and the single building.” (Bressi, 2002) In 1995 the supporters formed the organization, Congress for the New Urbanism. A year later, in 1996, the Congress developed a charter that guided their multi-faceted ideals. Influenced by the mixed-use communities of pre-automobile America, the New Urbanists’ sought to use elements from these traditional neighborhoods as a foundation for creating place in the modern world. The Charter of the New Urbanism serves as a manifesto that encompasses the principles of building better communities and aims at encouraging a multi-disciplinary approach to combat sprawl and to engage these

disciplines in making better places to live (Bressi, 2002). These principles guide their development policies which state their main mission and propose guidelines to their approach in achieving that mission (Leccese, McCormick, & Congress for the New Urbanism., 2000). (See Appendix A.1) The Charter proclaims that the cities and towns of our country are suffering and failing socially, economically, and environmentally because of the lack of proper planning and development visions, tools, and procedures.

In order to achieve the principles of the Charter for the New Urbanism, design-based zoning necessitated the reform of traditional zoning's approach to the governance and regulation of development. In this restructuring effort, a design-based zoning tool identified as form-based codes was produced. The intention of form-based codes was to assist in creating valuable places by promoting walkable, human-scaled urban environments, which provide for a community consisting of a contemporary mix of residential and commercial uses that are economically competitive with the typical suburban sprawl neighborhoods and commercial strips (Bressi, 2002). The codes address form, scale, and massing as a method of guiding a coherent and human-scaled community.

This design-based approach, utilizing form-based codes, was initially applied in 1982 by Duany, Playter-Zyberk and Company in the new master-planned community of Seaside, Florida located on the coast of the Florida panhandle. Their goal was to create a community with the distinctive character and identity of a traditional Southern community. The original Seaside code included seven "classes" of building types, each having an advised site placement, height, porch and outbuilding location, and parking guide. In a unique experiment to assess these parameters before development, the code was tested by an architecture class that was presented with the code and a site and asked to plan the site according to the parameters of the code. This experiment allowed for further refinement of their code before construction of the community of Seaside. Since the initial project, Duany Playter-Zyberk and Company have

continued to develop and apply form-based codes to direct the construction of numerous new and existing communities (Katz, 2004).

Definition of Form-Based Codes

Form-based codes are a method of regulating land development with an emphasis on achieving a specific form of the built environment. The form-based approach takes the emphasis away from regulating land use and therefore opens the uses to be determined by market demand. These codes specify preferred patterns of development. Fundamental aspects of urban form are regulated by form-based codes, including: building height and placement, orientation to the street, and parking placement. The design of the street itself is also prescribed by the code, creating a space where buildings and streets work together to form meaningful places (Heitzer, 2004, pp. 1-2). Form-based codes are typically comprised of a regulating plan, public space or urban regulations, building form standards, administration, and glossary or list of definitions. In addition, there can be architectural standards, landscape standards, signage standards, environmental resource standards, and text and illustrative annotations demonstrating how the provisions of the code will be applied.

These codes have broad applications, from guiding infill development in a historic downtown, to restructuring urban neighborhoods, to regulation of new development in historic districts; and can be written to “protect or even transform the urban fabric of an area.” Form-based codes are also being explored as a holistic regional planning tool, as opposed to the incremental decisions that currently determine regional growth. Form-based codes may be used to guide the development of new interconnected roads or allow for regional stormwater management. Codes in the form-based vocabulary are more straightforward than traditional Euclidian zoning; they are written in plain language, and utilize illustrations such as matrices and diagrams.

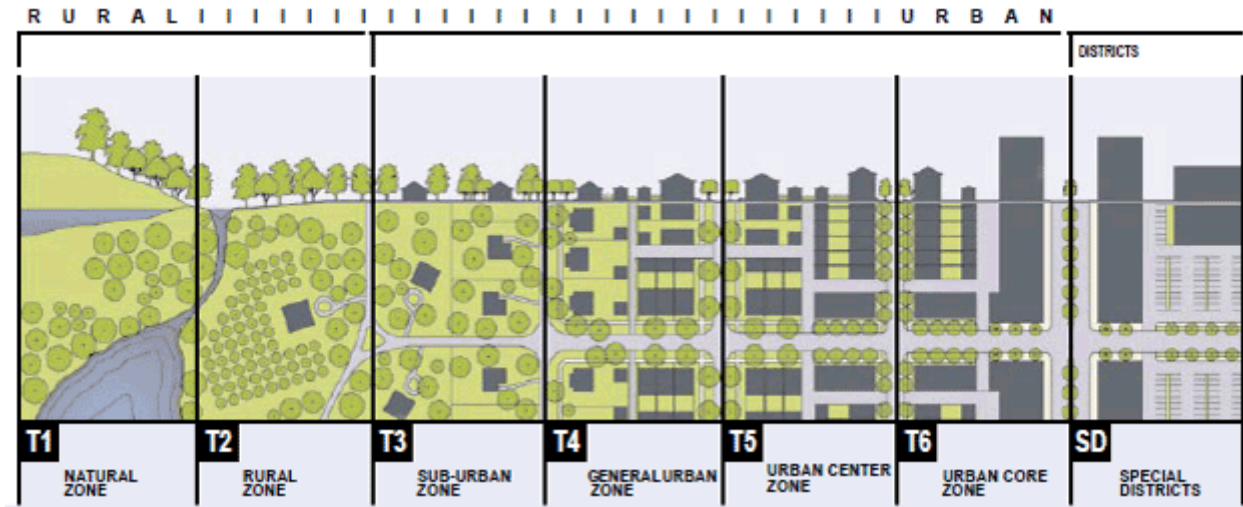


Figure 3.1: The Transect, describing zones that allow for different types and intensities of development from urban to rural. (Duany & Talen, 2002)

Crafted to address and achieve a specific vision for a defined area, form-based codes follow a public visioning process known as a charrette. In a series of exercises, stakeholders, designers, architects, planners, and citizens of the community produce a vision for the community to address its planning concerns. Establishing a clear vision of the desired end result is an essential first step in the planning process that form-based coding utilizes. The exercises conducted during the charrette produce site analysis diagrams, illustrative plans and perspective drawings. The workshop sessions are concluded by the creation of a final plan in aerial view that illustrates proposed buildings, key features, and existing and planned public spaces; and quantifies the vision into physical parameters, interpreted into a diagrammatic regulating plan (Katz, 2004). The regulating plan is derived from the initial aerial map and prescribes a particular building type, or types, to each parcel of land. Some regulating plans go further, specifying a range of building and frontage types that may be developed in each area.

In the initial steps, the code designates geographic areas of the community into zones based on typologies. Similar to the SmartCodeTransect (Figure 3.1), the typologies have a gradient of urban to rural and can include such ranges as Village Center (the most urban); Neighborhood Center; Neighborhood General; and Neighborhood Edge (least urban) (Walters, 2007). The regulating plan consists of a set of diagrams that assigns a type, or types of buildings to a particular parcel of land or suggests a range of building and street types that would be permissible in a given area. In the regulating plan, sites are classified according to the characteristics of street, block, and/or district (Heitzer, 2004). Building standards are typically expressed as a series of cross sections and plan view diagrams; and establish several parameters including, but not limited to, building height and setting a maximum and minimum number of floors. The standards also establish building siting or placement in relation to streets and adjacent lots; dimensions are specified to front, side, and rear building lines. Parking lot locations and the configuration of yards, entrances, and windows are also set forth in the standards. Uses can also be dictated in these cross-sections, indicating which uses are permissible on each floor, facilitating the typical mixed-use designation. In these codes, uses are regulated at the secondary level, while form of the buildings, street and sidewalk configuration remain at the primary level of the regulating focus. These standards, or patterns, are then applied to each district. The individual sites within each district are viewed as part of a whole and result in a unified design, also determining the form, look, feel, and function of future development.

Recognizing that one set of building standards does not apply to all, rules for each building type are stated. As an example: permitting the first floor of a townhome to be raised a half-floor from grade allows for privacy on the first floor from street level; whereas this concept would not be beneficial for a store owner that would benefit from eye level access to available merchandise (Katz, 2004).

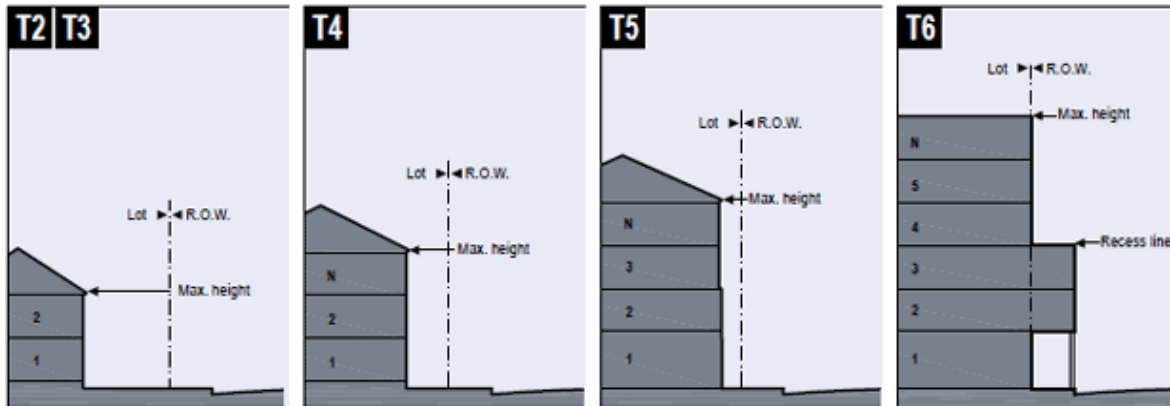
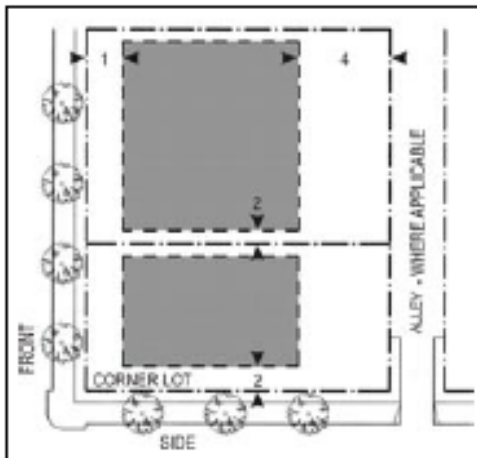
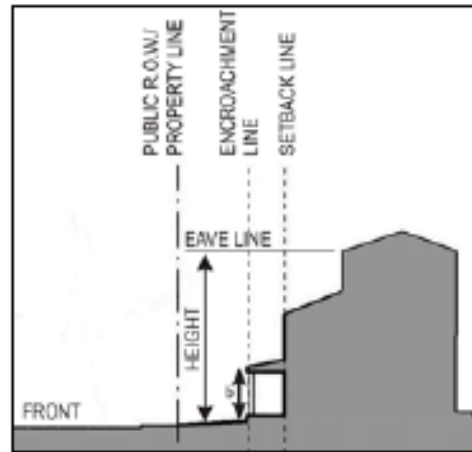


Figure 3.2: Building types permissible in each zone of the Transect. Smartcode v8.0

A. Building Placement



B. Building Profile and Frontage



C. Parking

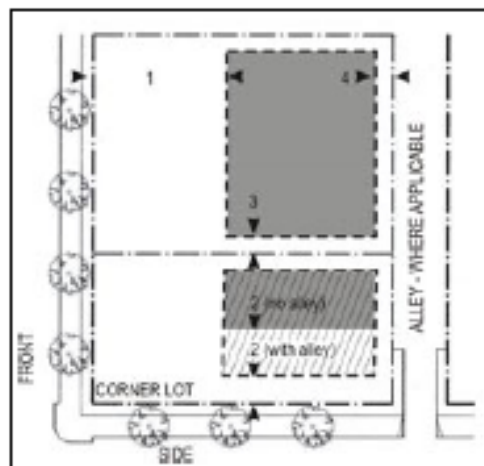
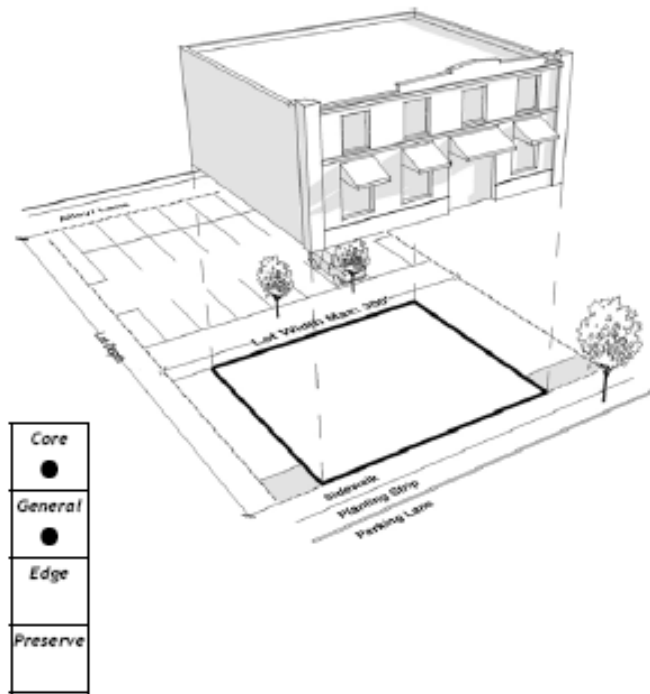


Figure 3.3: Urban standards for Thompson Corridor. City of Ventura, California.

Mixed-Use Building Lot (MU):



Character Examples:



Figure 3.4: Development standards and Character examples for mixed use building lot, Sarasota, Florida Code.

Street design is also governed by the code, allowing for the streets and buildings to work together to create a public realm of desirable characteristics. Street standards provide allowable or recommended street types. These standards are described by sections showing travel lanes, parking lanes, verges, medians, and sidewalks. Streetscapes are an essential component of form-based code because they demonstrate how the private realm links with the public realm. The location of property lines is also shown, as is the placement and alignment of street trees. Suitable tree and other plant species are generally included in the standards, as well as a variety of regionally appropriate species; designating where they are best used in the

landscape (for instance as a street or parking lot specimen). A glossary typically concludes the set of codes, providing definitions for terms that are used throughout the document.

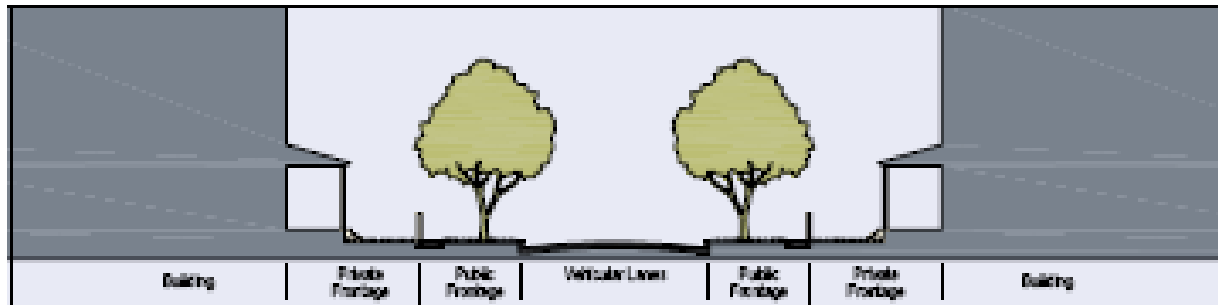


Figure 3.5: Street types and frontages. SmartCode v 8.0

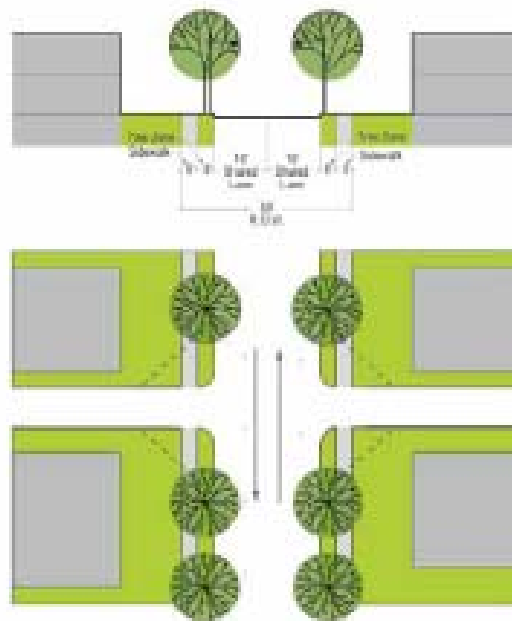


Figure 3.6: Street types. Knoxville South Waterfront.

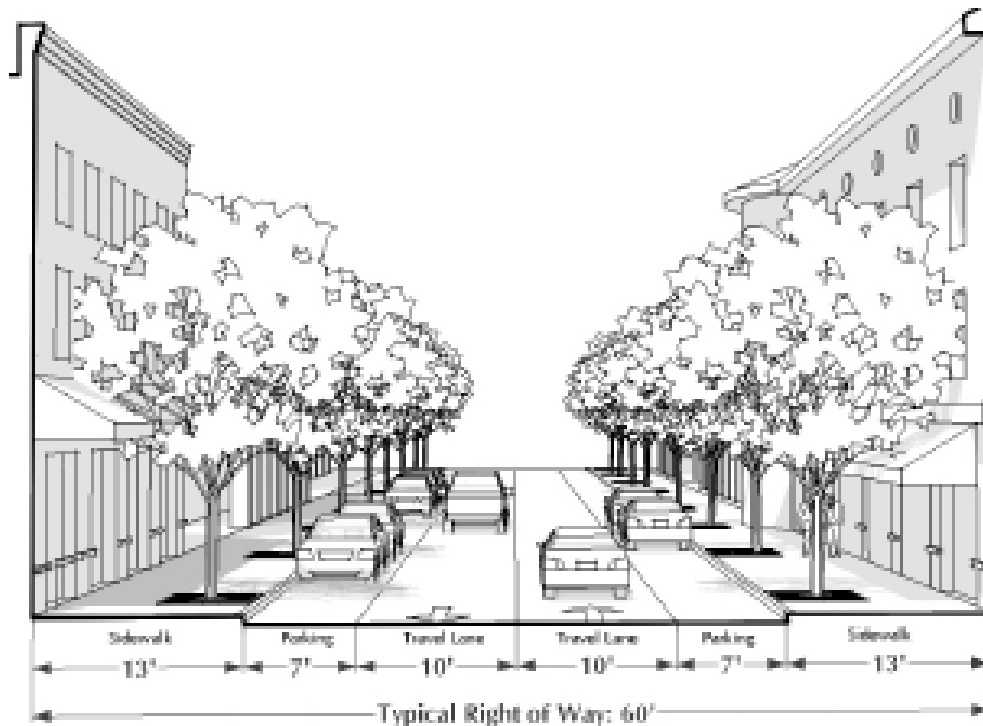


Figure 3.7: Street types. Sarasota, Florida.

Some special communities, neighborhoods, or corridors call for a more intense control of appearance; these scenarios can include master planned communities or historic districts. These situations can incorporate architectural design guidelines, in addition to the codes, to direct building materials and construction techniques, roof shape and pitch, cladding, and sometimes color selection (Katz, 2004).

The administration of the code is clearly laid out in the document. The application and approval process is less tedious and time-consuming than traditional zoning permitting. The elements required are clearly laid out in the code and are less open for interpretation. The simplicity of implementation of the form-based code is easily achieved with new communities under single-land ownership, although more complex in existing communities due to multiple landowners. When multiple landowners are involved, a form-based code would best be realized

as an overlay, an addition or alternate to the existing zoning ordinances and regulations, giving each landowner an option of which guidelines to follow. Of course, incentives are evident to the developer in choosing the form-based overlay, such as opportunity for greater density and chance for developing mixed-uses.

Mixed-use and pedestrian-friendly streets are often prohibited or extremely difficult to establish in Euclidian zoning regulations. These zoning ordinances were written with the intention of segregating land uses in the early twentieth century, and are still tailored to addressing development issues from a past era. Growth patterns and planning needs have changed for the modern city, calling for innovation in land development principles.

The goals for the redevelopment of the North Central Street Corridor by the implementation of form-based codes are similar to the guiding principles set forth in The Charter of the Congress for the New Urbanism. These principles are reflected in the development and actuality of form-based codes. Most Euclidean zoning ordinances are written so that they not only allow, but also promote sprawl whereas form-based codes allow for and promote smart Growth. Smart Growth is based upon an appreciation for the associations between development and quality of life. These principles of development - as detailed in the Charter - offer an opportunity to redirect development goals and objectives, providing for a broader-based economic and citizen lifestyle advantage.

As asserted in the Charter, "The neighborhood, the district, and the corridor are the essential elements of development and redevelopment in the metropolis." This assertion is rationale for the revitalization proposal of the North Central Street Corridor (Leccese et al., 2000). In applying form-based codes and their ideologies to guide and direct the redevelopment of the North Central Street Corridor, a vital element of the city of Knoxville's history and future can be rediscovered.

CHAPTER 4

CASE STUDIES

Introduction

The process of development of a form-based code is unique to each set of circumstances. Each community which exercises this process has a vision and objective that shapes their code.

The *Columbia Pike Special Revitalization District Form-Based Code* developed by Arlington County, Virginia provides an example of a code developed for a specific revitalization challenge for an historic main street that had transformed into an automobile-oriented and dominated, suburban thoroughfare. This document was one of the first projects to use form-based code in an application outside the realm of the basic grid of a downtown core or in a new development. This historic corridor has experienced significant improvement guided by their form-based code.

In another case study, Peoria, Illinois developed a form-based code for an area of their downtown that was economically depressed. Peoria utilized the remains of a traditional gridded downtown, and a willing desire from the community to revitalize this area and honor its influence as part of the city's history. Although Arlington's Columbia Pike has seen more time pass (allowing for more plans to be realized) *The Heart of Peoria Plan* offers key suggestions for a course of action to attain their visions for redevelopment.

These case studies were chosen because of their similarities to existing structure and redevelopment vision to that of the North Central Street Corridor. In each case, the driving goal behind the revitalization plan was to create or recreate an identity or character for an area, including a sense of arrival, and a sense of place. In each situation, it was found that a strategy for their concerns was much broader than could be addressed with standard planning and zoning practices. An innovative method in planning procedure and approach was needed; a method to create, guide, and to realize a vision. For each scenario this culminated in a form-based code.

Columbia Pike – Arlington, Virginia

History and Overview

Dating to the early 1900s, Columbia Pike is one of Arlington's oldest thoroughfares. The Pike has a rich history of commercial and neighborhood development, serving as the area's Main Street. The importance of the pedestrian is apparent in the orientation and scale of the historic buildings that line this and other traditional Main Street settings. A streetcar line and a bus line both serviced this area in the early 1900s creating nodes of commercial development at intersections and stops. With ground floor retail operations and upper story residential and retail, a continuous street wall was formed by the slot commercial buildings typical to the era, creating a form with a designated place for urban activity. These neighborhood shopping districts were in close proximity to the residential areas, as well as cohesive to the neighborhood with a unifying architecture. It was a definite convenience that shoppers could achieve several tasks and errands in one short trip away from home (County of Arlington, 2005).

The corridor was later phased into a dated suburban-like commercial strip dominated by the automobile. As a route from the Pentagon to the Arlington/Fairfax line, the Pike varies from four to six lanes and carries thousands of vehicles daily. Lined with low density buildings and

surface parking lots, this area was the most underdeveloped in a county otherwise built out to its maximum. Much like Knoxville's North Central Street Corridor, this area was bypassed by suburban development impositions in urban corridors in the 1950s and 1960s, the resultant lack of development proved beneficial. Columbia Pike had experienced very little investment or development over the course of several decades; but in introducing a form-based code to the area, the three and a half mile "Main Street" has witnessed a surge of investments and desirable development patterns.

The revitalization process for Columbia Pike began in 1998, when redevelopment and economic viability were envisioned for this area by county leaders and citizens alike. The desire to recreate a mixed-use, pedestrian-friendly environment was the basis for the idea. The guiding vision, "The Columbia Pike Initiative, a Revitalization Plan for the Columbia Pike Corridor", was first published in 2002. The goal of this initiative is to create a safer, cleaner, more economically competitive and vibrant community. In the initial visioning process, a series of illustrative and diagrammatic drawings were produced to convey the ideas envisioned for the corridor. Over the course of this process, it was also determined that the existing zoning regulations would not allow for the types of development that the community imagined for the area in reestablishing a traditional Main Street setting. An innovative approach was mandatory, and this realization resulted in the creation and adoption of a form-based code. The Columbia Pike Initiative has become one of the foremost precedents in a form-based approach to revitalizing an existing commercial corridor instead of the usual application to the urban grid or new development.

The *Columbia Pike Special Revitalization District Form-Based Code* was adopted in 2003 and is an option to the existing zoning. Incentives for use of the form-based code are numerous for both property owner and developer, including a density bonus and a more efficient permitting and approval process (County of Arlington, 2005).

Summary of the Code

There are four basic components included in the Columbia Pike Special Revitalization District Form-Based Code: the Regulating Plan; Building Envelope Standards; Streetscape Standards; and Architectural Standards.

The Regulating Plan is organized into sections addressing four main districts: the Town Center; the Village Center; Neighborhood Center; and the Western Gateway. Building envelope standards are designated within each district (termed “sites” in this code): as Main Street sites; Avenue Sites; Local Sites; and Neighborhood Sites. The Building Envelope standards establish guiding principles for height, siting, elements (as in fences and front porches), and use specifications particular to each site, based on which type of street they front. The Main Street frontage is applied to the major roads in the area including most of Columbia Pike.

Streetscape Standards provide guidelines that communicate the relationship between street and building. They address matters including sidewalks, turf and groundcover, street trees, on-street parking, and street furnishings. The intent of these standards is the promotion of pedestrian activity, centered on the concepts of accommodation and safety.

The Architectural Standards set forth the general principles and intent to favor a traditional neighborhood aesthetic and to specify an architectural language that favors a cohesive appearance. The standards address exterior building walls, roofs and parapets, windows and doors, street walls, signage, and lighting. In addition, there are definition and administration sections, providing clarification of terms and processes referred to throughout the code. These standards are represented by a series of images showing what is desirable (County of Arlington).

COLUMBIA PIKE CORRIDOR ILLUSTRATIVE PLAN



COLUMBIA PIKE CORRIDOR CONCEPT

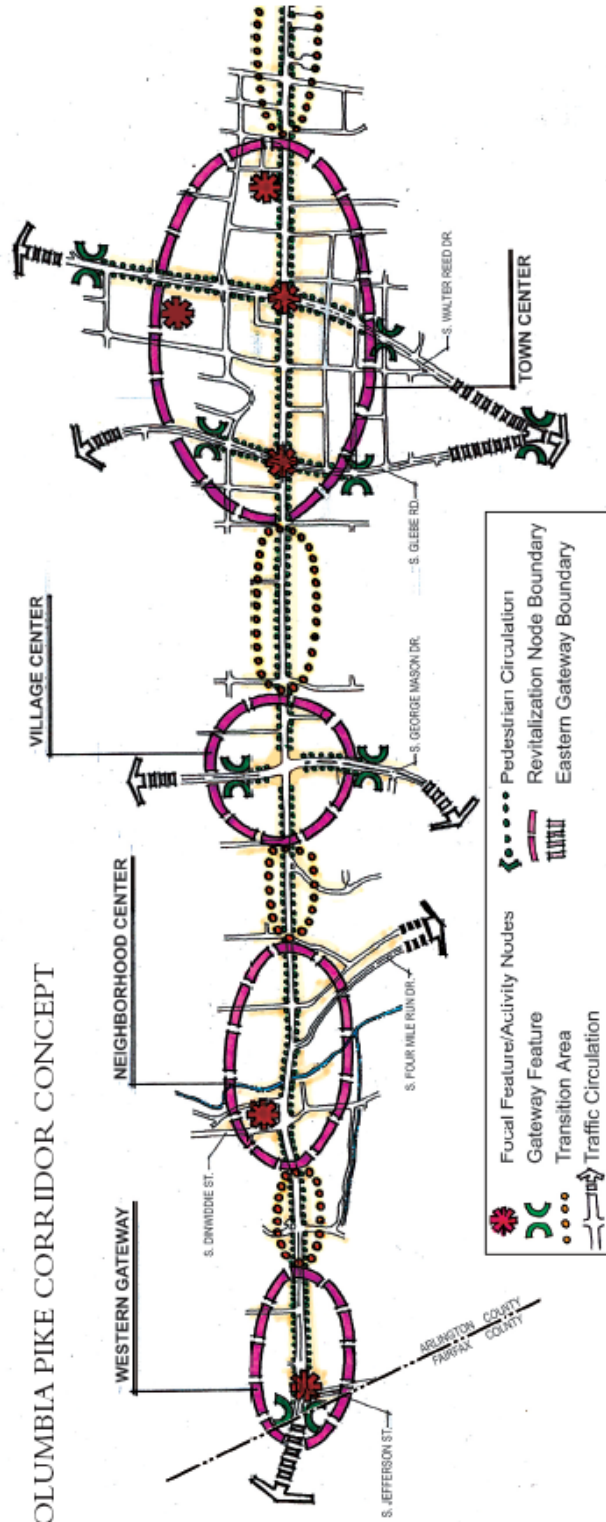


Fig. 4.1: Graphic portrayal of allowed building height in the Town Center District of Columbia Pike. (County of Arlington, 2005) page 10.

WESTERN GATEWAY ILLUSTRATIVE PLAN



Fig. 4.2: Illustrative plan for the Western Gateway District of Columbia Pike. page 15. (County of Arlington, 2005)

TOWN CENTER BUILDING HEIGHTS



Fig. 4.3: Graphic portrayal of allowed building height in the Town Center District of Columbia Pike. page 11. (County of Arlington, 2005)

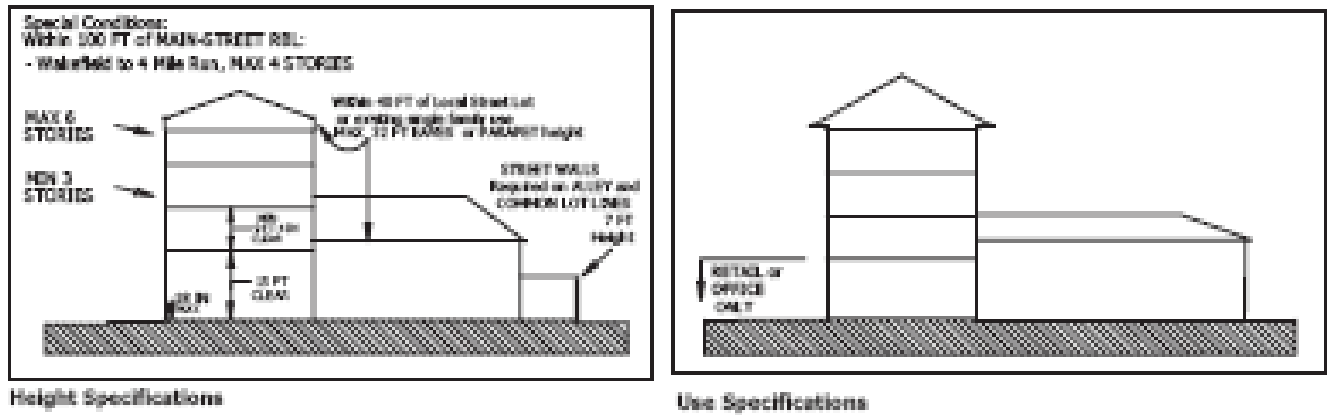


Fig. 4.4: Building Envelope Standards for Main Street Sites of Columbia Pike. page 139-140.

(County of Arlington, 2005)

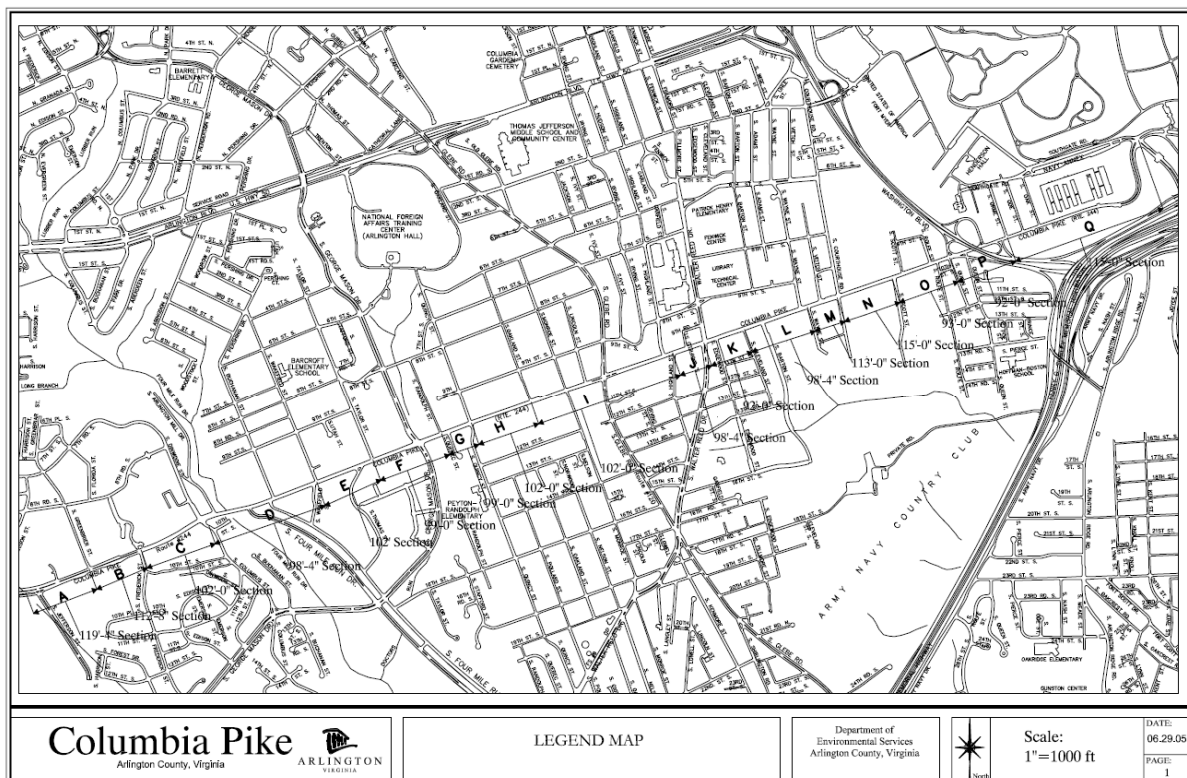


Fig. 4.5: Legend Map for Streetscape Standards for Columbia Pike Corridor. (County of Arlington)

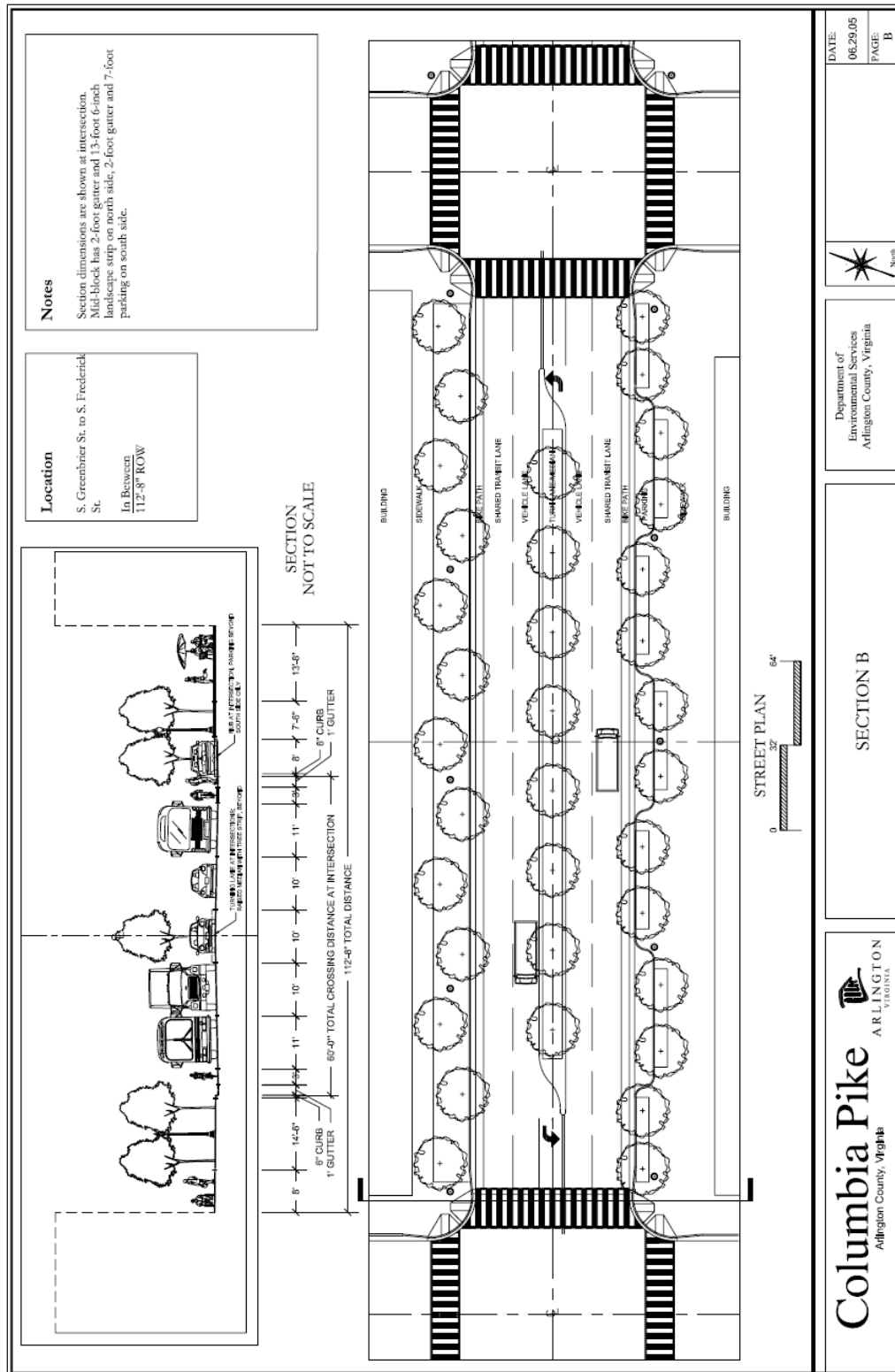


Fig. 4.6: Streetscape Standards for Section B of Columbia Pike Corridor. (County of Arlington)

Synopsis to date

The goal of the Columbia Pike Initiative is to “create a safer, cleaner, more competitive and vibrant Columbia Pike Community” (County of Arlington, 2005). With the preference of form-based codes as a tool for revitalization, this is confirmation that design is capable of achieving the goals of community and place for Columbia Pike. A unique mix of old and new, Columbia Pike is a distinctive combination of buildings and uses, collectively portraying a compilation of architectural styles. Welcoming sidewalks offer an immersion into Arlington’s history and diversity. Functioning as a major corridor for travel to several federal agencies (including the Pentagon) nearly forty thousand commuters travel this road every day. Approximately seventy thousand people call the tree-lined streets around it home, in some of Arlington’s most unique historic neighborhoods. The Columbia Pike area has been dubbed an Urban Village, characterized by its walkability, mixed-uses, and public transportation services. The residents live by the motto, “Live, work, shop, and play....no car required,” based on the fact that most activities can be accomplished without the use of a private automobile. There are several institutions that aim to create relationships within the community including an artist co-operative, providing local artists studio and gallery space; a weekend farmers’ market; and a community center hosting activities for all ages (CPRO, 2008). Form-based codes have assisted Arlington County in recreating a vibrant main street, pedestrian-oriented and walkable streets, mixed-use buildings, and a neighborhood that is centered on creating a genuine community. Since its adoption, the majority of the development proposals for the area have opted to use the new code, realizing the advantages (Katz, 2004).

Heart of Peoria - Peoria, Illinois

History and Overview

Like many cities of similar size and origin, Peoria’s downtown has experienced the influences of suburbanization with the transferring of their main concentration of commerce and

residential areas from the city center to suburban and rural areas. Remaining in the city center is a consistent pattern of gridded streets and the architectural bones of what was once a lively place of commerce and residential neighborhoods. Retaining the configuration of traditional historic neighborhoods, Peoria has a substantial historic housing stock in the neighborhoods that surround the downtown - homes mostly constructed before 1940.

Decline of commerce and residential activity in the center city led the citizens and community leaders to take action to realize the opportunities of their downtown, which was significant to the history of their city. The need and potential for revitalization of their downtown were recognized and *The Heart of Peoria Plan* was developed in 2002. The plan thoroughly describes the visions and opportunities that the charrette participants derived over the course of the forum they coined Studio HOP (Heart of Peoria). The prevailing ideas from Studio HOP were to address the state of the streets, promote reuse of buildings, create diversity in public spaces, allow for choice in housing, create walkability, apply traditional neighborhood development patterns, and control the scale and compatibility of new development. Studio HOP produced drawings to convey the desired results that the community envisioned for their revitalized downtown (Ferrell Madden Associates & Urban Advisors, 2006).

In May of 2006, an initiative to turn the *Heart of Peoria Plan* into a working revitalization plan began. The plan represented a vision for 8,000 acres of downtown business districts and neighborhoods. A form-based code was developed to focus attention on the forms and activities that the city aspired for the downtown. As part of the code, four special form district plans were produced as well as an overlay for the entire downtown.

The Warehouse District was of particular interest as a form district. There was much enthusiasm from the community regarding the transformation of the old warehouses and industrial buildings into commercial and residential uses (Figure 4.8), but there was also a

conflicting concern from several business and property owners that sought to keep the industrial potential of some buildings intact.



Figure 4.7: A visualization of the possible transformation of alley to a viable urban experience in the Warehouse District. page. IV.11 (Duany Plater-Zyberk & Company, 2002)

The concern of the owners was the need to allocate for truck traffic to support these industries in the proposed streetscape plans (Ferrell Madden Associates & Urban Advisors,

2006). This issue can be addressed successfully through form-based codes, in that it addresses these issues in a manner to achieve best opportunities for each investor with the same vision for the end result. The North Central Street Corridor also faces similar issues, having several viable industries, or sites suited for industry, located along the corridor. The balance between uses is critical, as is the allowance for truck traffic to co-exist with other street activity, especially pedestrian use.

Summary of the Code

The *Heart of Peoria Land Development Code* defines districts to which the provisions of the code apply. They include residential, commercial, industrial, institutional, parking, form, and overlay districts. Each parcel is designated to a district and uses and appropriate building envelope standards are applied. The building envelope standards applied depend upon the type of street that the building fronts in each area. These areas are described as urban, pedestrian, and general, providing for different densities and scales of development.

With attention to required building line, minimum and maximum setbacks, parking setbacks, height, siting, building projections, doors and windows, and street walls, the code presents the building envelope standards under the headings of height, siting, and elements.

The form-based codes are most specific in the form districts designated in the core of the downtown. The four form districts in this area include: the Prospect Road District, the Historic Sheridan Triangle District, the West Main Street Corridor, and the Warehouse District. They are intended to promote mixed-use and a traditional urban form. The components that guide the form districts are the regulating plan, building envelope standards, street specifications, streetscape standards, and parking requirements. The regulating plan shows each form district as a map, highlighting the applicable area and detailing the provisions for each district.

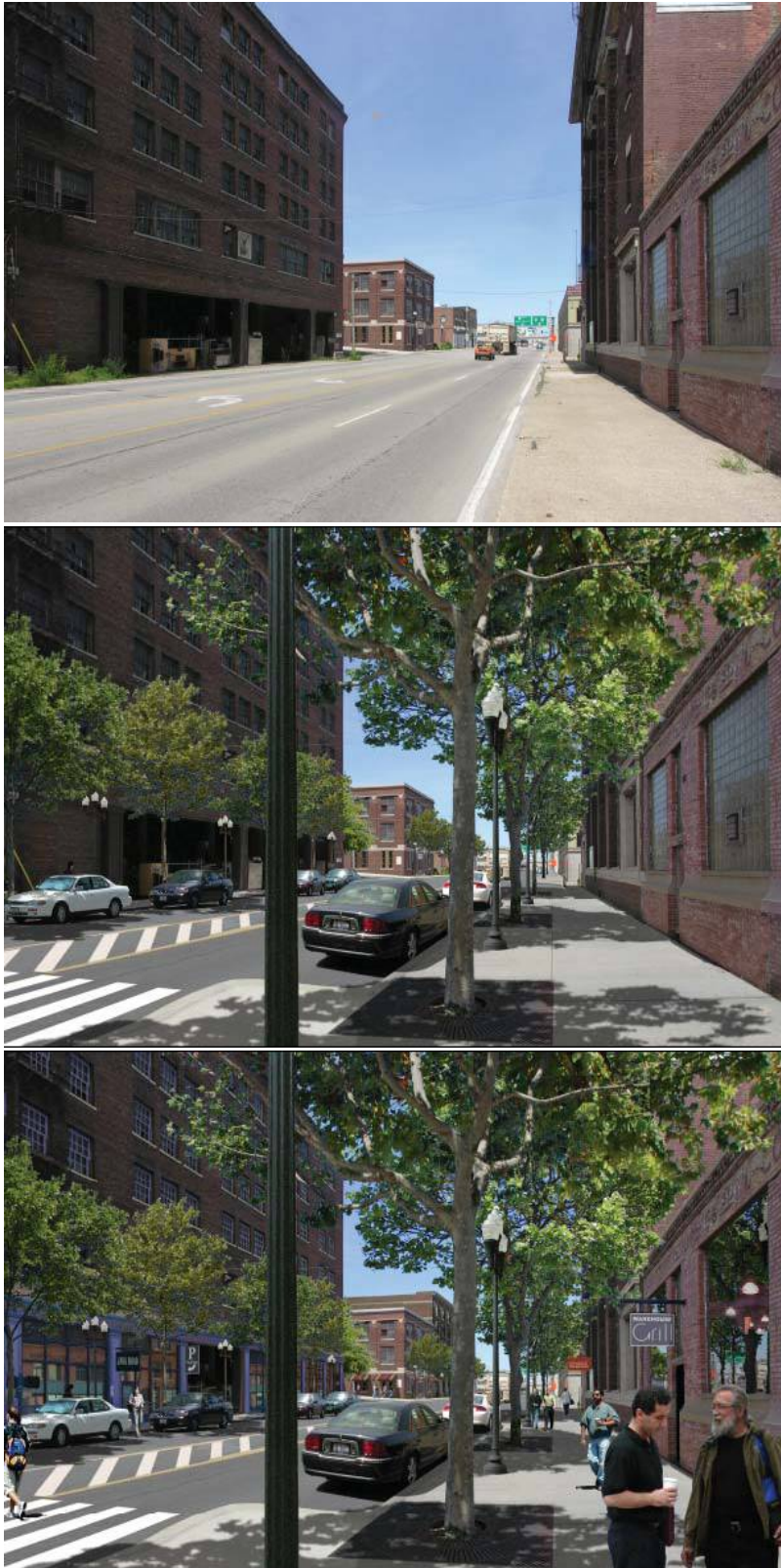
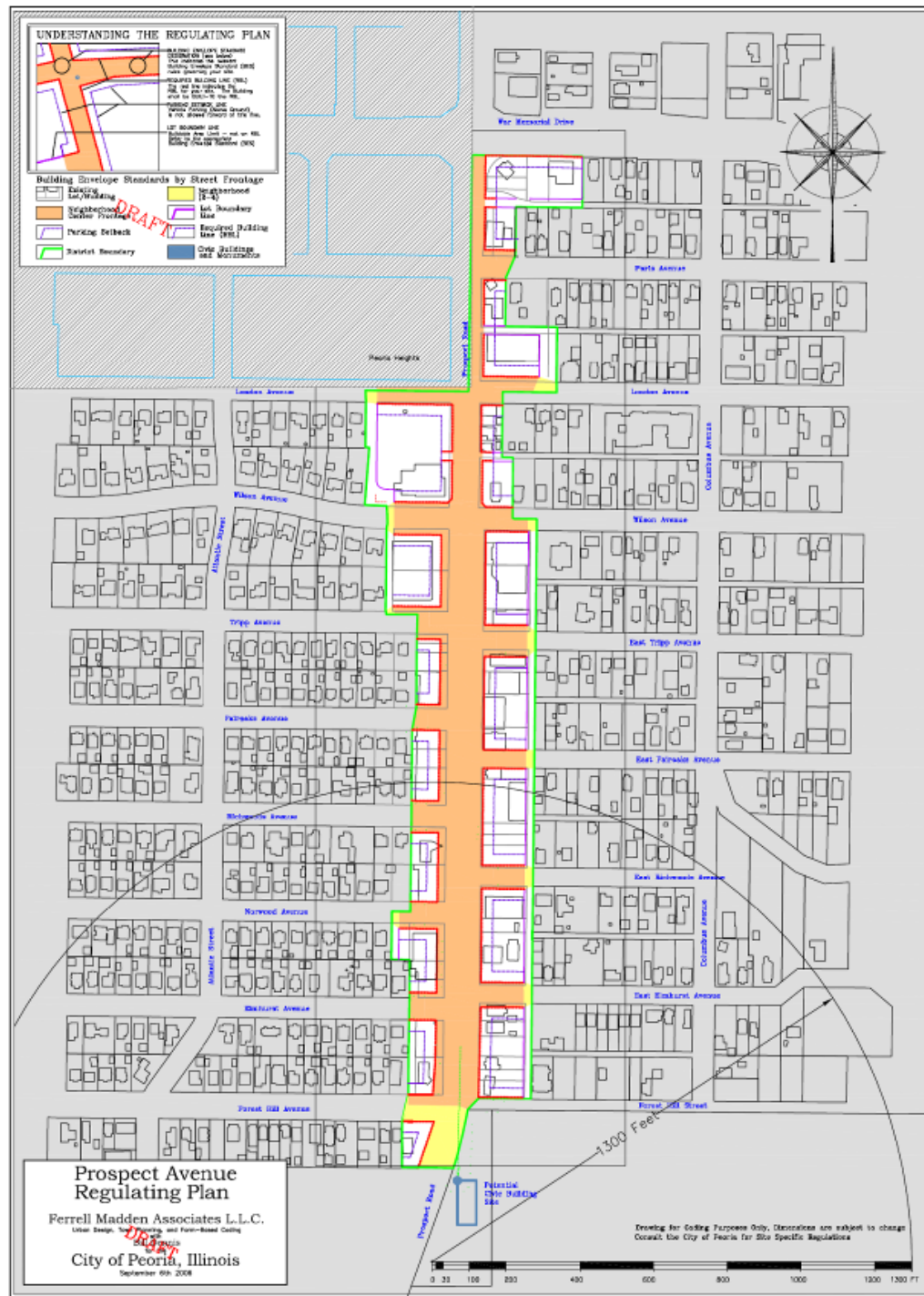


Figure 4.8: The Warehouse District possible change over time, Photo Visualization by Steve Price, UrbanAdvantage. (Ferrell Madden Associates & Urban Advisors, 2006) page 15



elements, and use. (Figure 4.10) The architectural standards have the intent of promoting a consistent architectural character to the form districts, as well as reflecting traditional architectural styles and history. The objective of the streetscape specifications is to create streets that accommodate a balance of transportation means and pedestrian activities. Specifications are recommended by street type and suggest typical patterns of lane widths, sidewalk widths, tree planting areas, and on street parking areas (Ferrell Madden Associates & Urban Advisors, 2006)

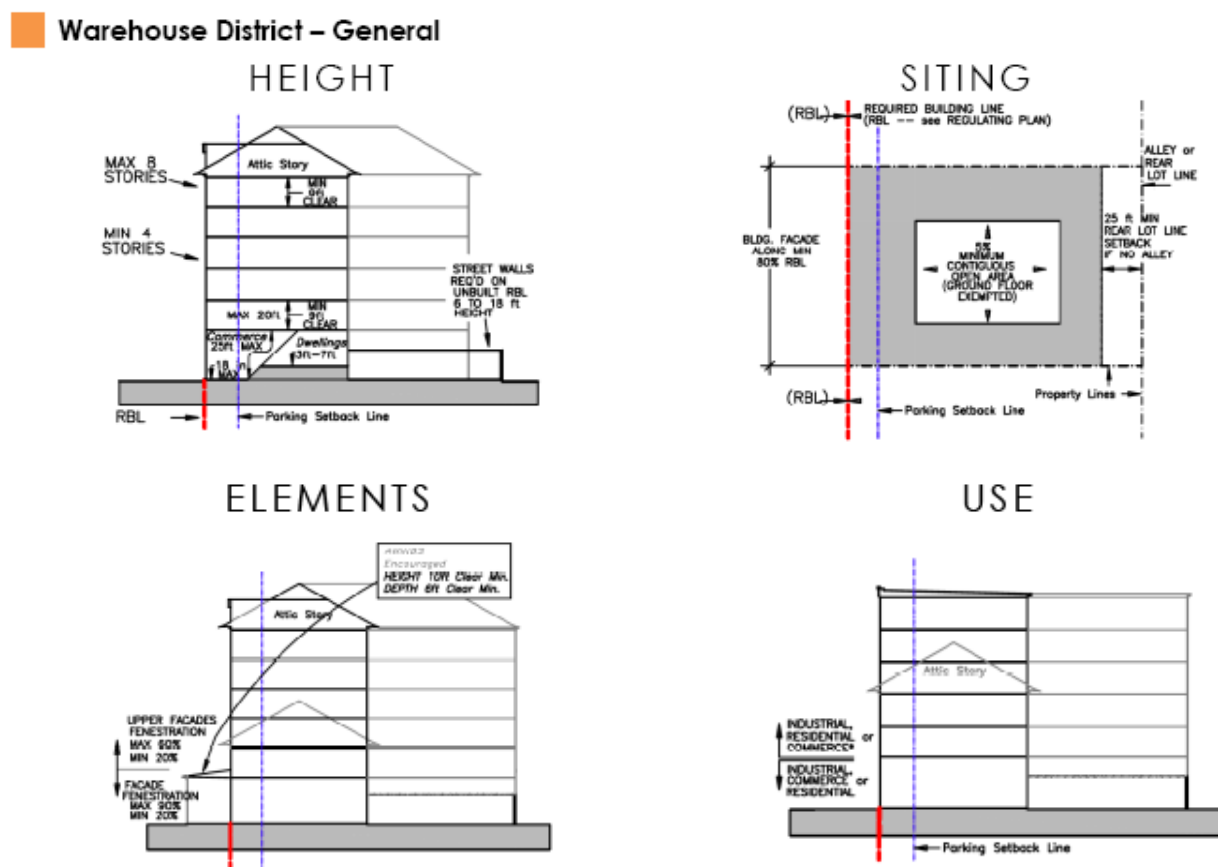


Figure 4.10: Building Envelope Standards for the Warehouse District. (Ferrell Madden Associates, 2006) page 139-140.



Figure 4.11: Prospect Corridor change over time, Photo Visualization by Steve Price, UrbanAdvantage. (Ferrell Madden Associates & Urban Advisors, 2006) page 17.

Synopsis to Date

The vision of the Heart of Peoria Plan has resulted in several actions by private and public participants. A Citizen Advisory Group, made up of area residents and business owners, has been formed to guide in the production of street and streetscape improvements to the

Sheridan Business District (Summers, 2008b). Citizens believe that the initial steps in attaining the visions in the *Heart of Peoria Plan* are for the city to take action to implement the suggested improvements to the streets, providing encouragement for private investors, businesses, and residents to invest in the areas (Summers, 2008a).

The City has taken several measures to realize the vision of the *Heart of Peoria Plan*. An Enterprise Zone and Tax Increment Financing District has been established that make significant incentives available for the redevelopment plan. A façade improvement program has been initiated as a tool to work alongside the *Heart of Peoria Plan* in achieving a cohesive architectural character along the corridor, while providing property owners with the opportunity for assistance in improving and enhancing their façades (Peoria, 2007). The Heart of Peoria Commission has also been established as the city liaison in the project, creating a work plan and outlining budgetary needs.

Several projects in the Warehouse District have turned long-abandoned warehouses into artist's studio space, galleries, restaurants, shops and other urban amenities, showing that the desire to live an urban lifestyle is prevalent, and this type of investment and development is encouraged by a form-based code. The buildings of the Warehouse District are an important architectural and historical asset to the city. To preserve these structures and allow for reuse would be a tremendous asset to the city. Several other key issues were in consensus for the Prospect Corridor, such as the need for a sense of arrival, greening of the streets, and creating a boulevard allowing for a more pedestrian-friendly atmosphere (Duany Plater-Zyberk & Company, 2002). Because of the span of the Corridor and the infrastructure required for realization, it is envisioned that this stage of the plan will be implemented several blocks at a time (Ferrell Madden Associates & Urban Advisors, 2006).

In his article *Form First*, Katz points out that in many cities, industrial warehouse districts have transformed into trendy arts districts with living spaces on top floors and galleries, shops, and restaurants on ground floors. The building forms have remained fairly constant while the uses and patterns of activities have changed drastically (Katz, 2004). Comparable to areas of the North Central Street Corridor and the Warehouse District in the Heart of Peoria Plan, this transformation can be realized by designing a form-based code that allows for and encourages mixed-use as well as reuse of existing structures.

CHAPTER 5

APPLICATION TO THE NORTH CENTRAL STREET CORRIDOR

Defining the Study Area

This area of study extends along North Central Street from the intersection of Jackson Avenue in the Old City north to Morelia Avenue. It includes the North Central Street Corridor at the center and stretches west to Interstate Highway 275, and east to Interstate Highway 40. The main attention of this study is focused on the Corridor. (Figure 5.1) Significant historic sites and neighborhoods referenced in the history chapter are keyed into the study area map and shown in Figure 5.2.

The communities and neighborhoods in the area have an extensive history and connection to the city of Knoxville. The Merriam-Webster Dictionary defines a corridor as “an area or stretch of land identified by a specific common characteristic or purpose”. The North Central Street Corridor was developed as a passageway for urbanization in response to the needs of the growing city in the Industrial Era. The purpose was to provide new lifestyle opportunities for the citizens offering streetcar transportation to and from homes and workplaces. The area grew with the consistent character of the pre-automobile suburb, having an appropriate form, scale, and massing that was conducive to the pedestrian and community building.

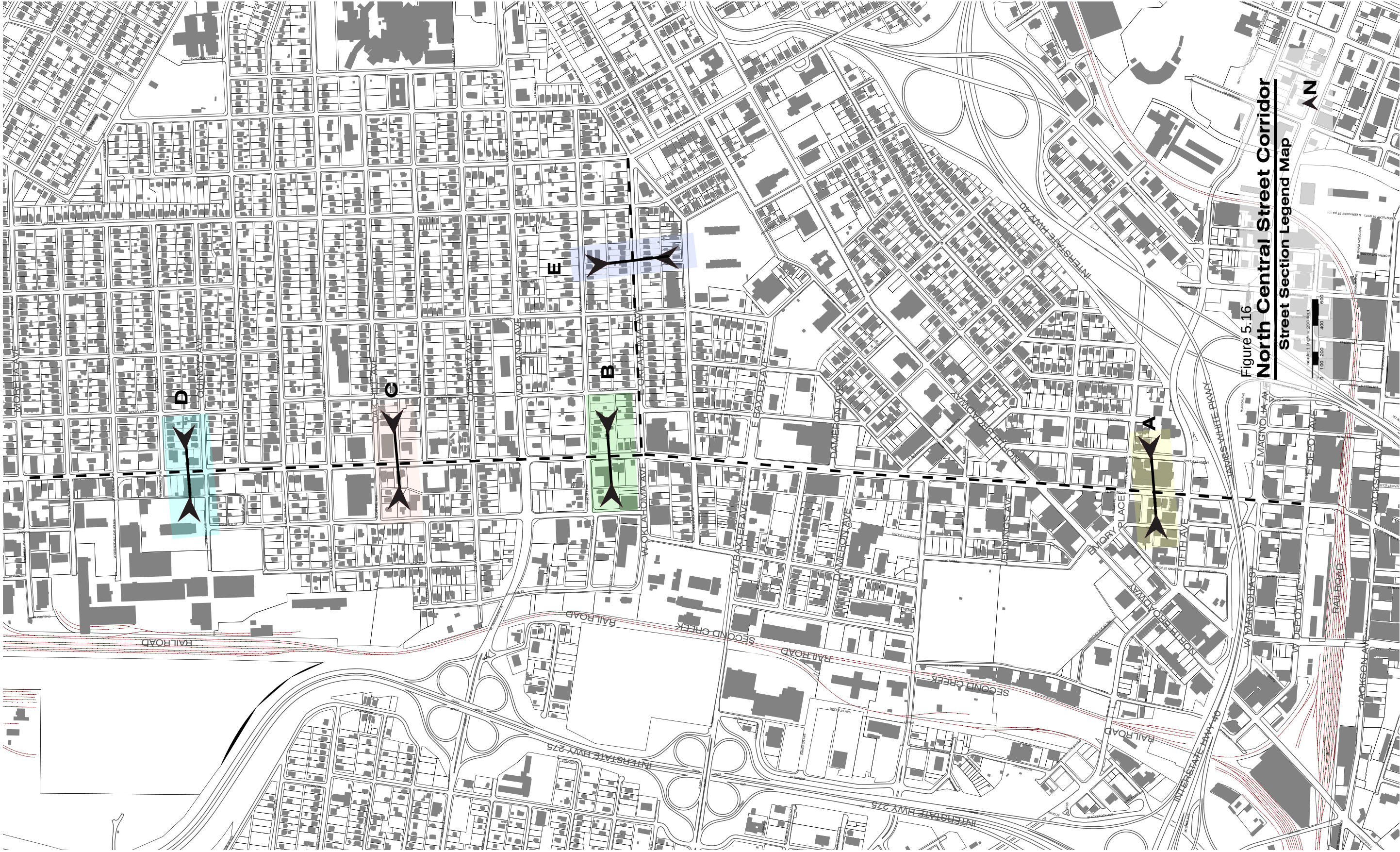


Figure 5.16
North Central Street Corridor
Street Section Legend Map

Figure 5.2
 North Central Street Corridor Photo Key to Study Area Map (Figure 5.1)



A - The Old City



B - Patrick Sullivans Saloon



C - Historic Knoxville High School



D - Emory Place



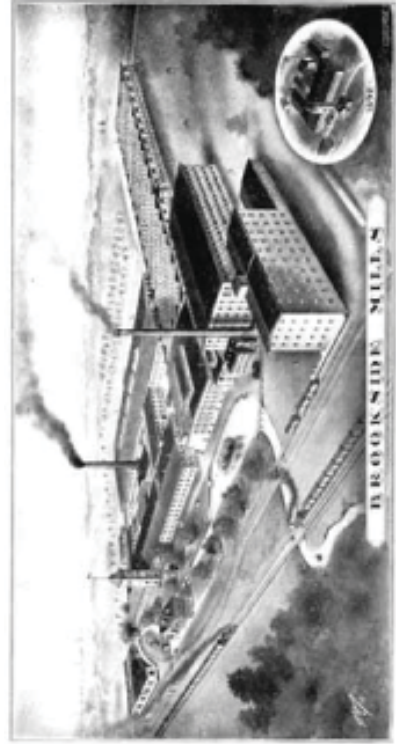
E - Old Grey Cemetery



F - Flatiron Building



G- Fourth and Gill Neighborhood



H -Brookside Mills



I -Happy Hollow



J -Old North Neighborhood



K - Oakwood Neighborhood



L - Lincoln Park Neighborhood

Overview of the Corridor Today: Current State and Characteristics

At present the study area is an incoherent combination of commercial, industrial, warehouse, residential, and office buildings. Several of the infill structures have taken on the characteristics of modern suburban development having a large front setback, front parking lot, and a lower density, resulting in a lack of consistency in urban character and form. Many large industrial warehouses and buildings still exist in the Old City area; but to the north at Magnolia Avenue, the imposition of the interstate has ruptured the connection between the urban neighborhoods surrounding the corridor and the downtown. At the Fifth Avenue intersection the monumental Knoxville High School still stands alongside several apartment and townhomes and the slot commercial buildings of Emory Place. Most of the street wall remains on the south, east, and west corners of the once architecturally profound Broadway and North Central intersection. The disadvantage is a suburban style bank that has forced an undesirable suburban footprint on the north corner, having a larger front setback, a front parking lot, and a one-story characterless building. Several warehouses have been rehabilitated to host artist's studios and loft-style living spaces on the side streets of the corridor. Other commercial buildings of varying character continue along the corridor backed with an impressive stock of historic housing, featuring many impressive historic architectural features. The number of lanes in some sections of North Central Street is not justified. The capacity for traffic flow is over-prescribed for the amount that the route currently carries, this is due mainly to the fact that the nearby interstate highway has taken most of the traffic off of this in town corridor (KCDC, 2007). A study of the corridor was conducted in order to identify existing functions and opportunities focusing on pedestrian and vehicular circulation, activity nodes, and gateways. (Figure 5.3)

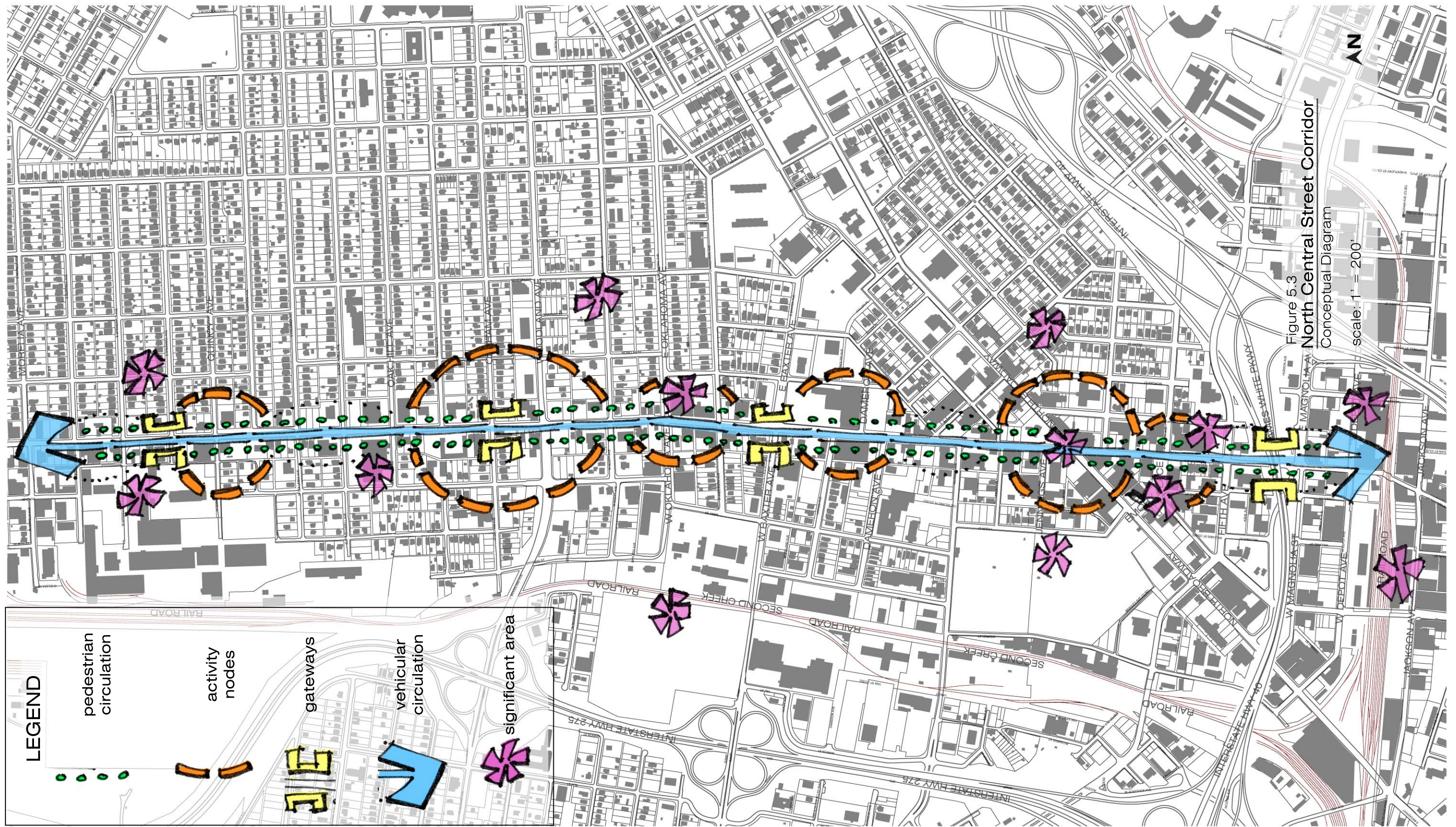




Figure 5.4: Existing forms to interpret through a form –based code for the North Central Street Corridor. Clockwise: Attached Residential, Civic / Institutional, Commercial, and Detached Residential. Photos by R.J. Justice.



Figure 5.5: Existing Streetscape of North Central Street, view north from Oklahoma Avenue intersection. Photo by R.J. Justice

Redevelopment Propositions

Several studies and plans have been conducted by various parties that take part or all of the study area into consideration. The Knoxville-Knox County Metropolitan Planning Commission (Knox MPC) has made several valuable observations on the current state and prospect of the area, and taken this information and proposed suggested parameters for revitalization. The vision presented for the North Central Street Corridor in the “I-275 / North Central Street Study” is a mixed-use corridor with revitalized commerce and neighborhoods. The study intends to provide the basis for encouraging economic investment and development in the corridor, as well as assisting in reversing degradation of the environment and historical elements in the area (Knox MPC, 2007b). The recommendations in the “Broadway-Central-Emory Place Small Area Plan” include: the creation of a “Downtown North;” enhancement of

neighborhood stability; rehabilitation and redevelopment of the North Central Street Corridor; and improvements to non-motorized transportation systems including greenway connections and accommodations for bicycles (Knox MPC, 2007a).

The Fifth and Broadway Task Force has taken the initiative to address to the homeless issue and related social issues that the area faces, with their statement of purpose being “to create, with the City of Knoxville and Knox County, a livable, enjoyable and sustainable environment that includes homeless care and business and neighborhood growth” (Fifth and Broadway Task Force, 2006). In the “Report to the Mayor” proposals for short and long term goals are presented in order to achieve these objectives.

The Knoxville Community Development Corporation (KCDC) has organized the “Downtown North I-275 Corridor Redevelopment and Urban Renewal Plan” in which they take into consideration the observations and recommendations put forth in the previous-mentioned reports and enlarge them into a more thorough report - highlighting restraints to overcome, stating goals and objectives of their redevelopment proposal and process, financing plans, and forming land acquisition policies.

These studies confirm that awareness of the historical assets, as well as a desire to reinvest attention to the area, is prevalent. Given the aspirations presented in the aforementioned plans and studies, the utilization of design-based zoning seems to be a viable option for redevelopment of the study area.

Redevelopment Possibilities: A Form-based Code for the North Central Street Corridor

The physical circumstances, together with the visions for redevelopment and revitalization of the North Central Street Corridor, provide a suitable scenario for the use of design-based zoning. A representative form-based code has been generated for the study area

modeled after design-based zoning currently applied throughout the country, such as in Arlington, Virginia; Peoria, Illinois; Azusa, California; and Sarasota, Florida. The proposal of a suggested form-based code for the revitalization of the North Central Street Corridor is presented in the following sections. This code was derived from field observations of the existing conditions of form, scale, and massing, as well as research of historic land use through the Sanborn fire insurance maps developed in the late 19th century.

The Regulating Plan

In design-based zoning, such as form-based codes, guiding principles are presented for: 1) type of urban area or zone (e.g. urban corridor or neighborhood edge); 2) building type or form (e.g. detached residential and civic); 3) open space type (park or greenway); 4) street types (e.g. boulevard and local street). The foundation of design-based zoning is form. The typology associated with the character of the area becomes the defining classification for determining zones and forms (Walters & Brown, 2004).

The initial step is to create a regulating plan that will designate the area into zones. Building form standards and streetscape standards are then prescribed for each zone. The regulating plan demonstrates how the redevelopment of the corridor might take place according to the parameters in the proposed form-based code. Individual buildings are not as important in these regulating plans as the concept as a whole (Figure 5.6, 5.7, and 5.8)

Figure 5.6

URBAN CORRIDOR ZONE REGULATING PLAN

PURPOSE

The URBAN CORRIDOR zone is the most intensely occupied zone, having mostly attached building types that create a continuous street facade. This area allows for the greatest density.

ALLOWABLE BUILDING FORMS

- Attached Residential
- Commercial One
- Commercial Two
- Civic / Institutional

BUILDING STANDARDS AND PLACEMENT ON LOTS

see Building Form Standards

ALLOWABLE STREET TYPES

see Streetscape Standards

SAMPLE CHARACTERISTICS



Commercial Two



Civic / Institutional

SAMPLE LOCATION MAP

see figure 5.1

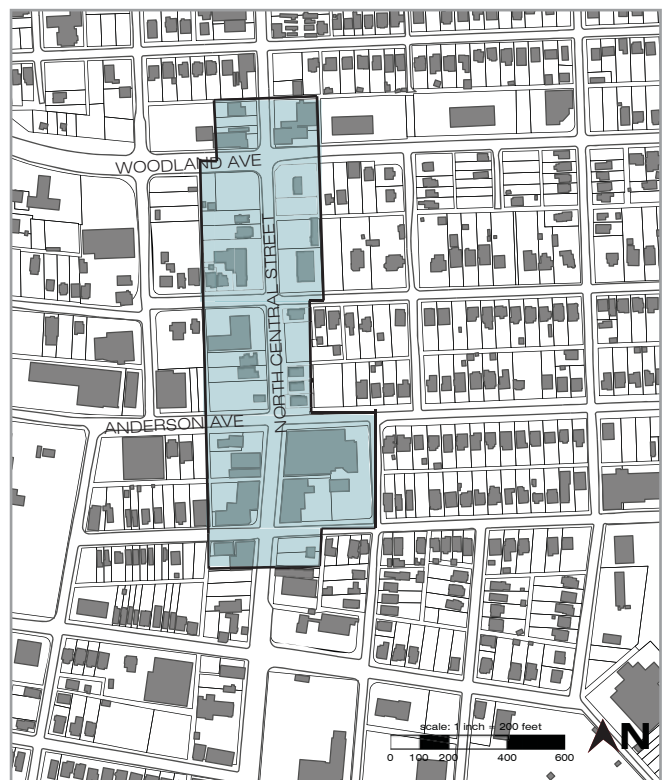


Figure 5.7

NEIGHBORHOOD CENTER ZONE REGULATING PLAN

PURPOSE

The NEIGHBORHOOD CENTER zone has a mixture of building types and uses, some buildings are attached creating areas of continual street facade.

ALLOWABLE BUILDING TYPES

- Attached Residential
- Commercial One

BUILDING STANDARDS AND PLACEMENT ON LOTS

see Building Form Standards

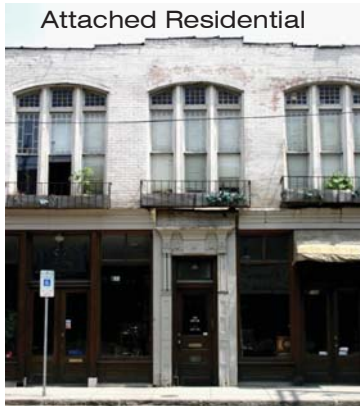
ALLOWABLE STREET TYPES

see Streetscape Standards

SAMPLE CHARACTERISTICS



Attached Residential



Commercial One

SAMPLE LOCATION MAP

see figure 5.1

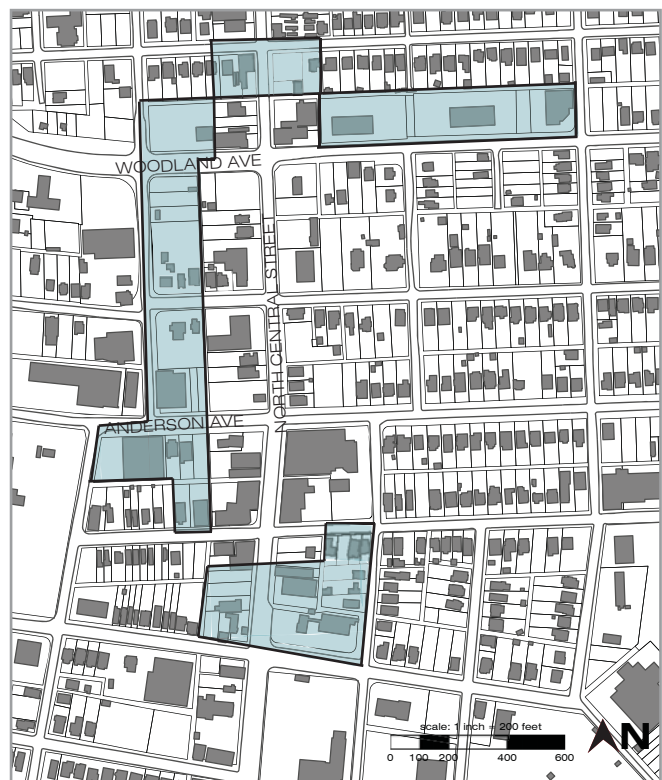


Figure 5.8

NEIGHBORHOOD GENERAL ZONE REGULATING PLAN

PURPOSE

The NEIGHBORHOOD GENERAL zone is primarily residential.

ALLOWABLE BUILDING FORMS

- Detached Residential One
- Detached Residential Two

BUILDING STANDARDS AND PLACEMENT ON LOTS

see Building Form Standards

ALLOWABLE STREET TYPES

see Streetscape Standards

SAMPLE CHARACTERISTICS



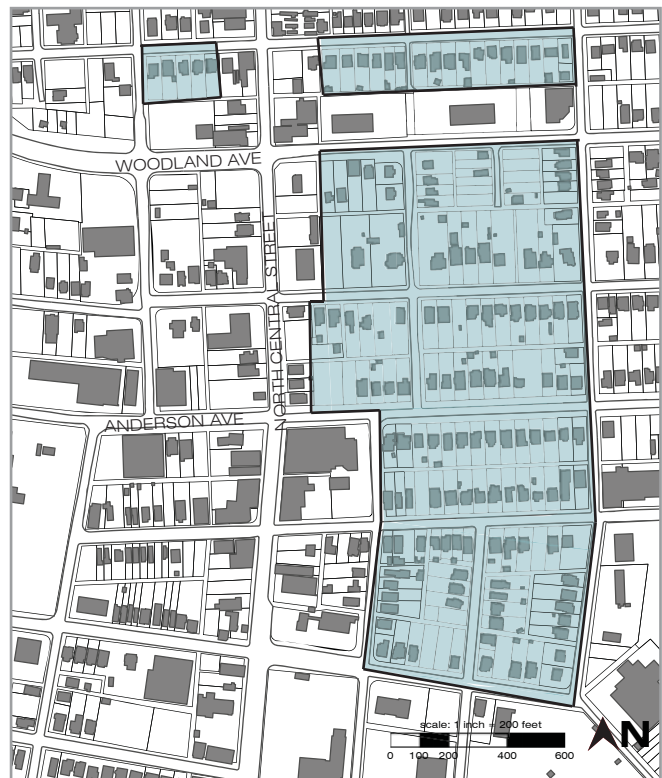
Detached Residential Two



Detached Residential One

SAMPLE LOCATION MAP

see figure 5.1



The General Provisions for the Regulating Plan as Applied to the North Central Street Corridor:

APPLICABILITY

The requirements of this section apply to all development within the North Central Corridor Study Area.

PURPOSE

The North Central Corridor Regulating Plan is intended to:

- A. Provide standards for the continuing orderly growth and development that will assist in enhancing and maintaining a distinct community identity;
- B. Create a comprehensive and stable pattern of development and land uses upon which to plan transportation, water supply, sewerage, energy, and other public facilities and utilities;
- C. Ensure that proposed development is of human scale, pedestrian-oriented, energy-conserving, and is designed to create attractive streetscapes and pedestrian spaces;
- D. Minimize automobile congestion through pedestrian-oriented development, compact community form, safe and effective traffic circulation, and adequate parking facilities; and
- E. Ensure compatibility between different types of development and land uses.

INTENT

The zones are designed to foster a series of mixed-use form districts - Urban Corridor, Neighborhood Center, and Neighborhood General. These are sub-areas intended to promote traditional urban form and a lively mix of uses. These sub-areas are intended to allow for mixed-uses such as shop fronts, sidewalk cafes, and other commercial uses at the street level, with wide sidewalks and canopy shade trees, overlooked by upper story residences and offices.

The regulating plan identifies the building envelope standards and parking standards for all building sites within each zone. The regulating plan also demonstrates how each lot relates to public spaces (streetscape, pedestrian pathways, etc.) and the surrounding neighborhood. There may be additional regulations for lots in special locations as identified on the specific regulating plan.

Building Form Standards

Building form standards for the North Central Corridor can include a range of types and characteristics. These forms are outlined in six model types addressing form, scale, and massing: Commercial One, Commercial Two, Civic/Institutional, Attached Residential, Detached Residential One, and Detached Residential Two. Building form standards addressing allowable siting, height, typical section, and parking placement are graphically illustrated in simple illustrations. Several building forms can be applied to each zone. Allowable forms are listed in each regulating plan and described in extensive detail on separate sheets for each building form. (Figure 5.9, 5.10, 5.11, 5.12, 5.13, 5.14, and 5.15)

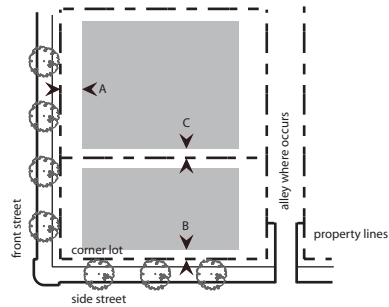
SITING

HEIGHT

SECTION

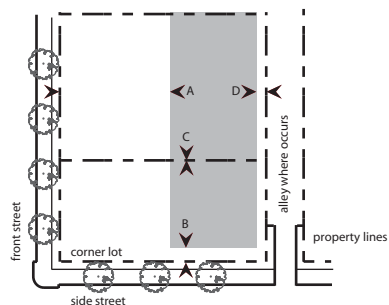
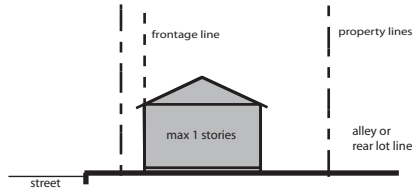
PARKING

detached residential one



Buildings shall be placed within the shaded areas as shown.

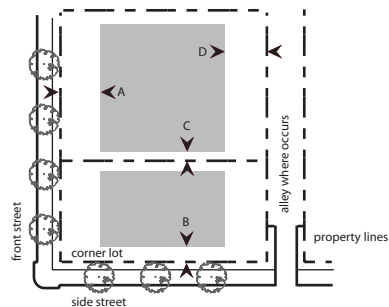
- A: Front Setback: 15 ft
- B: Side Street Setback: 5 ft
- C: Sideyard Setback: 5 ft
- D: Rear Setback: 15 ft



On-site parking is allowed within the shaded area as shown.

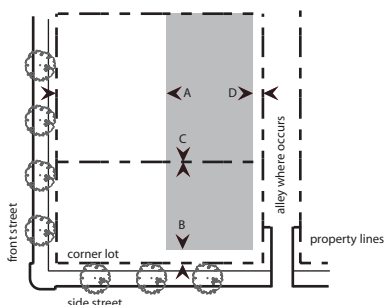
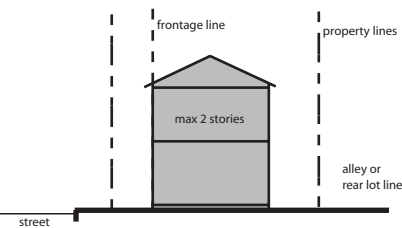
- A: Front Setback: 10 ft min behind front facade
- B: Side Street Setback: 5 ft min
- C: Sideyard Setback: not required
- D: Rear Setback: 5 ft min with alley, 3 ft min no alley

detached residential two



Buildings shall be placed within the shaded areas as shown.

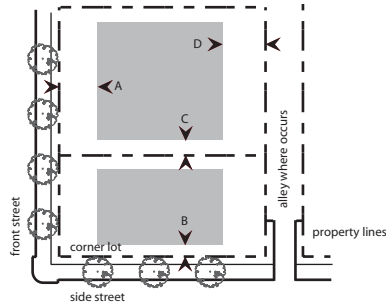
- A: Front Setback: 20 ft min
- B: Side Street Setback: 10 ft min
- C: Sideyard Setback: 6 ft min
- D: Rear Setback: 20 ft min



On street parking is allowed within the shaded area as shown.

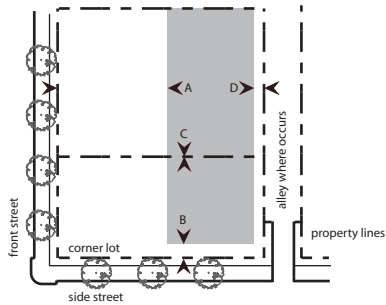
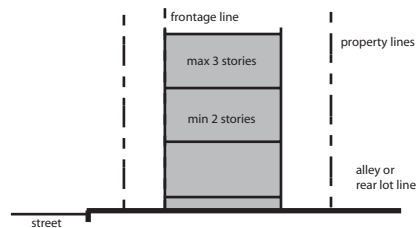
- A: Front Setback: 15 ft min behind front facade
- B: Side Street Setback: 5 ft min
- C: Sideyard Setback: not required
- D: Rear Setback: 5 ft min with alley, 3 ft min no alley

attached residential



Buildings shall be placed within the shaded areas as shown.

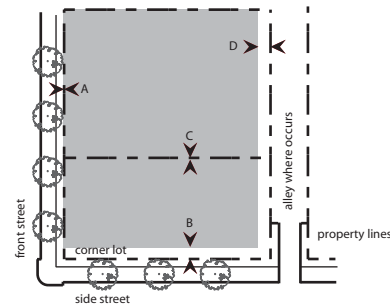
- A: Front Setback: 15-30 ft
- B: Side Street Setback: 6-10 ft
- C: Sideyard Setback: 6-10 ft
- D: Rear Setback: 50-60 ft



On street parking is allowed within the shaded area as shown.

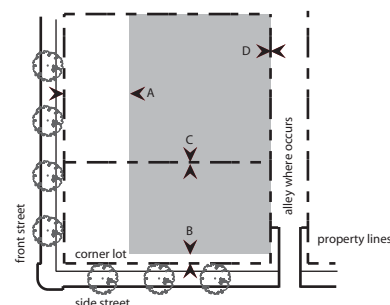
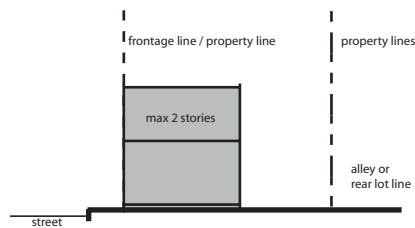
- A: Front Setback: 10 ft min behind front facade
- B: Side Street Setback: 5 ft min
- C: Sideyard Setback: not required
- D: Rear Setback: 5 ft min with alley, 3 ft min no alley

commercial one



Buildings shall be placed within the shaded areas as shown.

- A: Front Setback: 0 ft, 5 ft max for 90% min of frontage
- B: Side Street Setback: 0 ft, 5 ft max for 90% min of frontage
- C: Sideyard Setback: 0 ft, 15 ft min for abutting residential
- D: Rear Setback: 0 ft, 15 ft min for abutting residential

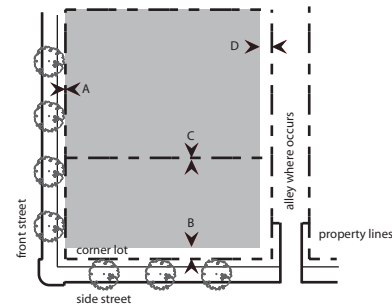


On-site parking is allowed within the shaded area as shown.

- A: Front Setback: 40% lot min depth
- B: Side Street Setback: 5 ft min
- C: Side Setback: not required
- D: Rear Setback: not required

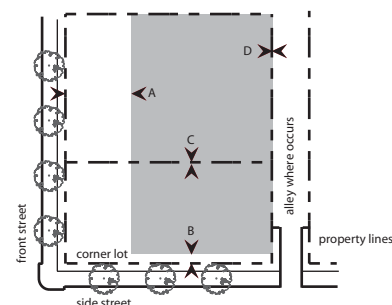
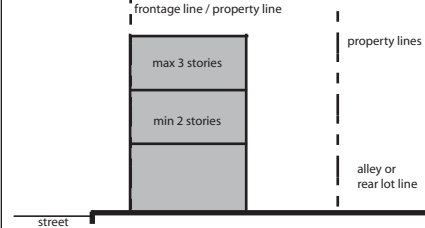
Off-site parking is allowed according to joint use agreements or shared parking districts.

commercial two



Buildings shall be placed within the shaded areas as shown.

- A: Front Setback: 0 ft, 5 ft max for 90% min of frontage
- B: Side Street Setback: 0 ft, 5 ft max for 90% min of frontage
- C: Sideyard Setback: 0 ft, 15 ft min for abutting residential
- D: Rear Setback: 0 ft, 15 ft min for abutting residential

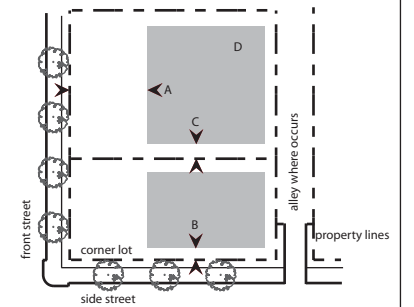


On-site parking is allowed within the shaded area as shown.

- A: Front Setback: 40% lot min depth
- B: Side Street Setback: 5 ft min
- C: Side Setback: not required
- D: Rear Setback: not required

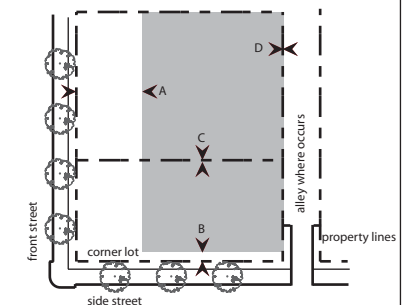
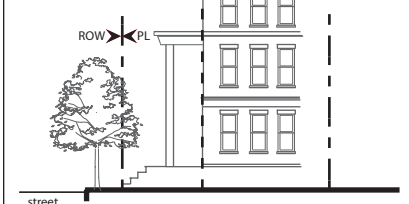
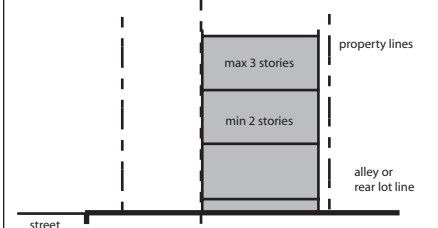
Off-site parking is allowed according to joint use agreements or shared parking districts.

civic / institutional



Buildings shall be placed within the shaded areas as shown.

- A: Front Setback: 0-30 ft
- B: Side Street Setback: 6-10 ft
- C: Sideyard Setback: 6-10 ft
- D: Rear Setback: 25-50 ft



On-site parking is allowed within the shaded area as shown.

- A: Front Setback: 40% lot min depth
- B: Side Street Setback: 5 ft min
- C: Side Setback: not required
- D: Rear Setback: not required

Off-site parking is allowed according to joint use agreements or shared parking districts.

LEGEND

- ROW - right of way
- FL - frontage line
- PL - property line

Figure 5.9

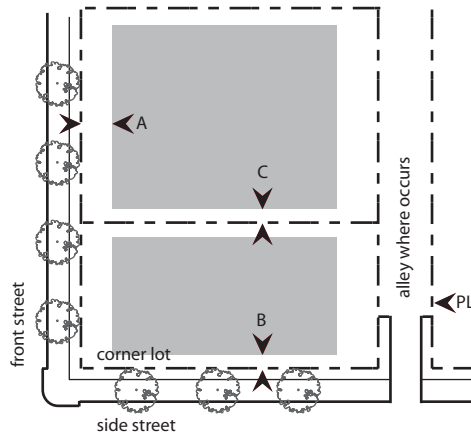
building form standards : North Central Street Corridor

Figure 5.10
detached residential one

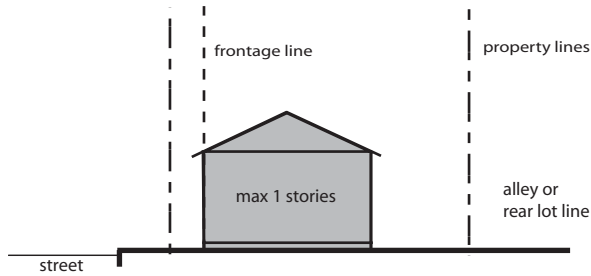
SITING

Buildings shall be placed within the shaded areas as shown.

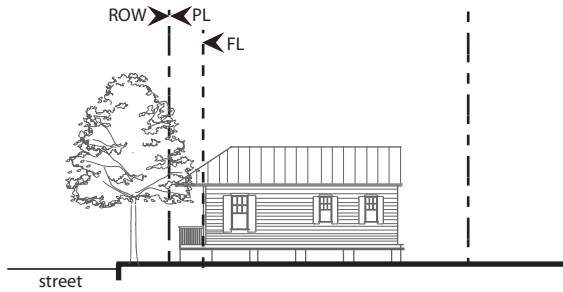
- A: Front Setback: 15 ft
- B: Side Street Setback: 5 ft
- C: Sideyard Setback: 5 ft
- D: Rear Setback: 15 ft



HEIGHT



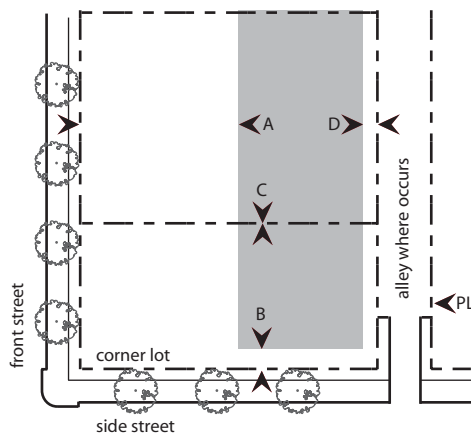
SECTION



PARKING

On-site parking is allowed within the shaded area as shown.

- A: Front Setback: 10 ft min behind front facade
- B: Side Street Setback: 5 ft min
- C: Sideyard Setback: not required
- D: Rear Setback: 5 ft min with alley, 3 ft min no alley



SAMPLE CHARACTERISTICS



LEGEND

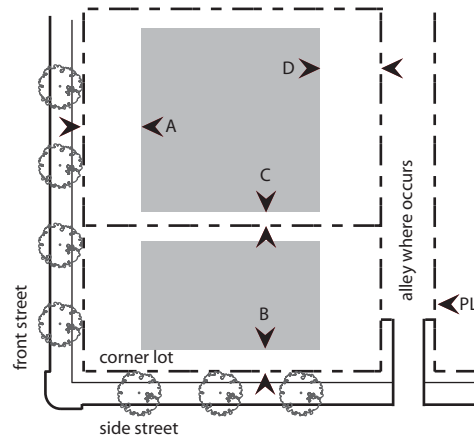
- ROW - right of way
- FL - frontage line
- PL - property line

Figure 5.11
detached residential two

SITING

Buildings shall be placed within the shaded areas as shown.

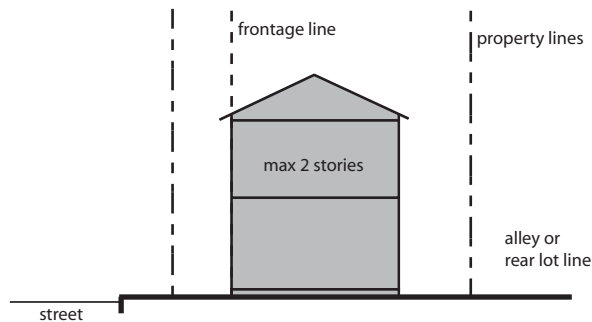
- A: Front Setback: 20 ft min
- B: Side Street Setback: 10 ft min
- C: Sideyard Setback: 6 ft min
- D: Rear Setback: 20 ft min



SAMPLE CHARACTERISTICS



HEIGHT



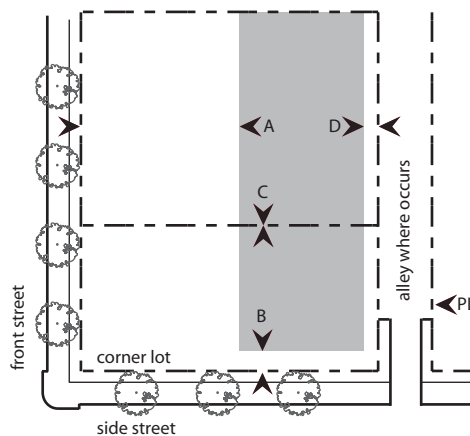
SECTION



PARKING

On street parking is allowed within the shaded area as shown.

- A: Front Setback: 15 ft min behind front facade
- B: Side Street Setback: 5 ft min
- C: Sideyard Setback: not required
- D: Rear Setback: 5 ft min with alley, 3 ft min no alley



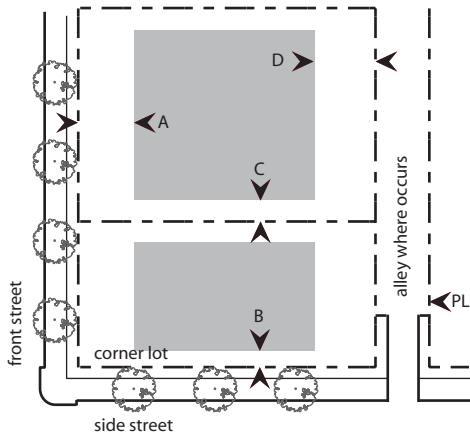
LEGEND

- ROW - right of way
- FL - frontage line
- PL - property line

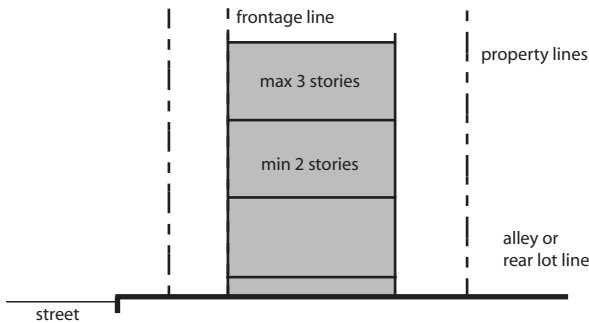
Figure 5.12
attached residential

SITING

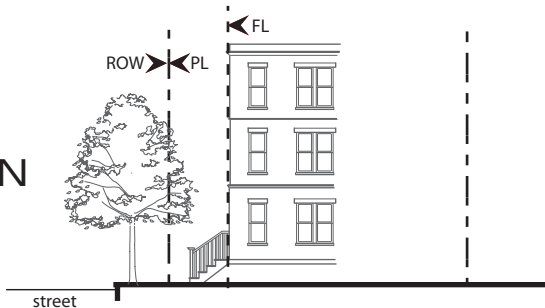
Buildings shall be placed within the shaded areas as shown.
A: Front Setback: 15-30-ft
B: Side Street Setback: 6-10 ft
C: Sideyard Setback: 6-10 ft
D: Rear Setback: 50-60 ft



HEIGHT

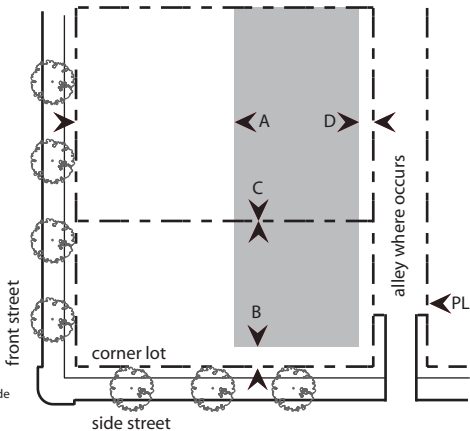


SECTION



PARKING

On street parking is allowed within the shaded area as shown.
A: Front Setback: 10 ft min behind front facade
B: Side Street Setback: 5 ft min
C: Sideyard Setback: not required
D: Rear Setback: 5 ft min with alley, 3 ft min no alley



SAMPLE CHARACTERISTICS



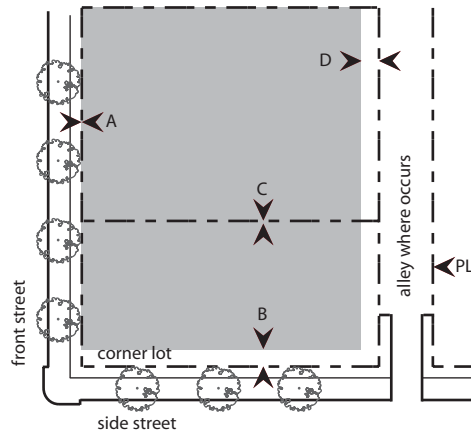
LEGEND	
ROW	- right of way
FL	- frontage line
PL	- property line

Figure 5.13
commercial one

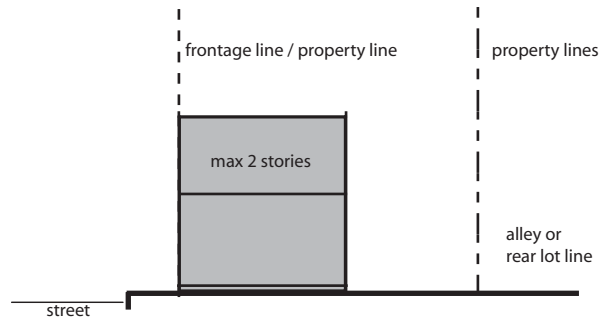
SITING

Buildings shall be placed within the shaded areas as shown.

- A: Front Setback: 0 ft, 5 ft max for 90% min of frontage
- B: Side Street Setback: 0 ft, 5 ft max for 90% min of frontage
- C: Sideyard Setback: 0 ft, 15 ft min for abutting residential
- D: Rear Setback: 0 ft, 15 ft min for abutting residential



HEIGHT



SECTION

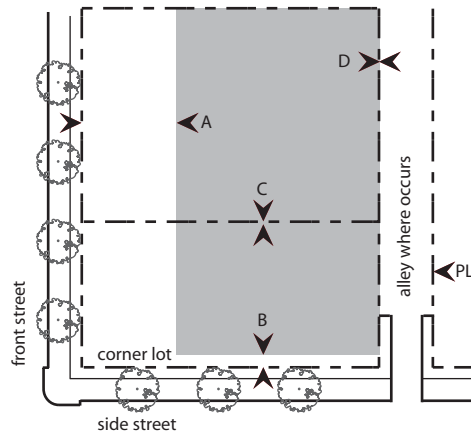


PARKING

On-site parking is allowed within the shaded area as shown.

- A: Front Setback: 40% lot min depth
- B: Side Street Setback: 5 ft min
- C: Side Setback: not required
- D: Rear Setback: not required

Off-site parking is allowed according to joint use agreements or shared parking districts.



SAMPLE CHARACTERISTICS



LEGEND

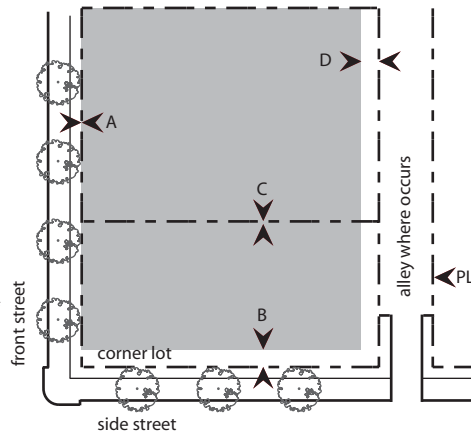
- ROW - right of way
- FL - frontage line
- PL - property line

Figure 5.14
commercial two

SITING

Buildings shall be placed within the shaded areas as shown.

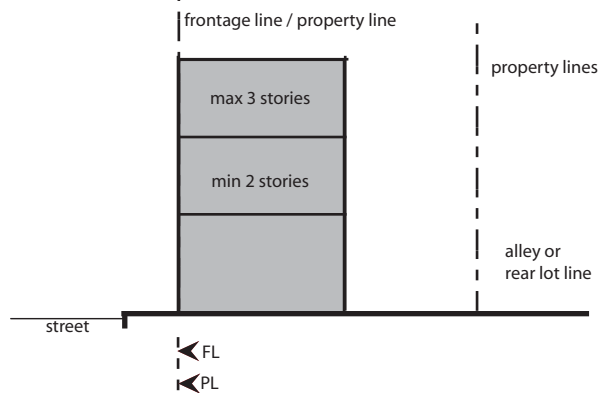
- A: Front Setback: 0 ft, 5 ft max for 90% min of frontage
- B: Side Street Setback: 0 ft, 5 ft max for 90% min of frontage
- C: Sideyard Setback: 0 ft, 15 ft min for abutting residential
- D: Rear Setback: 0 ft, 15 ft min for abutting residential



SAMPLE CHARACTERISTICS



HEIGHT



SECTION

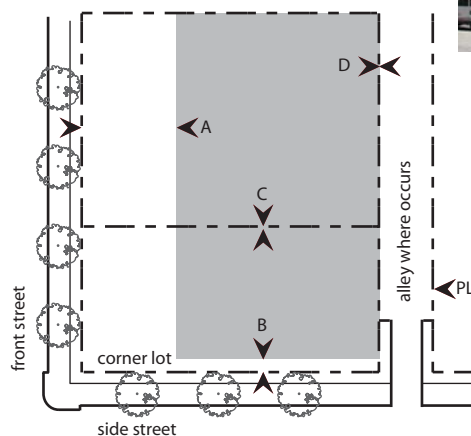


PARKING

On-site parking is allowed within the shaded area as shown.

- A: Front Setback: 40% lot min depth
- B: Side Street Setback: 5 ft min
- C: Side Setback: not required
- D: Rear Setback: not required

Off-site parking is allowed according to joint use agreements or shared parking districts.



LEGEND

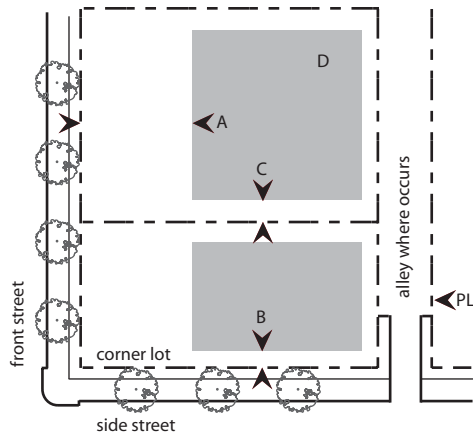
- ROW - right of way
- FL - frontage line
- PL - property line

Figure 5.15
civic / institutional

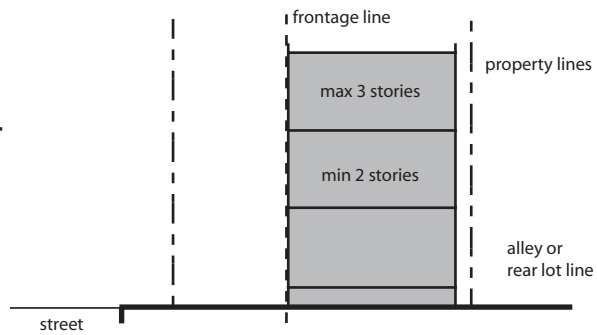
SITING

Buildings shall be placed within the shaded areas as shown.

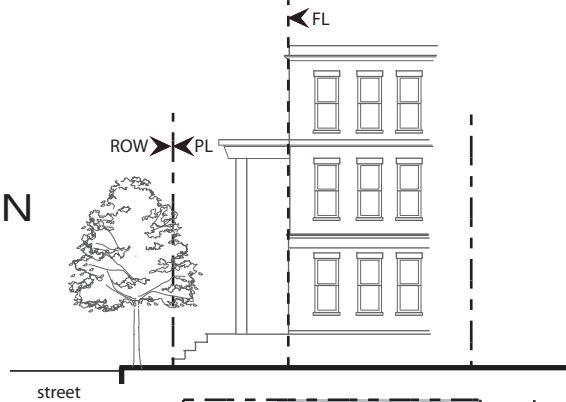
- A: Front Setback: 0-30 ft
- B: Side Street Setback: 6-10 ft
- C: Sideyard Setback: 6-10 ft
- D: Rear Setback: 25-50ft



HEIGHT



SECTION

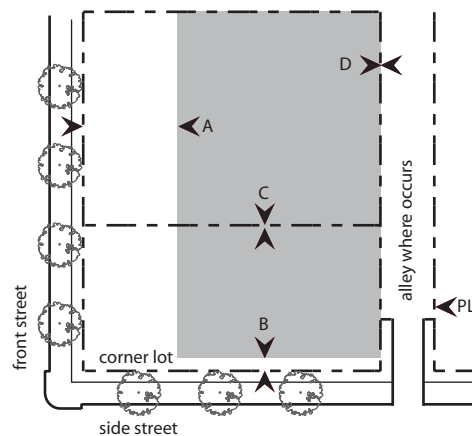


PARKING

On-site parking is allowed within the shaded area as shown.

- A: Front Setback: 40% lot min depth
- B: Side Street Setback: 5 ft min
- C: Side Setback: not required
- D: Rear Setback: not required

Off-site parking is allowed according to joint use agreements or shared parking districts.



SAMPLE CHARACTERISTICS



LEGEND

- ROW - right of way
- FL - frontage line
- PL - property line

Streetscape Standards

Streetscape standards are fundamental to the accomplishment of a vital public realm. Streetscape elements of the streetscape are important to create relationships between the public (street and sidewalk) and private (buildings) sectors. The streetscape standards map identifies sections of the corridor, A-E, that provide streetscape standards that are allowable in the referenced segment. These standards are a guide to what could provide a better relationship between realms; they offer a suggested configuration. Overall, the suggested streetscape standards intend to provide a sense of arrival and continuity throughout the corridor, a safer and more accommodating pedestrian atmosphere, as well as addressing the needs of cyclists and automobiles. Transitions of the streetscape are also addressed by continuing the elements, such as tree-lined sidewalks, into the surrounding residential areas. On-street parking is maximized with parallel and back-in angled parking, as well as suggestions for shared parking to alleviate intrusion into the surrounding residential neighborhoods.

(Figure 5.16 and 5.17)



Figure 5.16: Existing conditions, side street transitions. Intersection of North Central Street and East Burwell Avenue, view east. Photo by R.J. Justice

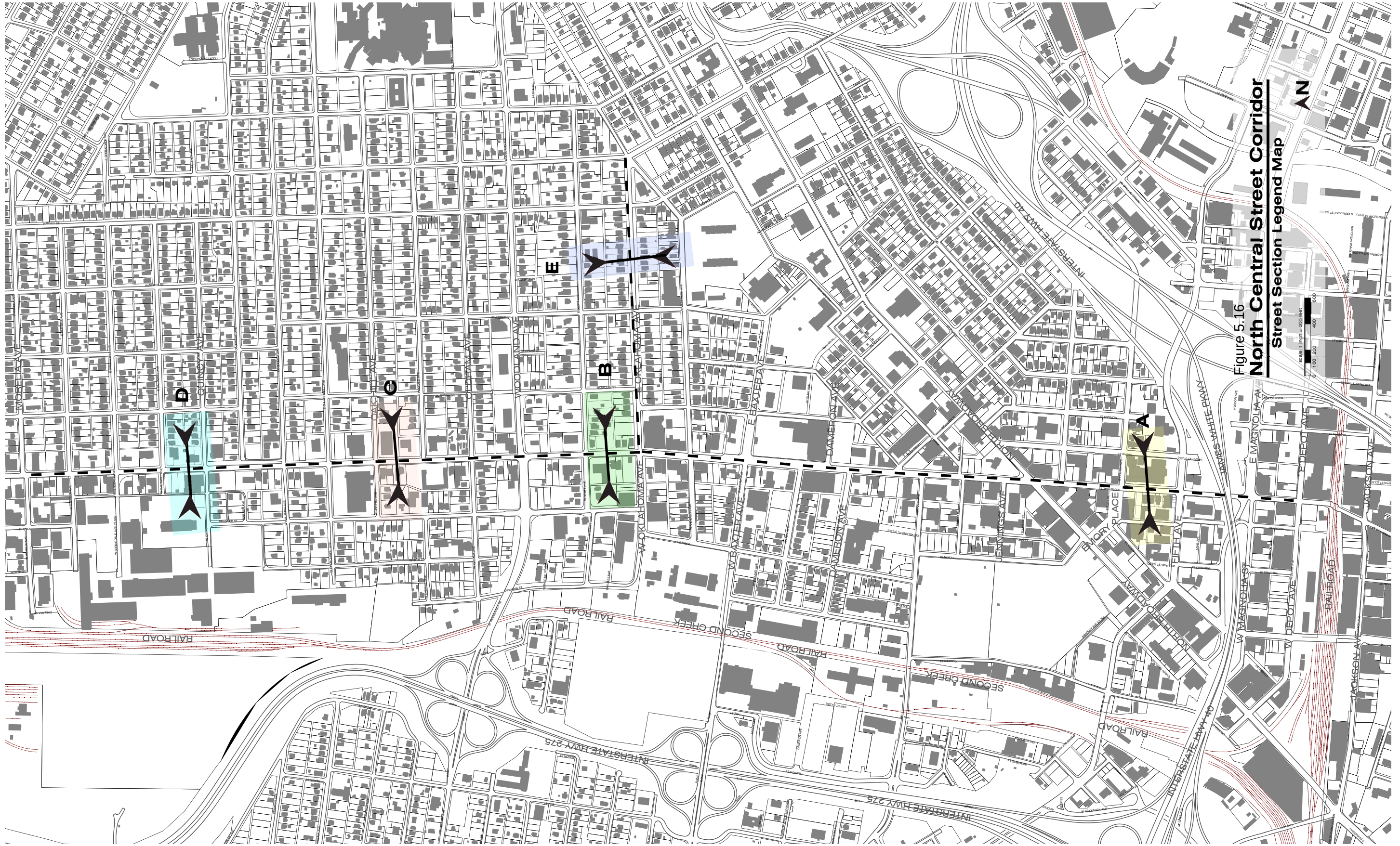
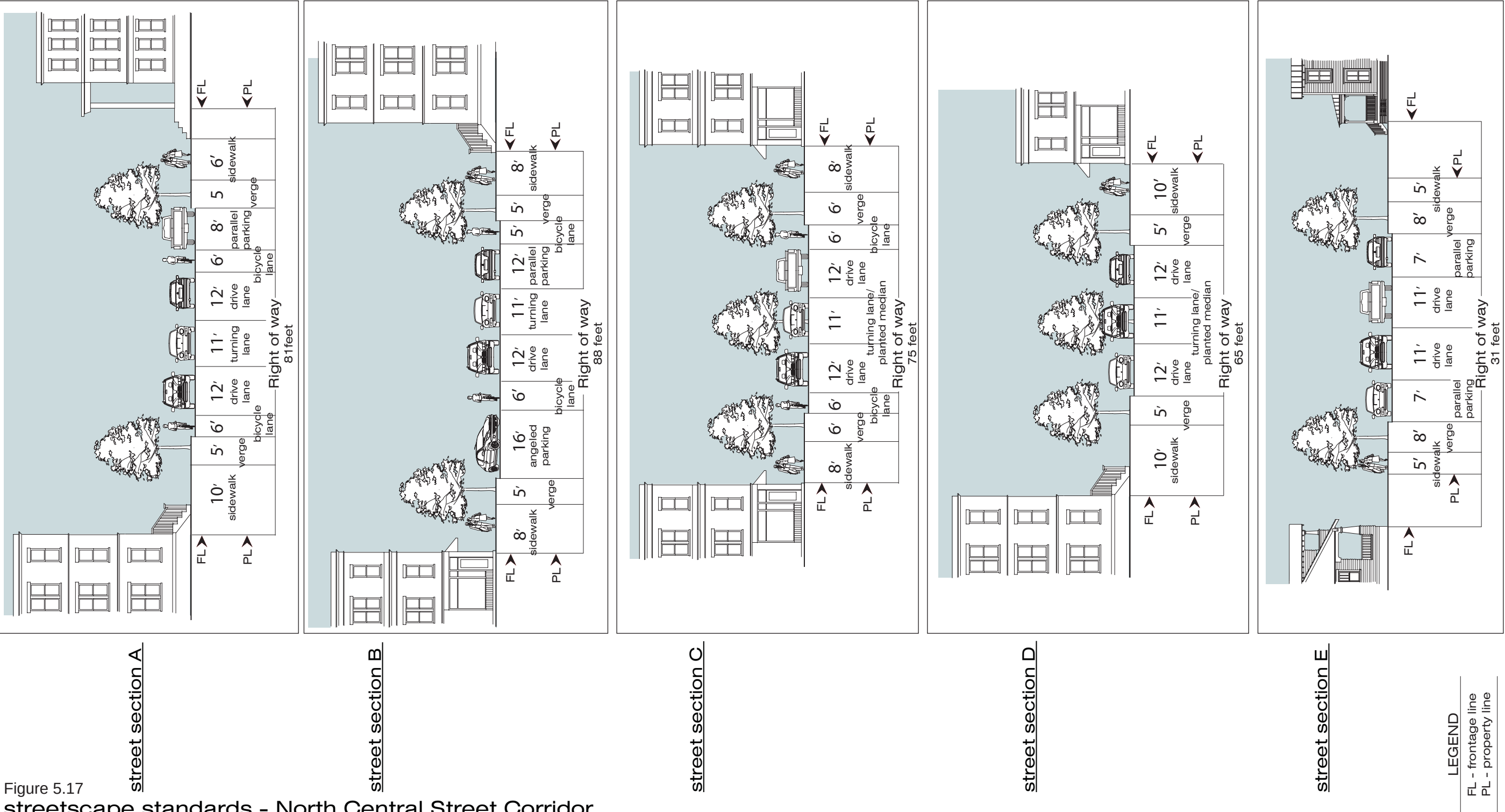


Figure 5.17

streetscape standards - North Central Street Corridor



CHAPTER 6

SUMMARY AND CONCLUSION

Throughout the history of the urbanization of Knoxville, development patterns have naturally created patterns for urban mixed-use living while also providing for economic and social needs. The urbanization of Knoxville in the nineteenth century led the development of these patterns into the area immediately north of the Old City. Like similar cities across America, the North Central Street Corridor has suffered the ills associated with several major impacts to urban areas. The rise in popularity of the automobile in the 1920s, the flight from the city center into the rural suburbs during the post World War II suburbanization, and the imposition of the interstate highway system in the 1960s, all had major impacts on the vitality of urban areas. Leaving the architectural bones and forms of the late 1800s and early 1900s behind, this brought on an opportunity for a new revitalization effort.

Across America designers evaluated these negative patterns of suburbanization and sprawl, and an aspiration to find an improved approach to development was nurtured through the Congress for the New Urbanism. In a charter stating their goals, they presented what would become an invigorated approach to development influencing the lifestyles of people on many levels. Through the philosophies of New Urbanism, design-based zoning was created to allow for these goals to become reality. Design-based zoning proposes to create better communities through design. In this proposal, form-based codes were to be the guiding principles of development with a focus on form and the relationships between private and public realms

resulting in a vital community, as opposed to Euclidian zoning's stress on use and numerical parameters.

Form-based codes are applicable in new developments as well as a viable opportunity for revitalization of historic urban areas. Because this is a relatively new approach, time testing has not yet confirmed the goals of the Charter, although in cases such as Arlington, Virginia benefits of design-based zoning are being realized. In Peoria, Illinois, a similar endeavor to revitalize their historic downtown also gives credence to the development of a form-based code with comparable goals to the North Central Street Corridor.

In a redevelopment situation with historical architectural values, design-based zoning provides assurance that infill development will be appropriate to the existing form characteristics of the area. Although the replication of the social and physical elements of the communities of the pre-automobile urban setting is not proposed to be recreated by new urbanism, the elements of these communities are encouraged with design-based zoning. For example, the design of an appropriately-sized shopping plaza with pedestrian accommodations and smaller-scaled streets is much more desirable than an oversized corridor that focuses more on the vehicle circulation and parking than the pedestrian and shopping experience (Katz, 2004).

A model form-based code is presented as a solution for the revitalization and redevelopment of Knoxville's North Central Street Corridor. A design-based approach is the preferred approach in attending to the multi-faceted concerns that influence the study area because this solution will allow for the preservation and enhancement of historic resources, while also allowing for compatible infill and mixed use. The development of a form-based code is the first step in initiating a redevelopment plan guided by design-based zoning. Subsequent to the establishment of form, scale, and massing, materiality is addressed in documents such as design guidelines. The level of development of each revitalization plan depends on the goals

and willingness of the community to experience and allow change. Encouragement of commerce and residential reinvestment in the area will be provided as improvements to the relationships between the public and private realms are realized. The proposed form-based code for the North Central Street Corridor utilizes design as a tool to revitalize and rediscover a distinctive area to the city of Knoxville's past and future.

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APPENDICES

The Charter of the New Urbanism (Document reprinted in entirety)

(Leccese, McCormick, & Congress for the New Urbanism., 2000)

The Congress for the New Urbanism views disinvestment in central cities, the spread of placeless sprawl, increasing separation by race and income, environmental deterioration, loss of agricultural lands and wilderness, and the erosion of society's built heritage as one interrelated community-building challenge.

We stand for the restoration of existing urban centers and towns within coherent metropolitan regions, the reconfiguration of sprawling suburbs into communities of real neighborhoods and diverse districts, the conservation of natural environments, and the preservation of our built legacy.

We recognize that physical solutions by themselves will not solve social and economic problems, but neither can economic vitality, community stability, and environmental health be sustained without a coherent and supportive physical framework.

We advocate the restructuring of public policy and development practices to support the following principles: neighborhoods should be diverse in use and population; communities should be designed for the pedestrian and transit as well as the car; cities and towns should be shaped by physically defined and universally accessible public spaces and community institutions; urban places should be framed by architecture and landscape design that celebrate local history, climate, ecology, and building practice.

We represent a broad-based citizenry, composed of public and private sector leaders, community activists, and multidisciplinary professionals. We are committed to reestablishing the relationship between the art of building and the making of community, through citizen-based participatory planning and design.

We dedicate ourselves to reclaiming our homes, blocks, streets, parks, neighborhoods, districts, towns, cities, regions, and environment.

We assert the following principles to guide public policy, development practice, urban planning, and design:

The region: Metropolis, city, and town

Metropolitan regions are finite places with geographic boundaries derived from topography, watersheds, coastlines, farmlands, regional parks, and river basins. The metropolis is made of multiple centers that are cities, towns, and villages, each with its own identifiable center and edges.

The metropolitan region is a fundamental economic unit of the contemporary world.

Governmental cooperation, public policy, physical planning, and economic strategies must reflect this new reality.

The metropolis has a necessary and fragile relationship to its agrarian hinterland and natural landscapes. The relationship is environmental, economic, and cultural. Farmland and nature are as important to the metropolis as the garden is to the house.

Development patterns should not blur or eradicate the edges of the metropolis. Infill development within existing urban areas conserves environmental resources, economic investment, and social fabric, while reclaiming marginal and abandoned areas. Metropolitan regions should develop strategies to encourage such infill development over peripheral expansion.

Where appropriate, new development contiguous to urban boundaries should be organized as neighborhoods and districts, and be integrated with the existing urban pattern. Noncontiguous

development should be organized as towns and villages with their own urban edges, and planned for a jobs/housing balance, not as bedroom suburbs.

The development and redevelopment of towns and cities should respect historical patterns, precedents, and boundaries.

Cities and towns should bring into proximity a broad spectrum of public and private uses to support a regional economy that benefits people of all incomes. Affordable housing should be distributed throughout the region to match job opportunities and to avoid concentrations of poverty.

The physical organization of the region should be supported by a framework of transportation alternatives. Transit, pedestrian, and bicycle systems should maximize access and mobility throughout the region while reducing dependence upon the automobile.

Revenues and resources can be shared more cooperatively among the municipalities and centers within regions to avoid destructive competition for tax base and to promote rational coordination of transportation, recreation, public services, housing, and community institutions.

The neighborhood, the district, and the corridor

The neighborhood, the district, and the corridor are the essential elements of development and redevelopment in the metropolis. They form identifiable areas that encourage citizens to take responsibility for their maintenance and evolution.

Neighborhoods should be compact, pedestrian-friendly, and mixed-use. Districts generally emphasize a special single use, and should follow the principles of neighborhood design when possible. Corridors are regional connectors of neighborhoods and districts; they range from boulevards and rail lines to rivers and parkways.

Many activities of daily living should occur within walking distance, allowing independence to those who do not drive, especially the elderly and the young. Interconnected networks of streets should be designed to encourage walking, reduce the number and length of automobile trips, and conserve energy.

Within neighborhoods, a broad range of housing types and price levels can bring people of diverse ages, races, and incomes into daily interaction, strengthening the personal and civic bonds essential to an authentic community.

Transit corridors, when properly planned and coordinated, can help organize metropolitan structure and revitalize urban centers. In contrast, highway corridors should not displace investment from existing centers.

Appropriate building densities and land uses should be within walking distance of transit stops, permitting public transit to become a viable alternative to the automobile.

Concentrations of civic, institutional, and commercial activity should be embedded in neighborhoods and districts, not isolated in remote, single-use complexes. Schools should be sized and located to enable children to walk or bicycle to them.

The economic health and harmonious evolution of neighborhoods, districts, and corridors can be improved through graphic urban design codes that serve as predictable guides for change.

A range of parks, from tot-lots and village greens to ballfields and community gardens, should be distributed within neighborhoods. Conservation areas and open lands should be used to define and connect different neighborhoods and districts.

The block, the street, and the building

A primary task of all urban architecture and landscape design is the physical definition of streets and public spaces as places of shared use.

Individual architectural projects should be seamlessly linked to their surroundings. This issue transcends style.

The revitalization of urban places depends on safety and security. The design of streets and buildings should reinforce safe environments, but not at the expense of accessibility and openness.

In the contemporary metropolis, development must adequately accommodate automobiles. It should do so in ways that respect the pedestrian and the form of public space.

Streets and squares should be safe, comfortable, and interesting to the pedestrian. Properly configured, they encourage walking and enable neighbors to know each other and protect their communities.

Architecture and landscape design should grow from local climate, topography, history, and building practice.

Civic buildings and public gathering places require important sites to reinforce community identity and the culture of democracy. They deserve distinctive form, because their role is different from that of other buildings and places that constitute the fabric of the city.

All buildings should provide their inhabitants with a clear sense of location, weather and time. Natural methods of heating and cooling can be more resource-efficient than mechanical systems.

Preservation and renewal of historic buildings, districts, and landscapes affirm the continuity and evolution of urban society.