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The Zoning Map and American City Form

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Abstract

This paper investigates a common mode of visual communication in planning practice, the use of maps to regulate urban development. Holding equal legal status with the text, the zoning map was invented in the early twentieth century as a tool for implementing municipal policy and, although debated, modified, and sometimes repurposed over the past nine decades, it remains standard. Mundane and largely taken for granted, the zoning map itself has aroused little scholarly interest. However, as an image of the city and as a graphic intermediary used in administrative processes, it reveals how planning thought is embedded in planning tools.

Keywords

maps, planning communication, planning history, urban form, zoning

Planners rely upon visual tools to communicate. Cities rely upon visual diagrams to regulate. The zoning map provides a useful example of both phenomena. In particular, the recent rethinking of the purposes and effects of urban standards and codes, and the increasing use of alternative regulatory and planning approaches such as form-based codes (FBCs) and LEED-ND development standards, points to the ways in which the visual and the textual are intertwined in planning practice (Ben-Joseph 2009; Talen 2009, 2012). Central to the critique of Euclidean zoning has been the issue of how standards and codes shape urban form, including the spatial relationships between buildings, density, walkability, the location of parking, the character of streets and sidewalks, and the relationship between urban center and rural periphery. With form-based codes and related approaches such as transect planning, proponents of New Urbanism and other reformers have sought to mend not end government regulation of land development, arguing for better codes and regulatory approaches tied to historic patterns of urban development and advocating for neo-traditional design approaches. This trend raises questions for planning scholars about the relationship between historic patterns of urban and suburban development in American cities and regions, the contemporary reading or interpretation of those forms by planners and other urban actors over time, and the representation or misrepresentation of key aspects of urban form in maps and diagrams. This paper provides historical context for these discussions, taking a unique approach by focusing on mapping practices and examining zoning maps as evidence.

The zoning map describes future possibilities as well as regulatory restrictions on building activities in relation to the existing built environment. It is an intermediary device: linking ordinance to territory, providing a point of reference in administrative processes as a standardized, customary, and

conventionally accepted means of doing business that has developed in American planning practice over nine decades. It is a mundane type of illustration used as a technical interface between planners and various interested parties in the contested realm of urban development.

Zoning has a relatively long history in the United States, originating in the nineteenth century; around the world, the idea of regulating the design of cities using rules of one type or another is hundreds of years old and a subject of longstanding interest to urban and planning historians and planning scholars (Reps 1965; Kostof 1991; Lynch 1981; Ben-Joseph 2005; Talen 2012). The modern American zoning map, however, is about one hundred years old. Adapted from historic precedents in the early twentieth century, these new maps made new regulatory language concretely applicable to the urban landscape. As a visual device, the American zoning map did two things: it provided a picture of American city structure at the time of its initial creation in the early twentieth century and it set forth instructions for the city's imagined future development. In this way, zoning maps were neither wholly descriptive nor prescriptive. Instead, they were, and they continue to be, a temporal compromise, combining existing conditions and future goals in one spatial diagram.

Visually speaking, zoning maps of the 1920s and 1930s tended to be rendered in black-and-white and use fewer than

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ten land use classifications, typically shown with alphabetic or numeric labels or shading patterns or both. Frequently they used a separate set of symbols and maps to designate height and/or area districts. Initially, small differences abounded from one municipality to another. They would become more standardized over time, assuming their now-familiar appearance by about the time of World War II. After 1950, zoning maps grew much more complex as zoning ordinances became more technical and specialized, subject to local amendments and revisions as well as new ideas in development regulation and modern planning such as floor-area ratio (FAR). This device for calculating and limiting the intensity of development in relation to lot size illustrates how “zoning gradually became a numerical affair losing touch with its original qualitative intentions” (Plater-Zyberk 2008, x). Nevertheless, the map persisted; it had become essential as a legal document holding equal status as the text. Color replaced black and white. Then, starting in the 1990s, digital production and display, aided by new mapping software and techniques such as geographic information systems (GIS), reshaped its means and methods of production again. Current zoning maps frequently include dozens of classifications. Phoenix is one extreme example, with 264 zoning categories (Talen 2012, 53–73).

At the same time, many of the fundamental characteristics of the zoning maps of many American cities remain unchanged, including land use categories, labeling conventions, and district delineation. A sense of visual fragmentation results from a patchwork pattern of hundreds of graphically differentiated individual districts. One notable feature of the twentieth-century development of the zoning map as regulatory tool is the extent to which once established it became very difficult to change and nearly permanent: what scholars in science and technology studies, as well as other fields, have labeled a path-dependent process. The increased complexity of zoning maps has only exacerbated underlying problems, further undermining a purported goal of its original creators: to clarify public understanding of American city form and to provide planning and development guidance based on that reading. For most city dwellers, the maps are unintelligible.

Recently, New Urbanists have successfully introduced transect diagrams, emphasizing the rural to urban continuum across metropolitan space drawing upon historical precedents such as Patrick Geddes's valley section and Ian McHarg's illustrations of natural features and metropolitan form (Duany and Brain 2003; Duany and Talen 2002; Talen 2002). Alternative codes and modes of visual communication have begun to make headway in changing zoning practices, but they have not yet overtaken the accepted standard in professional practice and municipal law. In this regard, the regulation of city design through standards and codes such as zoning has “reached a critical juncture” in Eran Ben-Joseph's view (2009, 2691). Similarly, Plater-Zyberk argued that by 2008 a sufficient number of case study examples of

alternative placemaking strategies had emerged to produce “an optimistic moment” but it is also a “time of urgency” and more changes are needed (xii).

This analysis is situated within the scholarly literature on zoning and planning history with an eye toward the contemporary uses of that history in debates about reforming Euclidean zoning. Proponents of new approaches to land use regulation such as FBCs and performance-based zoning have described the dominant mode of Euclidean zoning as use-based, relying upon “a hierarchy based on land use type, dividing residential, commercial, and industrial land uses in prescriptive zones” (Talen 2009; Baker, Sipe, and Gleeson 2006). The attempt to change codes and maps has been strongly motivated by the conclusion that Euclidean zoning produced bad urban form (Talen 2012; Congress for the New Urbanism 2004; Parolek, Parolek, and Crawford 2008; Morris 2009). Reading contemporary urban form at the scale of the metropolitan region, New Urbanists have identified suburban sprawl as a major problem of the late twentieth and early twenty-first centuries. But to understand how we got to this point requires consideration of how urban actors from an earlier era defined the problems of their time and how they read the American city. This investigation is oriented around three research questions. First, how did existing conditions, problem definition, and conceptions of city form influence the development of zoning? Second, who shaped these conversations and made the rules designed to reshape the city? Third, how did these rules get codified into accepted modes of visual representation and planning practice? Methods include archival research, a review of the planning and zoning literature in the early twentieth century, and secondary sources on zoning and planning history. The purpose is to explore the zoning map as a type of technical illustration, one that has assumed particular significance in everyday planning practice though historical investigation into its origins—particularly the way it was adapted from European examples in relation to ideas about the physical form, social character, and economic activities of the American city between 1900 and 1930. This research shows that key urban actors saw the American city as unique in form; that lawyers, planning consultants, property owners, and real estate interests played significant roles in the process; and, that rapid diffusion to local areas coupled with the emergence of regional and national planning experts led to standardization, further facilitated by the publication of technical reports, magazine articles, and conference proceedings.

A Map Adapted to the American City

Planning consultants and land use lawyers played an instrumental role in zoning's rapid spread across the country in the 1920s, when it was adopted by hundreds of municipalities, in cities large and small (Hubbard and Hubbard 1929, 162–63; Toll 1969; Hirt 2013, 2014). This period of debate and controversy, followed by legal and political acceptance, and then

diffusion, adoption, and standardization, is a decisive moment in planning history in the United States. During this period, two major events stand out: the adoption of the first comprehensive zoning ordinance by New York City in 1916 and the US Supreme Court's *Euclid* decision upholding the constitutionality of zoning in 1926. As a legal and administrative system, zoning developed as a response to the city, reflecting an analysis of existing conditions, a diagnosis of urban problems, and a treatment approach of proposed solutions. Lawyers like Frank B. Williams figured prominently in zoning's success. He argued for its constitutionality, suggested model ordinances and adoption processes, consulted with cities, and, in more general terms, explained what zoning was, and what it was supposed to do. With high hopes and great optimism, zoning's proponents aimed to rationalize and redirect the complex forces that shape cities. For example, as one Washington, DC, journalist explained, planners would first survey and document the city on maps and by collecting statistical and other data, then devise a solution to produce "a rearrangement of the city" (*Washington Post*, March 10, 1920). Idealism abounded. Better cities and a better future were ahead. Planning experts debated how best to read the American city, but largely agreed with the idea that surveys and mapping would inform the planning and zoning process (Williams 1916).

Debates about how to organize city form, and specifically how to use map-based regulation to order and control the development and growth of the American city, predate modern zoning. Not surprisingly, in the late nineteenth and early twentieth centuries, Americans looked to Europe for models and approaches. During this period, publications promoting the need for city planning in US often cited European, particularly German, practices: the use of building codes, the designation of districts, and the orderly planning of the city's future development (Baxter 1909; Marsh 1909; Williams 1916). In the first two decades of the new century, the zoning idea, or "districting" as it was known, mingled with City Beautiful ideas, housing reform programs, civic improvement schemes, and Progressive-era good government advocacy. In this political and intellectual context, the zoning or districting map offered a visual representation of a possible new approach toward the ordering, and re-ordering, of civic life and urban form. Planning advocate and housing reformer Benjamin C. Marsh and landscape architect and planner John Nolen both included illustrations showing German city zone maps in their pro-planning treatises (see Figure 1) (Marsh 1909; Nolen 1916).

In *City Planning*, edited by Nolen in 1916, Williams contributed an essay reflecting on zoning's origins. He explained that districting originated in Germany in the 1870s, later spreading to Switzerland and Scandinavia, with some use in England as well as Canada (Williams 1916, 76, 81). Referring to illustrations of zoning maps from German cities, Williams noted the spatial relationship between the "old or inner city" and the "outer city" (1916, 77).

Figure 1. Building zones, Dusseldorf, Germany.

Source: *An Introduction to City Planning: Democracy's Challenge to the American City* (Marsh 1909).

Note: German maps like this one appeared in several influential American city-planning texts in the early twentieth century, displaying examples of municipal-level land use regulation in relation to historic patterns of urban form.

Similarly, in 1922, lawyer Edward M. Bassett located the roots of the zoning idea in the spatial organization of the Medieval European city. He suggested that the new areas to be drawn and labeled as districts in American cities would correspond to a city dweller's sense of place.

A zone is a belt. Medieval walled towns in Europe were somewhat circular in form. When they outgrew their wall, especially in the case of large cities, the location of the walls would be made into public parks or circular boulevards, and outside of the former walls the land would be laid out in belts, sometimes restricted to different classes of residences. The term zoning, therefore, does not apply strictly in our cities where the different districts assume all sorts of forms, although in general there is a recognition of intensive use in the center of the city surrounded by belts of greater distribution as one goes toward the edge of the city. (Bassett 1922, 318)

Bassett thus interprets American city form as variegated, but still basically concentric, indirectly referencing a theory of spatial structure developed during this same time period of the early 1920s and common to both land economists and urban sociologists (Burgess 1925; Hoyt 1939; Warner and Whittemore 2012, 4).

Figure 2. Proposed zoning map, Bridgeport, Connecticut, 1913. Source: *City Planning* (Nolen 1916).

Note: An early example of what would become a familiar graphic approach to the zoning map, this black-and-white diagram relies upon shading patterns to illustrate the location of six land use categories, including three different classes of residential use. Darker shades dominate the city's core (business, industrial, and tenement), while lighter shades cover the northern edge (first residential and parks and open space), visually suggesting the center-periphery concept.

Using the metaphor of the belt, Bassett further reinforces a circular image: a spatial conception with appealing simplicity, but one that is barely discernable as an organizing framework for future development in city-scale zoning maps of the 1920s. For example, while some relationship between waterfront, downtown, and suburbs is legible in Nolen's 1913 map for Bridgeport (1916), by the 1920s many zoning maps departed from a center-periphery model in two ways: an increase in the total number of identified bounded territories (six land use categories applied to multiple areas across the city) and the emergence of linear districts (based on streets) (see Figure 2). The new boundaries did not reflect existing ones or any general characteristics of city form or urban life; they were independent of electoral districts, service areas, age of the housing stock, or neighborhoods. Williams had argued that the street would serve as an excellent basis for districting, and many cities embraced this suggestion (Williams 1913).

The visual complexity resulting from the display of multiple designations applied to dozens of varied shapes and sizes obscured but did not eliminate the sense of center and periphery in a single zoning map. A viewer's familiarity with street layout, the presence of white space, outlines of features such as rivers and harbors, map orientation, and in some cases, shading patterns still allowed for this reading. However, finer grain differentiation and specialization led to the publication of the zoning map in atlas form, with an index map at the city scale and specific pages devoted to city areas, typically graphically arranged according to a grid (see Figure 3 showing an example of New York's 1916 zoning maps). Zoning districts for American cities, however, would not assume "belt" form. As planning historians have demonstrated, German methods certainly influenced American zoning, but other peculiarly American cultural factors also played a role, notably the positive cultural values associated with the detached single-family house and neighborhoods composed only of these types of dwellings (Logan 1976; Boyer 1983; Wright 1981; Fischler 1998; Holleran 1998; Moskowitz 2004; Hirt 2007, 2013).

When it came time to draw the first zoning maps, the location, type, and boundaries of American city districts were less than obvious. Rather than establishing the relationship of industrial areas in relation to the historic inner core as in the European example, Williams suggests that part of the American zoning process would be *discovering the districts*.

The object of districting is twofold: first, to discover differences in different parts of cities and adapt regulations to them, where these differences are desirable, or, as is so often the case in the built-up sections, too deeply fixed to be change; secondly, to protect, accentuate, or create character in a district. All cities have within their limits localities of distinct and different character. (Williams 1916, 78–80)

Thus, American zoning borrowed concepts and ideas from Europe, but also would rely on an understanding of the unique morphological characteristics of the American city directly shaped by survey efforts and field observations. Rather than unifying the city under a single scheme, zoning promoted greater specialization of economic and social activities, including residential segregation by social class and separation of land uses. For example, Bassett explains that before zoning, "building laws, apart from those applying to fire limits, treated all parts of the city alike" (Bassett 1922, 315). Zoning, he assured the reader, would end that practice.

What Zoning Would Do

Zoning reflected prevailing intellectual and cultural trends of the 1920s, particularly a new interest in standards and procedures for the efficient conduct of business (Toll 1969; Moskowitz 2004). Questions of major concern in the early

Figure 3. New York City zoning, 1916: area, height, and use maps, section 9, Queens, and index.

Note: Using a system of letters, numbers, and line weights, New York created separate maps for area, height, and use for each of the 35 smaller geographic areas indicated on the map index. These section 9 maps show western Queens and a small part of Manhattan; the oblong-shaped white space at the lower center of each image is Sunnyside Yards, a major rail facility and corridor (zoning maps did not typically identify or label geographic features).

twentieth century involved how to relieve congestion (traffic as well as overcrowded housing), where to locate industrial development, and how to respond to the skyscraper and the tenement.

Issues of current interest, such as sustainability and walkability, were not discussed, but a strong focus on protecting and maintaining certain aspects of the status quo (particularly social and physical character of neighborhoods of single-family detached houses and their property values) is evident. As planning scholars have noted, zoning was also used explicitly “to curb apartment construction” (Baar 1992).

Newspaper articles and illustrations give a sense of the public conversation around zoning. A cartoon by Karl Kae Knecht published in the *Evansville Courier* on November 28, 1924, and later republished in the inaugural issue of *City*

Planning magazine on May 15, 1925, provides a good example. Knecht’s drawing shows five human figures uncomfortably crowded together in a trolley or bus, each one representing a land use or city characteristic (Dal Co 1983, 209). Under the original heading “Zoning Will Correct This,” later changed to “Zoning Will Prevent This” when it appeared in *City Planning*, a female figure labeled “city beauty” sits at one end of a streetcar, while a man dressed in overalls smoking a pipe marked with the label “factories, garages, etc.” and a man in business attire and hat marked with “stores, large apartments, etc. badly placed” are stepping on passengers’ toes. They crowd over a seated male figure at center representing “private homes” and another at right labeled “residence districts.” Reflecting the progressive idealism of the time, or perhaps poking fun at it, the Evansville cartoonist

indirectly suggests that zoning might improve manners in public places or alleviate tensions between the people associated with business, factories, and private residences. It also clearly depicts American zoning's emphasis on the need to protect districts of single-family homes.

Contemporary critics attacked zoning's relative weakness as a strategy for shaping the design of human settlements, especially when compared to comprehensive community planning and garden cities. Urban critic and author Lewis Mumford, for example, agreed that the American city of the 1920s had serious problems. But he diagnosed inefficiency, waste, congestion, unhealthy living conditions, poor quality housing, and lack of community as the result of the typical patterns of speculative city growth and unplanned expansion, problems for which zoning offered no solution. Furthermore, he argued, zoning would make no difference in the city's appearance—it would continue to appear chaotic and unplanned. Mumford wrote that “as long as these matters are left to hazard and speculative whim, the observer must be gifted with clairvoyance who would attempt to distinguish the disorder of the unzoned city from that of one which has been roundly zoned” (1929, 147). Mumford remarked that four times as many cities had adopted zoning than had a city plan in place, indicating that zoning was being considered “a panacea—a dose that can be swallowed at a gulp and forgotten” (1929, 147). Likewise, the housing reformer Marsh, who clashed with Frederick Law Olmsted Jr. over the control and direction of the new planning profession shortly after *An Introduction to City Planning* was published, saw the new emphasis on bureaucratic procedure as completely wrong (Peterson 2003, 2009). He left the profession altogether.

In the rhetoric of its proponents, zoning offered the means to regulate all kinds of urban problems—to get rid of unwanted adjacencies like the construction of a factory in a residential neighborhood, to protect the single-family home, to allocate the proper amount and location of industrial space, and/or to provide light and air in an increasingly congested and dark city. They worried about the “invasion” of unwanted uses into some city areas, the inappropriate mixing of people or land uses, and threats to property values, moral norms, and economic prosperity. They emphasized the ability of zoning to protect safety and to reduce health hazards, especially industrial dangers. Nuisance law dealt with some of these problems, but not others, and it placed the burden of proof upon the aggrieved or injured party, rather than providing advance protection. Race and ethnicity played a key role in zoning's development. Many municipalities used zoning to impose racial segregation (such as race-based zoning in Southern cities) or to relocate immigrants (such as ordinances regulating the location of Chinese laundries in California or garment factories that employed Jewish and Italian workers in New York) (Toll 1969; Wright 1981; Silver 1991; Page 1999). Debates about improving health, safety, prosperity, and progress in the American city often ignored or excluded immigrants, African Americans, and the poor.

What is peculiar about the rapid spread of zoning is how these various ideas, however ineffective, wrongheaded, class-biased, or racist, met up with the physical fabric of actual cities—their geology and topography, their built form, their corridors of transportation routes and movement, and their particular character. No single individual or organization held complete knowledge of the city fabric, much less a systematic plan for future development. So, making the first maps required consultation. Ordinances needed to be operationalized by drawing boundary lines on maps. In turn, survey work, consulting expertise, and property owner input regarding the location and classification of the new zones informed ordinance writing.

Making the Map to Remake the City

In principle, experts and citizens would work together to make decisions about the new zones. Employing scientific management and administrative systems, municipal planners could then direct and guide city development through implementation of the ordinance and application of its regulatory requirements to specific real estate parcels. While some proponents saw the new rules and maps as a practical way to take power out of the hands of *elected officials*, emphasizing non-partisan and efficient city government, others saw it equally as an opportunity to minimize discretionary decision making by *bureaucrats*, by placing land use controls in a rule-based regulatory system of laws and administrative procedures.

The spatial relationship between industry, private homes (detached single-family dwellings), stores, apartments, parks, schools, and other land uses was mapped in the process of developing the first ordinances. It was a visual process, one that required field surveys, notation, and sometimes photography, information that would later be rendered in more abstract form in plan-view maps—showing street patterns, lot shapes and sizes, natural features like rivers, and transportation corridors. The process also involved and drew upon local knowledge of lived places—places where property owners lived and/or worked—the maps, after all, had to correspond to what any citizen could simply investigate in person. Legally they needed to be defensible, based on a finding of facts. That existing conditions data, in turn, was used to create a new future-oriented map, designed on the substructure of survey information. The process was iterative, and it involved both discovery of new possible districts, as Williams suggested in 1916, and imposition of desired outcomes such as marking out new territories away from the downtown core for future development purposes.

Mapmaking and ordinance writing went hand in hand, part of “a cooperative discourse between the zoning commission and at least some of the property owners within each district of the city” (Boyer 1983, 165). The delegation of zoning districts tended to unfold in a particular sequence as “the easiest procedure [was] to mark out the industrial and

Figure 4. The zoning map and the zoning process, Chicago, 1922.

Source: Photo courtesy of the Chaddick Institute, DePaul University.
 Note: Officers of the Chicago Real Estate Board, including secretary Eva L. Nelson and zoning committee chair Charles M. Nichols, stand while listening to a presentation by H.T. Frost, chief of staff of the Chicago Zoning Commission (see Schwieterman and Caspall 2006, 20).

business sectors and to let residential uses fill in the leftover spaces. In conjunction with representatives of property owners, the zoning commissioners moved neighborhood by neighborhood, establishing boundaries where business, residential, and industrial zones would be placed” (see Figure 4) (Boyer 1983, 165).

As Boyer convincingly shows, citing Bassett and fellow zoning consultant Charles Cheney, bias in the process toward property owners’ interests (with little consideration given to renters) manifested in the mapmaking process. Partly as a result of this process, American zoning quickly diverged from its European precedents (Hirt 2013, 293). Instead, Americans used it to create district types and to encourage the construction of housing and neighborhood types rarely found in Europe: specifically the purely single-family residential district of detached homes, a pattern that was in comparative perspective “not only spatially but also *legally exceptional*” (Hirt 2013, 293, emphasis in original).

Ben-Joseph (2005, 56) also sees the process of drawing boundaries and designated districts as part of a temporal sequence, setting aside some areas before turning attention to

other locations. He argues that the adaptation of German zoning “began with concerns of the center city, and only later moved outward to the suburban edge, where it took on a new direction.” Further, he contends that the process was directly connected to a reading of city form at the time, including transportation corridors and existing residential areas.

Zoning began as an intensely local practice. Each jurisdiction made its own zoning map, usually beginning by setting aside very large areas for high-value industrial and commercial uses. In general, in the early years the industrial zones lay along the railroad rights-of-way, and the commercial and apartment-house zones followed the streetcar lines. Residential neighborhoods, whatever their inherited mix of uses, were grandfathered in as they stood. Out on the unbuilt edges of town planners established the future residential neighborhood zones. (55)

Ben-Joseph’s description suggests that in the process of discovering the districts, urban actors considered a variety of factors, particularly economic value, typically moving from center to periphery over time.

Planning historian Raphael Fischler adds further complexity and specificity to this notion of a sequence of boundary drawing moves, using the 1916 New York City zoning ordinance as a case. Fischler shows that multiple actors aimed to achieve multiple objectives through zoning, identifying different strategies for different areas of the five boroughs. He relates how the “scope of public intervention” increased dramatically during the survey and planning period between 1913 and 1916, with “a mixed set of actors . . . tackled a variety of issues” including “Manhattan skyscrapers and stores” as well as “the preservation of residential neighborhoods and the segregation of social groups, the management of urban infrastructure, and the control of municipal finances” (Fischler 1998, 172). Whereas in zoning for the residential sections of Brooklyn and Queens, they adopted a suburban approach.

Edward Bassett and his colleagues acted to shield homeowners and their families not only from the physical nuisances of high-density development, but also from the morally harmful influences of the crowded city. At the same time, they worked to protect the city from the fiscally and politically harmful competition of the outer suburbs. They did so by fostering the presence of suburbia within city limits. Their motivation was both economic and moral, their perspective at once local and regional. (178)

In this way, the periphery of the city was zoned as a series of protected patches for residential purposes, connected by major roads to commercial and other uses, but separated from them and from multi-family housing.

Hirt contends that this phenomenon is part of a longer historical trend, stating that “U.S. cities had been experimenting with municipal rules for residential segregation at least since the 1880s when San Francisco expelled Chinese laundries

Figure 5. St. Paul 1922 zoning map (detail) and key.

Note: Overlaying the street grid, parallel black-shaded rectangles representing linear commercial zoning districts extend westward from St. Paul's downtown core. This foldout, city-scale, black-and-white map accompanied the City Plan and relied on shading patterns to indicate seven different land uses and Roman numerals to indicate four height districts.

from certain areas" (2013, 298). Likewise, planning scholars have demonstrated that a variety of controls before and after zoning, including but not limited to restrictive covenants, building codes, and Federal Housing Administration (FHA) requirements, were used to shape city form to exclude people living in apartments (Fogelson 2005; Kolnick 2008; Weiss 1987). In contrast, Talen suggests that early zoning had the right idea in that it recognized "urban intensity" and "that each place has a particular character and quality that ranges from being more urban to less urban" (2012, 29). It was Herbert Hoover, she argues, who corrupted what had been a good idea, injecting elements of social conservatism and exclusionary housing practices, as well as placing an undue emphasis on efficiency as a goal (Talen 2012, 29).

Boyer, Ben-Joseph, Fischler, Hirt, and Talen examine zoning's origins and development from varying theoretical perspectives, offering contrasting views on its intents and purposes; nevertheless, a clear, albeit implicit, theme emerges from this planning history literature: mapmaking and its manipulation significantly influenced the development of zoning in the United States. Examination of the visual characteristics of the zoning maps that resulted from this process further reveals how zoning developed in relation to city form.

Reading the City, Reading the Zoning Map

In certain respects, the zoning map is a mundane historical artifact: boring, even. Neither beautifully illustrated nor

popularly known, early zoning maps were technical illustrations meant to serve an administrative purpose. City employees in newly created or reorganized building departments, city planning departments, and/or other bureaucratic divisions administered the map *as a process*. They deciphered the map. They explained it. They helped enforce it. Only by consulting the map could one determine what restrictions and/or requirements applied to a particular piece of property. Only by consulting the code could one determine how to read the map. As such, the map became an essential tool for city planners, administrators, engineers, building officials, planning commissioners, and other municipal actors; it illustrated the "rules" of the real estate game over the space of the city, abstracting three-dimensional city terrain into a two-dimensional patchwork of shaded, dotted, and hatch-marked parcels and developable building lots. But the early zoning map is also a unique visual artifact, one that illustrates a marked shift toward administrative oversight of city development through reference to a diagram meant to appear neutral and apolitical.

The overall visual impression created by the first zoning maps is complex and fragmented, difficult to capture, although one striking element is the presence of horizontal bands of black in many of the maps, indicating linear commercial strips along major thoroughfares such as in St. Paul and Nashville (see Figures 5 and 6). This characteristic could be interpreted as evidence of the streetcar and the automobile on American city form, of the separation of commercial from residential areas, or of the spoke-like spatial structure of

Figure 6. Nashville 1933 zoning map index and sheet 11.

Note: Like New York City, Nashville created a map atlas based on a grid framework. Black-and-white shading patterns represented nine land use categories, including five classes of residential use (compare to Figure 2). White is used to indicate residence A, but also streets and the Cumberland River, which becomes a dominant visual element in this map of downtown Nashville; a concentration of industrial uses (shaded black) lines the river's edges. This map appeared in *Building Zoning Ordinance, City of Nashville, Tennessee* (1936). Collection of Tennessee State Library and Archives.

linear routes running in and out of American downtown described by sector theory (Harris and Ullman 1945).

The maps, though, as Ben-Joseph (2005) has noted did not turn out all the same from city to city. Nor did the ordinances, or the categories of land use and regulation. Indeed, a strong legal focus on the process of adoption and the reasonableness of the requirements (so that they would not be found to be “arbitrary” or “capricious” by the courts) allowed for a wide variety of visual presentation styles in the 1920s and 1930s.

The zoning map places us in the position of seeing the city from above, as a flat surface covered with a patchwork of patterned shapes. One looks down on the city at the street pattern (itself often a grid or many partial grids, plats, and development schemes in haphazard combination) and the un-platted places of the city where there are no streets, such as natural areas like rivers. At base is the street pattern. Typically streets are left white, creating edges or seams that run through the composition: straight lines, curving lines, intersecting lines at a ninety-degree angle. Streets are announced in this view, highlighted as dividing lines, edges, or demarcations. Streets platted but not yet constructed or paved may also be shown.

Early zoning experts such as Bassett and Alfred Bettman offered guidance on how to draw the base map and officially fix spaces on it, to make them nearly unchangeable except

by public action and map revision (Bassett et al. 1935, 40). These elements of the cityscape, shown on the ground plan, were expected to stay as is: natural features, parks, streets, the basic street pattern and division of blocks, certain utilities or essential municipal facilities, and, occasionally, selected building such as a major post office, state capitol building, or other government office. It sometimes shows utility corridors (such as water supply), railroad lines, city-owned property, future parks, or large institutional properties. Considering the base map allows us to consider the structure of the map in relation to property ownership. When zones or district cut across blocks, or when municipal property or parks are shown in relation to city blocks, the boundary lines for these areas represent ownership. In this regard, a sort of hidden map underlies the base map, only surfacing when necessary to show a boundary. Real estate and fire insurance maps always showed these divisions, as they were an essential component in the map's purpose (Churchill 2004).

In the zoning map, only occasional glimpses of this underlying structure are possible. But, paradoxically, the individual urban parcel, the smallest urban unit of land ownership, was subject to zoning as municipal regulation. Zoning applied a label and a type to the parcel, influencing its potential future value. By restricting use, height, or area (setbacks),

Figure 7. Boston 1924 zoning map (detail).

Source: Used with permission, collection of The Boston Atlas and Boston Redevelopment Authority.

Note: Combining area, height, and use regulations made for more complex but potentially more useful maps. Mapmakers deployed a variety of rendering techniques, including the use of alphanumeric codes (often enclosed in a small circle or oval) with district boundaries marked out in heavier weight line as seen in the Boston example above. Further specialization through combined district-coding produced a great number of smaller-sized districts and a plethora of potential permutations.

it gave the parcel a type. It extends the logic of the grid one step further, as the lot as a tradable, exchangeable commodity became more specialized. Now one could buy and sell different types of lots, labeled and grouped in new ways to express potential exchange values as well as uses. The map shows only the amalgamated zones and it neglects the three-dimensional implications of the code on city form. Planners and builders could use the map to decipher how and where it might alter building shapes and sizes lot by lot. An individual building envelope (as it came to be known) could be calculated, and added together by block, by district, and by section, the sum of these envelopes produced a maximum build-out city. Diagrams accompanying zoning reports explored these issues separately. Famously, in the years before and after the 1916 New York ordinance, architect and artist Hugh Ferriss illustrated imaginary future possibilities for the skyline. Bassett's associates carved these possibilities in soap models. But these depictions were the exception rather than the rule. The zoning map itself remained stubbornly two-dimensional, a flat object that resisted surface variation (urban topography) and aboveground built form implications (architecture) alike. Likewise, the cross-section and axonometric perspective never obtained official map status.

While downtowns are legible, overall the zoning map obscures city form more than it reveals it. It provides a vision for future development, primarily as a two-dimensional surface for real estate investment. Polka dots, checkerboards, white spaces, black spaces, parallel diagonals, and bubble-wraps cover these maps, creating an abstract and fragmented pattern in black, white, and gray, composed of hundreds of discrete, small geometric objects with seemingly few interconnections. The results provide an indirect visual indication of the need for consensus among various stakeholder claims in a system of limited government power—a carefully orchestrated compromise designed to facilitate various types of business activity. In zoning maps that use labeling without shading such as Boston's 1924 map (see Figure 7), the street pattern assumes greater visual prominence; whereas the use of color in Cleveland draws the eye toward large shaded areas of gray and blue, highlighting the zones around the Cuyahoga River (see Figure 8).

Like any map, the zoning map omitted information, too (Monmonier 1996). It did not typically show building footprints, for example, or building materials, street numbers, or historic districts (such as the inner core of European cities)—details presumably left off for the sake of visual clarity or perhaps with the assumption that they may not be part of the

Figure 8. Cleveland 1935 zoning map, sheet 5.

Source: Used with permission, part of an online digital map archive called "Planning Maps of Midwestern Cities in the 1920s and 1930s," collection of the University of Chicago Library.

Note: The use of color, unusual for this time period, would become common in zoning maps by the late twentieth-century. (For a color version of this map, please see the online edition of the journal.) This map provides an early example of the visual complexity, and proliferation of categories and codes, that became common in the twentieth century. Cleveland used white for dwelling house, yellow for apartment house, red for retail business, gray for commercial, blue for first industrial, purple for second industrial, orange for third industrial, and green for parks. The letters A through E were used for area restrictions; numbers 1 to 5 were used to indicate height limits. Alphanumeric combinations such as C1, D2, or B3, enclosed by a small circle, are overlaid upon use districts indicated by blocks of color.

future city. A comparison with other maps from the time period for the same area of the same city, shows how inclusion or exclusion of these elements as well as graphic choices such as line weights and color strongly influence one's impression of city form (see Figure 9 showing three maps of the same area of Los Angeles). With few references to buildings or other landmarks, the zoning map removed experience, image, sense, and history from the image of city life. It announced itself as authoritative, backed by law, yet inscrutable, except to those persons in the know. The map played an essential role in an administrative system, yet could not stand on its own. It always required reference to additional material. In this regard, taken on their own, the maps offer visual interest, drawing the viewer in, but refusing to reveal the circumstances of their creation. No explanation is offered as to why one district is marked industrial, while another is commercial or residential or open space. Alone, they are incomplete.

Temporal Compromises, Obscured Origins, Speculative Opportunities

Zoning maps are familiar; they have been in use in many American cities for nearly a century. But they have also changed in significant ways. In the early twenty-first century, in medium and large-sized cities, they are likely to be produced and viewed as digital images, rendered in color, and connected to a base map that uses GIS. By zooming in and out, viewers can now review maps at various scales, and they can do so from virtually any location online. The maps have continued to become more complex, as a widening array of new classifications, overlay zones, historic district designations, and other regulatory devices proliferated over the twentieth century. Nevertheless, the map remains a key tool: it continues to hold legal force, it serves as an intermediary reference point in development discussions (a graphic law that paradoxically aims to minimize discretion by individual

Figure 9. Visual emphasis and characteristics of city form in three maps of Los Angeles.

Source: Baist and topographical maps courtesy of Los Angeles Public Library.

Note: From top to bottom, examples of a real estate, zoning, and topographical map for the same area of East Los Angeles in the 1920s. While this zoning map is not overly complex, it nevertheless obscures key characteristics of urban form that are evident in the real estate and topographical map.¹ (For a color version of this map, please see the online edition of the journal.)

planners while at the same time requiring decoding), and it stands in as an image of the future city, suggesting the likely future redevelopment trajectory of urban neighborhoods.

In conclusion, three aspects of early zoning maps and the patterns they established in American city planning and zoning are particularly notable: their temporal character, their relationship as final illustrations to the processes of their creation, and their perhaps unintended influence in visually highlighting potential fields for speculative investment.

First, zoning starts with the notion of controlling and demarcating every part of a municipality within specified boundaries. But while it aims for total spatial coverage, it obscures the temporal dimension. Looking at 1920s and 1930s maps today, it is obvious how early zoning both shaped urban form and where it failed or went a different direction. Early zoning maps are pictures of dead futures. Even in their own time, they represented a never-existing condition: neither the city as it was *nor* the ideal city. This temporal compromise was neither completely prescriptive (as existing uses were often grandfathered in) nor descriptive. The map, unlike a real estate map documenting a snapshot in time or a future vision imagining some point in the future, exists in a state of ambiguity from the moment of its creation. The maps quickly became obsolete, a new future vision superseding it and making it irrelevant.

Second, the maps display final decisions on regulatory policy, but provide the viewer with little to no understanding as to why certain areas were labeled, for example, industrial instead of residential. Zoning required looking for evidence from context, studying the existing city in order to create a guide for future development. As completed, it mapped function rather than space, and it displaced an ownership (real estate) view of the city as seen in previous maps with a technical-bureaucratic one. Although background reports may sometimes provide useful information, in general, the maps provide no way to trace the decision-making process that went into a determination. As a visual illustration, the maps announce a new schema for city making: adherence to a smaller subset of technical classifications with strong emphasis on maintaining the boundaries between different uses.

The process of preparing the first maps involved intensive expert surveys as well as citizen input, but even with this level of effort, the process raised as many questions as it answered: for example, what was the total buildable space of the entire city? or, what should the distribution be by type across the city? As a result, districting tended to follow existing general patterns, such as concentrations of manufacturing or of single-family houses, while at the same time applying the new logic of removing and separating out most other uses. Furthermore, the map hides how contested districting could be—it removed politics from the equation, perhaps in a mode similar to other Progressive-era good government initiatives such as appointing city managers to run cities. As became evident

within the first few years of adoption, many city dwellers had a strong interest in changing the codes applied to their properties; exceptions, exemptions, and revisions could rewrite the rules for a parcel, a set of properties, a block, or a larger area. In other cases, it was not immediately evident which one of a limited set of categories (typically between five and ten) applied to a use such as a funeral home. Like most maps, the zoning map hid as much as it revealed.

Third, the zoning map created a new type of lens for looking at the city: a way of seeing, and particularly, a way of identifying real estate opportunity and potential speculative profit, if one could simply obtain an exception, a variance, or, perhaps, change the classification of an area (for instance, from industrial to residential). The new administrative order of zoning, as an intermediary step in the development game, both signaled new development opportunities within zones and suggested the possible profit to be made if one could change the classification. It set rules that were, without stricter planning controls, made to be broken, subject to revision, and frequently circumvented. In the early twenty-first century, expeditors, fixers, and land use consultants in large American cities make it their business to know zoning. Citizens typically find the process highly technical and arcane, removed from everyday life. Increased technical and graphic complexity over time has further undercut both their legibility and their utility.

The first zoning maps set the pattern for future planning practice: decisions that would influence urban form and urban planning as a profession. As a historic artifact, the zoning map, because it relied upon reference to other sources of information and it was invented specifically to facilitate an administrative process by municipal government staff, highlights the social construction of the technical aspects of planning and the way in which a tool for implementation may become fixed in place.

While the assumptions underlying much of modern or Euclidean zoning have been critiqued from every angle, raising questions about equity and fairness, good urban form, and the goals and purposes of planning, the map remains. It is not difficult to see why. The zoning map translates the ordinance spatially and applies it real places, and does so with minimal interpretation. While codes may be tremendously complex, the zoning map aims for a legally defensible visual rendering of what applies where. At the same time, the ordinance cannot stand without the map, and only through a visual rendering of it can citizens, elected officials, or anyone else get a sense of what it means. The entire exercise is informed by visual thinking, while at the same time reducing it to arcane form.

Zoning was often imagined as an end in and of itself, independent of other city planning activities, provoking intense debates among planners about what zoning should be (Scott 1969, 152–63; Peterson 2003, 308–17). In the end, zoning developed quite independently from planning;

many cities adopted zoning without city plans, a development that many planning historians regard as a failure (Scott 1969; Peterson 2003). Peterson argues that many planners mistakenly embraced zoning as a means to advance planning, getting unwittingly swept up in it and diverted away from planning's true aims by "property protectionism" (2003, 315).

Functional in intent, the zoning map nonetheless exudes symbolic and historical significance: it shows how the new spatial logic of the ordinance was *applied* to the physical city, with its legacy of historic development patterns, building types, and architectural styles. Rather than clarifying city form, the zoning map instead displayed the carving up of the American city into pieces. The zoning map demonstrates the dynamic relationship between text and image, as each influenced the creation and modification of the other. The zoning map became an inadvertent diagrammatic representation of the contradictions of bureaucratic-administrative rationality and a symbol of zoning's departure from any conception of good city form. Recent alternatives such as transect diagrams and regulating plans offer new visual possibilities, as the public and scholarly debate over how to fix zoning continues.

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Note

1. These three map segments are oriented toward the west, with the Los Angeles River at the top of each image, for visual consistency. Each map shows three major bridges linking East Los Angeles to downtown: from left to right, the First Street, Aliso Street, and Macy Street. The real estate map (Baist, 1921; original in color) draws attention to tracts (note the text labels), building materials (with solid pink used to represent brick construction), and major property owners (such as California Fruit Growers at upper right). The zoning map (1925) abstracts many of these differences, dividing the area near the river into primarily two zones: heavy manufacturing (closest to the river) and light manufacturing. The topographical map (1928) strongly emphasizes building footprints, railway infrastructure, and topography (shown in brown contour lines in the color original).

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