

**A CASE STUDY EXAMINATION  
OF FORM-BASED CODE USE IN NORTH CAROLINA**

by

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A Masters Project submitted to the faculty  
of the University of North Carolina at Chapel Hill  
in partial fulfillment of the requirements  
for the degree of Master of Regional Planning  
in the Department of City and Regional Planning.

Chapel Hill

SPRING 2007

Approved by:

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READER (optional)

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ADVISOR

## **Overview**

Form-based codes (FBC) are a regulatory instrument that emerged from the New Urbanism movement in the 1990s as an alternative to conventional zoning. In contrast to conventional zoning, which regulates the ways land is used and to what intensity, FBC put the primary regulation on the types of allowed buildings, rather than on the uses contained within the structures. Proponents suggest that FBC can be used to shape the built environment according to human-scale patterns, rather than the car-oriented patterns that dominated the latter half of the 20<sup>th</sup> Century.

While FBC initially were used for new developments, municipalities across the nation have adopted them for existing urban areas. Some of these codes apply to specific districts within a traditional zoning scheme; others have completely replaced the conventional zoning systems. In North Carolina, at least nine municipalities have adopted form-based land use regulations. The first of these codes was adopted by the City of Belmont (1993), located west of Charlotte in Gaston County. Three towns along the Interstate 77 corridor in northern Mecklenburg County followed: Davidson (1995), Cornelius (1996), and Huntersville (1996). Other municipalities with FBC are scattered across the state: Catawba (2003) and Conover (1999) in Catawba County, Mooresville in Iredale County (2005), Waynesville in Haywood County (2005), and Knightdale in Wake County (2005).

Given the longevity of FBCs in the state and the number of municipalities that have adopted them in some capacity, an analysis of their application could be useful to planning professionals, elected officials and other interested parties. Therefore, the purpose of this project is to:

- a) Explain the rationale for FBC.
- b) Compare the approaches to their use in North Carolina.
- c) Evaluate the effectiveness of the codes in reaching their intended results.

## **Rationale for Form-Based Codes**

Since the U.S. Supreme Court ruling validating land use regulations in 1926 (*Village of Euclid v. Ambler Realty*), the underlying intent of zoning has remained essentially unchanged: to protect the health and safety of residents from the perils associated with proximity to nonresidential uses. Euclidean zoning, characterized by the separation of land uses into distinct residential, commercial, and industrial zones, has been largely successful in meeting this goal. However, the spatial patterns resulting from Euclidean zoning – characterized by sprawling, automobile-dependant development patterns – has come under increasing assault for a variety of reasons, including economic and racial segregation, infrastructure costs, traffic congestion and loss of agricultural land. Among the most vocal critics of conventional zoning has been the Congress of the New Urbanism, a movement made up of architects, planners, citizen activists, and public officials.

Drawing largely from the early 20<sup>th</sup> century traditions of the City Beautiful and Garden City movements, promoters of the New Urbanism have argued for compact, mixed-use, walkable communities. City Beautiful, one of the earliest systematic attempts by American architects and policy-makers to address issues of city form, was embodied most dramatically by Chicago's Columbian Exposition of 1893, which sought to create a beautiful city that “would in turn inspire its inhabitants to moral and civic virtue.”<sup>1</sup> The

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<sup>1</sup> *The City Beautiful Movement* / William H. Wilson. Baltimore: Johns Hopkins University Press, c1989.

City Beautiful emphasis on monumental architectural and planning concepts can be seen in many early- to mid-20<sup>th</sup> Century plans for American cities, including the 1901 McMillan Plan for Washington, DC and Daniel Burnham's 1909 plan for Chicago. The movement's profound belief in the ability of a well-planned urban form to strengthen civic pride and community served as inspiration for future generations of urban reformers, including the New Urbanists. The Garden City movement served as a second important intellectual precursor to New Urbanism. Its early inspirations emerged in England in the late 1880s, led by the work of individuals such as William Morris, who in lectures for the socialist league promoted the concept of "decency of surroundings, [including] ample space, well-built clean health housing, [and] abundant garden space."<sup>2</sup> These ideas were explored in greater detail in Ebenezer Howard's *Garden Cities of Tomorrow*, and in early garden cities, such as Letchworth, England.

Clearly building on Kevin Lynch's observations in *Image of the City*,<sup>3</sup> New Urbanists have asserted that the building blocks of cities include (1) a quality public realm that includes streets with terminated views, parks, public squares, etc. and (2) neighborhoods, each with identifiable center, general and edge conditions. Like many of their peers, proponents of the New Urbanism have argued that conventional zoning has led to sprawling land-use patterns and has prevented the human-scale, compact urban form characterized by iconic American places – from larger cities like New York, Boston and San Francisco to smaller ones, such as Charleston, Savannah, Saratoga Springs, and

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<sup>2</sup> Excerpts from *Art and Socialism*, delivered as a lecture to the Leicester Secular Society, January 23, 1884.

<sup>3</sup> Lynch identifies the five basic components of cities as paths, edges, districts, nodes, and landmarks, features that bear remarkable similarities to characteristics emphasized by the New Urbanism.

Coral Gables, all of which pre-date separation of uses. James Howard Kuntsler writes of this quagmire in *The Geography of Nowhere*:

*The crisis of place in America is illustrated most vividly by the condition of our cities. ... Historically, cities contain the essence of a civilization. They are the marketplaces for ideas and cultural values as well as material goods. They are the repositories of cultural memory. The city, above all, is the public realm monumentalized.*

In an attempt to replicate characteristics of American city planning of the early 20th century, the Miami-based architectural and planning firm Duany Plater-Zyberk (DPZ) developed a regulating document in 1982 that focused on the physical characteristics of a planned resort community. The Seaside (Florida) Urban Code is simple and straightforward, consisting of a one-page poster prescribing rules for building height, siting, and the treatment of yards and outbuildings for all private development, and an accompanying set of prototypical street sections. The code's graphical orientation is a radical departure from the extensive text typical of zoning ordinances. It focuses first on the placement and massing of buildings – specifically how they relate to the public spatial realm – and pays minimal attention to the uses within the buildings. This rearrangement of priorities is the opposite of those in the conventional zoning system; in this new paradigm, function follows form.

# URBAN CODE ★ THE TOWN OF SEASIDE

	TYPE I RESIDENTIAL DETACH & LIVING	TYPE II RESIDENTIAL DETACH & OFFICE	TYPE III RESIDENTIAL & BUSINESS	TYPE IV RESIDENTIAL & BUSINESS	TYPE V SPECIAL DISTRICT COMMERCIAL DISTRICT A CODE PROVISION SHALL BE CONTAINED IN CERTAIN CASES WHICH THE TOWN ENGINEER/PLANNING COMMISSIONER SHALL BE DETERMINED BY THE TOWN ENGINEER/PLANNING COMMISSIONER	TYPE VI RESIDENTIAL	TYPE VII RESIDENTIAL	TYPE VIII RESIDENTIAL	SPECIFICATIONS
<b>YARD</b> AN AREA LEFT FREE OF BUILDING OR STRUCTURE THAT IS AT LEAST 10 FT WIDE AND 10 FT DEEP									<ol style="list-style-type: none"> <li>ALL YARDING SHALL BE PROVIDED TO THE TOWN ENGINEER/PLANNING COMMISSIONER FOR REVIEW AND APPROVAL</li> <li>YARDING SHALL BE PROVIDED TO THE TOWN ENGINEER/PLANNING COMMISSIONER FOR REVIEW AND APPROVAL</li> <li>YARDING SHALL BE PROVIDED TO THE TOWN ENGINEER/PLANNING COMMISSIONER FOR REVIEW AND APPROVAL</li> </ol>
<b>PORCH</b> A COVERED STRUCTURE ATTACHED TO A BUILDING									<ol style="list-style-type: none"> <li>THE PORCH OR BALCONY SHALL BE PROVIDED TO THE TOWN ENGINEER/PLANNING COMMISSIONER FOR REVIEW AND APPROVAL</li> <li>THE PORCH OR BALCONY SHALL BE PROVIDED TO THE TOWN ENGINEER/PLANNING COMMISSIONER FOR REVIEW AND APPROVAL</li> <li>THE PORCH OR BALCONY SHALL BE PROVIDED TO THE TOWN ENGINEER/PLANNING COMMISSIONER FOR REVIEW AND APPROVAL</li> <li>THE PORCH OR BALCONY SHALL BE PROVIDED TO THE TOWN ENGINEER/PLANNING COMMISSIONER FOR REVIEW AND APPROVAL</li> </ol>
<b>BALCONY</b> A COVERED STRUCTURE ATTACHED TO A BUILDING									<ol style="list-style-type: none"> <li>THE PORCH OR BALCONY SHALL BE PROVIDED TO THE TOWN ENGINEER/PLANNING COMMISSIONER FOR REVIEW AND APPROVAL</li> <li>THE PORCH OR BALCONY SHALL BE PROVIDED TO THE TOWN ENGINEER/PLANNING COMMISSIONER FOR REVIEW AND APPROVAL</li> <li>THE PORCH OR BALCONY SHALL BE PROVIDED TO THE TOWN ENGINEER/PLANNING COMMISSIONER FOR REVIEW AND APPROVAL</li> <li>THE PORCH OR BALCONY SHALL BE PROVIDED TO THE TOWN ENGINEER/PLANNING COMMISSIONER FOR REVIEW AND APPROVAL</li> </ol>
<b>OUT-BUILDING</b> A STRUCTURE LOCATED OUTSIDE THE MAIN BUILDING									<ol style="list-style-type: none"> <li>THE OUTBUILDING SHALL BE PROVIDED TO THE TOWN ENGINEER/PLANNING COMMISSIONER FOR REVIEW AND APPROVAL</li> <li>THE OUTBUILDING SHALL BE PROVIDED TO THE TOWN ENGINEER/PLANNING COMMISSIONER FOR REVIEW AND APPROVAL</li> <li>THE OUTBUILDING SHALL BE PROVIDED TO THE TOWN ENGINEER/PLANNING COMMISSIONER FOR REVIEW AND APPROVAL</li> <li>THE OUTBUILDING SHALL BE PROVIDED TO THE TOWN ENGINEER/PLANNING COMMISSIONER FOR REVIEW AND APPROVAL</li> </ol>
<b>PARKING</b> AN AREA LEFT FREE OF BUILDING OR STRUCTURE THAT IS AT LEAST 10 FT WIDE AND 10 FT DEEP									<ol style="list-style-type: none"> <li>THE PARKING SHALL BE PROVIDED TO THE TOWN ENGINEER/PLANNING COMMISSIONER FOR REVIEW AND APPROVAL</li> <li>THE PARKING SHALL BE PROVIDED TO THE TOWN ENGINEER/PLANNING COMMISSIONER FOR REVIEW AND APPROVAL</li> <li>THE PARKING SHALL BE PROVIDED TO THE TOWN ENGINEER/PLANNING COMMISSIONER FOR REVIEW AND APPROVAL</li> </ol>
<b>HEIGHT</b> THE MAXIMUM HEIGHT OF A BUILDING OR STRUCTURE SHALL NOT EXCEED THE HEIGHT OF THE ADJACENT BUILDING OR STRUCTURE									<ol style="list-style-type: none"> <li>THE HEIGHT SHALL BE PROVIDED TO THE TOWN ENGINEER/PLANNING COMMISSIONER FOR REVIEW AND APPROVAL</li> <li>THE HEIGHT SHALL BE PROVIDED TO THE TOWN ENGINEER/PLANNING COMMISSIONER FOR REVIEW AND APPROVAL</li> <li>THE HEIGHT SHALL BE PROVIDED TO THE TOWN ENGINEER/PLANNING COMMISSIONER FOR REVIEW AND APPROVAL</li> <li>THE HEIGHT SHALL BE PROVIDED TO THE TOWN ENGINEER/PLANNING COMMISSIONER FOR REVIEW AND APPROVAL</li> </ol>

As the New Urbanism movement gained visibility in the late 1980s and early 1990s, municipalities, many of them in high-growth areas, began writing and adopting FBC. The earliest codes were place-specific form-based zones administered within the conventional system, and the concept gradually was expanded to include entire municipalities. Most of these early codes were written “from scratch” by municipal staffs and/or the small number of consulting firms with experience producing design codes for planned developments. Many form-based codes are now organized according a system modeled on the ecological transect, which is a cross-section of a natural area that is used for recording, mapping or studying ecosystems. The rural-to-urban adaptation organizes the built environment according to spatial cues so that users understand the characteristics of any given location and where it fits within the urban system. In 2003, DPZ released to the public domain a model, called SmartCode, which is designed for calibration to local

conditions. While a small percentage of the FBC adopted at this writing are based on the SmartCode model, its release marked a watershed for the FBC movement:

*The code reform war until now has been waged very slowly. ... In the absence of a standard, the task of custom-fitting each component of zoning reform must be repeated in each municipality, and each fight over the really progressive content must be refought in place after place. One gets drawn into the battle over parking requirements, the battle over setbacks and build-to lines, the skirmish over mixed land uses, the scuffle over street designs, and so on. Even at its best, New Urbanist land development regulation today is practiced like Gothic cathedral-building – it seems to take forever; the cost is enormous; very few individuals understand how the whole thing is meant to work; the result is a giant, one-of-a-kind thing. As a result, some turn out wonderful and some fall down. So we hope that the SmartCode begins instead a new era of plug-and-play usefulness, in which official implementation of new urbanist plans can be more rapid, less expensive, and we also hope a larger, more integrated package of regulatory change can be swallowed by local governments as a credible ensemble.”<sup>4</sup>*

Form-based codes and the New Urbanism gained widespread exposure as a result of work done in Mississippi after Hurricane Katrina. Three weeks after the August 2005 hurricane, Governor Haley Barbour had appointed a blue-ribbon commission to recommend ways to rebuild the state’s devastated communities. The commission tapped

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<sup>4</sup> Statement by Victor Dover, founding principal of Dover, Kohl & Partners in Coral Gables, Florida, quoted in *The Town Paper*, Vol. 5, No. 2. 2003.

Andres Duany, one of the principals of DPZ, to facilitate the planning process, and Duany brought dozens of planners, architects and urban designers to Biloxi to facilitate a week-long charrette. The teams produced plans for each of Mississippi's eleven coastal communities; only Biloxi has resisted the move toward form-based codes, and almost all of the other communities are at some stage of adopting a locally-calibrated version of the SmartCode.<sup>5</sup>

A key difference between conventional zoning and the form-based codes that emerged as a result of the New Urbanism movement is the approach to regulating spatial dimensions. In the Euclidian world, the dimensional requirements – such as setbacks from property lines and buffers between uses – typically are *proscriptive*, meaning that building contrary to the standards outlined in the code were prohibited. Over time, a number of other development standards, including density and floor-area ratios, have become accepted additions to the basic dimensional standards. In contrast, FBC emphasize specifics of design for building typologies – detached house, attached house, apartment building, shopfront building, commercial building – and create standards for how each of those building types relate to public spaces, such as streetscapes and public plazas. This approach reduces the need for extensive text, and is *prescriptive* in that it prescribes build-to lines (instead of minimum setbacks), placement of garages on sites, façade treatments, and design and planting of street rights-of-way, etc.

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<sup>5</sup> Christopher Swope, "Mississippi's Urbanist Odyssey," *Governing*, September 2006, accessed March 6, 2007. <http://www.governing.com/articles/9miss.htm>.



## **Potential benefits of Form-Based Codes**

Generally speaking, planning regulation is justified for at least two reasons: to reduce the negative externalities of the market system and/or to allocate resources more efficiently. As a matter of course, it is important to evaluate policies to determine whether they are addressing the identified problem and to look for unintended consequences of the policy. Likewise, public interventions in the market system can have benefits to both the public and private sectors, and it is wise to evaluate a policy's affect on those sectors. Proponents of code reform suggest that public and private benefits of FBC are more than aesthetic. The codes can be used to: reduce traffic congestion by integrating land uses, increase the diversity of housing stock, and create higher quality public spaces. These outcomes are worth measuring, but they are outside the scope of this analysis, which will look at the mechanics of two FBC ordinances in North Carolina – one a TND district, the other a TND system – as they relate to three intended outcomes: creating a predictable built environment based on a community vision, providing flexibility of use within planning districts, and streamlining the review process.

### ***1. Predictable built environment based on a community vision***

In the conventional zoning model, a comprehensive plan is developed as a guiding document for a municipality. Typically, a steering committee creates this document and holds public hearings at various stages in the process for public input. The resulting plan then serves as a guideline for future development, but the zoning areas are rarely changed proactively to reflect the desired future land use. This incongruity often goes unnoticed until an event that initiates the public review process – a rezoning

application or a permitted development that is either unwanted or unsightly – raises the ire of nearby landowners or residents.

In contrast, the FBC process is front-loaded for community input *and* regulatory change so that the planning and/or inspections staff can administer the code without relying on the board for case-by-case interpretations. Following an analysis of a community’s natural resources, historic and cultural assets, and infrastructure systems, a multi-day public workshop, frequently called a charrette, takes place over during an intensive period – ranging from five days to ten days – to gain input and give immediate feedback to participants. The goal is to engage community stakeholders so they can articulate a “vision” of what they want their community to become. Staff and/or consultants can then write new ordinances to enable that vision. The outcome of these charrettes is usually some variation of early 20<sup>th</sup> century town centers.<sup>6</sup> However, FBC can be used for auto-oriented business and industry, as well as pedestrian-friendly mixed-use districts.

The potential public benefits associated with this process include:

- Public gains a vocabulary for expressing its likes and dislikes of the built environment.
- Community identifies a “vision” for future growth and/or conservation.
- Vision is codified so future development must adhere to standards.
- The private sector can benefit by gaining insight into local consumer preferences.

## ***2. Flexibility of use to allow real estate market to be more efficient***

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<sup>6</sup> This might reflect a self-selecting bias, since dissatisfaction with sprawl is frequently the precursor to this process.

Supporters of FBC suggest that businesses will support more restrictive design standards if they are given greater discretion on the uses allowed within the buildings. Easy transitions between uses can reduce the “downtime” for property owners who, under a conventional system, would need a variance or rezoning if, for example, they wanted to change the first floor use of a building from office to retail. This flexibility also could reduce the number of empty storefronts and abandoned buildings, eliminate infrastructure costs associated with providing services to new development while existing buildings stand empty, and increase tax revenues as properties are matched with higher and better uses. Adaptive reuse of buildings also reduces or eliminates the blight associated with vacant buildings. It allows neighborhoods and communities to adapt to market changes and demographic changes over time. In financial terms, options have value, so property values increase as the number of allowed uses are increased.

### ***3. Streamlined and predictable review process***

Proponents of FBC suggest that communities should streamline the development review process as part of code reform. The justification is two-fold: the front-loaded community-based design process already has established the physical characteristics of the desired development, so a project-specific public review is redundant; secondly, streamlined permitting reduces the incentives for developers to seek variances that could compromise that community-based vision.

Because market forces tend to reward predictability, the private sector benefits are easy to identify: sketch plan meetings allow developers to make changes early in the process to meet code requirements; prescriptive standards give property owners more certainty about expectations for permitting; and fixed and/or reduced review periods

reduces a developer's holding costs. However, the public sector also benefits: streamlined review increases the productivity of the planning staff.

## **Applications in North Carolina**

Long before Hurricane Katrina, several of the small towns in Charlotte's metropolitan area adopted form-based codes with the expressed intent of preserving their small-town atmospheres. The City of Belmont in Gaston County adopted its code in 1993, followed by the Town of Davidson in 1995, and the towns of Cornelius and Huntersville in 1996.<sup>7</sup> Municipalities in other parts of the state followed: the City of Conover (1999) and the Town of Catawba (2003) in the western Piedmont, the Towns of Knightdale (Wake County), Mooresville (Iredale County) and Waynesville (Haywood County) in 2005. As in other states, some municipalities chose to use FBC zones within the conventional zoning structure, while others chose to toss out conventional zoning and adopt exclusively form-based systems. The ordinances examined in this study were divided almost equally between the two approaches, without any obvious correlations between the approach (code vs. system) and the geographic region, population, or year the code was adopted. A few patterns did emerge about the group as a whole: all were located along Interstate highways, eight of the nine municipalities had fewer than 12,000 residents when they adopted the ordinances, and seven of the nine were experiencing strong population growth or were anticipating it because of scheduled upgrades to transportation systems.

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<sup>7</sup> U.S. Census, 1990.

<i>Place</i>	<i>FBC Method</i>	<i>Yr. Adopted</i>	<i>Est. Pop. (when adopted)<sup>8</sup></i>	<i>Annual Pop. Growth</i>	<i>Interstate Corridor</i>	<i>Scheduled improvement</i>
<b>Belmont</b>	System	1993	8954	-0.4%	I-85	New interstate
<b>Catawba</b>	Zone	2003	714	1.9%	I-40	None
<b>Conover</b>	Zone	1999	6163	1.7%	I-40	New interstate exchange
<b>Cornelius</b>	System	1996	7066	8.9%	I-77	Future rail corridor
<b>Davidson</b>	System	1995	4801	5.5%	I-77	Future rail corridor
<b>Huntersville</b>	Zone	1996	11025	14.3%	I-77	Future rail corridor
<b>Knightdale</b>	System	2005	6319	10.7%	I-540	New interstate
<b> Mooresville</b>	Zone	2005	20488	5.3%	I-77	Future rail corridor
<b>Waynesville</b>	Zone	2005	9386	0.2%	I-40	None

Two municipalities – the City of Conover and the Town of Knightdale – were selected for case study analysis to explore the pre-cursors to adopting their new ordinances, to examine details of the codes, and to evaluate developments under the new system.

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<sup>8</sup> Population estimates by U.S. Census.

## Case Study: City of Conover



The City of Conover is located in the state’s western piedmont, eight miles east of Hickory in Catawba County. Like many North Carolina communities, the railroad played a prominent role in its early history, and its commercial center – a classic early 20<sup>th</sup> Century downtown – emerged around a train station. The city is now served by Interstate-40, located north of the central business district. Other major roads include US 70, US 321, US 70A, and NC 16. According to the 2000 Census, the city’s residential population is 6,667 residents, and the land area of the city was 10.2 square miles.<sup>9</sup> Despite restructuring in the once-dominant furniture industry, Conover has retained a healthy manufacturing economy, and the City’s daytime population is approximately 24,000.

<sup>9</sup> North Carolina Demographics Office, <http://demog.state.nc.us>, accessed April 2, 2007.

In 1998, the state Department of Transportation announced plans to construct a new interchange with I-40, just north of the city. Anticipating development in that area, the council passed a moratorium on 380 acres of land to create regulations that would result in a “higher quality of development.”<sup>10</sup> After a public process facilitated by the local planning staff, the council added TND districts to their zoning ordinance and applied them to the newly-annexed areas, with the intention of applying them to any future annexations. The city council chose to leave the conventional zoning districts in place, rather than initiate the rezoning process for existing city properties. In 2003, the city updated its comprehensive Land Development Plan and placed a new emphasis on creating mixed-use neighborhoods that reflect the building patterns of historic Conover:

*A dominating principle in the 2003 Plan is steering development in such a way so that it creates a sense of community and interaction, not isolation and separation. We want to create neighborhoods that are reflective of the socio-economic and cultural diversity that characterize the citizens. ... While an increased tax base will provide immediate financial benefits for the city, consequences such as less open space, suburban sprawl, and land degradation must be considered.*<sup>11</sup>

### **Land Use Ordinance**

The new TND zoning districts established prescriptive dimensional standards and building typologies. Each district specifies (1) permitted uses, both by right and with

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<sup>10</sup> Lance Hight, Interim Planning Director for City of Conover, personal communication, March 28, 1007.

<sup>11</sup> 2003 Land Development Plan, City of Conover, adopted 2003. <http://www.ci.conover.nc.us/planning/LDP/Frames/intro.html>. Accessed March 23, 2006.

conditions, (2) permitted building and lot types, (3) permitted accessory uses, and (4) general requirements. Four of these districts are loosely based on the transect model and range from the open space district to a mixed-use district. Two site-specific form-based districts were created to reflect either existing conditions (Campus Office and Institutional) or to require pedestrian-friendly features in automobile-oriented retail areas (Corridor Commercial.) All of the districts are classified according to the dominant use of that district.

<b>General District</b>	<b>Classification</b>
<i>OS: Open Space District</i>	Recreation
<i>NR: Neighborhood Residential District</i>	Residential
<i>NC: Neighborhood Center District</i>	Residential
<i>MX: Mixed Use District</i>	Mixed Use
<i>COI: Campus Office and Institutional District</i>	Mixed Use
<i>CC: Corridor Commercial District</i>	Commercial

### ***Permitted Uses***

For the purpose of this analysis, allowed uses have been divided into eight categories based on their general level of impact on adjacent properties. The eight categories are: civic/institutional, residential, entertainment/recreation, lodging, office/service, retail/restaurant, manufacturing/wholesale/storage, and infrastructure. The categories are not all-inclusive, meaning only designated sub-types of the listed use are allowed within the district. For example, single-family residential use is allowed in the Neighborhood Residential district, but multi-family residential use is not. Likewise, bed-and-breakfast inns are a lodging use allowed in Neighborhood Center, but motels are not. The following table indicates whether a type of that use is allowed in that district, either by right (P) or with conditions (PC). As expected, the types of allowed use increases as a district becomes more urban.



	<i>Open Space</i>	<i>Neighborhood Residential</i>	<i>Neighborhood Center</i>	<i>Mixed Use District</i>	<i>Campus Office &amp; Institutional</i>	<i>Corridor Commercial</i>
<i>Residential</i>		P	P	P		P
<i>Lodging</i>			P			P
<i>Office &amp; Service</i>	*	*	*	P	P	P
<i>Retail &amp; Restaurants</i>				P	P	
<i>Entertainment / Recreation</i>	PC	PC		P	P	P
<i>Manufacturing / Wholesale / Storage</i>				P	P	P
<i>Civic / Institutional</i>	PC	PC	P	P	P	P

*P: Permitted, PC: Permitted with conditions, \*Only government services in buildings less than 5000 s.f. are permitted.*

***Lot and Building Typology***

Seven lot and building typologies are permitted in the Conover ordinance. The lot requirements place an emphasis on the buildings and how they relate to the street or square. The following criteria apply to all building types:

- All lots must share a frontage line with a street or square; lots fronting a square must have rear alley access.
- Consistent build-to lines should be used on all streets and public space frontages. A minimum percentage of the build-to line must be built out, to avoid significant gaps along the street front.

Build-to lines, side and rear yard requirements are established for each lot type to create a consistent public realm within that district. Many of these dimensions are linked to the existing built conditions. For example, the build-to lines for shopfront building “will range from zero feet to 15 feet behind the street right-of-way. Special site conditions such as topography, pattern of lot widths, or setbacks of existing buildings permit a larger building setback.” Similarly, the building placement for detached houses

states that, along new streets, the build-to line is 25 feet behind the street right-of-way. However, along existing streets, “front build-to lines shall be equal to the average setbacks for buildings on the same side of the street within 300 feet.”

The following table indicates the lot and building types and their associated districts:

	<i>Open Space</i>	<i>Neighborhood Residential</i>	<i>Neighborhood Center</i>	<i>Mixed Use</i>	<i>Campus Office Institutional</i>	<i>Corridor Commercial</i>
<i>Civic Building</i>	P	P	P	P	P	P
<i>Detached House</i>		P	P			P
<i>Attached House</i>			P		P	P
<i>Apartment Building</i>			P	P	P	P
<i>Shopfront</i>				P	P	
<i>Urban Workplace</i>				P		
<i>Highway Commercial</i>						P

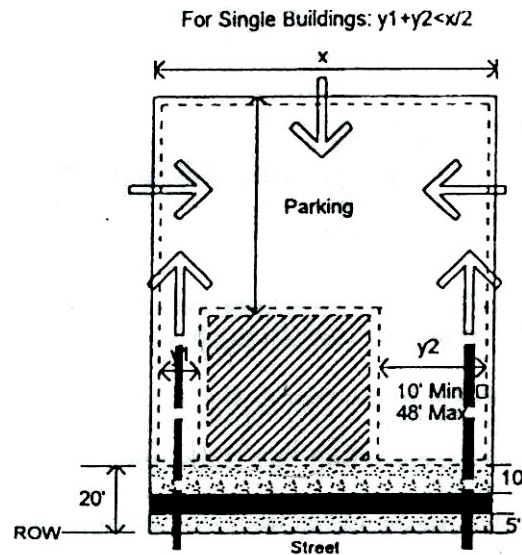
***Example: Highway Commercial Type***

The Highway Commercial building lot and type applies form-based codes to an area dominated by car-oriented businesses. A partial list of the lot requirements follows:

- Building façades must be parallel to the street.
- Parking must be primarily to the rear or side of the building, and sideyard parking “may occupy no more than 45 percent of the principle frontage line.”
- Trash containers must be located in a rear parking area and screened from the right-of-way.
- A garden wall, fence or hedge must be installed along any street frontage adjacent to parking areas.
- Drive-throughs must be located to the rear of the building.

The building regulations are “designed to bring these building types into a framework of town streets.” To accomplish this, the ordinance requires that buildings adhere to the build-to line and relate a principal façade to the sidewalk and street;

setbacks at street corners generally match those on the front of the building so that the corner is punctuated by the building. The architectural standards do not allow the use of metal paneling on street-fronting building face, and they require that all sides of the building match the color of the building front.



For shopping centers, all buildings must extend to the build-to line, and parking areas to be enclosed on two sides by the building. Entrances to smaller retail units (if included) should relate to the street, and if there are no small stores, a similar pattern of windows and architectural features should be established on the building. End units must have a street entrance and clear glass windows comprising no less than 30 percent of a wall area facing the public right-of-way. Large-scale single-use facilities may exceed maximum floor area standards if they are placed behind or above smaller scale uses that are oriented to pedestrians.

### ***Permitting Process***

The permitting process is identical for all of the zoning districts, so there is no advantage to being in a TND district from a permitting viewpoint. The planning staff

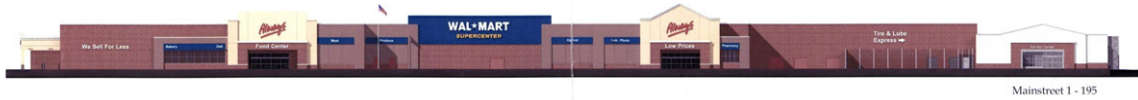
determines whether an application meets the standards for the TND Districts, therefore only applications that require Special Use Permits or are within an Overlay Zone are reviewed by the City Council.

***Example of development under the new code***

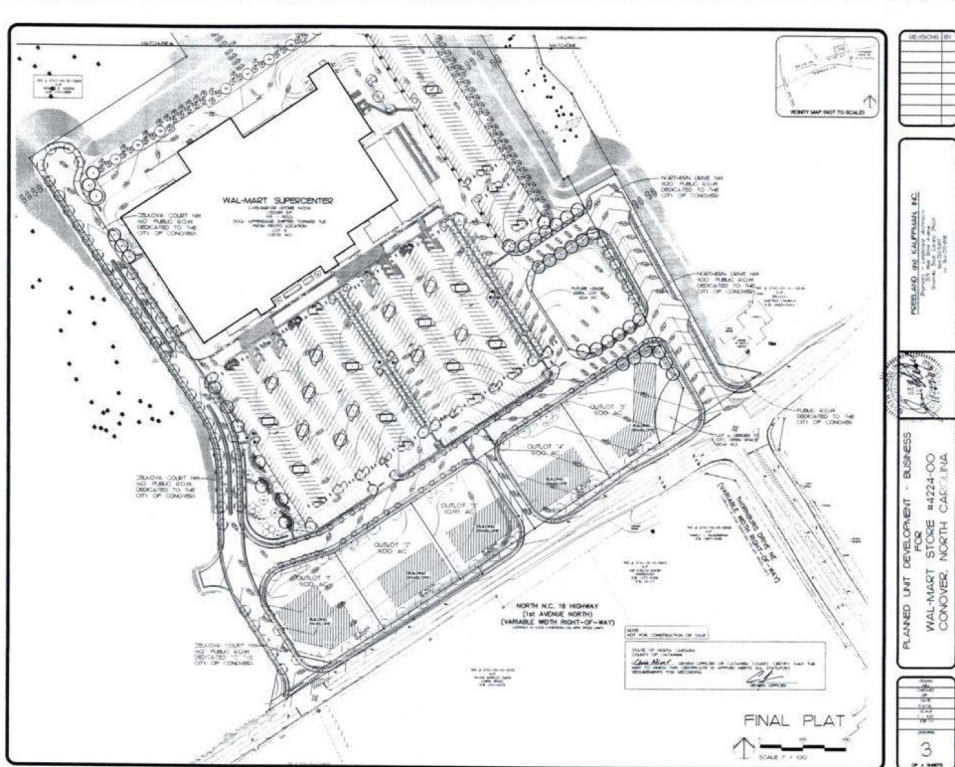
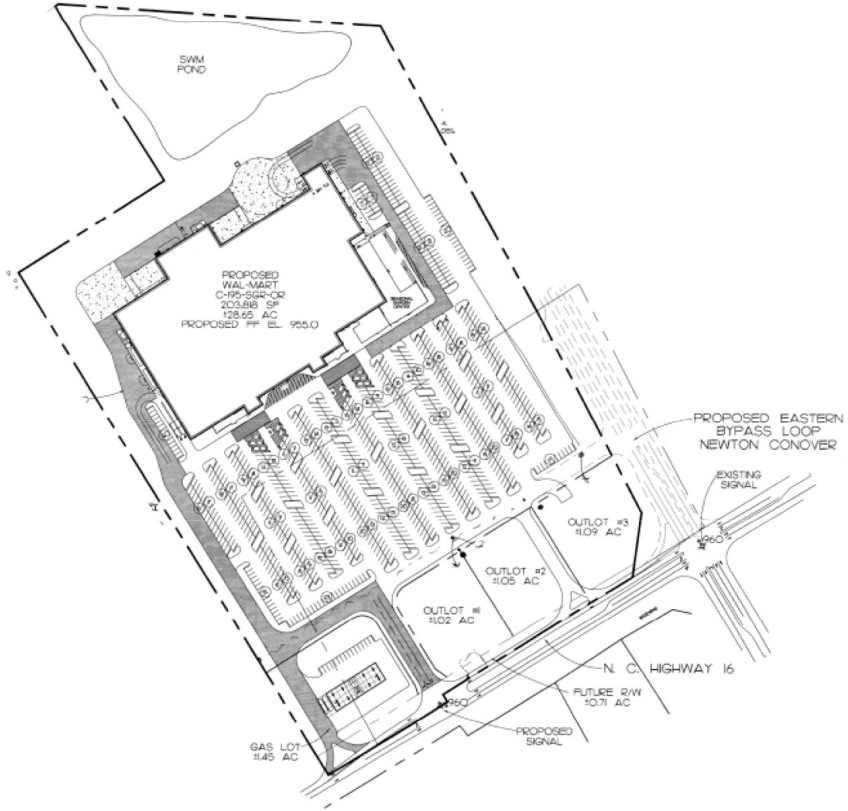
In January 2007, a 204,488 square-foot Wal-Mart opened in the Corridor Commercial district near the intersection of NC Hwy 16 and I-40. The completed development reflected many characteristics required by the new ordinance that were not present in the first set of documents submitted to the city. The original plan needed to be changed in many ways to meet the following Highway Commercial building and lot requirements:

- Building needed to meet the build-to line twenty feet from the right-of-way
- Parking should be placed behind or the side of the building, rather than in front
- Building mass should to be varied sufficiently “to reduce the perceived scale and volume” because building was more than 80,000 square feet
- Driveways needed to create the potential for interconnecting streets.

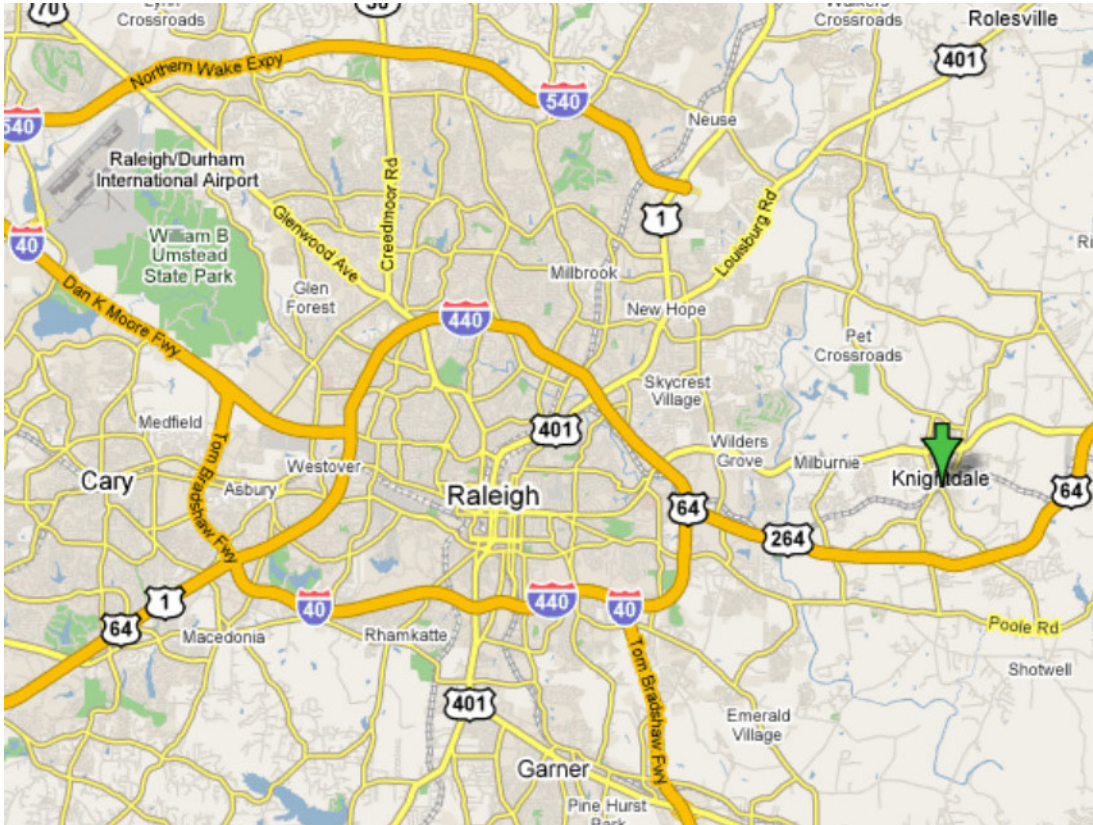
When finally approved, the plat met the code requirements by constructing a new city street on the west boundary of the property and a portion of a future thoroughfare on the east boundary. The building is only 25 feet from the new city street, which meets the requirement of buildings fronting a public street, as well as the parking located in the side yard. The developer also committed to the building envelopes for the outparcels, which are indicated on the final plat by the hatched areas. The following images depict the architectural details of the first submission and the approved building, which gives the perception of multiple storefront buildings.



The original site plan and the final plat are depicted on the following page and reflect the changes that were made during the administrative approval process.



## Case Study: Town of Knightdale



The Town of Knightdale is located in Wake County, about eight miles east of Raleigh, along state Hwy 264 and newly constructed Interstate 540. During the 18<sup>th</sup> and 19<sup>th</sup> Centuries, the town served as a local agricultural community. In 1904, the Norfolk and Southern Railroad built tracks through the town, which served as an economic engine on two fronts: it established Knightdale as a trade center that moved timber and goods to market, and many of the railroad workers settled in the town. On March 9, 1927, the North Carolina Legislature passed the articles of official incorporation for the town.<sup>12</sup> An early morning fire in 1940 destroyed almost all of the historic downtown, and new businesses have primarily located along Highway 64 since the 1960s. Between 1990 and

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<sup>12</sup> 2027 *Comprehensive Plan*, The Town of Knightdale, adopted July 7, 2003, 27.

2000 Knightdale's population increased from 1,700 to more than 6,000 residents, making it the 13th fastest growing town in North Carolina.

In the summer of 2003, the Town Council approved the *2027 Comprehensive Plan* as the guiding document for future development in and around the town. The plan was a “direct response to the growth concerns and issues facing the Town of Knightdale and offers building blocks for Knightdale’s future.”<sup>13</sup> The town had experienced unprecedented growth: the population had increased 216 percent from 1990 to 2000, which compromised the community’s ability to respond to the needs of residents and businesses. In 2003, the town’s population was 6,150,<sup>14</sup> and a five-fold increase was projected by 2025, which would bring the town’s population to 31,035.<sup>15</sup> As a result, the two primary concerns listed in the 2027 Plan were overcrowded roads and the loss of open space and community character:

*It is the hope of town leaders that when future Knightdale is envisioned it is more than a disconnected collection of buildings and left over bits of ‘open space,’ and instead is a town of rich architectural diversity, vibrant public spaces, and peaceful neighborhoods.<sup>16</sup>*

### ***New Ordinance***

After updating the Comprehensive Plan, the Town initiated the process for re-writing its development ordinances with a focus on implementing the new Comprehensive Plan’s guiding principles. These principles include economic, fiscal and social goals, two of which specifically addressed the town’s built environment:

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<sup>13</sup> *2027 Comprehensive Plan*, The Town of Knightdale, adopted July 7, 2003.

<sup>14</sup> Annual Time Series of Population Estimates Incorporated Places, U.S. Census.

<sup>15</sup> Quick Fact Data Sheet, Town of Knightdale Planning Department.

<sup>16</sup> *2027 Comprehensive Plan*.



- “Maintain a respect for the existing relationship between rural and urban Knightdale; the old English concept of town building based upon “town and country” is the foundation of this Plan.”
- “Provide balanced and responsible urban design, planning and development, and protection of the Town’s historical, cultural, and natural resources.”<sup>17</sup>

In October 2003, the Town contracted a planning and architectural firm to work with Town staff and a citizen advisory committee to draft new ordinance language, development standards and zoning districts. After two years of study and many public meetings, the Town Council voted to adopt the new ordinance on November 16, 2005. The new ordinance reduces both the number of zoning districts and categories of use from twenty-two zones to twelve.

Using the transect as a guide, the Knightdale ordinance designates zoning districts that are assigned to land areas on the zoning map. Each base district (sometimes referred to as a design district) has standards for 1) types of allowed buildings, 2) dimensional requirements, and 3) allowed uses. The base districts and their associated zoning designations (in parentheses) are:

- Open Space Preserve (OSP)
- Rural Residential (RR1)
- General Residential (GR3 and GR8)
- Urban Residential (UR12)
- Residential Mixed-Use (RMX)
- Neighborhood Mixed-Use (NMX)
- Town Center (TC)
- Highway Business (HB)

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<sup>17</sup> *2027 Comprehensive Plan.*

- Manufacturing and Industrial (MI)

In addition, the ordinance allows two floating planned development districts, which are subject to the minimum development size and/or density of the underlying district. These districts are for developments for manufactured homes (allowed by special use permit) and traditional neighborhood development (allowed by right). Conditional Districts for each of the zoning district classifications are allowed minimum acreage counts are met. The conditional district can include more-stringent and less-stringent design and use criteria, which are negotiated during the approval process. Finally, two overlay districts also were implemented to impose more stringent standards for quarries and highways.

### ***Building Types***

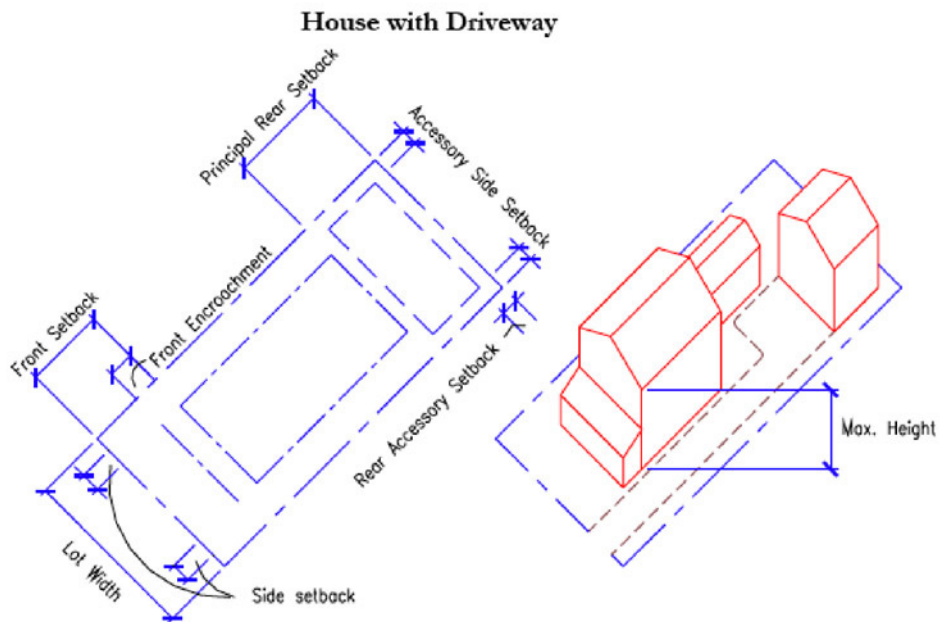
There are seven building typologies described in the ordinance: civic, institutional, house, townhouse, apartment, mixed-use and commercial, each with general and specific requirements for its typology. For example, a “House” is described the following way:

*It is flexible in use (where permitted), accommodating single family uses, multi-family uses up to four units, home occupations, professional offices, and limited retail uses based on the District in which it is located. The two types of Houses are a function of how the lot is accessed with an automobile, hence the different standards for lots accessed by a driveway from a fronting street or lots accessed by a rear lane or alley. In general, within a block, building types should be uniform in their use of driveways or rear lanes/alleys.<sup>18</sup>*

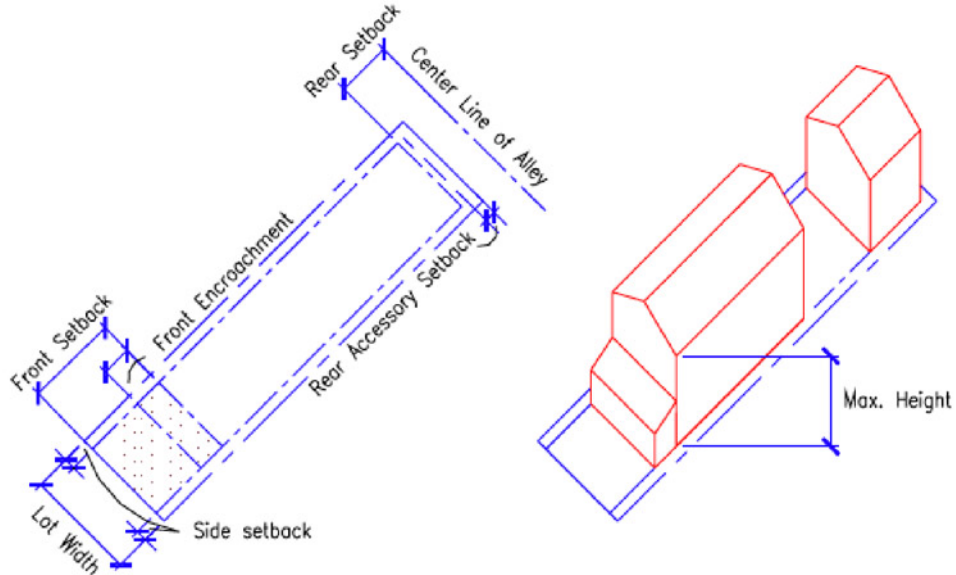
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<sup>18</sup> Knightdale UDO, Sec. 5.7.A.

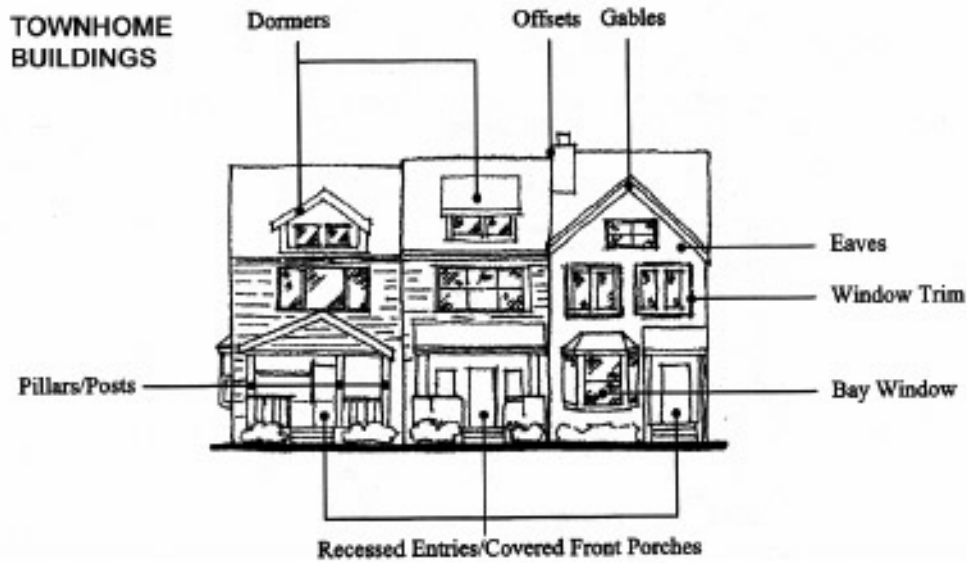
Following a description of the typology, general requirements are enumerated, followed by site plan information (front, side and rear yards) and architectural elements, such as porch encroachments, placement of garage doors, roof pitch, combinations of exterior finishes, design details about dormers, recessed entries, and eaves, etc. The ordinance has accompanying diagrams to illustrate the application of the dimensions; these illustrations convey concepts, rather than measurements, which are designated elsewhere in the ordinance and vary from one district to another. The following diagrams illustrate the dimensional standards for detached houses, with and without a rear lane or alley.



### House with Rear Lane/Alley



The level of detail required varies according to typology. For example, civic buildings “should be of sufficient design to create visual anchors for the community.” The two measurable criteria are related to combining wall materials (the material that appears heavier should be placed on the bottom) and rooftop equipment (it should be screened from view). In contrast, the requirements for townhouses are much more detailed, specifying bulk and scale; porches and stoops; fenestration on the front and rear elevations; front entrances, design details of architectural features (such as); materials; rooftop equipment; and several other items. While the dimensions of these architectural elements are not defined, the ordinance does require that their detail and proportion be appropriate for the building’s architectural style (Colonial, Victorian, Greek Revival, etc). The following illustration clarifies the architectural features described in the ordinance.



***Dimensional Standards***

Each district is assigned dimensional standards that are applied to building types in that district. For example, the following table shows the dimensions that apply to general residential districts; by applying these standards to the House typology illustrations shown in the previous section, a consistent spatial pattern is created for the district. For example, the following table gives the dimensional standards for the General Residential District:

	<i>House</i>	<i>Townhouse</i>	<i>Civic &amp; Institutional</i>
<i>Lot Width (a) (Minimum)</i>	30 ft	n/a	100 ft
<i>Front Setback (Minimum)</i>	10 ft	0 ft	10 ft
<i>Front Setback (Maximum)</i>	n/a	25 ft	n/a
<i>Front Yard Encroachment (b)</i>	8 ft	(e)	10 ft
<i>Side Setback (Minimum)</i>	20% of lot width (d)	10 ft between buildings	15 ft
<i>Rear Setback (Minimum)</i>	25 ft	n/a	30 ft
<i>Rear Setback from Rear Lane/Alley (c) (Minimum)</i>	15 ft from centerline	15 ft from centerline	n/a
<i>Accessory Structure Side/Rear Setback (Minimum)</i>	5 ft	5 ft	5 ft

Notes:

- (a) For lots less than 60 feet wide, alley/rear lane access to all off-street parking areas is required, except when such lots front onto an approved cul-de-sac, in which case shared driveways shall be required. For in-fill lots less than 60 feet wide where no alley/rear lane access exists, shared driveways shall be required. For lots 60 feet wide or greater, access to off-street parking is permitted from the fronting street or rear lane/alley.
- (b) Balconies, stoops, stairs, chimneys, open porches, bay windows, and raised doorways are permitted to encroach into the front setback.
- (c) For lots that provide access to off-street parking from a rear lane/alley
- (d) In new developments, the entire setback may be allocated to one side with a minimum of 6 feet of total building separation, providing the setback condition is consistent with the block
- (e) Upper story balconies may encroach into the right-of-way (over sidewalk only) with permission from the Town.

***Allowed Uses***

There are nine general use categories: residential, lodging, office/service, retail/restaurant, entertainment/recreation, manufacturing/wholesale/storage, civic/institutional, and infrastructure. Each of these use categories has a subset of uses, all of which are designated one of the following, according to district: permitted, permitted subject to additional standards, allowed with a special use permit, not permitted, or allowed only in a conditional district. The following table indicates if at least one subset of the use categories is allowed in the district. As expected, the more-urban districts contain more allowed uses.

	<i>Open Space</i>	<i>Rural Residential</i>	<i>General Residential</i>	<i>Urban Residential</i>	<i>Residential Mixed Use</i>	<i>Neighborhood Mixed Use</i>	<i>Town Center</i>
<i>Residential</i>		P	P	P	P	P	P
<i>Lodging</i>		P	P	P	P	P	P
<i>Civic / Institutional</i>	P	P	P	P	P	P	P
<i>Office / Service</i>	*	P	P	P	P	P	P
<i>Entertainment / Recreation</i>	P	P	P	P	P	P	P
<i>Retail / Restaurant</i>					P	P	P
<i>Manufacturing / Wholesale / Storage</i>	*					P	P

*\* Gov't services and Agriculture allowed in OS*

***Development Process***

Under the new ordinance, the responsibilities of the Land Use Review Board and the Town Council are related to big-picture items, such as granting special use permits and variances, negotiating conditional districts, ruling on vested right applications, approving/rejecting text amendments and map amendments (re-zonings). All decisions related to these items, as decisions made on appeals, require a super-majority for approval (either 4/5 or 2/3 of the board, depending on the decision).

Since the appropriate dimensions were prescribed during the public visioning and code-writing phases, the staff or Technical Review Committee are empowered to rule on all zoning compliance and/or development permit applications. This shortens the time frame for approvals and simplifies the pre-development process. Under the previous ordinance, the Planning Board made recommendations and the Town Board voted on nearly every site plan and land use permit.

	<i>Decision-Making Authority</i>	<i>Appeal</i>
<b>Zoning Compliance &amp; Sign Permits</b>		
<i>Sketch Plan</i>	Staff	LURB
<b>Floodplain Development Permits</b>		
<i>Floodplain Development Permits</i>	Staff	LURB
<b>Site Plans</b>		
<i>Sketch Plan</i>	Staff (non-binding)	n/a
<i>Master Plan</i>	TRC	Town Council
<i>Construction Documents</i>	Staff	Town Council
<b>Minor Subdivisions / Family Subdivisions</b>		
<i>Sketch Plan</i>	Staff (non-binding)	n/a
<i>Final Plat</i>	Staff	Town Council
<b>Major Subdivisions</b>		
<i>Sketch Plan</i>	Staff (non-binding)	n/a
<i>Master Plan</i>	TRC	Town Council
<i>Preliminary Plat</i>	Staff	TRC
<i>Final Plat</i>	Staff	Town Council

The administrator can waive the permitting process if submitting a development plan “would serve no useful purpose.” This applies to permits for:

- accessory structures for all building types.
- any enlargement of a principal building, as long as the size is increased by less than 20 percent, and provided the enlargement does not involve landscaping improvements or expanded parking areas.

### ***Development example***

Knightdale offers an excellent opportunity to compare the spatial arrangement and characteristics of buildings constructed under the new ordinance to those approved under the previous system. Two buildings – a restaurant and a tire store – located on Village Park Drive serve as excellent examples of this difference because they were built within a two-year time frame, on the same street, within 500 feet of each other. Village Park Drive is a local street that runs parallel with Knightdale Boulevard (US Highway 64), and is fronted by a variety of strip shopping centers, several mid-rise office buildings and stand-alone restaurants and service buildings. Regulations under the new ordinance required buildings create a pedestrian-oriented spatial order on the local street, rather than solely address the state highway to the north. To facilitate this, the ordinance mandates build-to lines and a pedestrian entrance on the local street; it prohibits parking in front of the building, and it allows on-street parking. The following aerial image shows the location of Village Park Drive and the immediately surrounding areas.





A comparison of the two buildings clearly shows a difference in spatial relationships that resulted from the new ordinance. The restaurant, which was permitted under the previous ordinance and opened in 2006, is oriented exclusively toward Knightdale Boulevard; only the back entrance to the building, off-street parking, and the service area are visible from Village Park Drive. In contrast, the face of the tire store building is located only five feet from the sidewalk, a customer entrance faces the street, and all on-site parking is located at the side and rear of the building. When looking at the street-section, the tire store clearly defines the northern face of the street.



## **Analysis and Recommendations**

As stated earlier, the purpose of this analysis is to evaluate whether the policies are written in ways that will provide the intended public and/or private benefits. Both ordinances meet the stated goals, in whole or in part, and suggestions are made for ways the ordinances could be improved.

### **City of Conover**

#### ***(1) Predictable built environment based on community vision.***

Several public meetings were held about the new zoning ordinance, which was applied only to newly-annexed property bordering I-40 and north of the Interstate. The form-based districts in the Conover ordinance appear to include sufficient dimensional standards to shape the public realm in predictable ways. The ordinance does this by designating building types (with height and mass requirements) and build-to lines that maintain consistency on any particular street. Build-to lines on new streets must be the consistent according to building and lot type, including build-to lines. Along existing streets, new buildings must reflect the general spacing of structures, building mass and scale, and street frontage relationships of the existing buildings.

#### ***(2) Flexibility of use***

The new ordinance offers very limited flexibility of use in the districts. Setting aside the site-specific districts, only the mixed-use district allows an integration of uses or adaptive reuse of buildings.

#### ***(3) Streamlined Review***

The Conover ordinance provides explicit dimensional standards and architectural requirements (rather than subjective guidelines) for the TND districts, making it easy for planning staff to determine whether a zoning compliance application is acceptable. This reduces the need for council involvement, which speeds up the application process. However, the ordinance is cumbersome because all of the conventional zoning districts have been retained. This means that both the public and private sectors must accommodate two fundamentally different systems within the same jurisdiction.

***Recommendations:***

The greatest shortcoming of the code is the small number of uses allowed in the “residential” districts, and in this way, the ordinance appears very similar to Euclidian zoning. In the short term, this limits access to goods and services that can be provided at the neighborhood scale. In the longer term, it limits the community’s ability to grow and change according to its needs. Furthermore, the single-family-only requirement of the Rural Residential District perpetuates one of the main characteristics of sprawl; this could be addressed by allowing multiple dwelling units in the Single Family House building type.

The effectiveness of the ordinance is also limited by its scope: the city council has limited the benefits of the new code to newly-annexed areas or to property owners who seek rezoning to a TND district. The dual system likely reflects the political complexities of creating a new ordinance and rezoning an entire city; however, the council could adopt a timeline for phasing out the conventional districts as familiarity with the code increases. This would offer an opportunity for creating finely detailed regulating plans for small areas, which then could receive the stated benefits of the form-

based codes. A phased approach to rezoning the conventional districts also would allow the city to address another significant short-coming of the ordinance: its complexity and, therefore, inefficiency.

## **Knightdale**

### ***(1) Predictable Built Environment***

The new Knightdale ordinance includes clear prescriptive standards that were the result of an extensive public process that lasted two years, starting in November 2003 and ending on November 15, 2005, when city council adopted the code and rezoned portions of town to comply with the comprehensive plan. Several development moratoria were issued for high-priority areas to allow time for development of community-based small area plans, which would reflect a greater level of urban design detail (and, therefore, greater predictability).

### ***(2) Flexibility of Use***

A broad range of allowed uses can be found within each district, and a change-of-use requires only that a zoning compliance certificate be obtained from staff. However, changes of use also require that non-conforming building types be brought into compliance with the building and lot standards, which will result in the intended spatial patterns.

### ***(3) Streamlined Review Process***

The new ordinance is far superior to its predecessor in terms of review and permitting processes. The number of zoning districts was reduced dramatically, from twenty-two to twelve, and almost all applications under the previous ordinance required

board action – from the simplest site plan review to the most complicated planned development. The development standards are objective, rather than subjective and therefore can be easily and consistently applied by staff.

### **Recommendations:**

The Knightdale ordinance clearly links the policies examined in this study with the intended outcomes and their associated public and private benefits, therefore no recommendations for changes are made.

### **Conclusion**

In North Carolina, form-based codes have found appeal in places with concerns that rapid growth has or will compromise the community's small town character. This is not surprising, given that the most prominent New Urbanist developments have replicated the spatial form of small towns. However, form-based codes, like all planning interventions should be clearly written so they achieve their intended purposes. In this analysis, the following goals were met – in whole or in part – by the ordinances: (1) predictable built environment, (2) flexibility of use, and (3) streamlined review. This suggests that form-based codes can be an effective planning tool.