Form-Based Codes:
A Cure for the Cancer Called Euclidean Zoning?

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ABSTRACT

Zoning is premised upon the segregation of land uses. Rudimentary zoning ordinances originated in New York around 1916 as a means of separating the lower class fabric markets from the upscale retailers of 5th Avenue nearby, and to reduce density. The Standard Enabling Acts of the 1920s granted governments the broad authority to enact zoning ordinances to reduce population densities in cities for the purposes of health, safety, and well being. The United States Supreme Court upheld this authority as constitutional in the landmark case of Euclid v. Ambler Realty (1926).

In the roughly eighty years since the Euclid decision, zoning has become the planning profession's primary tool to regulate land use. While an effective policy response to issues at that time of a rapidly industrializing America, Euclidean zoning has unintentionally shaped the US landscape into a sprawling, auto-dependent society characterized by segregated communities of isolated populations.

Euclidean zoning makes it extremely difficult to mix uses. As a result, "traditional" development patterns with high-density housing, nearby commercial, and pedestrian-friendly walkways are virtually impossible to create. Many critics suggest that zoning promulgates sprawl. In short, Euclidean zoning prevents "good" urban design.

In recent years, new trends have emerged to address these problems to varying degrees of success. Form-Based Codes are one of the most recent planning innovations. With origins in the New Urbanist school of development, Form-Based Codes elevates physical design in city planning, as opposed to the "use-based" restrictions of Euclidean zoning.

This paper examines whether or not Form-Based Codes could be a viable solution to the ills associated with Euclidean zoning. Benefits and drawbacks of both Euclidean zoning and Form-Based Codes are debated, including a case study analysis, as well as a discussion of legal ramifications and future scenarios in land use planning.

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1.0 INTRODUCTION

In the approximately eighty years since the landmark *Village of Euclid v. Ambler Realty* decision that legitimized zoning as an effective method of protecting public safety and welfare, zoning has influenced and shaped development across the United States. Not until Jane Jacobs' critique, The Death and Life of Great American Cities, published in 1961, was the practice of zoning ever seriously questioned outside the legal arena (Wickersham, 2001). Like Jacobs, many planners and critics of current development practices believe zoning is an outdated, static tool that prevents the creation of livable and aesthetically pleasing communities. Consequently, new tools have emerged to supplement traditional Euclidean zoning to varying degrees of success.

One of the most recent innovations is the development of the Form-Based Code. Form-Based Codes are tied very closely to the New Urbanist school of development, which advocates compact, pedestrian-oriented development, a healthy mixing of uses, neighborhood interaction, and an integration between the buildings that shape the public realm. Form-Based Codes consider the codification of a physical plan based upon the form of buildings to be paramount. While use is not completely ignored under Form-Based Coding, use is not the guiding force as under conventional Euclidean zoning.

Many communities choose to establish "form districts" within the realm of the zoning framework. Effectively, these form districts become new types of zones that function alongside current zones like "Residential" or "Commercial." Thus, Form-Based Code zones coexist with Euclidean-based zones.

By prescribing parameters for form, communities may expect high quality urban design unlike conventional development patterns. Form-Based Coding allows the use of particular building types to evolve as dictated by demographic and socio-economic change, without

requiring a massive regulatory overhaul. As a modern and forward-thinking planning tool, Form-Based Coding stands in stark contrast to the outdated regulatory framework of conventional Euclidean zoning. If zoning is to be considered a "cancer" that has festered for the greater part of a century, are Form-Based Codes the cure for what ails modern land development practice?

This paper evaluates Euclidean zoning to date, discussing its origins, legal basis, and consequences. The characteristics of "good urban design," as revealed by the literature, are also delineated. The merits and faults of new developments in planning are then examined, leading to a full analysis of the Form-Based Code. A case study from Arlington, Virginia augments this debate. Finally, the paper explores the practicality and application of the Form-Based Code, and offers suggestions as to the direction the planning profession might be aimed.

2.0 LAND USE PLANNING, PAST AND PRESENT

2.1 The Origins of Zoning

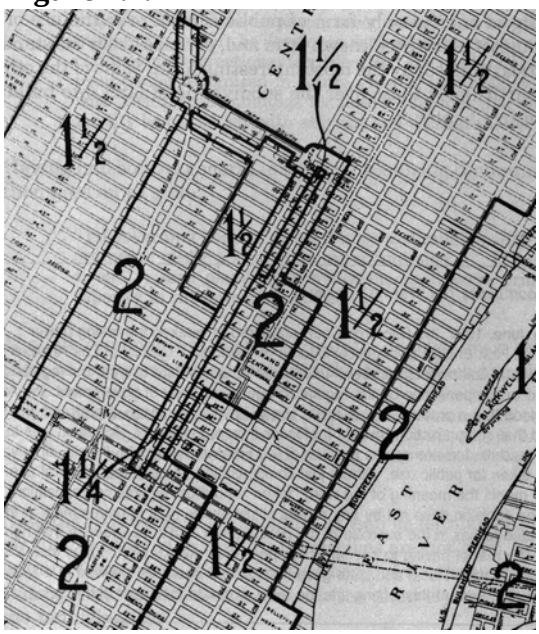
King Phillip II of Spain established the Law of the Indies on July 13, 1573, thus creating the first known development regulation in North America. This mandate regulated Spanish settlements in the New World and included detailed criteria regarding the design and location of a central plaza, the organization of civic buildings, the allowance for communal open space, and the separation of incompatible uses (Lewis, 2003).

Local leaders in Germany and the Netherlands created the precursor to modern zoning near the end of the 19th century to separate newly created heavy industry from historic and residential districts (Barnett, 2003). Rudimentary ordinances existed in several large US cities to regulate building heights for the purposes of light, air, and traffic congestion around the turn of the 20th century (Levy, 1988). The United States Congress passed a bill in 1899 restricting building heights in Washington, DC to 90 feet in residential areas, and 130 feet on wider avenues. A similar act passed by the Massachusetts Legislature in 1904 limited structures in Boston's business district to 125 feet, while restricting other structures throughout the city to 80 feet. A Boston property owner challenged the Massachusetts law several years later, but the court upheld the regulation as a valid exercise of the police power (Levy, 1988). The judiciary's support of a 1909 Los Angeles regulation that divided the city into commercial and residential districts further strengthened municipal rights under the police power, guaranteed by the 5th and 14th Amendments (Levy, 1988). The police power is a government's authority to regulate for the advancement of a community's health, morals, safety, or general welfare.

New York City enacted what many consider to be the first modern zoning ordinance in the United States in 1916. Faced with diminishing developable property as a result of a rapidly industrializing city, commercial construction grew vertically, sometimes upwards of 50 stories,

encompassing entire city blocks. These new skyscrapers cast long shadows through the city's streets, reducing the amount of available sunlight and fresh air. In addition, a new subway system brought thousands of workers to Manhattan everyday. New York City therefore epitomized the early 20th century commercial center. Consequently, the upscale retailers of 5th Avenue became increasingly leery of the manufacturing firms and garment markets that began locating nearby (Levy, 1988; Barnett, 2003). Considering these issues, local leaders adopted a zoning ordinance that divided the entire city into nine "Use Districts": a residential district, four retail districts, two business districts, one manufacturing district, and one unrestricted district allowing the mixing of uses (Kwartler, 1989). An overlay district regulated building height as a proportion of street widths to remedy congestion and increase available sunlight.

Figure 2.1.1



Early Manhattan Zoning Districts
Zoning districts in Midtown Manhattan according to the 1916 plan. Building heights were expressed as ratios to street width. (Levy, 1988; Garvin, 2002)

The ordinance also included five districts with lot coverage specifications, such as minimum lot size, as well as building envelopes for skyscrapers that mandated specific increasing setbacks as building height increased. Accordingly, the city prescribed enough land within these zones to accommodate an eventual population of 340 million people (Williams, 1989).

Attorney Edward M. Bassett designed the 1916 New York zoning ordinance based upon the police power. As such, Bassett crafted each provision of the regulation to directly correlate with some matter of public health, safety, or welfare (Levy, 1988). Consequently, the new ordinance proved to be insusceptible to legal challenges of

the day. Municipalities were not required to compensate land owners for any loss of property value zoning might have inflicted as the regulation resided fully within the realm of the enabling police power (Levy, 1988).

While the New York zoning ordinance failed to regulate physical design beyond basic dimensional criterion (i.e. setbacks and density restrictions) to permit light and air and to reduce congestion (Rouse et al, 2001), the provisions also served to "prevent the intrusion of improper uses into homogenous areas" (O'Harrow, 1967). Many felt zoning also limited land speculation (Palen, 1995). Almost immediately, communities across the country enacted similar regulations.

Zoning provided a salient tool to regulate land use and development at a most critical time. Industrialization created the perception (and reality) of a dirty city. Streetcar suburbs had given way to automobile-oriented suburbs. Automobile ownership was increasing at an estimated two million vehicles per year (Levy, 1988). Through zoning, communities simultaneously reduced "improper" usages and prevented "noncompatible" usages from entering higher-status residential and retail districts (Palen, 1995).

2.2 Zoning Basics

Zoning ordinances provide the principal tools employed by planners in the United States to control and promote sound development. The police power—the power to regulate for the advancement of a community's health, morals, safety, or general welfare—provides the legal basis to zone. The federal government formalized states' authority to enable zoning through the Standard Enabling Act, issued in the early 1920s. Commonly, the state constitution or a municipal charter denotes the enabling authority to zone. Local governments utilize state enabling statutes to authorize local zoning ordinances (Gitelman, 1997).

The term "zoning" denotes the process of dividing a community into a set of distinct zones in which specific land uses are either allowed or prohibited (Abeles, 1989). Local

governing bodies (county, city, town, townships, etc.) prescribe regulations for each zone addressing three general issues: *Use*, *Intensity*, and *Bulk* (Kelly, 1993).

Generally, four basic categories comprise building and land use: agricultural, commercial (or business), industrial (or manufacturing), and residential. For each zone, ordinances indicate allowed ("of right"), special ("conditional"), and prohibited uses. In present times, larger cities often employ subcategories within each zone to provide for special use districts like downtown, light industrial, neighborhood business, office, or warehouse (Kelly, 1993). In theory, this separation facilitates the confinement of factories and rail yards to "industrial" zones and houses and apartments to "residential" zones (Gillham, 2002). The underlying objective seeks to keep incompatible uses apart from one another such that citizens would not be living next to factories.

Zoning also regulates building intensity. Intensity refers to the amount of a particular use on a designated piece of land. Minimum lot sizes and a limit on the number of dwellings per unit regulate residential density. Floor-area ratios (FAR) regulate intensity for commercial and industrial zones. For all intents and purposes, the FAR acts as a multiplier (Barnett, 2003). For example, if the area of the building lot is 5,000 square feet, and the floor-area ratio is five, the allowable floor area is five times the lot area: 25,000 square feet. Building height restrictions and parking requirements also affect intensity of use.

Bulk refers to the actual volume of space or massing of a building. Building setback regulations (expressed as a distance from lot lines or streets) and maximum building coverage requirements address bulk issues (Kelly, 1993). Height restrictions may also be used to regulate a building's bulk.

Use, intensity, and bulk restrictions are standardized throughout a particular zone, but may vary between zones in a particular community (Kelly, 1993). Planners utilize zoning maps to delineate unique zoning districts throughout a community.

2.3 The Standard Enabling Act

By 1921, 48 municipalities (with a total population of 11 million) had enacted zoning ordinances; two years later, these numbers increased to 218 municipalities (with a total population of 22 million) (Levy, 1988).

As zoning gradually became the dominant form of land use regulation in the United States, the federal government sought to create a model state enabling statute (Garvin, 2002). The resulting Standard State Zoning Enabling Act (referred to here as the Standard Enabling Act), promulgated by the Department of Commerce under the direction of Secretary Herbert Hoover in 1924, provided communities further impetus to zone. Drafted by Bassett, who also authored New York City's zoning ordinance, the Standard Enabling Act provided a zoning template for communities across the country. The Standard Enabling Act sought to reduce density, prevent the overcrowding of land, and avoid the undue concentration of people (Wickersham, 2001):

> For the purpose of promoting health, safety, moral and the general welfare of the community, the legislative bodies of cities and incorporated villages is hereby empowered to regulate and restrict the height, number of stories, and size to the building, and other structures the percentage of the lot that may be occupied, the size of the yards, courts, and other open spaces, the density of the population, and the location and use of buildings, structures, and land for trade, industry, residence, or other purpose… (Baker, 1927)

The language of the Standard Enabling Act assured states that their new zoning regulations would be upheld against any legal challenges (Levy, 1988; Meck, 1996).

As the United States continued to industrialize and populate, 85 percent of communities across the country enacted zoning ordinances over the next 20 years (Gillham, 2002). At one time, all 50 states had adopted all or parts of the Standard Enabling Act. Today, the Act still forms the basis for zoning in almost all states (Gitelman, 1997). In effect, the New York City

ordinance, developed in response to the problems of early 20th century industrialization, became the template for land use regulation across the United States (Kelly, 1993).

2.4 Euclid v. Ambler Realty

The Village of Euclid, Ohio v. Ambler Realty Co. (United States Supreme Court, 1926) proved to be a seminal event in the history of zoning. Euclid, a largely rural suburb of Cleveland, enacted its zoning ordinance in 1922. Euclid's regulation created six specific zones based upon a pyramid of increasing inclusion:

Table 2.4.1
Euclid's Zoning Districts

U-1	Single-family detached homes
U-2	U-1 plus duplex units
U-3	U-2 plus apartments
U-4	U-3 plus office and commercial
U-5	U-4 plus warehouse and some manufacturing
U-6	U-5 plus all other industries

(Gitelmam, 1997)

Ambler Realty owned 68 acres of land purchased in 1911. Euclid's zoning code restricted Ambler's property to 40 acres of industrial use (60 percent), four acres of apartment use (six percent), and 22 acres of duplex use (33 percent).

Ambler's land was situated adjacent to a railroad link to Cleveland, and, the company claimed it had purchased the land for the express purpose of industrial development (Garvin, 2002). Land prices at the time valued industrial uses at $10,000/acre while residential uses were valued at $2,500/acre. Effectively, Euclid's new zoning regulations reduced Ambler's property value by 29 percent (Feagin, 1989).

Ambler filed suit arguing that the zoning ordinance deprived the company of property without due process (5th and 14th Amendments). The trial court concurred and held that Euclid's zoning ordinance was an improper use of the police power (Garvin, 2002).

Before the United States Supreme Court, Euclid argued that zoning was an effective method of nuisance control and a reasonable exercise of the police power. The Court agreed. Writing for the majority, Justice Sutherland concluded:

> Until recent years, urban life was comparatively simple; but with the great increase and concentration of population, problems have developed…which require, and will continue to require, additional restrictions in respect of the use and occupation of private lands in urban communities… The exclusion of buildings devoted to business, trade, etc., from residential districts, bears a rational relation to the health and safety of the community. Some of the grounds for this conclusion are…aiding the health and safety of the community by excluding from residential areas the confusion and danger of fire, contagion and disorder which in greater or less degree attach to the location of stores, shops, and factories.
>
> *Euclid v. Ambler Realty* (United States Supreme Court, 1926)

The Court's decision elevated single-family home to a "pedestal"—so to speak, and legitimized what came to be known as *Euclidean zoning* as a constitutional enforcement of the police power.

Since the landmark decision, Euclid's pyramid-based zoning scheme has mostly dissipated for many reasons. Primarily, in a current litigious society, industries and residents dually aim to avoid incompatible uses (Kelly, 1988). While Euclidean zoning in its purest form may no longer exist, its ramifications are manifested daily in the course of American land planning and development.

2.5 The Effects of Euclidean Zoning

In the approximately eighty years since the Euclid decision legitimized zoning as an effective method of protecting public safety and welfare, the practice has shaped and influenced development across the United States. Planners utilize zoning regulations to separate noxious uses and promote sound development of land. Jane Jacobs' critique, The Death and Life of Great American Cities, published in 1961, first seriously questioned the practice of zoning outside the legal arena (Wickersham, 2001). While zoning delivers observable benefits, many critics of current development practices consider zoning an outdated, static tool that has not evolved with changes in American demographics or land use desires. This section describes and analyzes the consequences of Euclidean zoning, both good and bad.

2.6 Euclidean Zoning's Successes

Zoning achieves its original objectives (increasing light and air, and reducing density) for the most part, save congestion. Generally speaking, factories locate away from schools or homes, and lower density land use patterns dominate the landscape. One might suggest that a functionalist interpretation of land use emerged, with each distinctive function placed in the appropriate zone (Wickersham, 2001). Zoning proved an appropriate governmental policy response to combat the ills of early industrial cities.

Kwartler (1989) suggests that despite the rigidities characteristic to Euclidean zoning, its structure allows for development predictability, certainty, and administrative accountability and objectivity. While zoning sacrifices personal building choice to some extent, many consider the relative predictability regarding the potential use on adjacent sites a fair exchange. Thus, zoning protects both personal property investments and public rights. Zoning's inflexible regulations pledge accountability. Zoning describes parameters for land development and future projects conform to these parameters. Upon individual review of proposed projects, no gray area exists. Projects either comply with said ordinance, or do not comply—ensuring objectivity, as the reviewing planner has virtually no discretion.

Americans are notoriously protective of their personal property rights guaranteed by the Constitution. Zoning provides direct land use control at the most local of levels (Gordon and Richardson, 2001).

As evidenced by the United States Supreme Court's decision, in Euclid, zoning places the single family home at the highest level of protection. Accordingly, zoning is a useful method to guarantee that these homes retain their value (Richardson, 2002; Kelly, 1993) and an effective tool to preserve the status quo of a community.

Similarly, economists suggest that current land use development patterns are market driven (Gordon, 1998). The market provides citizens an appealing choice of housing options, these economists contend. Citizens purchase homes where they forgo the least amount of trade-offs in relation to house size, location, schools, commute, and retail. Citizens act as consumers and will choose the community that offers the best package of amenities (Tiebout, 1956).

Finally, zoning costs virtually nothing to municipal governments (Levy, 1995). Aside from basic administrative costs or occasional legal costs, zoning proves far cheaper than public ownership of land or the purchase of easements, which could instill the same amount of control or greater (Levy, 1995).

2.7 Euclidean Zoning's Failures

Euclidean zoning admittedly achieves its intended objectives—the separation of incompatible uses, increasing light and air, and reducing density. However, the entire regulatory structure tends to foster sprawl, exclude certain populations, prove inflexible over great periods of time, thwart the public's general comprehension of basic ordinances, and impede the creation of livable communities of mixed use.

Euclidean zoning's framework separates, for the most part, residential and commercial uses. Critics of zoning argue that the separation of these basic daily uses, albeit well intentioned, manifests itself as sprawl (Wilson, et al, 1998; Wickersham, 2001). The very ordinances designed to protect citizens from bad development, actually prevent the creation of good neighborhoods, towns, and cities (Ferrell & Madden, 2002).

Jane Jacobs (1961) argues that Euclidean zoning has been hard where it should be soft, and soft where it should be hard. Implicitly, zoning is overly rigid in dividing cities into uniform, low-density, singular-use districts. Conversely, zoning has been overly soft (or permissive) in its

failure to establish design standards for streets and buildings that would promote interaction within the public realm. Jacobs states:

> The greatest flaw in city zoning is that it *permits* monotony. Perhaps the next greatest flaw is that it ignores *scale* of use, where this is an important consideration, or confuses it with *kinds* of use, and this leads, on the one hand, to visual (and sometimes functional) disintegration of streets, or on the other hand, to indiscriminate attempts to sort out and segregate kinds of uses no matter what their size or empiric effect. Diversity itself is thus unnecessarily suppressed.
>
> (Jacobs, 1961)

Jacobs concludes that zoning is often used as a method of social and economic exclusion. Notably, she offered this critique in the early 1960s, well before the consequences of current land development patterns were fully realized.

Other detractors maintain that Euclidean zoning is a static tool that has not evolved with changes in society (specifically governmental polices, the rise of the automobile, and technological innovations). Further, many suggest that current zoning ordinances are incomprehensible to the common citizen, and require legal expertise to decipher. Finally, zoning impedes the creation of mixed-use development. As such, "livable communities" are impossible to create. This section addresses and expands upon all of the above-mentioned critiques of Euclidean zoning.

2.8 Sprawl

"Suburban sprawl has been the dominant form of metropolitan area growth in the United States for the past 50 years," writes Anthony Downs (1998). Sprawl is a subjective word privy to multiple interpretations. Some define sprawl as an unlimited outward extension of development; low-density housing and commercial development; leapfrog development; "edgeless" cities; and reliance on private automobiles for transportation (Squires, 2002). Others define sprawl as low-density development rapidly spreading across rural areas caused by

complex interactions among government regulations and private initiatives (Barnett 2003). Still others claim sprawl involves a strict separation of human activities, mandatory driving, and huge supplies of free parking (Kunstler, 1998).

Ewing developed a set of characteristics employed by many organizations in opposition to sprawl, as well as groups advocating the status quo (Ewing, 1994; Gillham, 2002). These characteristics include: leapfrog development; commercial strip development; low density; large expanses of single-use development; poor accessibility; and a lack of functional open space. As sprawl is a "generalist" term, looking at each characteristic of sprawl and its relationship to Euclidean zoning proves helpful.

Leapfrog Development

Leapfrog development refers to any type of development that has "skipped" over adjacent tracts of vacant land. This development pattern results in a widely dispersed, haphazard patchwork that consumes far more land than contiguous development (Ewing, 1994; Gillham, 2002). Additionally, the costs of extending services to noncontiguous communities often severely burdens municipalities.

While aiming to reduce density, Euclidean zoning often produces leapfrog development. Euclidean zoning might not necessarily "promote" leapfrog development, but the regulatory framework often does not include provisions to discourage this type of development from occurring.

Commercial Strip Development

Numerous curb cuts along primary roads providing access to an array of commercial entities (gas stations, shopping malls, fast food restaurants, and banks) characterize commercial strip development. Kunstler (1998), colorfully describes commercial development: "the fry pits, the big-box stores, the office units, the lube joints, the carpet warehouses, the parking lagoons,

the jive plastic townhouse clusters, the uproar of signs, [and] the highway itself clogged with cars."

Most often, retail is configured in long, low boxes or small buildings surrounded by large parking lots (Ewing, 1994; Gillham, 2002). Landscaping is usually minimal at best, so as not to interfere with parking or signage, and sidewalks are scarce (Ewing, 1994; Gillham, 2002). Commercial strip development is allowable under Euclidean zoning's regulatory regime, which generally provides no design parameters relating to the context of the site.

Low Density

Regarding density, sprawl entails lower numbers of buildings and less population per a given area. Buildings are often separated by large expanses of roadways and parking (Ewing, 1994; Gillham, 2002); Euclidean zoning creates an innate fear of density (Crawford, 2003). Zoning seeks to create low-density communities, and utilizes large roadway networks and parking requirements to accomplish this.

Single-Use Development

Generally, Euclidean zoning mandates single-use development—another characteristic of sprawl. As a result of the deliberate segregation of uses, housing consists primarily of single-family homes on individual lots, usually situated great distances from other types of uses (Ewing, 1994; Gillham, 2002). The mixing of uses, characteristic of urban core areas, is rarely found in suburban development. Further, zoning treats land as a commodity rather than an ecosystem (Barnett, 2003). Inasmuch zoning protects suburban residents from negative uses, zoning should instead enable a positive template for the entire community.

Poor Accessibility

Poor accessibility refers specifically to dependency on the automobile. Because Euclidean zoning separates dissimilar uses, great distances often exist between common daily

activities. As such, automobiles are necessary to travel between simple destinations like the grocery store, work, school, and home. However, large segments of the general population (children, teenagers, the poor, the elderly) do not have access to an automobile, rendering them isolated from the community (Bressi, 1994). This civic isolation, among other reasons, forms the subject of Robert Putnam's social critique Bowling Alone (2000), which argues that Americans have become increasingly disconnected from family, friends, neighbors, and local institutions. Zoning continues to mandate the separation of the "naturally integrated human activities of dwelling, working, shopping, schooling, worshiping, and recreating" (Katz, 1994). Comparatively, suburban sprawl offers relatively few mass transit options, and walking or biking between activities could prove difficult or even dangerous (Gillham, 2002).

Victims of sprawl also include the middle-class commuters, who spend an increasingly greater amount of time traveling to and from their places of employment (Duany et al, 2000). According to one study, the average two-car suburban family makes ten car trips per day (Mitchell, 2001). A person living an hour's drive from work spends the equivalent of 500 hours (12 work weeks) in a car per year just commuting.

Lack of a Functional Open Space

Ewing (1994) suggests that a lack of public open space is a defining characteristic of sprawl. While large shopping malls or parking lots promote the illusion of public space, a functional public space is often missing from sprawling suburbia. Similarly, Gillham (2002) asserts that another indicator of sprawl is an "unbroken fabric of privately owned land divided only by public roads." Under conventional zoning practices, at least one-third of all urban development is devoted to roads, parking lots, and other motor vehicle infrastructure. Much is wasted, as residential roadways comprise 80 percent of the total national road miles while carrying only 15 percent of total vehicle miles (Ben-Joseph, 2002). Zoning mandates new

residential street widths between forty and sixty feet, the same dimensions required of highways just a few years ago (Altman, et al, 2003). Excessive road widths lead to higher automobile speeds, and compromise the general safety of neighborhoods.

Figure 2.8.1

Sprawl
Prominent features of sprawl include excessive roadway infrastructure and large land consumption.
(Ben-Joseph 2002)

Sprawl consumes excessive amounts of land (Crawford, 2003). Seventy million people lived in urbanized areas in 1950, inhabiting an estimated 13,000 square miles. By 1990, the urban-suburban population had doubled while land inhabitated almost quintupled to more than 60,000 square miles (Mitchell, 2001).

Many critics feel Euclidean zoning shoulders the primary blame for facilitating sprawl (Wilson, et al, 1998). A recent survey performed by the Atlanta Regional Business Coalition lends support to this argument. The *Quality Growth Audit* examined zoning codes for 26 metro Atlanta cities and counties (Frankston, 2003). The study found that while many Atlanta-area communities' zoning structures create housing near retail, the ordinances neglect to provide a direct path for pedestrians. Thus, people are required to travel by automobile for the most simple of trips. One local planner professed, "Our zoning codes have been called the DNA of development… If the DNA dictates sprawl, then that's what you'll get" (Frankston, 2003). Arlington County Board Member Chris Zimmerman echoes this sentiment: "The code is really absolute on things that don't matter to us at all…the tools are all wrong for the job we're trying to do" (Swope, 2003a).

Other Factors

Admittedly, zoning cannot be blamed entirely for fostering sprawl. Houston, renowned for its lack of zoning regulation, looks much like every other large city (Neuman, 2003). A host of early 20th century factors, aside from the *Euclid* decision, influenced current land development practices. Industrialization permitted Americans to become increasingly wealthy. With increased wealth comes an increased desire for a larger house or an automobile. Technological innovations also made automobile manufacturing cheaper, and thus more affordable to the common citizen. These same technological innovations provided for the mass production of tract housing later in the century.

Post-World War II policies and events further increased sprawl development. Soldiers returning home from war found newly liberalized governmental policies aimed at helping them attain the so-called "American" dream (Palen, 1995). The Veteran's Administration (VA) offered loans to veterans at low interest rates (below conventional mortgages), with no money down, and a twenty-five to thirty year term. Similarly, the Federal Housing Authority (FHA) offered comparable incentives to non-veterans (Palen, 1995). As a result, home ownership (albeit government subsidized) became far more attainable than ever before.

The 1947 Interstate Highway Act, while aimed at increasing commercial activity and providing for national defense, abetted "white flight" from urban areas (Jackson, 1985). These new highways made suburban destinations far easier to reach (Palen, 1995). Likewise, suburbia offered an escape from the supposed grit and crime of urban life. New single-family homes in suburbia offered returning soldiers and their ever-expanding "baby boom" families a safe and secure alternative to the city.

2.9 *Exclusionary Zoning*

Zoning itself discriminates because it is exclusionary by nature (Gitelman, 1997). The separation of land based upon building height, area, and uses deemed appropriate, provides the fundamental foundation of zoning (Wolf, 1989). All uses, save for those specifically or conditionally allowed, are excluded from a particular zone.

From its earliest inception in New York when upscale retailers attempted to separate themselves from the lower class, immigrant-operated fabric markets, Euclidean zoning has been employed as a method of social and economic exclusion (Jackson, 1985). Since the 1920s, communities have used zoning as a legal method of keeping out undesirable activities, housing, and people (Palen, 1995). Common methods used to implement this exclusion through zoning include minimum lot size requirements, minimum house sizes, the prohibition of multi-family housing, and excessive setback requirements (Gitelman, 1997; Palen, 1995; Feagin, 1989).

By default, zoning guides investment (Farmer, 2003). Through specific or conditional use requirements, zoning dictates what and whom will locate where. Since World War II, this method of exclusion manifests itself through suburban land development. Either implicitly or directly, most suburban zoning regulations seek to exclude certain peoples from certain neighborhoods, or even from the entire community (Abeles, 1989). Wealthier people who can afford large houses on large lots are primarily directed towards suburbs. Likewise, poorer people are directed towards the inner city and thus, excluded from the suburbs.

Moreover, this capital-based exclusion becomes a *de facto* type of racial discrimination. As a whole, African-Americans have lower incomes than Caucasians (Levy 1998 and 1995). Zoning remains a popular tool for wealthier communities to preserve the status quo and exclude poorer minorities (Abeles, 1989).

On the surface, Euclidean zoning seeks to prevent the mixing of incompatible uses for the public good. However, zoning's underlying objectives are premised on the exclusion of unwanted activities and persons, and can be traced back to 1916 New York.

2.10 *Static Ordinances*

Despite waves of demographic, economic, and social change, Euclidean zoning endures as a static tool to regulate land development (Wolf, 1989). Over the past half-century, these ordinances demonstrated limited ability to regulate physical design in the context of socioeconomic changes (Rouse, et al, 2001). This reluctance to evolve is one of the greatest criticisms of current zoning practice. Current zoning ordinances in many older cities may have been authored fifty or sixty years ago (Swope, 2003b). Newer cities obviously have more recent zoning codes, but the underlying structure of many have not changed for decades. As a result, these archaic codes lock cities into undesirable growth patterns (Swope, 2003b).

Since the onset of zoning, American demographics and perceptions have changed dramatically. Foremost, the automobile has transformed the way society operates facilitating the movement of people much quicker than anyone could have imagined and increasing accessibility to previously inaccessible places (Hayden, 2000). Whites fled the cities. Blacks moved into the cities (Jackson, 1985). Now the trend of movement has reversed as whites are moving back to the cities while well-to-do blacks find suburbia attractive (Gantt, 2002; Powell, 2002). These evolving trends of spatial location represent just a few of the numerous demographic, economic, and social changes that have transformed the United States over the past eighty years.

While zoning amendments technically provide the means to "adjust" ordinances, they often result in compounding the problem. Critics argue that because the basic foundation of zoning is wrong, incremental changes fail because the system itself fails. "Because this social experiment [zoning] is flawed in its physical form, when it doesn't work, it cannot heal itself

(Katz and Ferrell, 2003). Katz (personal communication) suggests that variances, amendments, and the like unintentionally function as "Band-Aids" to a wounded framework. These layers of Band-Aids have many unintended consequences—most notably, the sheer incomprehensibility of the layers of regulation.

2.11 *Incomprehensible Ordinances*

As mentioned above, planners utilize amendments in an attempt to fix current zoning ordinances, or reflect a change in community standards. However, the resulting ordinance often results in a "mishmash of vague and conflicting rules" (Swope, 2003b) that would require legal expertise to decipher (Katz and Ferrell, 2003). As a result, many communities have adopted amendments for the sole purpose of explaining the contradictory nature of current regulations. Troy, Ohio provides one example:

> **1000.02020 OVERLAPPING OR CONTRADICTORY REGULATIONS**
>
> Where the conditions imposed by any provision of this Zoning Code upon the use of land, buildings, or structures are either more restrictive or less restrictive than comparable conditions imposed by any other provision of this Zoning Code; or of any other law, ordinance, resolution, rule or regulation of any kind, the regulations which are more restrictive shall govern.
>
> *(City of Troy, Ohio)*

Similarly, the Town of Barnstable, Massachusetts makes similar provisions for contradictory zoning ordinances:

> **1-3.1 Overlapping / Contradictory Regulations:**
>
> Except as otherwise provided herein, this ordinance shall not interfere with or annul any other ordinance, rule, regulation or permit, provided that, unless specifically excepted, where this ordinance is more stringent, it shall control.
>
> *(Town of Barnstable, Massachusetts)*

Contradictions arise when ordinances are amended repeatedly such that the general population cannot discern which regulation is legitimate. Moreover, matters are complicated further when a specific parcel straddles two zones.

Further contradictions occur due to dichotomy between the vagueness and the explicitness of current zoning regulation (Swope, 2003b). Zoning is a relatively crude instrument (Levy, 1988). While zoning prescribes what cannot be created, it lacks the foresight to specify what should be created (Levy, 1988). This rigidity often leads to sub-optimal results (Levy, 1988). For instance, Arlington County's "C-2" zone designates "C" for commercial and "2" for medium density. As a result, a C-2 designation is so unclear that it could yield any number of building types. The Floor Area Ratio ultimately determines building size—a calculation that does not consider whether or not the building is suitable for a Main Street or an interstate highway (Swope, 2003a).

The Floor-Area Ratio (FAR) concept, a complex mathematical formula understood by few (Peirce, 2003a), bothers many. Some communities publish directions for the sole purpose of deciphering FAR.

Complex mathematical formulas, contradictory ordinances, and arcane language represent several aspects of the incomprehensible zoning regulations that dominate current municipal land governance. This absolute incomprehensibility stands as one of the greatest obstacles to efficient administration of the regulatory process (Katz, 2003).

2.12 *Impossible to Create "Livable" Communities of Mixed-Uses*

Traditional Euclidean zoning codes contain three components: 1) information on how private property may be used; 2) a series of standards for planning and design of development; and 3) procedures for review and approval of project (Crawford, 2003). Conventional zoning regulations are "one size fits all" designations that excessively limit the range of possible land

uses, and are typically applied with little regard to the context of the existing community (Crawford, 2003). Zoning works to protect society from creating bad environments, but ultimately results in thwarting the building of healthy, mixed-use communities (Peirce, 2003a).

For the better part of 300 years, Americans survived without zoning. A popular consensus existed about the right methods of assembling communities. The best and most historic residential neighborhoods were not created by regulation but by cultural agreement (Kunstler, 1998). Now zoning dictates what type of development is located where. And because zoning relies on the separation of uses, vibrant mixed-use communities are difficult to create.

Jane Jacobs (1961) argues that city vitality is premised upon a variety of primary uses. "The district… must serve more than one primary function; preferably, more than two." In essence, each block should attract a plethora of uses, and should never be dominated by a single use—no matter how prosperous. She suggests that mixed-use communities that provide a range of residential, commercial, and other services attract a far wider range of people while spreading out their interactions over longer periods of time. Creating a greater level of human activity ultimately leads to a greater sense of safety on the street for pedestrians.

Despite the fact that vibrant downtowns found in older cities (like Old Town in Alexandria, Virginia, or Greenwich Village in New York) have survived for decades, these downtowns would not be legal under most current zoning regulation (Wilson, et al, 1998). Because zoning inherently relies on a system of prohibitions (Levy, 1995), zoning regulations often prevent the creation of the types of communities many citizens want (Wilson, et al, 1998).

2.13 Urban Design

Generally, the above-mentioned ills could be summed to conclude that Euclidean zoning prevents "good" urban design. Urban design involves the macro level organization of buildings and the spaces between them. High quality design can engender a sense of community,

encourage diversity and interactions between people, as well as create a safe environment (Moorish, 2003). Like defining sprawl, determining what constitutes "good" urban design often proves difficult. Steger (1988) suggests that urban design seeks to improve the quality of people's lives through design. Design accomplishes this goal by "the elimination of barriers, as well as the creation of opportunities for people to move about the city in a free, safe, and pleasant way" (Steger, 1988).

A review of the literature (Jacobs, 1961; K. Lynch, 1981; Katz, 1994; and Barnett, 2003) provides a better understanding of what constitutes "good" urban design. Spanning 40 years, the literature reviewed indicates nine aspects inherent to good urban design. These nine design characteristics include: density, mixed-use and vitality, streets and sidewalks, buildings, sense of place/community, fit, access/mobility, control, and equity.

Table 2.13.1 Urban Design Literature Review Comparison

Design Characteristic	**JACOBS (1961)**	**LYNCH (1981)**	**KATZ (1994)**	**BARNETT (2003)**
Density	X		X	
Mixed-Use (Vitality)	X	X	X	X
Streets and Sidewalks	X		X	X
Buildings	X		X	
Sense of Place/ Community	X	X	X	X
Fit	X	X		
Access/ Mobility	X	X	X	X
Control		X		X
Equity	X			X

Density

Physical design and diversity represent paramount aspects of Jacobs' offering (1961) of good urban design characteristics. Density provides one important component to achieving

physical design and diversity. Jacobs asserts that high densities of population and activities, like the vibrant urban center of her native Greenwich Village, positively affect both commercial and residential areas. Writing in the mid-century era of the modernist movement, Jacobs rejects standardized high-density housing characteristic of Urban Renewal. A variety of housing options are necessary to foster diversity.

Katz (1994) bases his theory on urban design in the New Urbanism movement. Begun roughly fifteen years ago, New Urbanism generally adheres to mixed uses, pedestrian-friendly neighborhoods and cities, increased density, a variety of housing options, and an overall connectivity between buildings, streets, people, and open spaces. Also called "traditional neighborhood development" or "neo-traditional design," the New Urbanists' ideas hearken back to planning concepts of yesteryear, primarily between 1890-1920. A compact development footprint comprises an intrinsic aspect of the New Urbanist movement.

Mixed-Use and Vitality

Jacobs (1961) advocates a mixture of primary uses within communities to attract diverse peoples and activities. Mixed-use development creates a safer environment because the streets and sidewalks are busier for longer periods of time. Jacobs states that the urban cores of America's great cities are dying because of the deliberate separation of work and leisure uses. No shared or common purpose exists among city dwellers if uses remain separated.

According to Katz (1994) and the New Urbanists, the *neighborhood* unit offers a balanced mix of housing types, employment opportunities, civic structures, and parks. The neighborhood is a smaller component of the *district* unit, which are functionally specialized areas of cities. Districts are not single-use in function, but support a host of complementary uses and rely on access to a variety of transportation options. The neighborhood unit is structured around a defined center and edge. The preferred distance from center to edge is one quarter-

mile, more or less a five-minute walk. The neighborhood should be organized on a fine network of interconnecting streets, and priority should be given to public spaces and civic institutions.

Asserting that good urban design must produce vitality, Lynch (1981) argues that communities should support vital health and biological functions to protect the survival of humanity. Inherent to this vitality are *sustenance* (the adequate supply of food, energy, air, water, and proper disposal of wastes), *safety* (hazards are effectively controlled or suppressed), and *consonance* (suited to supporting and maintaining natural activities).

Streets and Sidewalks

Jacobs (1961) declares small-scale streets and sidewalks to be integral public spaces necessary to community interaction. Street blocks should be short with frequent opportunities to turn corners. Doing so suppresses design monotony and provides the opportunity for new encounters of varied types. Parks, squares, and public buildings at primary locations enhance a network of short blocks.

Katz (Moule & Polyzoides, in Katz,1994) believes the street should function as communal rooms and passages. The pattern of the street network should facilitate connectivity and the mixing of uses and activities. Several optional paths from one point to another serve to minimize traffic loads and encourage exploration. There should be a hierarchy of street types based upon pedestrian and vehicular carrying capacity. Building heights should reflect right-of-way widths, and should frame the street using appropriate scale. Street details should favor the pedestrian, specifically regarding safety and comfort. Turning radii should be reduced to slow traffic, and crosswalks and curbs should be aptly delineated and maintained.

In the private home, Barnett (2003) suggests that Americans have never lived better (nice homes, paved streets, adequate utilities, heating and air conditioning). The problem resides in the *livability* of the public environment—the method in which a grouping of homes fit together.

Barnett suggests that making streets and sidewalks the center of the public environment increases a community's livability.

Buildings

Older buildings should be retained alongside newer buildings, advises Jacobs (1961). Older buildings serve as visual and emotional landmarks that define neighborhoods, while also providing an opportunity for low-rent commercial or residential space.

Katz (Moule & Polyzoides, in Katz, 1994) and the New Urbanists view the *building* as the most fundamental and basic unit of urban design that ultimately determines the character of a community. Buildings should be designed according to specific type. Building use should not take precedence. As such, building use could evolve as the community's needs change over time. Building envelope guidelines should replace Floor-Area Ratio standards in determining densities. Contrary to current development practice, parking requirements should be determined at the neighborhood and district levels, not at the building unit.

Sense of Place/Community

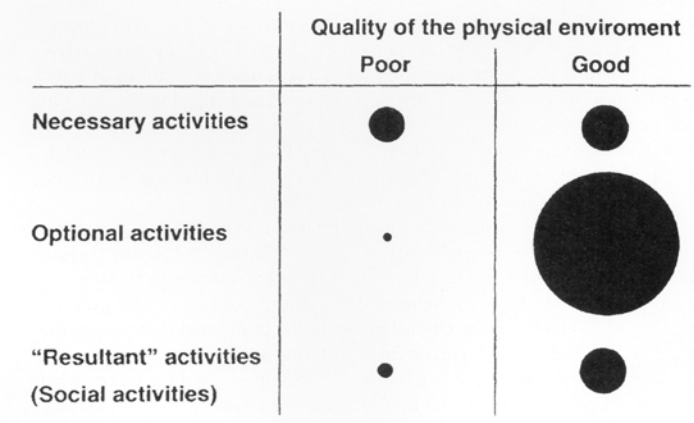
Lynch (1981) uses sense to measure the degree to which communities can fundamentally be perceived and identified from other communities. Sense refers to the cultural constructs urban forms impose on society, and how humans interpret these constructs. These senses may engender or define an emotional attachment to a community.

Similarly, Katz suggests that blocks help to define relationships between people and the automobile. While blocks can be any shape (square, rectangular, irregular), the size should be no greater than 600 feet and no less than 250 feet. These size constraints allow single buildings to abut block edges at variable densities. Blocks should be configured among other blocks so as to define public space. The outer edges of blocks should be pedestrian centered, while inner blocks could facilitate the storage of automobiles through the use of alleys. The green

streetscaping of blocks provides pedestrian safety, and also functions as an aesthetically pleasing complement to adjacent buildings.

Because "life takes place on foot," Barnett (2003) argues that people still need casual encounters to foster a sense of community. Due to the prevalence of the automobile, cell phones, and the Internet, these casual encounters are becoming increasingly rare. Creating attractive and inviting public spaces facilitates the creation of community.

Figure 2.13.2 Urban Design and Activities



(Barnett, 2003)

Barnett cites a chart devised by Danish architect Jan Gehl (1987) that illustrates the relationship between the quality of public spaces and the rate of occurrence of public activities. Gehl concluded that the people would engage in necessary activities regardless of the quality of the physical environment. However, given an attractive environment, people generally would linger in the environment engaging in what Gehl calls optional activities. These optional activities include resting on a park bench, stopping for a bite to eat, or window-shopping. Gehl suggests that the more optional activities located in a public space, the more likely resultant activities would occur. Basically, resultant activities relate to sociability: happenstance meetings between neighbors or conversations with strangers.

Fit

Fit is a performance dimension Lynch (1981) employs to evaluate the spatial form of a city. Fit implies the degree to which form and spaces correlate to the customary behavior patterns and actions in which people participate. More specifically, fit is a measure of suitability

based upon cultural expectations and norms. The fit of a community should be adaptable to cultural shifts in behavior.

Similarly, Jacobs (1961) relates to Lynch's discussion of fit in her discussion of maintaining older buildings. Jacobs argues that older buildings' use may change over time to reflect a community's changing dynamics. Effectively, older buildings provide the opportunity to adapt "fit" as needed.

Access and Mobility

Simply put, mobility refers to the availability and access to travel about the city. Barnett (2003) claims that good urban design requires the availability of public transit (subway, light rail, bus) and access to all parts of the city. Designing cities solely for automobile access results in poor urban design.

Lynch (1981) describes access as the ability to reach other people, activities, resources, services, information, or places. Because access is unequally distributed, good city form should facilitate increased access for disadvantaged peoples through the improvement of transportation routes and modes, and the removal of barriers. Conversely, Lynch views instantaneous access to all things for all peoples as undesirable. As mentioned above, Jacobs (1961) views streets and sidewalks as vital components of good urban design. Healthy streets and sidewalks provide access and opportunities for new encounters among common pedestrians.

According to Katz (Duany & Plater-Zyberk, in Katz, 1994), the *corridor* unit, as described by the New Urbanists, provides access and mobility. Corridors serve to both separate and connect neighborhoods and districts. Either natural (rivers) or man-made (highways), a corridor's location and type is determined both by technological intensity and contextual density. Light rail, bus lines, and walking trails may all serve as corridors. However, corridors may be difficult to achieve, improve, or sustain because they require regional cooperation.

Control

Lynch (1981) uses control to denote the degree to which the people who live, work, and recreate in communities have the power to manage repairs, modifications, and planning for said community. Basically, do the inhabitants of a community have the power to guide regulation of the place in which they live? Lynch views spatial controls as having strong psychological consequences: anxiety, satisfaction, pride, or submission. He concludes that control of a community should be certain, responsible, and congruent.

Lynch's views relate to Barnett's assessment that communities should use development regulation as a positive template (2003). While similar to vitality, Barnett uses sustainability to describe planning policies that accommodate current development needs while preserving natural resources for future generations. Current land-consumptive development patterns are America's biggest threat to sustainability. Compact urban forms enhance sustainability.

Equity

Equity refers to the decentralization of poverty, availability of affordable housing, and the consideration of environmental justice issues in land development. Barnett (2003) writes that city planners and designers must recognize that a history of injustice has created distressed communities. The public should compensate these communities by directing investment towards them, thus making these areas more competitive.

While equity is not universally discussed within the literature review, all authors suggest equitable practices in some form or another. For instance, Jacobs (1961) suggests that older buildings could be reused to provide an affordable housing option.

Literature Summary

While these are just four interpretations as to what is required of good urban form, these authors/practitioners provide a solid foundation to understanding the fundamental objectives of urban design.

It must also be noted that these techniques cannot be applied everywhere due to small populations, poor resources, or simply put, lack of initiative. As Lynch might suggest, the "fit" is just not appropriate. However, local planners and designers may glean portions of this literature review to provide the requisite impetus to create better communities.

2.14 Alternatives to Traditional Euclidean Zoning

In an effort to create more livable communities based upon good urban design practices within the framework of traditional Euclidean zoning, planners have created new tools to augment or replace current development regulations. Some of these tools include: bonus/incentive zoning, inclusionary zoning, the transfer of development rights (TDR), planned unit developments (PUD), cluster zoning, performance zoning, and the form-based code (FBC).

Many communities use *Bonus/Incentive Zoning* to entice developers to increase density provided they meet some pre-established criteria (Levy 1988). For example, an ordinance might permit only eight units per acre, but the allowable units may be pushed to 15 if a specified number are reserved for low and moderate income households. Similar incentives are provided with regards to commercial development. Height restrictions mandated by zoning may be suspended or extended provided that the developer provides certain amenities at ground level (i.e. a plaza or a pocket park).

While similar to bonus/incentive zoning, *inclusionary zoning* is another tool communities use to plan for the general welfare of its population. Under inclusionary zoning, developers who elect to build more than a specified number of units must set aside a number of these units for

affordable housing (Levy, 1988). This tool differs from bonus/incentive zoning in that the inclusion of units for low- and moderate-income households is not discretionary. However, this added cost required to the developer is most often then shifted to the buyer.

The *transfer of development rights* allows municipalities to concentrate development where it is most suited, and restrict it from where it is not. TDRs allow the sale of the development rights on a particular site from one owner to another (Peiser, 2003). For example, if one landowner would like to maintain his five-story building within a zone that permits twelve stories, he may sell the developable rights for the additional seven stories to another landowner. After the sale, however, the original owner may not build additional stories. TDRs have been used to maintain open space, to limit development in ecologically sensitive areas, and to preserve historic structures (Levy, 1988). In theory, TDRs should be able to concentrate development in the most urban of areas while protecting other areas from unwanted development. However, TDRs have not been as successful as planners had envisioned. Some problems include finding areas to receive higher-density development, standardizing values for development rights, and creating a program simple enough for the general populace to comprehend (Peiser, 2003). Further, TDRs are not enabled in all states.

Planned Unit Developments (PUD) allows a property owner with a minimum amount of acres to sidestep conventional zoning ordinances and develop the property as a PUD. The goal of Planned Unit Developments is to overcome the inflexibility associated with single-use districts (Rouse, et al, 2001). Also known as "residential unit developments" and "planned residential developments," PUDs are based on a unified master plan (Rouse, et al, 2001) and evaluated as an entirety outside of traditional zoning regulations (Peiser, 2003). Commonly, PUDs exceed traditional density restrictions, provide for a mixing of commercial and residential uses, make available several different types of housing options, and provide community open

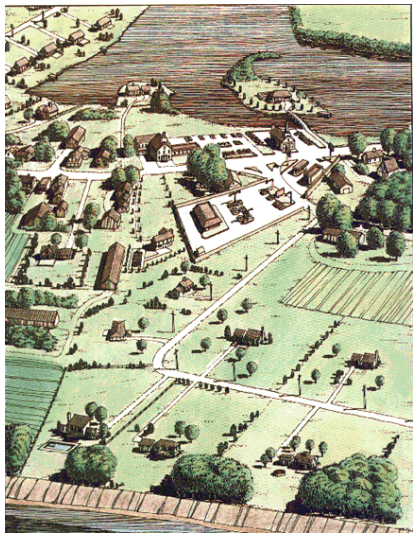
space and facilities. PUDs involve a series of negotiations between local planning authorities, the developer, and the community. As a result, PUDs are extremely flexible and can be adapted to each specific community. As PUDs go against the separation of uses mandated by Euclidean zoning, they allow for the opportunity to create more livable communities with a healthy mix of commercial and residential uses. However, as PUDs are randomly applied to properties that satisfy minimum size requirements, they often create segregated enclaves of homogenous development that are not well integrated into the context of the community (Rouse, et al, 2001).

Cluster development has increased in popularity, largely due to author Randell Arendt. Like PUDs, cluster developments also contrast sharply with the rigid realm of Euclidean zoning. Under this type of development, housing units are built at higher densities on smaller lots in a specific area of the site so that other areas on the site may be preserved as open space (Peiser, 2003). For example, a zoning ordinance might dictate a minimum lot size of one-half acre; cluster provisions would allow building on one-quarter acre lots, provided that the completed development would have no more houses on it were it developed as half-acre lots (Levy, 1988). The balance of the land would be designated as open space. Figure 2.15.1 below compares

Figure 2.14.1

Development Comparison *Here, the same site is developed as a cluster (on the left) and as traditional zoning regulations would mandate (on the right).*

(Center for Rural Massachusetts, 1992)



typical development under Euclidean zoning and a clustered development. Advantages to cluster development include the obvious: the preservation of open space. Further, development costs are reduced, as units are placed more closely together. Critics, however, suggest that cluster development is just another incarnation of leapfrog sprawl development.

Performance zoning is one of the most recent developments in planning, and highlights environmental impacts more clearly than other tools do. Instead of giving detailed specifications as to what can or cannot be developed, performance zoning is based upon the impact of the development (Levy, 1988).

Seemingly more flexible than Euclidean zoning in that building heights, types of housing, and setbacks are unregulated, performance zoning evaluates causal consequences of intensity, such as the amount of development which can be under impervious cover, or the amount of storm water runoff produced by the development. As a result, performance zoning tends to be more flexible in permitting a range of land uses, as long as their impact is not a negative one (Tyler, 1999). One drawback to performance zoning is that because if its relative flexibility, it requires a steeper learning curve to fully comprehend sometimes confusing calculations of performance estimates (Tyler, 1999).

2.15 Conclusion

Euclidean zoning arrived at a time to address the externalities associated with industrialization. Since then, zoning became the template for land regulation for much of the United States. Resultantly, factories and homes are not adjacent to one another, for the most part. But oftentimes, neither are corner markets and homes, or more importantly, schools and homes.

The majority of current land development patterns can be classified as sprawl: low density, leapfrog commercial and residential development with large expanses of single-uses, poor accessibility, and little functional open space. The creation of vibrant, mixed-use

neighborhoods is virtually impossible under the current regulatory framework. While zoning functions as a placeholder until development arrives to a site (Katz, personal communication), zoning also perpetuates monotony.

Use becomes predictable under the Euclidean regime. Building form, however, is entirely unpredictable. This unpredictability often leads to haphazard development unable to integrate into the localized context. Further, Euclidean zoning inherently excludes certain segments of society without access to an automobile, or without the means to afford a large lot single-family home.

Euclidean zoning directly addressed the ills of the day, but proves inflexible in spite of massive demographic and socio-economic change since the 1920s. Zoning amendments provide minute changes to the Euclidean regulatory framework, but often result in incomprehensible and contradictory regulations.

Planners created new tools such as the transfer of development rights, planned unit developments, and performance zoning to address some of the problems associated with Euclidean zoning to varying degrees of success. These tools direct the planning profession away from the basic premise of Euclidean zoning. For instance, most New Urbanist developments are PUDs—a useful tool.

Effectively, the planning profession attempts to evolve within the regulatory framework of Euclidean zoning. In an effort to create more livable communities within the framework of traditional Euclidean zoning, planners endeavor to develop a comprehensive tool that addresses the negative consequences associated with current land development practices.

The Form-Based Code is the most recent incarnation of this slow evolution away from the fundamentals of Euclidean zoning. Most notably, Form-Based Codes are based upon a physical plan. Practitioners of Form-Based Coding do not intend for this new tool to address all

of the ills associated with current land development regulations. A closer analysis of the Form-Based Code provides insight as to how this tool could be employed to facilitate a new perspective on land use regulation.

3.0 FORM-BASED CODES

Codes that focus more heavily on physical design than building use represent one of the most recent innovations developed to challenge conventional Euclidian zoning regulations. Often referred to as "Form-Based Codes" (Peirce, 2003a), this new tool presents communities a new perspective on land regulation. Understanding what Form-Based Codes entail, how they work, as well as the consequences of Form-Based Coding provides a better foundation for complete analysis. Additionally, a case study analysis from Arlington, Virginia complements this examination of the Form-Based Code.

3.1 What Are Form-Based Codes?

"Design is more important than use" embodies the underlying philosophy behind the Form-Based Code (Ferrell & Madden, 2002). Form-Based Codes represent multi-disciplinary codes that connect the design of circulation and public space networks to the design of building form (Altman, et al, 2003). A community's physical form—namely, its buildings, streets, and public spaces—signifies its most defining characteristic (Dover, 2003) as they shape the public realm (Katz & Ferrell, 2003). Asserting more control over a community's form could lead to improvements in the way the community functions (Ferrell & Madden, 2002). This increased control includes the fostering of pedestrian-friendly mixed-use developments, and a range of housing types.

Form-Based Codes regulate fewer elements than typical zoning regulations because the provisions do not constrain every possible combination of setback and density (Dover, 2003). Euclidean zoning is often considered a "placeholder" until development occurs on a specified site. As such, the physical form of the site is largely unpredictable. Conversely, form-based regulations do not attempt to control every possible aspect of a development, merely "what is considered important" (Katz & Ferrell, 2003). What many consider to be most important are

those things that are of legitimate public concern—primarily the building form as it affects the street space (Ferrell, personal communication). As Form-Based Codes consider physical design to be paramount, these codes specify through graphic illustrations what types of development are most appropriate for a particular area (Dover, 2003).

Form-Based Codes are developed with an end result in mind—the physical plan, which can be applied to both new development and redevelopment (Madden, personal communication). Most often, this includes building alignment on the street, the space between buildings, and relative heights, which are expressed as ranges of acceptable values (Dover, 2003). The Form-Based Code functions as a template whereby having clear controls on building form, landowners and their neighbors can easily predict what future development would look like (Chael, 2003; Ferrell & Madden, 2002). In short, Form-Based Codes function as a "recipe for building entire, functioning neighborhoods that include all types of housing and the supporting commercial uses that bring life's daily needs to the neighborhood" (Altman, et al, 2003).

Design standards directed by Form-Based Codes do not limit a building's usage (Kucharski, 2003). In fact, just the opposite occurs. Because use is a secondary consideration, the market directs the appropriate use to the site based upon the prescribed building form. For example, a Form-Based Code might direct development along a commercial strip to consist of buildings between two and six stories closely abutting the street. This code likely produces a commercial or retail operation on the ground floor, with residential uses situated on the upper floors. Moreover, as the neighborhood's demographics or needs changed, the building's use could easily evolve to reflect these changes without augmenting the initial code whatsoever (Katz & Ferrell, 2003).

Crafted based upon stakeholder input, Form-Based Codes enable a community's "vision." This vision represents a future land use plan for the community as identified by

stakeholders. While the general template for the code is relatively unchanged, each separate community wholly determines its own unique vision.

To achieve the community vision, experienced code practitioners lead stakeholders in what is called a "charrette." A charrette is the process by which local stakeholders develop a physical plan for their community. In doing so, community members are provided with maps of the areas and divided into working groups. These groups then use the maps to explain in great detail what they would like to see developed or preserved (Dover, 2001).

The charrette helps to ensure that the proposed plan is feasible. Additionally, the charrette assists in formulating a consensus among key stakeholders—residents, major institutions, government officials, developers, and builders—about expected objectives of the physical plan. (Baltimore County, 2003). The Form-Based Codes then codify this community-based physical plan (Katz, personal communication).

3.2 How Do Form-Based Codes Work?

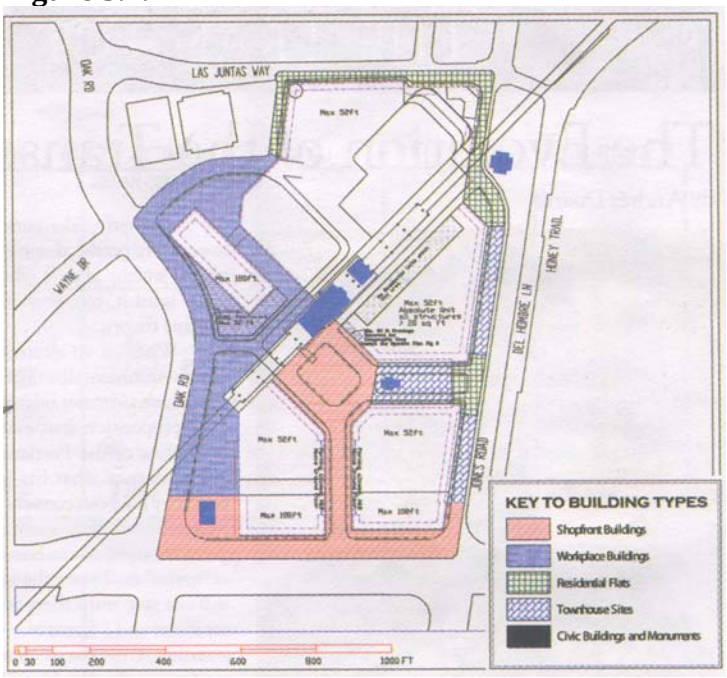
Form-Based Codes usually consist of three primary components (and one optional component) that are employed to implement a community's vision-based physical plan. These components include: Regulating Plan, Building Envelope Standards, Definitions, and the optional Architectural Standards (Katz & Ferrell, 2003).

The Regulating Plan

The *Regulating Plan* provides the coding key for the building envelope standards, and specific information for the character of each building site (Geoffrey Ferrell Associates with Dover Kohl & Partners). The regulating plan also illustrates the relationship between sites and public spaces, and to the surrounding neighborhood (Geoffrey Ferrell Associates with Dover Kohl & Partners). Similar to a zoning map in that both places delineate where specific rules apply, the regulating plan takes this one step further by focusing on the detail of *all* proposed

streets (large and small), and the blocks they define (Katz, 2003; Katz & Ferrell, 2003). Additional detailed elements beyond a traditional zoning map include property lines, a "required building line," a street tree alignment line, the location of public places such as parks and squares, as well as the predicted footprints of planned public buildings (Katz, 2003; Katz & Ferrell, 2003). This additional detail provides the opportunity to evaluate a site as a whole, rather than as separate unique entities. Further distancing itself from a traditional zoning map, the regulating plan defines a plan that has been designed (Katz, 2003; Katz & Ferrell, 2003). A zoning map merely indicates an assortment of potential land-use classifications.

Figure 3.2.1



Regulating Plan
A typical regulating plan from the Pleasant Hill BART station near San Francisco. The shading pattern within the street indicates the "building envelope standard" for fronting property.
(Geoffrey Ferrell & Associates, 2003)

Another distinction between the regulating plan and the traditional zoning map relates to what is specifically regulated by the document (Katz, 2003; Katz & Ferrell, 2003). Zoning maps designate zoning classifications, such as R-20. This implies that 20 is the appropriate amount of residential units per acre in this specific zone. However, one must dig through mountains of zoning codes, sometimes upwards of 100 pages, to describe the zone further in terms of by-right and special uses, minimum

lot sizes, setbacks, lot coverage, maximum buildable floor area per acre, parking requirements and landscaping criteria, just to name a few (Katz, 2003; Katz & Ferrell, 2003).

Conversely, regulating plans indicate the type of building that can be constructed on a given site in a community (Katz, 2003; Katz & Ferrell, 2003). Typically, between three and 10 building types are listed for communities that may have anywhere between 20 to 1,000 available building sites. Building type designations include, but are not limited to stacked flats, courtyard buildings, shop-houses, live-works, townhouses, detached villas, and high-rise towers (Katz, 2003; Katz & Ferrell, 2003). These building types are not uniform among Form-Based Coders. Moreover, rules governing building types are not specific to only one type of building.

Building Envelope Standards

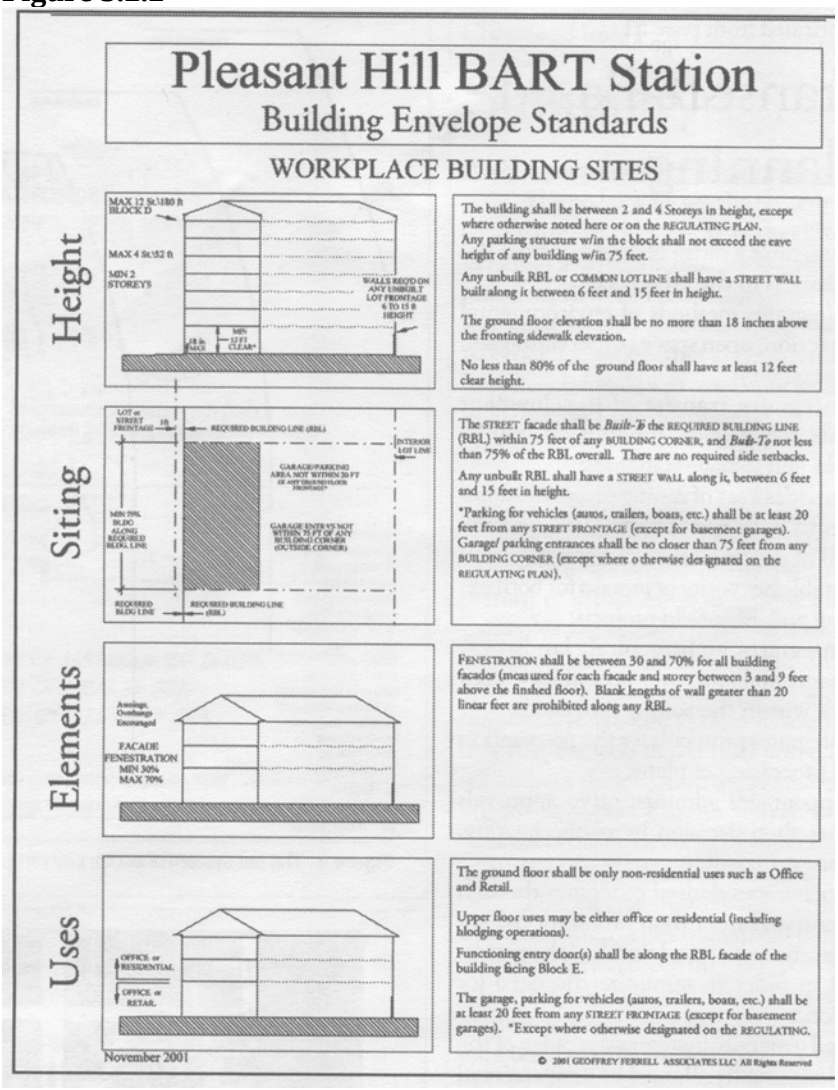
The *Building Envelope Standards* guide basic parameters regulating building form (Geoffrey Ferrell Associates with Dover Kohl & Partners). These parameters are illustrated in a series of cross sections specifying key dimensions (Katz, 2003; Katz & Ferrell, 2003). Specifications regarding height, siting, elements, and uses are described in the building envelope standards (Katz, 2003). Figure 3.1 on the following page provides a good example of a building envelope standard.

Height is commonly expressed in terms of a maximum-height-to-the-eave dimension, or as a range of acceptable number of stories (Katz, 2003; Katz & Ferrell, 2003). The minimum number in the range generally reflects the number of floors required to maintain a "street wall" (Katz, 2003; Katz & Ferrell, 2003). The maximum number in the range reflects the highest a building could reach before it appears overwhelming and out of context in relation to the surrounding community (Katz, 2003; Katz & Ferrell, 2003).

Commonly, when building heights are expressed in terms of one single dimension as they are in traditional zoning, developers attempt to reduce floor-to-ceiling heights to a minimum in

order to maximize the number of floors they may build (Katz, 2003; Katz & Ferrell, 2003). Often, this practice results in poor quality construction. As height specifications are expressed in terms of two dimensions when using Form-Based Codes (maximum-height-to-the-eave dimension; range of acceptable number of stories), this problem is avoided (Katz, 2003; Katz & Ferrell, 2003).

Figure 3.2.2



Building Envelope Standards
An example of building envelope standards from the Pleasant Hill BART station near San Francisco.
(Geoffrey Ferrell & Associates, 2003).

Additionally, building envelope standards specify minimum above grade dimensions for certain building types. For example, townhomes may sit several feet above street grade to ensure privacy (Katz, 2003; Katz & Ferrell, 2003).

Siting regulates the placement of a building in relation to fronting streets and neighboring building lots. (Katz, 2003; Katz & Ferrell, 2003). Build to-, side, and rear setbacks are delineated (Katz, 2003; Katz & Ferrell, 2003). Further,

siting also entails the designations and arrangement of building entrances, parking locations, yards, and courtyards (Katz, 2003; Katz & Ferrell, 2003).

The major architectural *elements* of a building are also included in the building envelope standards. These include windows, doors, porches, stoops, balconies, and chimneys. Specific regulations regarding quantity, configuration, and size are described here in this portion of the code (Katz, 2003; Katz & Ferrell, 2003).

Finally, although Form-Based Code views physical design to be paramount, *use* designations are not completely disregarded (Katz, 2003; Katz & Ferrell, 2003). Specific use designations are illustrated on the building envelope standards cross-section diagrams in Figure 3.1. As a result, different uses can be accorded different situational designations within the same building (Katz, 2003; Katz & Ferrell, 2003). For instance, retail may be designated on the ground floor, while upper floors are specified for residential uses. While allowing and encouraging the mixing of dissimilar uses, the graphic representation also allows for a greater comprehension of integral design elements (Katz, 2003; Katz & Ferrell, 2003).

Definitions

The glossary of *Definitions* is another integral part of the Form-Based Code. Simply put, this component allows for a full explanation of all vital design elements of the Form-Based Code. Items included in the definitions section are used in very specific ways, and may differ from common usage interpretations (Katz, 2003; Katz & Ferrell, 2003).

Further, definitions of these elements vary from code to code, and are wholly based within the context of the said community (Katz, 2003; Katz & Ferrell, 2003). Highlighting these words allows for precision when interpreting the code. Practitioners of Form-Based Coding believe key definitions of a code's physical elements will lead to greater precision and clarity in determining the meaning of a community's built form (Katz, 2003; Katz & Ferrell, 2003).

Architectural Standards

Architectural Standards relate primarily to aesthetics of a community, and are only included in a Form-Based Code at the discretion of the local stakeholders (Katz, 2003; Katz & Ferrell, 2003). Admittedly, architectural standards also prove to be very subjective, which explains why property owners may be reluctant to engage in such an agreement.

Architectural Standards require a higher level of aesthetic control than the other three components of the Form-Based Code, and are usually regulated by a community covenant or homeowner's association in a new or private development (Katz, 2003; Katz & Ferrell, 2003). However, Form-Based Codes applied to existing properties usually incorporate architectural standards into the code itself, and are therefore, often less strict (Madden, personal communication). Some types of standards include the regulation of roof materials and slopes, building materials and finishes, paint colors, and window and door detailing (Katz, 2003; Katz & Ferrell, 2003). As the acceptance of such architectural standards is optional, each unique community may determine the amount of aesthetics they wish to regulate.

3.3 Applying Form-Based Codes

Four components are necessary to the successful implementation of a Form-Based Code (Lewis, 2003). First, clear and concise standards specifically link design standards to measurable objectives and results. Doing so allows for a greater comprehension of expectations among all stakeholders. Secondly, Form-Based Codes should be style neutral. This prevents "over-designing" a particular community. Generally, Form-Based Codes represent a more permissive style than conventional appearance regulations associated with Euclidean zoning. "Good urbanism can trump bad architecture," (Lewis, 2003). Thirdly, codes should be easily understood. Simple graphics and photos of acceptable parameters lend support to good codes.

Finally, permitting should be streamlined. Controlling an efficient and predictable permitting process saves times and money for all parties.

Municipalities that elect to incorporate Form-Based Coding into their regulatory framework have three options (Altman, et al, 2003). 1) Communities may modify existing regulatory codes to include new criteria for building forms. This might prove time consuming and cumbersome since generally, most regulations provide for the segregating of use, limited densities, and the accommodation for traffic and parking. 2) Communities may replace existing zoning regulations with a Form-Based Code. This solution might be best for communities with a strong history of adherence to "Smart Growth" initiatives. However, eliminating an entire regulatory framework could be quite controversial. 3) Communities may adopt a new Form-Based Code expressly for districts planned for urban expansion of revitalization. Existing zoning framework may remain, and adjusted as dictated by community needs.

Arlington County, Virginia provides a good example of this third option. Arlington adopted "parallel codes" for the Columbia Pike district while leaving the balance of the County unchanged. Ideally, once the new codes prove successful, the codes could be implemented incrementally elsewhere in the County. This approach "levels the field"—so to speak, such that within the regulatory framework, Form-Based Codes may compete with conventional land regulation practices (Altman, et al, 2003). Provided with an opportunity and environment to succeed, Form-Based Codes could provide a viable alternative to conventional Euclidean zoning.

While many communities are willing to address the consequences associated with Euclidean zoning, many would not consider abandoning their entire regulatory framework. Thus, the adoption of parallel codes for a specific district serves as a good strategy to approach Form-Based Coding, without sacrificing the historical and familiar foundation for land use regulation.

Moreover, many communities like Arlington choose to establish "form districts" within the realm of the zoning framework. Effectively, these form districts become new types of zones that function alongside current zones like "Residential" or "Commercial." Thus, Form-Based Code zones coexist with Euclidean-based zones.

3.4 Consequences of Form-Based Coding

As Form-Based Coding is a relatively new planning tool, determining whether or not this new version of coding achieves intended objectives could prove quite difficult. As long-term evaluation is impossible at this juncture, one must examine incremental components of the Form-Based Code to determine their relative success.

Negatives

Weaknesses pertaining to Form-Based Coding include the lack of standardization, the relative newness of the tool, the perceived support of an "urban" agenda, and possible gentrification. A lack of standardization, particularly relating to building type classifications (Katz & Ferrell, 2003), could hinder the expansion of Form-Based Coding. Standardization regarding building types (namely, what constitutes a "mid-rise tower" versus a "detached villa") could prove quite helpful. As new practitioners of Form-Based Coding gain experience and begin to fully comprehend their methodologies, an industry-wide standardization could develop. Currently, only a few planning/design firms are well versed in the practice of Form-Based Coding (Peirce, 2003a). Until this new coding mechanism becomes a more common practice across the United States, inexperienced planners and urban designers must investigate Form-Based Codes through a process of trial and error.

Additionally, because of the newness and unconventionality associated with Form-Based Coding, developers, local governmental leaders, lending institutions, and homeowners could

prove resistant to change (Peirce, 2003a). These apprehensive feelings could wane as more stakeholders become familiar with the results of Form-Based Coding.

Lane Kendig, also a critic of traditional Euclidean zoning, suggests that practitioners assert Form-Based Codes solely as a solution to land use problems (Meck, 2003). Consequently, suburban and rural character takes a backseat in favor of the advancement of a universal urban solution (Meck, 2003). This urban agenda might be defined as employing a grid-like network of roads, or buildings types of medium to high density.

Kendig further claims that Form-Based Codes to be environmentally insensitive as the regulations ignore landscape features and topography (Meck, 2003). Admittedly, one cannot assume Form-Based Codes to be universally applicable, or function in a "one size fits all" mentality. Communities vary with regards to populations, resources, environment, and initiative. Form-Based Codes do not preclude the need to plan based upon these varied components of community (Madden, personal communication). The planning process addresses these variable elements, including landscape and topography, and incorporates them into the code (Madden, personal communication). As Form-Based Codes are developed with a physical plan in mind, the building envelope standards or regulating plan for a rural hamlet or village will differ from those for a large metropolitan area or a Main Street district (Madden, personal communication).

Kendig also contends that Form-Based Coding "ignores the economics of modern society," specifically economies of scale and job-home relationships (Meck, 2003). To some extent, this argument lacks merit. Form-Based Coding enables the opportunity to create a positive, healthy, equitable living community for all household income levels.

Finally, questions pertaining to affordable housing must be addressed. Many critics perceive an inevitable gentrification of a community upon application of Form-Based Coding regulations. As the quality of development in a community increases, building prices and rents

inevitably increase. Supporters of Form-Based Coding contend that affordable housing options could continue to exist as potentially six different types of housing could coexist within one city block (Katz, 2003). Form-Based Codes merely enable a wide range of housing options to exist in close proximity to one another (Madden, personal communication).

Moreover, some communities like Arlington, Virginia, created regulatory provisions to ensure a viable stock of affordable housing. This notion is expanded upon further in the Arlington case study discussion. Similarly, other communities incorporate inclusionary housing requirements and required diversity of building types into the Form-Based Code to adequately address affordable housing concerns (Dover, personal communication).

Positives

Benefits associated with Form-Based Coding might include increased community involvement, better comprehension of the regulations, improved flexibility, the promotion of good urban design, and enlarged community equity. Form-Based Codes work best with the charrette and the community visioning process. As such, community members are enabled the opportunity to actively participate in the decision-making process.

Most significantly, this stakeholder involvement characterizes a largely *proactive* process. This involvement contrasts starkly with the largely *reactive*, NIMBY-based community participation facilitated by traditional Euclidean zoning. Conventional Euclidean zoning regulations represent knee-jerk reactions to an undesirable occurrence (Crawford, 2002). Thus, zoning regulations are structured so as to prevent other undesirable occurrences, rather than facilitating and encouraging good development practices (Crawford, 2002).

Form-Based Codes also rely on the simple graphic and text presentation of regulations. The common citizen, who is not fluent in legalese, could fully understand integral concepts like the regulating plan or building envelope standards. Further, neighbors tend to be less skeptical of

others' development intentions when they can see a clear and accepted community vision in the physical plan.

Form-Based Codes facilitate a greater flexibility among both the implementing communities and the land developer. In the visioning process, stakeholders detail what is most suited for their community. Similarly, developers avoid maneuvering through the complicated formulas of Floor-Area Ratios, impact fees, long approval processes and the like. Thus, developers garner a greater understanding of expectations regarding the projects they build. As building development is directed by the community vision (conceptualized in the physical plan), developers do not waste time pursuing uncertain projects. Consequently, developers save money through this increasingly streamlined approval process (Katz & Ferrell, 2003).

As Form-Based Codes are closely tied to the New Urbanism, the provisions highlight essential characteristics of good urban design as reviewed in the literature. These elements of good design contrast to current land development practices resulting from traditional Euclidean zoning. Some of these desirable design elements include compact footprints, a mixing of uses, pedestrian-focused forms, creating a sense of place, affording access and mobility, and providing an efficient control mechanism. Poor urban design is largely due to the reactive nature of Euclidean zoning. Instead of encouraging and facilitating good urban design, zoning's regulatory framework functions as a menu of prohibitions.

Finally, the monetary value of buildings in neo-traditional developments resulting from Form-Based Codes and similar design-based coding tend to increase at a greater rate than conventional developments. Home buyers are willing to pay a premium for traditional elements like connected street networks, smaller blocks, good pedestrian access, and proximity to mass transit (Frangos, 2003). On average, single-family homes garner 15.5 percent more than homes in conventional suburbs (Frangos, 2003).

Similarly, land values increase significantly in areas where Form-Based Codes have been implemented. For example, Kendall, a suburb of Miami, Florida implemented a Form-Based Code in 2000. By 2003, the average land value per square foot had increased from $60 (2000) to $92 (2003); the average office leasing rates per square foot increased from $23-27 (2000) to $25-30 (2003); and the average retail leasing rates per square foot increased from $15-40 (2000) to $32-55 (2003) (Rawlinson, 2003).

3.5 Case Study: Arlington County, Virginia *(Columbia Pike)*

Arlington, Virginia is a suburb of 190,000 located immediately across the river from Washington, DC (Swope, 2003a). The Pentagon and Washington Reagan National, one of the region's three primary airports, are also located in Arlington.

Arlington is also home to Columbia Pike, an ethnically diverse district characterized by a 3.5-mile traffic-clogged arterial road bounded by commercial strip development, fast food restaurants, and apartment complexes with excessive parking (Peirce, 2003b). Urban planner Geoffrey Ferrell likened Columbia Pike to a "linear greyfield of asphalt" (Peirce, 2003b). Past planning strategies focused primarily on using the Pike as a thoroughfare for moving traffic through Arlington, as opposed to creating a quality street for local residents (Ferrell and Madden, 2002).

For years, Columbia Pike sat idle while newer development was concentrated in other parts of the County—Rosslyn, Ballston, and Clarendon (Chamis, 2000). Even though retail occupancy was high in Columbia Pike, retail offerings were limited. Similarly, residential occupancy levels were high—due primarily to the Pike's proximity to Washington, but most of the residential stock was old with limited amenities (T. Lynch, 2003).

Local planners joined with the Columbia Pike Redevelopment Commission in 1998 to develop strategies aimed at breathing life back into the downtrodden district, which had not seen

any new major construction in more than 40 years (Peirce, 2003b). However, local zoning codes and parking requirements limited any by-right development to no more than two stories. Consequently, any new development would prove too costly, time consuming, and risky (T. Lynch, 2003).

Local leaders eventually looked to Form-Based Coding as a viable option for redeveloping the Columbia Pike corridor. At the request of Arlington planners, County officials began a public Request for Proposals (RFP) process to locate and contract suitable firms to manage the implementation of the Form-Based Code. Consequently, Arlington County hired Miami-based Dover Kohl to direct the community charrettes, and Geoffrey Ferrell & Associates of Washington, DC to write the new Form-Based Code (Peirce, 2003b).

During the charrette process, community members detailed their vision for Columbia Pike. Included in this vision was a desire for a "Main Street" type development—one that was easily walkable, contained a variety of local retailing options, as well as having diverse and affordable housing opportunities. Further, community members wanted to see Columbia Pike evolve from "suburban" to "urban" in character, and for all new developments to be appropriate in terms of scale and fit (Columbia Pike Revitalization Organization; Jenkins 2002; Peirce, 2003b). Figure 3.5.1 depicts this community vision.

Figure 3.5.1

Conceptual Vision for Columbia Pike
(Columbia Pike Redevelopment Organization)

Following an estimated 140 meetings over a two-year time period, the Arlington

County Board adopted the Form-Based Code plan in February 2003 (Chamis, 2002). The plan identified four primary areas in the Columbia Pike district for development: a town center, a village center, a neighborhood center, and a western gateway district at the Fairfax County line (Columbia Pike Revitalization Organization).

To implement the Form-Based Code, Arlington County made changes to its General Land Use Plan and Zoning Ordinances (Arlington County, 2003). The current "C-S-C" commercial service district designation within the redevelopment district would be amended to "CP-FBC"—Columbia Pike Form-Based Code (Arlington County, 2003). Consequently, the new form-based district comprises an entirely new zone within the Euclidean framework. Only within this new zone would the Form-Based Code regulate development.

Local planners foresee the Form-Based Codes as streamlining the approval process for new development. Because developers know well in advance the operational parameters within which development may occur, approvals could occur in as little as 30 or 60 days (Vasquez, 2003; T. Lynch 2003). Approval time varies based upon the size of the property and the project. Smaller projects (lots less than 40,000 sq/ft) use an expedited 30-day approval process. Larger projects must receive permission from the Arlington County Planning Commission and Board under a 60-day approval process (T. Lynch, 2003).

The plan adopted by Arlington leaders also included providing incentives to local developers to ensure the Form-Based Code's success. First, planners developed a consolidated parking strategy. Instead of each building supplying a requisite number of parking spaces based on building size, Arlington planners adopted a district-based strategy ensuring that sufficient parking was located within a 600-foot walk of any new development (T. Lynch, 2003).

Additionally, Arlington leaders created a funding mechanism to pay for costs associated with new parking, street construction, and other infrastructure elements. Using a Tax Increment

Public Infrastructure Fund (TIPIF), up to 85 percent of tax revenues generated by a new project within the Columbia Pike form district could be reinvested into the project (T. Lynch, 2003). Arlington would distribute qualifying funds based upon several criteria including the type of development, the expected community benefit from the project, and the ability of the project to benefit from public infrastructure investment (Arlington County, 2002)

Aiming to accommodate smaller property owners as well, Arlington leaders revised its Rehabilitation Tax Exemption. This exemption permits the full development of properties during a five-year period in which an owner's property taxes remain held at pre-development levels (T. Lynch, 2003).

Expectations are high for the redevelopment of Columbia Pike based upon the Form-Based Code. Local planners suggest that up to one million square feet of new residential and commercial development could be built along the Pike within five years (Jenkins, 2002). As of late 2003, over $300 million in new development projects were in the pipeline for Columbia Pike (T. Lynch, 2003).

One major point of concern for Arlington planners is the possible displacement of available affordable housing and mom-and-pop shops as new development occurs. Proponents of the plan maintain that affordable housing will remain in the district, primarily with the assistance of government subsidies (Jenkins, 2002). In 2002, Arlington created a $7 million trust fund aimed at maintaining affordable housing in all parts of the county (Jenkins, 2002). Additionally, Arlington planners have encouraged non-profit organizations to invest in apartment complexes before they succumb to market influences (Jenkins, 2002).

Other obstacles include existing tenants with long-term leases and skepticism among some property owners (Chamis, 2002). Arlington officials hope the broad package of incentives

complementing the new Form-Based Code will persuade uncertain property owners that this type of change can only benefit Columbia Pike.

Arlington planners tout the Form-Based Code as an innovative tool facilitating the expeditious yet controlled redevelopment of Columbia Pike (Vasquez, 2003). Whether the Form-Based Code proves ultimately successful remains to be determined. However, involving community members from the earliest stages and incorporating a healthy package of incentives for all stakeholders are good indicators that the Columbia Pike revitalization will succeed.

4.0 DO FORM-BASED CODES ADDRESS THE ILLS OF EUCLIDEAN ZONING?

Form-Based Codes provide a new mechanism to regulate land development. However, one must ask if this new tool addresses any of the problems associated with the conventional land development regulations of Euclidean zoning. Table 4.0 serves to compare the ills associated with Euclidean zoning, and how Form-Based Coding might address these ills.

The ills associated with Euclidean zoning as discussed in this paper include separating land uses, promoting sprawl, employing incomprehensible and inflexible ordinances, fostering unpredictable development, limiting stakeholder involvement, command and control of the regulatory structures, and promoting poor urban design. In Table 4.0.1, sprawl is subdivided into its characteristic components: single-use, leapfrog development, commercial strip development, low-density, poor accessibility, and a lack of a functional open space.

Table 4.0.1 Comparing the Ills of Euclidean Zoning and Form-Based Codes

ILLS OF EUCLIDEAN ZONING	FORM-BASED CODES
Separates Land Uses	Allows for the mixing of uses. Considers use a secondary factor in regulating development. Separates noxious uses as directed by the community vision and the market.
Leapfrog Development	Permits and encourages compact, contiguous development based upon community vision.
Commercial Strip Development	Enables vertical development, as opposed to long, single-story buildings.
Low-Density Development	Allows for increased development density where appropriate.
Poor Accessibility	Encourages compact, walkable developments. Enables community to plan for the pedestrian, as opposed to planning for the automobile.
Lack of Functional Open Space	Enables communities to mandate civic-oriented places like parks and plazas.
Incomprehensible Ordinances	The use of simple, graphic-based guidelines with minimal text allow for a more complete understanding of the regulation.
Inflexible Uses	Regulations are flexible in that they permit use to change or adjust as needed over time without regulatory approval.

Promotes Exclusion	While aiming to include all community stakeholders, once development/redevelopment take place, certain populations could remain excluded as building equity increases.
Unpredictable Development	Use is largely predictable, and is often delineated in the Building Envelope Standards. Building form is entirely predictable.
Lack of Stakeholder Input	Generally, stakeholders are involved from the very beginning through the charrette and community visioning processes.
Command and Control	Employs a "bottom-up" approach. Although local authorities generally initiate the process, stakeholders develop a vision for their community that planners later codify.
Poor Urban Design	This is largely subjective. However, regulations facilitate compatible and diverse community design.

This chart compares the conditional approaches Form-Based Codes employ. This comparison provides a better understanding as to how effective Form-Based Codes are in addressing the faults associated with Euclidean zoning.

Euclidean zoning seeks to separate land development based upon use. To that end, zoning is largely successful. In theory, the separation of noxious uses provides for a healthier and safer community. However, this is not always true. While reduced density generally provides ample air and light, it also fosters increased road networks and consequently, sprawl. Ironically, these increased road networks often reduce safety by increasing a community's automobile traffic, making a simple task like crossing the street perilous.

Conversely, Form-Based Codes considers use important, but not paramount to development regulation. Form-Based Codes enable the separation of noxious uses through the community visioning process.

Form-Based Coding allow for the creation of compact, walkable, pedestrian-friendly developments. Unlike typical commercial strip development, Form-Based Codes enable the construction of vertical building development. Compact development proves to engender feelings of safety in most communities, and provides a viable alternative to current sprawling

development patterns. Consequently, this increased density affords citizens additional opportunities and accessibility throughout their respective communities. Likewise, communities may also encourage or mandate provisions for functional open spaces by implementing a Form-Based Coding regulatory framework.

Commonly, zoning ordinances under the Euclidean regime are difficult to decipher and unclear to the common person. Further, changing these ordinances through variances or amendments to zoning regulations often require a complex and time-consuming approval process. Form-Based Coding employs simple graphic illustrations to convey code parameters. These illustrations allow for a more complete understanding of the regulation. Further, the coding structure permits the option to adjust a building's use over time as needed without requiring a regulatory overhaul.

Euclidean zoning repeatedly proves to isolate certain populations (young, old, those without cars, minorities, the poor). Form-Based Coding enables the inclusion of all community members. Whether or not these populations choose to be included varies from community to community. Further, as discussed in the Arlington Case Study, gentrification could take place as redevelopment of a particular district progresses. While many communities implement mechanisms to guard against gentrification, it is impossible to say that Form-Based Codes could not perpetuate this exclusion of certain populations.

In terms of use, Euclidean zoning succeeds in the promotion of predictable development. Building form though is rarely predictable, often leading to random, unattractive commercial strip development. Conversely, Form-Based Codes generally facilitate the predictability of both use and building form.

Zoning's regulatory structure is largely top-down. The Planning Commission or Board makes virtually all planning-related decisions. Commonly, citizens only involve themselves

when a project affects them personally (NIMBYism). While support from the local Planning Commission is necessary to implement Form-Based Coding, the regulatory structure is more of a bottom-up approach. For the most part, the common citizenry are involved from the very beginning in the charrette and community visioning processes.

Finally, Euclidean zoning generally prohibits good urban design. While this is largely subjective, one needs only to look at the countless miles of commercial strip development, acres of parking lots, and infinite separated uses to pass judgment. On the other hand, Form-Based Coding facilitates compatible and diverse community design wholly based upon stakeholder involvement. Stakeholders may identify a physical plan for a community based upon good urban design characteristics.

One must realize though that Form-Based Codes and Euclidean zoning are not completely analogous approaches (Katz, personal communication). Form-Based Codes require a physical plan be created for a particular site before they are implemented. The regulations merely codify the physical plan accepted by the community. Because of this inherent functional difference, Form-Based Coding and Euclidean zoning cannot be considered interchangeable. Thus, many communities attempt to incorporate the Form-Based Code district within the standard zoning framework, whereas the new form district becomes a unique zone in and of itself.

Similarly, Form-Based Codes also differ from design guidelines. Communities employ design guidelines to foster high quality development. These guidelines often identify significant design concerns in a community such as historic preservation or streetscaping. The community then defines development guidelines to satisfy these design concerns (Porter, 1997). For example, Scottsdale, Arizona implemented design guidelines based upon character, open space, and streetscapes (Porter, 1997).

While Form-Based Codes provide a template that can be altered to an individual community based upon the charrette and visioning process, design guidelines provide no such template. By implementing community-specific versions of the regulating plan, building envelope standards, definitions, and architectural standards, communities aim to codify their envisioned plan. However, design guidelines address specific design concerns that could regulate far more, or far less, than the conventional Form-Based Code. Design guidelines are entirely based upon local discretion of a community as no standardization or template exists. Thus, design guidelines may or may not include building envelope standards, or may or may not include historic preservation regulations. The objectives of Form-Based Codes and design guidelines may be similar, but the means to achieve these objectives differ greatly.

Additionally, intrinsic differences relating to content and implementation further separate Form-Based Codes from design guidelines. One such difference involves the legal enforcement. Design guidelines are generally advisory or discretionary, and are often employed as starting points for discussion and negotiation among community stakeholders (Madden, personal communication). Unlike Form-Based Codes, design guidelines commonly function as recommendations as opposed to requirements (Madden, personal communication). Moreover, most design guidelines regulate cosmetic and appearance issues, rather than the functioning elements of the built form (Madden, personal communication).

Both Form-Based Codes and design guidelines are often implemented to repair the consequences of poor development. More specifically, Form-Based Codes serves as a tool to implement a physical plan for a community. In designing zoning regulations, local planners may outline what type of uses should go where when the time comes to develop a particular area. Thus, the physical form of this site is largely unpredictable under conventional zoning.

Form-Based Codes view the physical form of buildings and the spaces between buildings as an integral component of shaping the public realm. During the charrette and visioning processes, local stakeholders have the opportunity to take an active role in planning the future of their community. Most often, the vision lies in direct contrast to the sprawling nature of current land development patterns. This vision entails creating livable, integrated communities that feature compact, pedestrian-friendly designs, a healthy mix of commercial and residential uses, access to several means of transportation, and adequate civic-oriented areas like parks and libraries that promote neighborhood interaction. Unlike current development patterns fostered by Euclidean zoning, the automobile and parking requirements do not take precedence in creating a community.

Regulating form enables this community-created vision to become reality. On the other hand, regulating for use leads to uncertainty. The use-based standards incorporated in current zoning regulations were designed to address problems associated with industrialization in the early 20th century. Unfortunately, the basic components of zoning have remained static in spite of great socio-economic, demographic, cultural, and behavioral changes represented in American society over the course of almost 100 years. As use is a secondary consideration under Form-Based Codes, buildings are easily adaptable to reflect changing societal patterns as needed over time. Unlike Euclidean zoning, these changes need not require a massive administrative review or overhaul. These changes are market directed, and reflect the needs of the immediate community. Noxious uses are inherently separated because 1) the market would not facilitate such a spatial relationship; and 2) the community would not vision in such a manner.

Current zoning regulations are virtually incomprehensible to the common citizen. Complex mathematical formulas and legal speak prohibit a full understanding of what the regulation actually dictates. Conversely, Form-Based Codes employ simplistic graphic

representations—likened to a "picture book," (Swope, 2003a)—to depict form regulations and acceptable parameters. This graphic interpretation permits a far greater understanding of the Code than any typical zoning ordinance could provide. When considering building form, current zoning ordinances become entirely unpredictable. Ordinances merely dictate what *cannot* be built. Simple graphics in coding allows for a greater predictability among planners, developers, and property owners by specifying what *can* be built.

Additionally, Form-Based Codes function as a "bottom-up" tool, as opposed to the "top-down" approach of conventional Euclidean zoning. Currently, property owners and developers are forced to react in response to zoning directives of the planning board. In contrast, under Form-Based Codes, community members could be invested from the beginning, forging a proactive relationship with both planners and designers. This basic involvement allows for a greater comprehension of the entire community building process.

The community-based charrette and visioning process are a means to address the exclusionary nature of Euclidean zoning. Ideally, all stakeholders in the community (both wealthy and poor, white and black, young and old) would contribute towards defining an accepted community vision. Unfortunately, this may not always hold true. While Form-Based Codes employ tools to ensure inclusion of all peoples, one cannot force someone to participate. As seen in the Kendall, Florida redevelopment and later in the Arlington case study, Form-Based Codes also carry with them a fear of gentrification. Once new development occurs, many current residents could be forced out of the revitalized neighborhood as property values increase. Arlington addressed these fears by developing safeguards to ensure that an adequate supply of affordable housing remains post-development, and that the intrinsic character of a community is not altered completely. Complementary tools like these help to make certain that Form-Based Codes do not submit to the same exclusionary traps that Euclidean zoning has fallen.

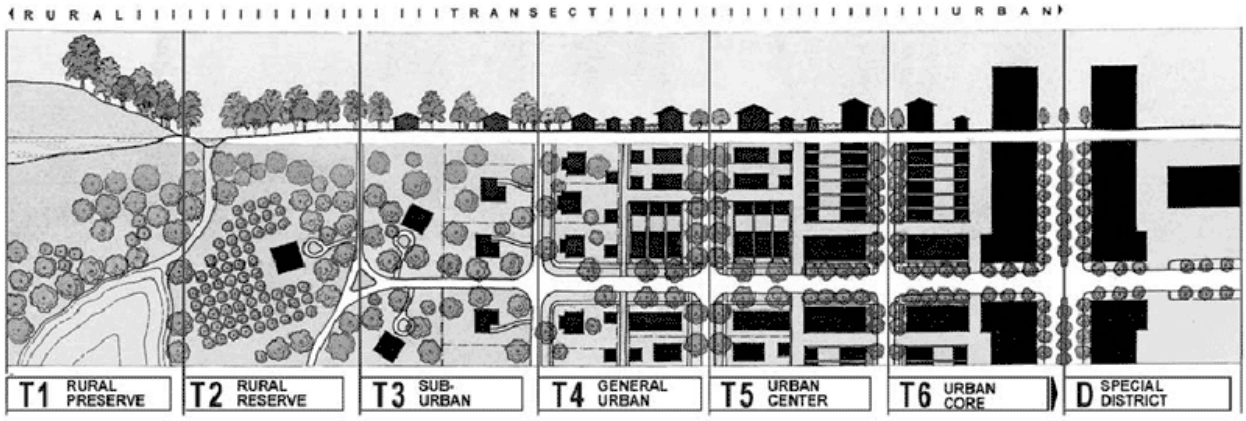
4.1 Alternative Form-Based Codes

Some forward-thinking planners elect to take the Form-Based Code beyond conventional implementation. For example, Andres Duany developed a similar version of coding that applies the basic directives of the Form-Based Code to a regional context (Duany, 2003; Duany and Talen, 2002). Duany calls his version the "SmartCode," and it is based upon the concept of the *transect*. The SmartCode asserts that there is a range of forms the built environment may take (Swope, 2003a).

The transect is a geographical cross section of six series of environments of increasing density (Duany, 2003). The cross-section is divided into six *ecozones*: Rural Preserve, Rural Reserve, Sub-Urban, General Urban, Urban Center, and Urban Core (Duany and Talen, 2002). A unique Form-Based Code should be devised for *each* of these six unique zones (Duany, 2003). These ecozones are illustrated in Figure 3.3 on the following page.

Duany sees fundamental ecology as the foundation for the transect. The transect accomplishes this by specifying a range for human habitats, providing for a functional linkage between buildings and behaviors, and prescribing an internal diversity for each ecozone (Duany and Talen, 2002). Consequently, an integration of econzones would occur as the transect moves from rural to urban (Duany and Talen, 2002).

Figure 4.1.1 The Transect as advocated in Duany's SmartCode



(Duany Plater-Zyberk & Company)

Prescribing a unique Form-Based Code for each of the six ecozones facilitates the creation of the most appropriate building forms in the most suitable ecozone. Duany asserts that most buildings the public does not like result from "transect violations" (Duany, 2003). For instance, a two or three story glass office building located in suburbia violates the suburban ecozone. While the building form might be appropriate for some type of office or commercial function, the building fails to integrate within the local community context because of its "mis-location" in an unsuitable ecozone. A Form-Based Code based upon the transect would exclude such a transect violation from occurring.

While conventional Form-Based Coding works within the current regulatory framework, transect planning could operate outside the realm of Euclidean zoning. Duany believes the practice of zoning should be shelved all together in favor of his new system of classification that organizes elements of urbanism based upon the transect (Duany, 2003; Duany and Talen, 2002). In practice, planners would acquire more design-based discretion in locating appropriate urban elements within the transect (Duany and Talen, 2002). Many practitioners feel that the transect is a good alternative to the mono-functionality associated with Euclidean zoning (Marcantonio, 2003).

The lack of multi-governmental collaboration signifies one fault associated with transect planning. The likelihood that one municipality regulates development across the entire transect is doubtful. As such, implementing such a regional-based regulatory framework proves difficult. Nashville, Tennessee provides an example of the successful implementation of Form-Based Codes based upon the transect (Bernhardt, 2003). However, Nashville represents a unique case in that the city and county governments consolidated as one entity several decades ago, allowing for the smooth implementation of such a regional-based transect framework. Consequently, a

more localized Form-Based Coding approach appears more likely to succeed given the uncertainty associated with regional governmental collaboration.

However, the lack of regional governmental collaboration should not dissuade smaller communities within a larger metropolitan region from incorporating transect-based planning into their regulatory frameworks. A smaller municipality that governs one or two transect zones within a larger metropolitan region could easily incorporate transect planning within its jurisdiction (Dover, personal communication).

4.2 Conclusion

Form-Based Codes provide an innovative tool in the practice of land development regulation. Form-Based Codes' reliance on physical design bucks the trend of conventional use-based regulation. While Euclidean zoning remains relatively unchanged over the greater part of a century, Form-Based Codes provide planners across the country a new impetus to creating livable communities. Further, Form-Based Codes inherently rely upon a motivated citizenry—key to any community planning process.

Form-Based Codes seek to address to the undesirable consequences of Euclidean zoning. These consequences include the promotion of sprawl, the exclusion of certain populations, the incomprehensibility/inflexibility of current zoning ordinances, and the inability to create healthy, attractive communities of mixed uses.

Form-Based Codes generally adhere to fundamental principles of urban design as revealed by the literature. As Form-Based Codes are employed in a limited number of communities across the United States, it is too early to determine if this new planning tool achieves its intended objectives.

However, Form-Based Codes are not without fault, and should not be considered a panacea for all the negative consequences of current land development practices. Planners' lack

of experience with this new tool and communities' reluctance to change are two of Form-Based Codes' largest barriers to implementation. Limiting gentrification also looms as a serious point of concern. Yet, the innate proactive, community-based principles of Form-Based Coding cannot be ignored. For these reasons alone, Form-Based Codes must be considered a considerable step forward for the planning profession.

However, Form-Based Coding presently cannot replace the current Euclidean regulatory framework. Rudimentary differences exist between Form-Based Coding and Euclidean zoning. Form-Based Codes serve as a means of implementing a physical plan for a community. Zoning serves as a placeholder until development arrives at a site. Due to this inherent functional difference, Form-Based Coding and Euclidean zoning cannot be considered transposable. Form-Based Codes should plug in to a Code of Ordinances that is retooled to receive them (Dover, personal communication). Utilizing Form-Based Codes in such a complementary role works best, as detailed in the Arlington Case Study.

5.0 CONCLUSION AND RECOMMENDATIONS

The introduction of Form-Based Codes presents an interesting twist on conventional land use regulations. While design-based regulations certainly are not new, Form-Based Coding represents a wholly different approach to conventional use-based regulatory frameworks. Focusing on "what's important"—namely the physical form of buildings and the public realm—could lead to the creation of communities where people actually would like to live and interact.

Traditional Euclidean zoning addressed pertinent concerns when established over eighty years ago. This solution to the externalities associated with industrialization continues to serve as a template for modern land use regulation. The consequences of Euclidean zoning (sprawl, unpredictability, inflexibility, incomprehension, and excluded populations) have come to define what is inefficient and wrong with American land development practices.

Scrapping such a system, however, represents a highly unlikely solution. Thus, form-based regulations will never replace Euclidean zoning entirely. Form-Based Codes, however, provide a proactive tool that works within the framework of conventional zoning. As such, communities could consider employing Form-Based Codes for both district revitalization and new development efforts, or wherever they deem most appropriate.

Unlike the variances and amendments associated with Euclidean zoning, Form-Based Codes do not function as an additional layer of "Band-Aids" in an attempt to heal the regulatory framework. Form-Based Codes operate with an end result in mind—the physical plan. This end result alone counters the unpredictability associated with current land regulation practices, and the variable discretion related to design guidelines.

Moreover, Form-Based Codes may actively involve the citizenry to contribute to the betterment of their respective communities. Developers are granted a greater understanding of

expectations regarding the projects they build, and thus, afforded a greater efficiency in the approval process.

While this analysis seeks to provide some insight as to how Form-Based Codes address the faults associated with Euclidean zoning, additional questions emerged regarding the application and consequences of Form-Based Coding, among others. Many of these questions relate to the functionality and viability of Form-Based Coding, but are difficult to address because of the relative newness of the tool.

Additionally, some feel that the exclusion associated with the Euclidean regime could be perpetuated, or even exacerbated, under Form-Based Coding. This is a most serious issue that could ultimately derail the anticipated expansion of form-based regulation. As such, each community should uniquely explore further before making the decision to implement such a Form-Based framework. Arlington chose to address these issues relating to affordable housing by employing complementary mechanisms to safeguard against gentrification and exclusion. However, results gauging the effectiveness of these mechanisms are unavailable as Arlington is just beginning the early stages of the redevelopment process.

Additional roadblocks include Euclidean zoning frameworks that are not adaptable to receive new form-based regulations. To that end, a regulatory overhaul might be necessary. Unfortunately, a revamping of the Euclidean framework conflicts with Form-Based Codes' perceived simplified regulations, and could provide a point of contention among stakeholders. Herein, communities must individually decide if such a regulatory overhaul is worth pursuing, and weigh these obstacles against forecasted end results. As discussed here, Form-Based Codes are not a panacea to the ills of Euclidean zoning. However, Form-Based Codes have a far greater chance of adoption, and later, success, if the current regulatory framework is adjusted to receive the new codes.

Questions also persist regarding communities' enabling authority to establish Form-Based Codes. While an examination of the legality of Form-Based Coding bears significantly on it its ultimate viability as a planning tool, this examination lies outside the scope of this paper. However, as communities and planners become more familiar with the practice of Form-Based Coding, answers to these questions should emerge.

One of the most important findings to be gleaned from this analysis is that Form-Based Codes cannot be applied everywhere as a "one size fits all" template, and are not without weaknesses. Communities interested in utilizing Form-Based Codes should first evaluate the appropriateness considering community context, among other resource-based criterion. Gauging stakeholder initiative is imperative. Because the Form-Based Code is decidedly bottom-up in structure, a community's vested interest is vital to secure any degree of success. Considering this, communities should also not eliminate the entire Euclidean framework for risk of alienating the public and developers, among others.

Additionally, creating supplementary mechanisms to compensate for some of the shortcomings of Form-Based Codes (like those described in the Arlington case study) would be ideal. Mechanisms that specifically address known weaknesses associated with Form-Based Coding allow for a better opportunity that the new codes might succeed in creating better communities.

If anything, Form-Based Codes have provided an impetus to rethink conventional wisdom regarding land development regulations. Duany's transect planning is one such forward thinking tool emerging from this debate.

Other hybrid tools are certain to emerge as Form-Based Coding expands in application. For instance, communities could incorporate the best components of performance zoning, incentive zoning, or even Euclidean zoning. These components could be combined with the

most desirable aspects of Form-Based Coding to provide a powerful tool for communities to shape their built environment.

Form-Based Codes represent a relatively new means of creating diverse and vibrant communities of mixed-use. This relative newness leads to uncertainty on all fronts. Communities seriously interested in implementing a Form-Based Code should contract a planning or design firm with experience in the matter to minimize the risk associated with employing such a tool. Creating a joint venture between an experienced firm and a local firm provides a good approach to share best practices associated with Form-Based Coding. Forming such a relationship facilitates the highest quality process, and ultimately, urban design.

Questions also remain as to how effectively the planning profession might employ Form-Based Coding in the years to come. One might argue that the best strategy would be the most obvious: plan. Communities need to plan adequately if Form-Based Codes are to be employed successfully. Planning should involve comprehensive analysis, assessment, implementation, and evaluation. Through proper planning, communities may determine if specific objectives were achieved, and ultimately, if implementing Form-Based Codes was the correct decision.

In conclusion, Form-Based Codes may not ultimately be the cure-all for the cancer called Euclidean zoning. But, Form-Based Codes do challenge current conventions and trigger progressive thought regarding land regulation, community building, and public participation. As more and more communities seek to address the consequences associated with Euclidean zoning, Form-Based Coding will expand in application.

However many communities choose to implement this new tool in the coming years, one thing remains certain: Form-Based Codes do not alleviate the need for the fundamental planning process. Without adequate community planning, no new tool—however unconventional or thorough—could succeed. Form-Based Codes' definitive success is yet to be determined, and

empirical data could be years in the making. Nonetheless, this new tool must be recognized for the perspective it provides in reevaluating current zoning practices.

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