Zoning’s Centennial: A Complete Account of the Evolution of Zoning into a Robust System of Land Use Law—1916-2016 (Part III)

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I. Designing Density

In land use, there are two things that Americans dislike: one is sprawl, the other is density. This catch-22 can be resolved by mitigating those aspects of urban living associated with density: congestion, bulky buildings, sameness, design incongruities, unsafe streets, inefficiency, and the sense that neighborhoods are not livable and pleasant. These characteristics of density cut against sustainability. They define places that people want to leave as soon as they can. To reduce vehicle miles travelled and carbon emissions, as well as to prevent sprawl, we must create places of enduring value, located next to transit in walkable and sustainable neighborhoods.

When zoning was first adopted a century ago, little attention was paid to design. The focus was on separating incompatible uses and rigidly defining building heights, setbacks, and lot coverage: the ingredients of sameness, often the antithesis of livability. Gradually, over the years, communities addressed this issue by creating Architectural Boards of Review, Landmarks Commissions, Historic District Commissions, and adopting design review standards for individual buildings, whether new, landmarked, or historic. Over time, these initiatives have been supplemented by adopting standards contained in the U.S. Green Building Council’s LEED-Neighborhood Development rating system and by incorporating into zoning the Congress for the New Urbanism’s form-based codes approach to urban design control.³

³Dear Reader: Please note that this is the third part of a four part series of articles that will span through the next 2 issues starting with this past October, Volume 39, Issue 9 release and ending with the January, Volume 40 Issue 1 release.
The law in many states expressly supplements traditional zoning by authorizing localities to create boards and commissions and design standards that are either advisory or regulatory. Such locally created commissions and boards can issue certificates of consistency to rehabilitate landmarks or build in historic neighborhoods. Similarly, these laws authorize the creation of Architectural Review Boards (ARBs), and the adoption of design guidelines for all buildings within the community, enforced either by the ARB or, with the ARB’s advice, by the local Planning Commission. In the latter case, the Planning Commission is authorized to require design features in all development it approves through subdivision or site plan review or the issuance of special permits.

The idea is to ensure that individual buildings are consistent with the historic fabric of the locality or are architecturally compatible with the neighborhood. These techniques are not Euclidian Zoning, but rather constitute an attempt to mitigate the designs wrought by use separation and area and bulk requirements that are traditionally applied uniformly in zoning districts.

Two relatively recent land use innovations have evolved organically to breathe better design into zoning at the neighborhood scale: the voluntary LEED-Neighborhood Development rating system, promulgated by the U.S. Green Building Council, and form-based codes, developed by the Congress for New Urbanism and the Form-Based Codes Institute.

The LEED-ND rating system was developed by the USGBC in response to criticism of its New Construction rating system, which could result in Platinum or Gold rated buildings located in agricultural zones or environmentally sensitive areas. These buildings, while internally sustainable, are decidedly not consistent with larger principles of sustainability that emphasize environmental conservation and the reduction of automobile use and vehicle miles travelled. Here, place matters, and LEED-ND contains prerequisites and criteria that require rated buildings to be sustainability located as well as built.

Local governments have begun to incorporate LEED-ND standards in their zoning and land use regulations. See, for example, the Technical Guidance Manual for local governments developed by the Land Use Law Center for the USGBC. This document includes a step-by-step process for incorporating sustainable neighborhood standards into the local comprehensive plan, zoning, land use regulations, approval processes, and capital budgets.

Finally, form-based codes are beginning to catch on, especially in urban neighborhoods. The unique aspect of such codes is that they deemphasize use, bulk, and area requirements, substituting for them actual physical designs, adopted as code, that govern development. Diagrams and illustrations become regulations and govern building styles, details, and materials that are permitted, as well as the ways in
which they can be incorporated into specific building elements. These regulations reach into the public realm and present in graphic form the width and dimensions of streets, sidewalks, paths, street trees, furniture, and more.

To zoning’s credit, design standards fit into the Standard Zoning Enabling Act (SZEA), its focus on the appropriate use of the land and the processes it uses to review and approve specific buildings. We are unaware of any case that has successfully challenged as ultra vires the incorporation of LEED-ND standards or the precepts of form-based codes in to local law. And, since historic, landmark, and architectural guidelines are often authorized by discrete state laws, the power of local governments to design density is clear, and is becoming an important aspect of sustainable development.

II. Green Infrastructure

Green infrastructure has also become a major component of sustainable development. At their inception, comprehensive planning and zoning focused intensely on capital infrastructure: streets and roads; water and sewer; and electric lines and other utilities. These served development parcels with their buildings, driveways, and other hardscapes. Streets and roads were classified by traffic load and function with local streets, secondary streets, collectors, and arterials governing the flow of traffic in the public interest. When viewed from 10,000 feet, this gray infrastructure is clearly visible: a thoughtful pattern of connectivity to serve the built environment. This result was one of the principal objectives of early zoning.

Over time, evolving concerns with flooding, public safety, wetland and watershed protection, the urban heat island effect, and the loss of open space and its ecological services gave rise to mapping and preserving the green infrastructure of a community. These plans connect the natural assets of the community in much the same way that planners design a locality’s gray infrastructure. Planners concerned with green infrastructure calculate the current green space coverage and connectivity and then figure out methods of increasing it to a healthy amount of the surface area of the community. This process ensures that an adequate percentage of the land is sheltered and shaded, with its soils held intact and its ability to absorb and retain water preserved, if not enhanced. Water and wildlife, like vehicles and people, need to travel through connected paths and landscapes.

The broad view of green infrastructure envisions it as a strategy for adapting to climate change, bettering air quality, lowering heat stress, creating greater biodiversity, conserving energy, providing ecological services, sequestering carbon, preserving and expanding habitats, enhancing aesthetics, increasing property values, and improving the livability of neighborhoods.

The elements of green infrastructure include green roofs; planters; rainwater harvesting; street trees; preserved open space on building sites; natural vegetated corridors and swales; permeable paved areas accented with green features; xeriscaping; private gardens and public parks; detention basins; bio-retention ponds and rain gardens; green building facades; and greened medians and edges along streets, paths, and rail lines. Parking lots can be greened by adding trees and using permeable surfaces that allow infiltration and permit vegetative growth. When seen from the air, the community with robust green infrastructure appears more connected naturally; ideally, the green and the gray are complementary.

All of these elements of green infrastructure can be built into local planning, zoning, and land use regulations. Cities can begin green
infrastructure planning at the same time they create and implement their plans for building and development to accommodate anticipated increases in population. The local comprehensive plan can be supplemented by the addition of a green infrastructure component that grows out of this planning process. Then, zoning and land use regulations can be amended to implement the green infrastructure component’s vision.

An adopted overlay zone can trace the contours of the green infrastructure plan and, within that zone, local review boards can condition approvals, or use zoning incentives, to implement it. Landscaping requirements, along with erosion and sediment controls, can be added to subdivision and site plan regulations. Developers can be required to include green features in, on, and around their buildings. They can also be required to pull development back from floodplains and wetlands and to leave room on their sites for open space. They can pay impact fees where they cause the destruction of vegetated areas and the proceeds can be used to pay for the greening of nearby public spaces. Local and state capital budgets can support street trees, medians, parks, the greening of publicly-owned buildings and sites, and open space preservation.

What the architects of green infrastructure do is use these land use techniques in an integrated fashion; they plan the entire community so that its natural functions are connected and create healthy and livable neighborhoods. In communities that have made green infrastructure a priority, zoning achieves objectives not understood when it was invented 100 years ago.

III. Land Use and Energy Conservation

The private sector is cooperating with land use regulators to dramatically reduce the energy use in buildings; a key, if not essential, strategy for reducing reliance on fossil fuels and mitigating climate change.

Approximately 40% of total U.S. energy consumption and 70% of all electricity consumed domestically are attributed to residential and commercial buildings.13 Two-thirds of the energy used to produce electricity is wasted as heat escapes into the atmosphere during generation14 and up to 15-20% of the net energy produced at these plants is lost in transmission.15

The following is laundry list of energy conservation and climate change mitigation techniques that rely on land use law, assembled from real projects on the ground:

- Because of the enormous waste of energy at the point of generation in remote locations, the lowest-hanging fruit in the orchard of energy-conserving land use techniques is to permit or require on-site generation, which is now technically and financially possible in many situations. The LEED-ND rating system gives developers credit for on-site generation and many are earning those points.16 What LEED recognizes, local governments can make mandatory as part of zoning.

- The principal method of achieving energy efficiency in new building construction and the substantial renovation of buildings is the energy conservation code; promulgated by the International Codes Council, it has been adopted in most states, and is enforced by local governments.17 This code contains minimum standards for the design, construction, and installation of the building shell or envelope, mechanical systems, and lighting.18 By vigorously enforcing this code, dramatic progress can be made in energy conservation.

- Land use law in some states allows local
governments to enhance the energy code by adopting additional standards aimed at achieving greater energy efficiency. A creative example is found in Marin County, California. The County requires large homes under 4,000 sq. ft. to exceed the energy conservation code requirements by 15%.\textsuperscript{19} If the home is over 4,000 sq. ft., but less than 5,500 sq. ft., it must exceed the state code in efficiency by 20%.\textsuperscript{20} For homes between 5,500 and 6,500 sq. ft., the requirement is 30%.\textsuperscript{21} Homes over 7,000 sq. ft. must be “net zero energy” users; a goal that green builders can actually achieve.\textsuperscript{22}

- In New York, the Town of Greenburgh amended its local code to require that all new homes comply with the Energy Star rating system,\textsuperscript{23} promulgated by the Environmental Protection Agency and the U.S. Department of Energy.\textsuperscript{24} Energy Star can achieve energy savings in excess of 30% greater than the base energy code. It governs appliances, heating and cooling systems, the thermal envelope, electrical, ventilation, and equipment efficiency.\textsuperscript{25}

- The Town of Blooming Grove, New York, uses a density bonus to encourage home developers to adopt Energy Star. The Town awards a 10% increase in the number of homes that can be constructed under local zoning in exchange for making them all Energy Star compliant.\textsuperscript{26}

- Local subdivision and site plan regulations can be amended to govern building orientation, layout, or landscaping on sites, which can be used to reduce energy consumption in new buildings. Land use laws can require homes in subdivisions to be clustered and designed to conserve energy, or equipped with solar panels (or at least to be wired and built to accommodate them).

- Solar and wind generation facilities can be either frustrated or facilitated by local land use law. Onsite solar arrays and rooftop wind turbines can be prohibited by use, setback, and height restrictions found in traditional zoning codes. Amendments to these provisions can designate renewable energy facilities as as-of-right uses, allow them by special permit, or permit them as accessory uses. Bonuses, like those found in Blooming Grove, can be used to incentivize renewables.

- Local land use boards can require developers and their design consultants to follow an integrated design process, where they collaborate during the early stages of the project review process to achieve the greatest possible energy conservation and cost reduction. It is at this stage that decisions can be made about building orientation, form, shading, energy-efficient exterior lighting, window size and location, rooflines and extensions, reflective roofing, height-to-floor ratios, and building features that relate to passive ventilation and cooling.

- Local land use laws can achieve extraordinary energy efficiency by permitting and encouraging the use of combined heat and power (CHP) systems in individual buildings and interconnected energy systems in certain mixed use districts. By employing CHP - a mechanical system that can be used to produce electricity, heating and cooling in higher-density, mixed-use neighborhoods, the potential for energy efficiency, and therefore energy conservation, is remarkably greater than if used on an individual parcel of land.

- To increase the use of district energy systems (DESs), the local land use regulatory system can be adjusted to allow, or even to incentivize, them. DESs must be made an allowable use under local zoning and site plan regulations, as well as local
building and energy codes. They, too, may be encouraged through bonus zoning provisions that provide additional development densities for developers who adopt DES technologies.

- Finally, the number of localities that are adopting Transit-Oriented Development (TOD) zoning ordinances has been growing exponentially over the past ten years. There are hundreds of examples of new zoning districts that create livable, mixed-use neighborhoods where new buildings are connected to transit systems through design and infrastructure enhancements. In these neighborhoods, per capita CO2 emissions can be two-thirds less than those in typically-zoned neighborhoods in the suburbs.

IV. Transit Oriented Development

Transit Oriented Development, or TOD, is a modern zoning imperative with exceptional potential to reduce GHG emissions. According to the Presidential Climate Action Project, “[t]he greatest potential for reducing greenhouse gas emissions . . . is to reduce vehicle miles traveled (VMT)—the miles Americans drive each year.”

TOD land use plans and zoning encourage mixed use, compact development in transit neighborhoods. They locate housing and jobs near transit stops and significantly reduce the number and distance of vehicle trips. Encouraging land use patterns that house and employ more people in urban, transit-connected areas will cause a significant reduction in VMT, while placing households in smaller, more energy efficient homes and offices will further reduce fossil fuel consumption and CO2 emissions.

Transportation Efficient Development, or TED, is TOD’s country cousin. TOD and TED have many relatives. They bracket a profusion of terms that describe the rapidly increasing focus on reducing VMT through zoning. The terminology used is varied. Some authors write about “transit supportive” or “transit ready” development, or “transportation efficient” land use patterns. Others refer to “transit friendly zoning,” “station area planning,” “transportation demand management,” “traditional neighborhood development,” “planned unit development,” “development-oriented transit,” “transit supportive urban design,” “transit station communities,” “transit focused development,” and “transit villages.”

These terms encompass many different geographical contexts, populations, densities, and transportation modalities. Any attempt to describe a single approach is subject to a host of exceptions, but some common principles can be articulated to highlight the legal underpinnings of this important subject and to explain why zoning matters.

When neighborhood density is increased for both residential and commercial uses, the distance between origin and destination is shorter and walking, bicycling, and mass transit services are more feasible. In order for increased densities to be tolerated, standards requiring attractive building, landscape, and streetscape design must be employed.

The successful development of transit stations and rail and bus lines is dependent upon land use densities and mixed uses. There must be a large enough number of commuters in a relevant area to provide a base level of ridership. In addition, ridership must be sufficiently diverse to ensure that people are traveling to work, to shop, to seek entertainment, and to go home at various times during the day, thereby increasing the cost efficiency of the transit system.

Local land use plans and zoning, which determine population density and building uses, control how much the population will
increase over time in a certain area, and what transportation needs new people will have. This, in turn, dictates the demand for various types of transportation services. Locally, this planning is done at the neighborhood level and should be guided by objectives contained in the city’s comprehensive plan. To make transit systems feasible, land use planning among localities in a transportation region must be coordinated with transportation planning and development, which occurs under federal programs in urban areas at the metropolitan-area scale.

Many state enabling statutes require or encourage local governments to include a transportation element in their comprehensive plans. Increasingly, these transportation elements have incorporated planning strategies intended to encourage people to drive less and to walk, bicycle, and use mass transportation more frequently.

Arizona’s planning enabling statute, for example, requires cities with more than 50,000 people to prepare a bike transportation element as part of their comprehensive plan. Nevada’s enabling legislation supports planning for mass transit, bicycle, and pedestrian infrastructure. This statute encourages local planning to include a transit element that “[s]how[s] a proposed multimodal system of transit lines, including mass transit, streetcar, motorcoach and trolley coach lines, paths for bicycles and pedestrians, satellite parking and related facilities.”

Even where communities are not currently served by transit systems, they can create compact, mixed use neighborhoods that reduce car trips and miles traveled. Zoning controls in TED zones can limit the size of housing units and combine retail, office, and residential land uses, putting services, shops, and jobs in closer proximity to homes. Zoning can also require new construction to meet energy standards and further reduce GHG emissions.

Communities not yet served by transit can design one or more priority growth districts and create overlay zones for them that allow greater densities and more land uses than permitted in the underlying zoning districts. By clustering development strategically, these growing localities position themselves for future service by commuter rail or bus rapid transit, thereby becoming “transit ready.”

Suburban areas that adopt higher-density, mixed-use zoning will find it easier politically to adopt strong environmental protection ordinances applicable to the land outside high-density zones. Where state law permits, density bonuses may be provided in TED zones and cash contributions made by developers in exchange. This money can be used to purchase development rights from landowners in sensitive environmental areas outside the higher-density zone, areas that mitigate climate change through sequestration. This balance between development and conservation can be accomplished within TOD areas as well - highlighting again zoning’s ability to create sustainable settlement patterns and to mitigate climate change.

V. Zoning in Solar and Clean Energy

As zoning turns 100, it is showing its age by its exclusion of modern clean energy systems in many communities. It is also demonstrating its historical resiliency, as more and more progressive communities act to reform zoning to permit, require, and incentivize renewable and clean energy facilities. These rapidly evolving systems include building integrated solar systems, ground- and roof-mounted solar arrays, large- and small-scale wind generation, multi-building combined heat and power facilities, microgrids, on-site electricity generation, and geothermal systems.

For clean energy systems to be constructed, they must be permitted by local zoning and not subject to expensive regulatory barriers
that discourage their use and increase their cost. Promoting clean energy systems under local land use regulations is one of the latest efforts on the part of local governments to mitigate climate change, which, in the aggregate, are most impressive.

It is an uphill battle. By analyzing the comprehensive plans and zoning codes of most local governments, it is evident that regulatory barriers to clean energy systems are ubiquitous. These range from the simple failure to define and permit clean energy systems, to excessive height and setback restrictions, to additional or outdated permitting requirements, which greatly increase the costs of systems or discourage their use due to the unpredictability or length and costs of the approval process. The battle is being fought first on the solar front, given the popularity, improved technology, and reduced costs of solar energy systems.

Although both the federal and state levels of government have a strong interest in encouraging the deployment of renewable energy systems, the power to permit solar energy systems under land use law has been delegated by most states to local villages, towns, and cities. Most states are not willing to preempt local control of solar and other clean energy systems; as a result, it is state policy to defer to local discretion in these matters, allowing local policymakers to determine the types of solar and other clean energy systems that will be deployed in the state.

Local officials who want to encourage solar energy systems are adjusting the local land use system first by adding a solar energy component to the comprehensive plan or adopting a special solar energy policy or plan to guide the reform of land use regulations. These local governments are then amending zoning regulations to permit and encourage these systems.

The primary, and most common, barrier to solar energy system implementation occurs when solar energy systems are neither defined nor permitted in one or more zoning districts. Without explicit definitions of solar facilities, they cannot be permitted by reference in the district use provisions of local zoning. In addition, the lack of clear clean energy- or solar-related definitions misses the opportunity for municipalities to send a signal to developers, property owners, and installers that they are “open for clean energy business.” Municipalities are beginning to fix this problem by amending their zoning code to include definitions of the different solar energy systems available, based on type, size, and/or energy capacity.

Since solar energy systems vary significantly by type, location, size, and energy capacity, zoning definitions generally are based on these factors. Where these characteristics align with the intensity of use or impact of a solar energy system, they justify different land use regulations for each type and guide local planners as to where to allow each type of system to be constructed.

Municipalities chose to permit solar energy systems by designating them as principal, accessory, secondary, or specially permitted uses. They are subjecting them to modified and expedited site plan review, waiving design standards enforced by local Architectural Review Boards, and providing exemptions from Historic District Review standards for conforming designs and proper locations.

Solar easements, not recognized by common law in most states, can be created by local government regulation to ensure access to sunlight over the life of the solar system. Typically, these regulations require written and recorded solar easements that define easement dimensions, how the easement will terminate, and compensation for easement maintenance or interference, among other provisions.

Some localities are requiring developers to
install solar energy systems or, short of that, make buildings solar ready. Other communities incentivize, rather than require, these solar facilities, typically by providing density bonuses for solar panels, solar readiness, and solar access easements.

The process for zoning to allow other forms of clean energy follows the pattern set by zoning for solar. First, local comprehensive plans should set forth as a goal furthering clean energy facilities; next, zoning should define each of these clean energy technologies; and finally, district use regulations should be amended to permit them in appropriate locations at appropriate scales. The processes used to regulate and approve such facilities should be streamlined as fully and prudently as possible.

There is a clear need for municipal attorneys, local land use leaders, and state agencies interested in reducing energy costs and harmful fossil fuel emissions to develop model laws and approval processes for all clean energy facilities, in order to further the important objectives that they accomplish. These will all aid zoning in its adaptation to meet yet another contemporary challenge.

ENDNOTES:

1 Distinguished Professor of Law, Counsel, Land Use Law Center, Elisabeth Haub School of Law. The author acknowledges the significant work of his research assistants, Allison Sloto, Kara Paulsen, and Ollia Pappas.

2 Pace Land Use Law Center, Technical Guidance Manual for Sustainable Neighborhoods (2013); Form-Based Codes Defined, Form Based Codes Institute http://formbasedcodes.org/definition (last visited Apr. 6, 2016).


5 Library of Codes, Form-Based Codes Institute, http://formbasedcodes.org/codes/ (last visited Jul. 8, 2016).


7 Id.

8 Id.

9 Id.

10 Id.


14 E-mail from Thomas Bourgeois, Deputy Dir., Pace Energy & Climate Ctr., to author (June 30, 2011, 21:55 EST) (on file with author).

15 E-mail from Thomas Bourgeois, Deputy Dir., Pace Energy & Climate Ctr., to author (June 30, 2011, 17:22 EST) (on file with author).


18 Id.


20 Id.
21 Id.

22 Id.


25 Id.


27 See Land Use for Energy Conservation, supra note 108.


