DUBUQUE COUNTY, IA
RURAL MODEL SMART CODE

PART 1 OF 2:
ZONING MANUAL

CREATED BY:

MSA PROFESSIONAL SERVICES

WITH ASSISTANCE FROM:

DUBUQUE COUNTY ZONING DEPARTMENT

2012

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EXECUTIVE SUMMARY

In November 2010, the State of Iowa awarded Dubuque County and the Cities of Asbury, Cascade, Dubuque, Dyersville, Epworth, Farley and Peosta a grant to create a regional plan for sustainable development. These seven cities and the County established the Dubuque Smart Planning Consortium. The primary objective of the Consortium is to create a "Smart Plan" that will incorporate the principles of sustainability (e.g. renewable energy, energy efficiency, stormwater best practices, complete streets, low impact development, groundwater conservation, mixed land uses, etc.) into everyday life. Adoption of the Smart Plan is anticipated to occur in November of 2012. Since the Smart Plan on its own has no legal authority, the Smart Planning Consortium has begun to explore possible methods for implementing the recommendations of the Smart Plan.

In February 2012, Dubuque County was awarded a Community Development Block Grant (CDBG) made possible by the American Recovery & Reinvestment Act (ARRA), distributed through the Iowa Economic Development Authority (IEDA) for the purpose of creating a Rural Model Smart Code. In May of 2012, Dubuque County hired MSA Professional Services, Inc. to assist the County with the development of a sample smart code for the County. The Dubuque County Rural Model Smart Code is intended to help achieve the goals and objectives of the Dubuque County Smart Plan by using a hybrid form-based zoning approach that places more emphasis on design and density of new development rather than the traditional Euclidian zoning approach with its primary emphasis on separation of uses.

The Cities of Bankston, Durango, and Sageville served as pilot communities for the development of the model code. The pilot communities have low to moderate income populations greater than 51%. Cost constraints and a lack of in-house staff limit the capacity of these cities to create a development code on their own. Other than floodplain ordinances, the three cities do not have any traditional zoning ordinances and limited capacity to implement them.

The planning process was guided by a Technical Advisory Committee (TAC) comprised of representatives from Dubuque County, East Central Intergovernmental Association (ECIA), the Dubuque County Smart Planning Consortium, and representatives from the Cities of Bankston, Durango and Sageville. The TAC met four times during the planning process to discuss and modify the Rural Model Smart Code. During the planning process, various county and city engineers, zoning administrators, planners and elected officials were invited to provide input on the Rural Model Smart Code. The final code was presented for public comment at two public informational meetings in the month of August, 2012.

Adoption or "codification" of the Dubuque County Rural Model Smart Code by each of the three cities, or Dubuque County, was not part of the scope of this project; however, the introductory portion of the code (Part 1) discusses the process by which each city and the County can calibrate the model code to fit their particular needs. In addition, as part of the planning project, specific implementation plans were crafted for each of the pilot cities including recommendations for adopting relevant sections of the code and code administration, including approaches to hiring regional code administrators.

The purpose of this project was to provide training in the use and establishment of a hybrid form-based code within the three pilot communities, which can be replicated elsewhere within Dubuque County. By developing a base model smart code from which all cities and the County can work from it is the desire that not only will the County achieve sustainability principles outlined in the Smart Plan, but that there may also be efficiencies and transparency gained through having a coordinated land use regulatory framework that is consistent from one city to another, and between cities and the County.

INTRODUCTION

SMART CODE DEFINED

- The Smart Code is a hybrid form-based zoning code that incorporates Smart Growth, New Urbanism, and Transect-Based Zoning principles.

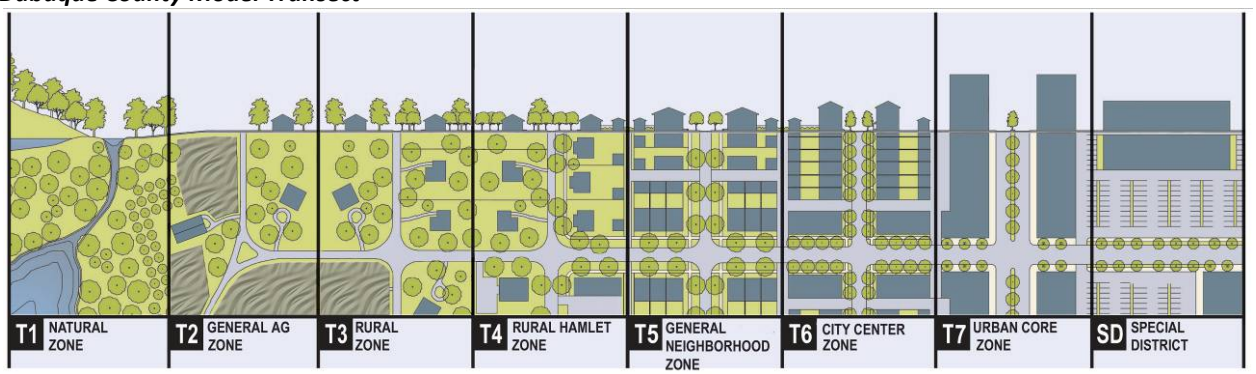
Form-based codes – a type of land development regulatory tool (i.e. zoning code) that places greater emphasis on the physical form of the built environment with the end goal of producing a specific type of 'place'. The Smart Code is a hybrid code since it incorporates aspects of traditional use-based zoning, performance impact-based zoning, and principles of sustainability.

Smart Growth – a policy of rural and urban planning which seeks to create, in an open and collaborative process, community land use plans and development codes that result in more sustainable (i.e. lighter impact on the natural environment), and resilient communities (i.e. resistant to natural and economic adversities).

New Urbanism – a discipline of city planning which seeks to guide the form of the built environment to resemble that of traditional neighborhoods, towns and villages. New Urbanism is strongly influenced by urban design standards that were prominent until the rise of the automobile in the mid-20th century. The objective is neighborhoods with strong social connectivity in which it is safe, convenient and pleasant to travel by walking.

Transect-Based Zoning – a concept of New Urbanism whereby zoning districts are arranged based on a geographical cross section of a region. Such a cross-section can be used to identify a set of habitats that vary by their level and intensity of development and character, a continuum that ranges from *natural-to-rural-to-urban*.

Dubuque County Model Transect



The principles of Smart Growth and New Urbanism support communities that are town-centered and transit and pedestrian oriented, with a mix of housing, commercial and retail uses, while preserving open lands and achieving other environmental goals. While their objectives are similar, Smart Growth is a policy-driven movement and New Urbanism is a design/regulatory-oriented movement.

SMART GROWTH IN IOWA

The Iowa Smart Planning Principles were signed into law on April 26, 2010, as one of the three primary components of the Iowa Smart Planning Act contained in State Code Chapter 18B; Land Use - Smart Planning. These Principles must be considered and may be applied when local governments and state agencies deliberate all appropriate planning, zoning, development and resource management decisions. Application of these Principles is intended to produce greater economic opportunity, enhance environmental integrity, improve public health outcomes, and safeguard Iowa's exceptional quality of life. Successful integration of the Principles also addresses the need for fair and equitable decision-making regarding the growth of communities, and can produce cost savings regarding the provision of public services. The Iowa Smart Planning Principles include:

1. Collaboration - Governmental, community, and individual stakeholders, including those outside the jurisdiction of the entity, are encouraged to be involved and provide comment during deliberation of planning, zoning, development, and resource management decisions and during implementation of such decisions.

2. Efficiency, Transparency, and Consistency - Planning, zoning, development, and resource management should be undertaken to provide efficient, transparent, and consistent outcomes. Individuals, communities, regions, and governmental entities should share in the responsibility to promote the equitable distribution of development benefits and costs.

3. Clean, Renewable, and Efficient Energy - Planning, zoning, development, and resource management should be undertaken to promote clean and renewable energy use and increased energy efficiency.

4. Occupational Diversity - Planning, zoning, development, and resource management should promote increased diversity of employment and business opportunities, promote access to education and training, expand entrepreneurial opportunities, and promote the establishment of businesses in locations near existing housing, infrastructure, and transportation.

5. Revitalization - Planning, zoning, development, and resource management should facilitate the revitalization of established town centers and neighborhoods by promoting development that conserves land, protects historic resources, promotes pedestrian accessibility, and integrates different uses of property. Remediation and reuse of existing sites, structures, and infrastructure is preferred over new construction in undeveloped areas.

6. Housing Diversity - Planning, zoning, development, and resource management should encourage diversity in the types of available housing, support the rehabilitation of existing housing, and promote the location of housing near public transportation and employment centers.

7. Community Character - Planning, zoning, development, and resource management should promote activities and development that are consistent with the character and architectural style of the community and should respond to local values regarding the physical character of the community.

8. Natural Resources and Agricultural Protection - Planning, zoning, development, and resource management should emphasize protection, preservation, and restoration of natural resources, agricultural land, and cultural and historic landscapes, and should increase the availability of open spaces and recreational facilities.

9. Sustainable Design - Planning, zoning, development, and resource management should promote developments, buildings, and infrastructure that utilize sustainable design and construction standards and conserve natural resources by reducing waste and pollution through efficient use of land, energy, water, air, and materials.

10. Transportation Diversity - Planning, zoning, development, and resource management should promote expanded transportation options for residents of the community. Consideration should be given to transportation options that maximize mobility, reduce congestion, conserve fuel, and improve air quality.

The Dubuque Rural Model Smart Code was developed and is intended to promote the Iowa Smart Planning Principles.

BRIEF HISTORY OF ZONING REGULATIONS, USE-IMPACT-FORM

The first zoning ordinance in the United States was adopted in 1916 by the City of New York, NY to compact public health issues from industrial uses and to protect individual buildings access to sunlight. In the 1920s the Hoover Administration advocated for states to adopt the Standard State Zoning Enabling Act ("SZEA"), which authorized the adoption of zoning ordinances to regulate and restrict the erection, construction, reconstruction, alteration, repair, or the use of buildings, structures, or land to promote the health, safety, morals, and general welfare of the community. A city's authority to enact zoning regulations was first upheld by the US Supreme Court in 1926 under Euclid vs. Amber, thus giving rise to term "Euclidean Zoning", the traditional form of zoning adopted and still in use by most communities in the United States. Euclidean Zoning is also referred to as "Traditional Zoning", or "Use-Based Zoning". The main feature of Traditional Use-Based Zoning is the segregation of land uses into three main categories: residential, commercial, and industrial. The complete isolation of different uses is one of the root causes of urban sprawl.

During the Environmental Movement of the 1960s and 1970s a new field of zoning regulation emerged referred to as "Performance Zoning" or "Impact-Based Zoning". Impact-based zoning regulates land uses based on quantitative measurements (e.g. heat, smoke, vibration, and noise output). Unlike Traditional Use-Based Zoning, performance codes do not establish use districts, in that since everything's place is everywhere as long as certain quantifiable environmental standards are met. Fort Collins, CO became the first city in the United States to adopt a performance zoning code in 1982. Due to the familiarity/popularity of traditional use-based zoning, and the sophisticated technical resources required for administration, performance impact-based zoning codes were not widely implemented.

Beginning with the design of the new traditional town of Seaside (FL) in the 1980s, a third theory of zoning practice emerged known as Design or "Form-Based" Zoning. The New Urbanist Movement was a reaction to the fact that both traditional use-based and performance impact-based zoning codes failed to account for the importance of the design of buildings, lots, blocks, streets, and other public spaces to creating a sense of place/community. Unlike Traditional Use-Based Zoning, design codes emphasize

building context and compatibility regardless of use. New Urbanism is strongly influenced by urban design standards that were prominent until the rise of the automobile in the mid-20th century. It seeks to guide the form of the build environment to resemble that of traditional (planned and sometimes planned) mixed-use neighborhoods, towns and villages. The objective is neighborhoods with strong social connectivity in which it is safe, convenient and pleasant to travel by walking

Summary Chart, Aspects of Use-, Form-, and Design-Based Zoning Codes

	Traditional, Use-Based Zoning	Performance, Impact-Based Zoning	Design, Form-Based Zoning
Origin	Industrial Revolution	Environmental Movement	New Urbanist Movement
Goals	Group similar uses	Protect natural resources	Promote traditional urban form
Pros	Separates incompatible uses, relatively easy to implement, provides neighborhood certainty	Focuses on natural resource protection, clear rationale for standards	Easy to mix and change land uses; promotes walkability and connectivity
Cons	Encourages sameness, inhibits creative design, very process oriented, focuses on negative	Very complex and formulaic, requires sophisticated staffing, difficult to monitor	Increased cost to establish, provides less neighborhood certainty
Use Flexibility	Little	Some	Lots
Key Feature	Function (use) trumps performance (impact) and design (form)	Performance (impact) trumps function (use) and design (form)	Design (form) trumps function (use) and performance (impact)

All of the approaches have their pros and cons and each has evolved to resolve the issues of its time. The Dubuque Rural Model Smart Code is essentially a hybrid of all three zoning approaches.

THE ORIGINS OF SPRAWL

When we look at older towns, it is obvious that the methods by which municipalities grow have changed. Prior to World War II, areas mapped for development included each of the essential town-making elements – streets, parks, housing, commercial and civic buildings. Growth was mixed-use, compact, and building design varied. This is no longer the case.

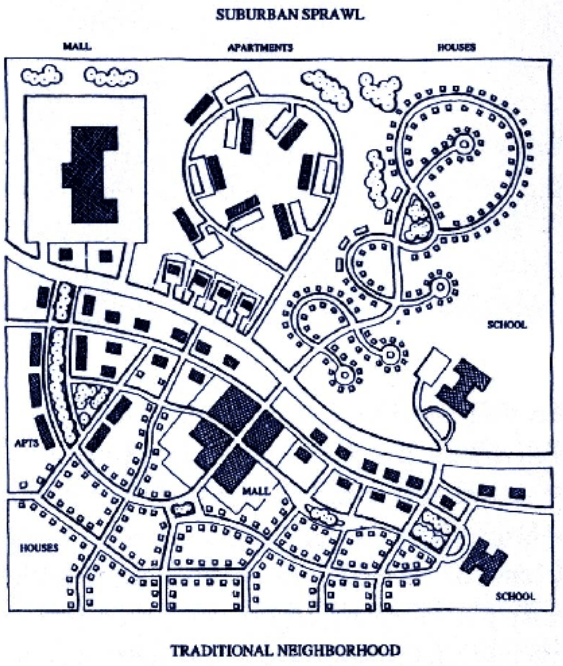
The basic genetic material of sprawl consists of the following:

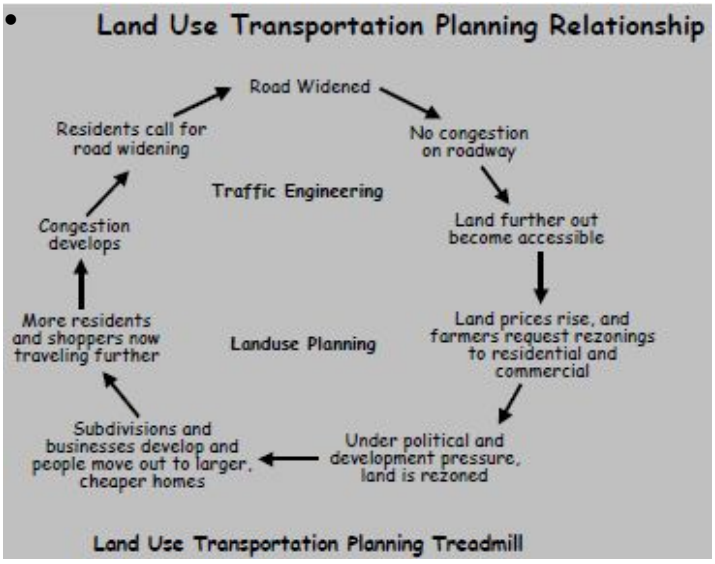
- Single-Use Zoning of Large Land Areas. It is clear that neither the SZEA nor the ordinances that resulted were intended to create sprawl or obstruct traditional villages, towns, or urban neighborhoods. Their primary concern was to protect the public health and safety by separating dangerous or noxious industrial operations from residential areas, and controlling density for health purposes. But in hindsight, at least since the nature of industry has changed in the 20th Century (due in-part to both federal regulations and self-policing resulting from the Environmental Movement), traditional use-based zoning has actually had a negative impact on the public health overall. In our present development pattern, we must drive from place to place, enduring the stresses of congested traffic and wasted time, while polluting our air and depleting natural resources. Meanwhile, we walk much less than we would if our daily needs and destinations were close by. The health benefits of walking have been thoroughly documented.
- Insufficient Variety of Subdivision, Setback, Lot Size, Density, and Parking Requirements. Separate from zoning per se is subdivision regulations, the land use regulatory mechanism for the division of tracts of land into smaller parcels for building. In areas that are zoned, as well as those that are not,

subdivision requirements can result in sprawl. This arises chiefly from excessive lot size and "setback" requirements (e.g. front, rear, and side). Development sites become correspondingly larger and each development, being lower density, spreads development more thinly. Walking distances become unmanageable because of the greater gaps in the development pattern.

- Precise Use and Locational Requirements but Relaxed Physical Ones. Traditional use-based zoning codes focus on the type and location of various uses but routinely ignore the form or design of the development. Prior to World War II, new buildings were often occupied by their builder. This resulted in an increase in the variety of building forms, often representing regional European origins, within neighborhoods. Since World War II the prevalence of entire neighborhoods developed by single builders has become the norm. To control costs and decrease construction timelines, developers have chosen to use repetitive residential building blueprints within a community. In addition, the expansion of commercial chains has resulted in the repetition of commercial building blueprints from one community to the next. These trends, combined with a lack of design guidelines and standards within traditional use-based zoning codes has resulted in bland suburban sprawl.

- Traffic Engineering and Road Building Practices. Traffic engineering and public works manuals routinely prescribed overwide thoroughfares designed for only a single transportation mode, the automobile. Solutions to traffic congestion often revolved around building additional vehicle lanes, promoting faster speeds and pushing land development further from urban cores until congestion increased and the process was repeated. They also prescribed patterns of collectors and arterials to force drivers along a limited number of thoroughfares, limiting connectivity, dispersion, and flexibility of route choice. Connective grids, on the other hand, are designed to "calm" traffic, slowing vehicle speeds and making streets smaller and hence more walkable. They also provide a choice of alternative driving routes when one is blocked. In addition, the proliferation of "Complete Street" policies by municipalities, has led transportation planners and engineers to routinely design and operate the entire right of way to enable safe access for all users, regardless of age, ability, or mode of transportation.



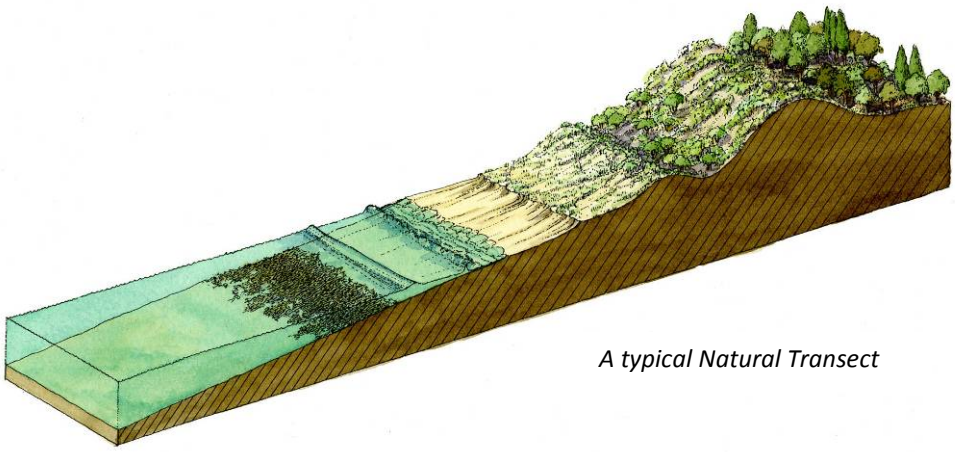


Lax or Inconsistent Regulations in Outlying Areas. Most open land that lies some distance from metropolitan areas is either free of land use regulation or only loosely regulated. Developers who do not want to be troubled with regulation on plan review are thereby encouraged to locate their projects in more remote locations. Differences in regulations within extraterritorial plat review areas can also prohibit or delay the approval of development projects.

From this material, sprawl replicates. Components of a community spread out and the public realm degrades. Historic buildings and districts decay because use-based zoning keeps them from adapting to societal changes. New development leaps to points further along the highway where there is less regulation and cheaper land. In this way the loss of open lands and the decay of downtowns are closely related. Conventional zoning ordinances, traffic engineering and road design, and subdivision regulations do not consider adequately the character of the environments to which they are being applied. Instead, one-size-fits-all requirements are universally mandated. This is a fundamental oversight that results in poor human and natural environments. In spite of six decades of such results, sprawl remains our predominant development pattern. The solution is context-based planning and design. In the Smart Code, that means transect-based planning and design.

BASICS OF THE SMART CODE

The Dubuque County Rural Model Smart Code is a transect-based code. A transect, in its origins (Von Humboldt 1790), is a geographical cross-section of a region used to reveal a sequence of environments. Originally, it was used to analyze natural ecologies, showing varying characteristics through different zones such as shores, wetlands, plains, and uplands. It helps study the many elements that contribute to habitats where certain plants and animals thrive in symbiotic relationship to the minerals and microclimate.



A typical Natural Transect

For human environments, such a cross-section can be used to identify a set of habitats that vary by their level and intensity of urban character, a continuum that ranges from rural to urban environments. Each environment, or Transect Zone (T-Zone), is comprised of elements that support and intensify its locational character. Through the Transect, planners are able to specify different urban contexts that have the function and intensity appropriate to their locations. For instance, a ranch house would undermine the immersive quality of a neighborhood center, whereas an apartment building would not. Wide roads and open swales find a place on the Transect in more rural areas, while narrow streets and

raised curbs are appropriate for urban areas. A deep suburban setback destroys the spatial enclosure of an urban street; it is out of context. These distinctions and rules don't limit choices; they expand them. This is the antidote for the one-size-fits-all development of today.

Based on local practices, most elements can be locally calibrated to contribute to the regional character of a given place. The essential task is to find the main qualities of the local environments. Once those are determined, Transect principles are applied to rectify the inappropriate intermixing of rural and urban character. Finding the proper balance between rural and urban elements results in places appropriate to every point of the spectrum, and sprawl conditions can be avoided or gradually repaired over time. Smart-Code elements are coordinated by these T-zones at all scales of planning, from the region through the community scale down to the individual lot and building.

The Transect is evident in two ways: (1) it exists as place and (2) it evolves over time. As place, the T-Zones display more-or-less fixed identifiable characteristics. Yet the evolution of communities over time is the unseen element in urbanism. A town may evolve into a rural hamlet and then into a city, its T-Zones increasing in density and intensity over a period of many years. Once adopted, the Smart Code stays in place, allowing urbanism to evolve and mature without losing its necessary foundation of order. It also ensures that a community will not have to scrutinize all proposed projects, because the intentions of the citizens will have already been determined in the process that leads to the code. The Smart Code is a comprehensive framework for that process.

HOW THE TRANSECT WORKS

The zoning system of the Dubuque County Rural Model Smart Code uses the natural-to-rural-to-urban Transect.

- The Transect is a framework that identifies a continuous range of habitats from the most natural to the most urban.
- The continuum of the Transect, when subdivided, lends itself to the creation of zoning categories.
- These zoning categories include standards that encourage diversity similar to that of organically evolved settlements.
- The standards specified by the zoning categories overlap, reflecting the successful ecozones of natural and human communities.
- The Transect integrates environmental and zoning methodologies, enabling environmentalists to assess the design of social habitats and urbanists to support the viability of natural ones.

SUMMARY: WHAT THE SMART CODE DOES

- It utilizes a type of zoning category that ranges systematically from the wilderness to the urban core.
- It enables and qualifies Smart Growth community patterns that include Clustered Land Development (CLD), Traditional Neighborhood Development (TND™), Regional Center Development (RCD), and Transit-Oriented Development (TOD).
- It integrates the scale of planning concern from the Regional Sector through the Community Sector, on down to the individual lot and, if desired, its architectural elements.

- It integrates the design process across professional disciplines.
- It integrates methods of environmental protection, open space conservation and water quality control.
- It integrates subdivision, public works and Transfer of Development Rights (TDR) standards.
- It provides a set of zoning categories common to new communities and to the infill of existing urbanized areas.
- It is compatible with architectural, environmental, signage, lighting, hazard mitigation, and visitability standards.
- It establishes parity of process for existing and new urban areas.
- It integrates protocols for the preparation and processing of plans.
- It encourages the efficiency of administrative approvals when appropriate, rather than decision by public hearing.
- It encourages specific outcomes through incentives, rather than through prohibitions.
- It specifies standards parametrically (by range) in order to minimize the need for variances.
- It generally increases the range of the options over those allowed by conventional zoning codes.

ELEMENTS OF THE SMART CODE

The Dubuque Rural Model Smart Code contains seven articles:

- Article 1 contains the general instructions pertaining to all other Articles.
- Article 2 prescribes how Regional Plans designate the Open Sectors intended for open lands and the Growth Sectors intended for development and redevelopment. It also prescribes what Community Unit types (i.e. subdivisions) belong in each Sector.
- Article 3 prescribes the requirements for New Communities (i.e. subdivisions), including the Transect Zones that make up each type.
- Article 4 prescribes the Infill requirements for areas already urbanized.
- Article 5 prescribes lot and building standards within each Transect Zone.
- Article 6 contains diagrams and tables supporting the other Articles.
- Article 7 contains terms and definitions supporting the other Articles.

The Smart Code is a unified planning ordinance that applies to three scales of land use. The three patterns are in a nesting relationship.

A. **Regional Sectors** contain designated types of Communities (Article 2).

B. **Community Units** contain designated ratios of Transect Zones (Articles 3 and 4).

C. **Transect Zones** contain the building elements appropriate to them (Articles 5 and 6).

1. Regional Scale:

"Sector" is a neutral term for a geographic area. In the Smart Code, six Sectors establish the locations where certain patterns of development are allowed. This system addresses preservation and development at the Regional scale. The Sectors are assigned as follows:

- **O-1 Preserved Open Sector** and **O-2 Reserved Open Sector** for protection of open lands
- **G-1 Restricted Growth Sector, G-2 Controlled Growth Sector,** and **G-3 Intended Growth Sector** for New Communities
- **G-4 Infill Growth Sector** for managed growth of existing urbanized areas.

2. Community Scale:

The Regional Sectors each contain one or more of the three basic Community Unit types (CLD, TND, RCD).

- **CLD - Clustered Land Development** (Hamlet, settlement, cluster) permitted in Growth Sectors G1, G2
- **TND - Traditional Neighborhood Development** (Village, neighborhood) –permitted in Growth Sectors G2, G3, G4
- **RCD - Regional Center Development** (Regional Center, town center, downtown) – permitted in Growth Sectors G3, G4

3. Transect Zones:

The Regional Sectors each contain one or more of the nine basic Transect Zones.

- **T-1 Natural Zone** consists of lands approximating or reverting to a wilderness condition, including lands unsuitable for settlement due to topography, hydrology or vegetation. Recreational trails may provide connectivity to other T-Zones.
- **T-2 General Ag. Zone** consists of sparsely settled lands in open or cultivated state. These include woodland, agricultural land, prairies, and grassland. Typical buildings are farmhouses, agricultural buildings, cabins, and limited single-family homes in low-density unplatted areas. May include agricultural related sales and service businesses and home occupations. Recreational trails may provide connectivity to other T-Zones. Lots are almost exclusively served by private septic and well utilities.
- **T-3 Rural Zone** consists of low density residential areas, in mostly platted subdivisions. Home occupations and outbuildings are allowed. Planting is naturalistic and setbacks may be relatively deep depending on the method of platting (i.e. conventional vs. cluster). Blocks may be large and the roads irregular to accommodate natural conditions. Homes may be clustered to preserve prime agricultural land, historic sites, or sensitive natural features. Recreational trails may connect subdivisions through preserved open space to higher density areas. Lots, unless part of a cluster development, are generally served by individual private septic and well utilities.
- **T-4 Rural Hamlet Zone** consists of a small settlement in a rural area with a mixed of residential, commercial, and civic uses. It may have a wide range of residential building types: single, duplex, and multi-family. Setbacks and landscaping are variable but generally closer than found in the Rural Zone. The presence of curbs is variable and blocks are medium-sized. Sidewalks, if present, may be located along only one side of the street. Recreational trails, or designated on-

road bicycle routes, may provide connectivity to other T-Zones. Lots may be served by either public or private sewer and water utilities.

- **T-5 General Neighborhood Zone** consists of a mixed-use but primarily single-family residential urban fabric. It may have a wide range of residential building types: single, sideyard, and rowhouses. Setbacks and landscaping are variable. Streets with curbs and sidewalks (usually on both sides of the street) define medium-sized blocks. Commercial uses and higher density residential development (i.e. duplexes, multi-family buildings, etc.) are generally on the periphery of the block or neighborhood along major thoroughfares. Commercial uses are compatible with the predominately single-family neighborhood and may feature second- or third-story apartments. Recreational trails, or designated on-road bicycle routes, may provide connectivity to other T-Zones. Lots, unless part of previous farmhouse, are almost exclusively served by public sewer and water utilities.
- **T-6 City Center Zone** consists of higher density mixed-uses that accommodate retail, offices, civic uses, rowhouses, and apartments. Single-family buildings may be present but are less prevalent. Uses may be mixed both within buildings (vertical mixed-use) and between adjacent buildings (horizontal mixed-use). It has a tight network of streets, with wider sidewalks (almost exclusively on both sides of the street), steady street tree plantings and buildings set close to the sidewalks. Recreational trails, or designated on-road bicycle routes, may provide connectivity to other T-Zones. Lots are exclusively served by public sewer and water utilities.
- **T-7 Urban Core Zone** consists of the highest density and height, with the greatest variety of uses, and civic buildings of regional importance. Residential uses include mostly rowhouses and apartments. Uses may be mixed both within buildings (vertical mixed-use) and between adjacent buildings (horizontal mixed-use). It may have larger blocks; streets have steady street tree planting and buildings set close to the wide sidewalks (exclusively on both sides of the street). Designated on-road bicycle routes may provide connectivity to other recreational trails or T-Zones. Lots are exclusively served by public sewer and water utilities.
- **SD Special Districts** consist of areas with buildings that by their function, disposition, or configuration cannot, or should not, conform to one or more of the seven normative Transect Zones. This may include, for example, an industrial plant which traverses many acres and includes several buildings.
- **Civic Zone** consists of existing or planned areas for Civic Buildings (CB) and/or Civic Spaces (CS) that are intended to be preserved in perpetuity and cannot, or should not, conform to one or more of the seven normative Transect Zones. This may include, for example, a college campus.

Calibrating the Smart Code for Individual Communities

The Dubuque Rural Model Smart Code was created as a model code for use by all cities in the County, and for the County's use. It is not persuasive and instructive like a guideline, nor is it intentionally general like a vision statement. It is meant to be law, precise and technical, administered by municipal planning departments and interpreted by elected representatives of local government. The Smart Code is inclusive of the types of growth sectors, communities, and transects found within the entire Dubuque County region. While the Smart Code has been calibrated to fit the general context of Dubuque County, implementation by local communities will require additional calibration to account for local preferences, character, and metrics. Smart Code calibration should be done with the input of the public and with the advice of urban planners, architects, civil engineers, and municipal attorneys. Of particular importance

will be the involvement of the Dubuque County Zoning Department. One of the goals expressed during the development of the model code was to create more consistent and transparent land use regulations across the entire County. Staff from the County Zoning Department should provide input in the implementation of local smart codes to ensure that calibrations do not create confusion with the broader structure this model ordinance establishes.

A. Application of the Smart Code

In general, communities may decide to apply the Smart Code in one of three ways:

1. As a stand-alone zoning code which applies to all areas within the jurisdiction of the municipality, replacing the existing traditional zoning ordinance; or
2. As a stand-alone zoning code which applies only within certain areas or undeveloped portions of the municipality. Existing developed areas would continue to follow the community's traditional zoning ordinance; or
3. As an alternative overlay zoning code which applies to certain portions of a municipality, either by right (i.e. a developer may elect to submit a development proposal under the Smart Code in-lieu of traditional zoning ordinances) or by law (i.e. required by the municipality for new development, existing development would follow the traditional zoning ordinance).

Decisions regarding the application of a locally calibrated smart code should be done with the assistance of the Municipal Community Development Department, Dubuque County Zoning Department, municipal attorneys, and professional planners, architects, and civil engineers.

B. Formation of Articles under the Smart Code

The Articles of this Smart Code are modular and may be discarded or reassembled for different purposes.

- All codes will require the inclusion of **Article 1 General To All Plans, Article 6 Standards & Tables** and **Article 7 Definitions of Terms.**
- If a Regional Plan has already been prepared, or if the code will be used entirely for Infill situations, **Article 2 Regional Scale Plans** may be eliminated.
- If a Community Scale plan has already been prepared, or if there is no prospect of greenfield development, **Article 3 New Community Scale Plans** may be adjusted or eliminated. (Note: Article 4 depends on Article 3 for larger Infill parcels.)
- If an Infill Community Plan already has been prepared or if there is no prospect of Infill development, **Article 4 Infill Community Scale Plans** may be eliminated.
- If and when all plans have been prepared, **Article 5 Building Scale Plans** becomes the de facto code for builders and architects. This Article may be used by developers as the guidelines for their private property owners association.
- A calibrated Smart Code for a municipality should include some thoroughfare standards and large-site provisions even if Article 3 and/or Article 4 are not used. Portions of Section 3.7 and Article 4 may be incorporated into Article 5 or a new Article created for **Thoroughfare Standards** or **Public Space Standards.**
- In **Article 6,** tables may be individually dropped or modified as necessary.

- In **Article 7,** definitions that do not apply should be deleted, and any necessary new ones added. Note that any term in the text of the Smart Code that is dependent on a specific Definition in Article 7 is capitalized.

Portions of text that should be considered for alteration appear in **teal** in this model code, other portions of the text may be considered for alteration as needed. Care should be taken when considering modifications to the standards of the model code so as to not erode the purpose and intent for which the model code is created. Calibration of the Articles within the Dubuque County Rural Model Smart Code should be done with the assistance of the Municipal Community Development Department, Dubuque County Zoning Department, municipal attorneys, and professional planners, architects, and civil engineers. If a local Comprehensive Land Use Plan, or a component Master/Neighborhood/Corridor Plan, has been created, these plans should be consulted and used as the basis for local calibration of the Smart Code. After going through the process to calibrate the Smart Code municipalities may find it necessary to make minor amendments to their existing comprehensive plans to maintain consistency between community plans and ordinances.

C. Code Adoption

The adoption of the Smart Code involves the same legal requirements as adoption of traditional zoning ordinances. The adoption process depends upon extensive community involvement and consideration by local authorities and agencies. Typically, the process would be initiated by and coordinated through the local Plan Commission. The Smart Code must be presented to and supported by the Planning/Zoning Office (if one exists), the Mayor and the local Legislative Body. Local counsel should be consulted for advice. As with any proposal involving a change to the status quo, it is necessary to educate those involved or affected, to reach a consensus that the proposal has merit. Educational materials, meetings, conferences and seminars are all useful for these purposes. To support enforceability of the Smart Code, keep a record of the preliminary and adopting proceedings, including a detailed legislative record.

A zoning ordinance must meet the standard established in *Village of Euclid* and later cases, making clear connections to health, safety, general welfare, transportation, environmental, conservation and other important objectives. In many cases, the "general welfare" portion of the SZEA may suffice for the adoption of the Smart Code. Although the Smart Code's emphasis on form may make its purpose seem aesthetic *only,* its basis is not aesthetic. In any event, the U. S. Supreme Court has affirmed aesthetics as reason enough to exercise the police power for the general welfare; however, some jurisdictions may still require other benefits to uphold an ordinance containing aesthetic elements or effect. In this case, include in the Intent Section 1.2, a provision regarding the benefits and policies derived from and served by the Smart Code, such as environmental protection, land and energy conservation, safety, reduction in traffic congestion, improvement of transportation, health benefits of the pedestrian lifestyle, historic preservation, convenience, educational benefit, reduction in wasted public funds, and the economic benefits of using existing infrastructure.

D. Responsibilities for Implementation & Enforcement

Once adopted, implementation of the Smart Code will usually fall upon the municipal planning/zoning staff. If a community has no existing staff, implementation could be contracted to private professional planners or could be provided by other municipal planning/zoning staff through an intergovernmental agreement. Implementation and enforcement of the Smart Code will require similar record keeping as traditional zoning codes.

E. Relationship to State and Federal Regulations

There are several sections of the Smart Code that may not be fully enforceable because they are already subject to state or federal oversight, including accessibility, storm water, environmental and riparian regulation. Consider removing them in part or in their entirety. A few elements of the Smart Code are so widely unavailable that they should only be considered aspiration. For example, the Smart Code presents the important dual concept of increasing the regulatory flexibility of environmental constraints in Growth Sectors while reducing that flexibility in the Reserve and Preserve Sectors. While local government may restrict permitting in conservation zones, it does not typically control the federal and state agencies that set standards. Thus, it cannot by ordinance ease these regulations. The locality can, however, work with the relevant agencies to implement regional permitting plans, or even pre-permit areas for intensive development, to essentially the same end.

Example Approach to Calibrating the Smart Code for an Individual Community

The following provides an abbreviated approach for calibrating the Smart Code for use by individual communities. Note, that absent from this section are the numerous individual tasks, meetings, conversations and interviews (both formal and informal), which will be necessary to complete the project. In addition, the effort required to adapt this Dubuque County Rural Model Smart Code for local use will vary significantly by community size and complexity - small cities such as Bankston, Durango, and Sageville should be able to proceed with a relatively simple and straightforward approach, while larger cities will likely prefer a more extensive process.

A. Phase One: Public Participation Plan

At the outset of the project the local community should prepare a public participation plan outlining the planning process and how the public will be kept informed and invited to participate in the decision-making process.

B. Phase Two: Visual Preference Survey, Data Collection & Analysis

Prior to calibrating the model code, both a visual survey and a review of existing community plans should be completed. Reviewing the latest aerial photography and performing a visual inspection of the project area will help to identify locations that could be representative of the model Transect Zones of the code to be written. Reviewing existing comprehensive plans, transportation plans, and utility service area plans will also inform both the development of the Regional Growth Sector and Transect Zoning Maps. These desktop and field surveys should also be supplemented with conversations with professional planners and engineers from local, county, and regional federal offices.

C. Phase Three: Calibrate the Model Smart Code

The information gained during Phase II, along with public input, will serve as the basis for determining how to calibrate the model Smart Code to fit the particular needs of the community, including how the Smart Code will be applied within the municipality.

D. Develop Regional Growth Sector and Transect Zoning Maps

After determining how the model Smart Code will be modified to fit the local context, Regional Growth Sector and Transect Zoning Maps can be created using the model symbology described within this Introduction. Community Types will be identified for each Regional Growth Sector. Initial Regional Growth Sector and Transect Zoning Maps should be developed with the aid of professional planners using the latest geographical informational systems (GIS) data. Public design charrettes can be used to involve the public in modifying the initial maps into a preferred alternative.

E. Draft Review

The draft Smart Code and associated maps should be reviewed by area professionals and the public in order to refine the code prior to adoption.

F. Code Adoption

Following a statutory required public hearing, the local Plan Commission will provide the local legislative body with a recommendation regarding the approval of the Smart Code. Prior to the local legislative body taking action the Smart Code should be reviewed by the municipal attorney.

Regional Growth Sector and Transect Zoning District Mapping Colors

This model Smart Code provides a set of Regional Growth Sector and Transect Zoning District mapping colors to permit consistent mapping layouts within all local and County maps. Using one consistent color scheme will permit developers, professional, and the public to quickly and accurately understand the development preferences from one community to the next. The colors have been picked to purposely avoid the common traditional zoning land use colors (i.e. yellow for single-family). This will also permit the ability to combine transect zoning maps with traditional zoning maps for those communities who adopt the model Smart Code as an additional zoning or overlay zoning option.

Regional Growth Sector and Transect Zoning District Colors

Regional Growth Sectors

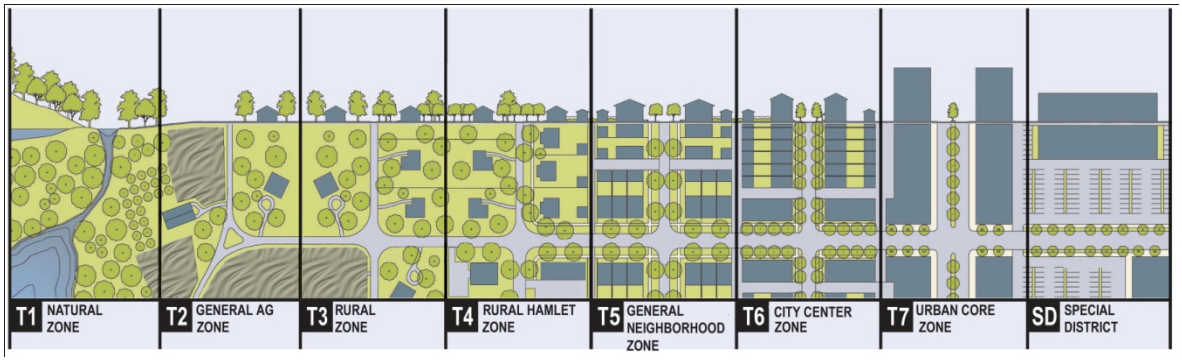
	O1	O2	G1	G2	G3	G4	SD
	79	194	245	232	255	151	127
RGB	98	214	248	199	192	72	127
	40	154	171	96	0	7	127

Transect Zoning Districts

	T1	T2	T3	T4	T5	T6	T7	SD	CB	CS
	79	194	229	178	121	63	15	127	0	0
RGB	98	214	224	161	48	49	37	127	176	255
	40	154	236	199	160	81	63	127	240	0

Summary Outline of the Smart Code

	ARTICLE 2 REGIONAL SCALE PLANS	ARTICLE 3 & ARTICLE 4 COMMUNITY SCALE PLANS		ARTICLE 5 BUILDING SCALE PLANS
	A. Regional Sector	**B. Community Unit**	**C.Transect Zones**	**Standards**
Open Lands	O1 Preserved Open Sector	None	T1 Natural Zone T2 General Ag Zone	Building Disposition Building Configuration Building Function Density Calculations Parking Standards Landscape Standards Signage Standards Supplementary Modules
	O2 Reserved Open Sector	None		
New Development	G1 Restricted Growth Sector	CLD Clustered Land Development	T2 General Ag Zone T3 Rural Zone T4 Rural Hamlet Zone	
	G2 Controlled Growth Sector	CLD Clustered Land Development	T3 Rural Zone T4 Rural Hamlet Zone T5 General Neighborhood Zone	
		TND Traditional Neighborhood Development	T4 Rural Hamlet Zone T5 General Neighborhood Zone T6 City Center Zone	
	G3 Intended Growth Sector	TND Traditional Neighborhood Development	T4 Rural Hamlet Zone T5 General Neighborhood Zone T6 City Center Zone	
		RCD Regional Center Development	T5 General Neighborhood Zone T6 City Center Zone T7 Urban Core Zone	
Existing Development	G4 Infill Growth Sector	INFILL TND Traditional Neighborhood Development	T4 Rural Hamlet Zone T5 General Neighborhood Zone T6 City Center Zone T7 Urban Core Zone	
		INFILL RCD Regional Center Development	T6 City Center Zone T7 Urban Core Zone	
Other			CB Civic Building CS Civic Space	
		SD Sprcial Districts	SD Sprcial Districts	



NOTES

The following section provides notes pertaining to particular portions of the Dubuque County Rural Model Smart Code. These notes are included within this manual to assist with local calibration of the Smart Code. Care should be taken when considering modifications to the standards of the model code so as to not erode the purpose and intent for which the model code is created. In addition, the Center for Applied Transect Studies has commissioned a number of transect-based Modules from prominent New Urbanist practitioners. Modules consist of additional policies, tables, and notes pertaining to particular subject matters which can be inserted and calibrated into local codes. This base Smart Code includes information from some of the available modules such as the Incentives, Flood Hazard Mitigation, Natural Drainage, Renewable Resources, and Sustainable Urbanism Modules. The notes corresponding to these additions can be identified by their **green** text. They have been inserted to help facilitate the goals of the Dubuque County Smart Plan and the Iowa Smart Planning Principles. They may also be considered for adjustment during local calibration.

ARTICLE 1. GENERAL TO ALL PLANS

1.1 Authority

This section establishes the authority for the Smart Code, as well as its relationship with any Master or Comprehensive Plan and the relevant state zoning and subdivision enabling statutes. The Code must be synchronized with the existing governance by adjusting the paragraphs or terms in **teal** print. It is important to recite the basis of the state statutory authority, and analyze the enabling statutes and case law regarding zoning and subdivision matters. It is important not to be overly conservative in melding authorities, because there have rarely been risk-free Codes; an overly conservative attorney for a jurisdiction can completely gut the effectiveness of the Smart Code in trying to completely eliminate risk.

1.2 Applicability

This section describes how the Smart Code is related to local Codes and ordinances. Because the Smart Code is a complete zoning and development Code in and of itself, it could be adopted by a jurisdiction as its sole zoning and development Code; however, jurisdictions may adopt portions of this Code as an option for the developer or owner, replacing the conventional zoning code. In either case, modification of this provision should be considered carefully to assure that the intended relationship between any existing zoning ordinance and the Smart Code is clearly established. Thus the Smart Code is optional but incentivized (with the exception of Article 4; see 4.1). This is recommended practice if no code exists. The attempt to create a single Code may result in a compromise of the standards to the extent that the built outcome may not be worth the effort.

1.2.3 In case of a conflict between Existing Local Codes and the Intent section of the Smart Code, it could be necessary to resolve the matter by using either the Special Permission or Variance procedure provided in Section 1.5.

1.2.4 By negative implication, this section may leave open the question whether definitions appearing in the existing zoning Code, but not appearing in the Definitions Section of the Smart Code, exactly apply to terms used in the Smart Code. The terms of the existing Code must be analyzed in conjunction with the Smart Code, to avoid unintended results. Throughout the Smart Code, terms that are defined

specifically in this Code are capitalized, to help clarify which of multiple meanings are intended. Take note of this subsection, as not all Codes perform in this manner.

1.3 Intent

This section establishes the intent of the Smart Code. The policies listed in this section are derived from the Charter of the New Urbanism, with modifications. They should be replaced with the provisions of a local comprehensive plan if one exists. It may also be possible to use this section with only minor modifications, as the provisions of recent comprehensive plans have usually coincided with these policies. Not all "intents" are appropriate for all jurisdictions. Intent is also used by courts in interpreting ordinances. This section may be adopted as policy when a jurisdiction is beginning the process of considering a Smart Code along with removing impediments to it. Some of these intents, such as holding Infill and redevelopment in parity with new communities, integrating with the existing urban pattern, distributing affordable housing, and preserving transportation corridors, among others, need stakeholder buy-in and a clear political commitment. This section also serves as a reference for amendments, Variances and other decisions. It is useful in determining whether a deviation from the Code requires a Special Permission or a Variance (see Section 1.5).

1.4 Process

1.4.1 The Consolidated Review Committee (CRC) is intended to serve at least three important functions. First, it simplifies and expedites permitting by providing the developer with a single interface with the various regulatory agencies that oversee applications. This integrated permitting system avoids the separation of the various professional disciplines involved in the design of a project, one of the contributing factors to sprawl development. Second, applications for projects that comply with the Smart Code are approved in an administrative process by the CRC, rather than a full public hearing process before the full legislative body of the municipality. Finally, as noted in 1.5, the Smart Code sets up a two-pronged process for deviations from the Code, whereby Special Permissions are handled administratively by the CRC, rather than requiring approval by the Board of Appeals. The role played by the CRC encourages owners and developers to employ the Smart Code option. These provisions smooth out the permitting of projects. They also free the planning commission and the legislative body for higher purposes than the granting of minor Variances. It is not essential to the Smart Code that the permitting process be improved, but it can be a valuable and effective incentive. Sections 1.4.1 to 1.4.4 may be eliminated if the existing process is to remain, or modified to include the appropriate mix of professional representation. Membership within the CRC should be approved by the legislative body.

1.4.2 It is crucial that Smart Code projects are not subjected to a more difficult process, i.e. a higher level of public scrutiny, than conventional suburban projects which are processed "as of right." This statement levels the playing field. It determines that this Code will be adopted through a public process. If this will not be the case, then the statement should be removed.

1.5 Special Permissions and Variances

1.5.1 Sections 1.5.1 to 1.5.5 determine two levels of deviations from the Code—Special Permissions, which may be handled administratively, and Variances, which should be conventionally handled through the public process. This parsing spares the elected officials the aggravation of discussion of minor matters. The determination of whether a request requires a Special Permission or a Variance is based on the Intent Section.

1.5.2 Administrative requests (here "Special Permissions") must be within delegated authority, typically with clear parameters of such authority. There is substantial precedent for such Special Permissions in the subdivision approval process, public right of way encroachment committees and Zoning Director "opinions." A Special Permission should not be referred to as a Variance. True Variances are typically regulated by state law, which dictates who can grant them, under what circumstances, using what standards. These standards often include that there be a hardship that is not self-imposed and that the circumstance being changed is not commonly found.

1.5.5 The five items listed here are important ones that tend to be discarded by many developers wishing to execute only the superficial characteristics of Smart Growth. Variances granted against these standards tend to seriously subvert the desired outcome of compact, walkable and diverse communities. Developers unwilling to comply with these provisions should use the existing local code and not exercise the Smart Code option. To compromise on these issues will ultimately subvert the intentions and good name of Smart Growth and result in disappointing subdivisions with none of the benefits resulting from these provisions.

This is a very important provision but it may have unintended consequences. It was created as a self-imposed limit on giving up some of the benefits of the Smart Code in order to prevent developers from voluntarily (or under pressure from Neighborhood groups) sacrificing these benefits, affecting future occupants of the land. Pursuant to this provision, even if you wanted to, you could not reduce your allowable Density, change permitted ratios of Residential and commercial, increase parking, give up ancillary apartments etc. Thus, even if the Retailers want more parking, they may not be able to have it. Even if the fire marshal demands a wider street section, it cannot be given. This can sometimes foreclose reasonable compromise.

1.6 Succession

1.6.1 Once adopted the Smart Code should not be continually amended or adjusted as the standard response to development proposals that do not fit the Smart Code. However, since one of the intentions of this Smart Code is to facilitate infill and redevelopment it is appropriate to consider that over time Sectors or Transects may/should transition to the next successive zone. Another time period (besides ten years) is an option, should this section be included. This section enables the growth of a region or a community in a more orderly manner than through Variances and spot zoning.

1.7 Incentives (Additional code insertion from the "Incentives SmartCode Module")

If the Smart Code is adopted as a parallel code (i.e., mapped and available as an option by right, with the old code also available), or as a floating zone (unmapped, a code without a regulating plan), it is advisable to incentivize its use. Each of these provisions should be discussed and accepted dependent on local circumstances, for they may not prove to be true incentives, nor politically feasible.

1.7.1 The phrase "to the extent authorized by state law" should be superfluous in a properly calibrated code. It should be possible to determine whether the municipality can legally grant an incentive. Subsections (a) through (h) are types of incentives that have been used in various jurisdictions, but the calibrator should not avoid research and wordsmithing, while being aggressive and creative.

1.7.1a Whether a public hearing is required or optional is typically a matter of state law. For the Smart Code, the ideal process concludes that the required hearings were, in effect, complied with in the process of the adoption of the code by the Legislative Body. Therefore if a plan follows the code without need of Special Permissions or Variances, it has been effectively approved under the authority of the code-approval hearings. These conditions must therefore be verified by an attorney. Many state codes have mandatory time periods in which applications must be heard. Care must be taken not to delay non-Smart Code projects past those deadlines.

1.7.1 g & h Tax relief is specific to local authority.

1.8 Affordable Housing Incentives (Additional code insertion from the "Incentives SmartCode Module")
See also the notes for 1.7.1a, g & h above. Other incentives may be added particular to the local situation. For example, if there are oversized lots in an area where the community supports adding affordable housing, a subdivision incentive may be possible, whereby a property owner can create a substandard lot if it is dedicated to a deed-restricted affordable unit. Municipalities may want to specify a percentage of affordable housing after which the incentives would apply. It is important to design affordable units so that there is no discernible outward difference between them and nearby market rate units.

1.9 Pre-Existing and Post-Emergency Conditions (Additional code from the "Flood Hazard Mitigation SmartCode Module")

ARTICLE 2. SECTOR SCALE PLANS

2.1 Instructions
This section introduces the requirements for Sector Plans. The model code features two Open Sectors for the preservation of open space, and four Growth Sectors for development. Article 2 also contains provisions for Special Districts for Types of development that cannot conform to the standards of this Code, such as institutional campuses, refineries, and airports.

2.2 Sequence of Sector Determinations

2.2.4 Smaller cities within Dubuque County may find that there are no areas appropriately suited for the Intended Growth Sector (G3). If this is the case, local calibration of the Smart Code should eliminate references to the Intended Growth Sector, but should not renumber the Infill Growth Sector from G4 to G3, so as to maintain consistency with other Smart Codes in the County.

2.2.5 The Smart Code allows permitting under the jurisdiction's existing zoning ordinance as an option. Note that if the Code is instead adopted as the exclusive zoning ordinance, permitting under the existing Code would not be available and the Smart Code would need to be modified to take that into account.

2.2.6 When allocating the Special Districts, consider existing conditions that do not conform as well as projected designs but are justified. College campuses, hospitals, airports, and some industrial districts like the John Deere Factory are examples of justified districts. Most single-use suburban zoning (housing subdivisions, office parks, apartment clusters, shopping centers and shopping malls) are unjustified

districts. Unjustified Districts should be considered for Infill development so that they conform to standard Transect Zones if possible. Both justified and unjustified Special Districts require Variances. Special Districts may be handled at this Sector scale or at the Community scale or both. Generally, development that is vast in scale like an airport should be mapped at the Sector scale.

2.2.7 The Transfer of Development Rights (TDR) system may be carried out by the initiative of private-sector realtors or market-rate fees.

2.3 (O-1) Preserved Open Sector

The O-1 Sector is casually called 'The Preserve." It is one of two Open Sectors (see 2.4). There is no principle building development permitted By Right in the O-1 Sector. Protection of Preserved Open lands generally occurs by environmental regulation or conservation measures, such as purchase of the property by a land trust, grant of a conservation easement, or the sale of development rights to the property. The adopting jurisdiction should consider what other sorts of areas should be included in their Preserved Open Sectors, and provide for the same under paragraph 2.3.2. As this Sector is intended to be permanently protected from development, any development or construction within the Sector must be in accordance with legislation adopted by federal, state, or local Legislative Bodies.

2.3.2 Although the Preserved Sector is "open space protected from development," it includes transportation corridors and residuals to cluster open space (leftovers) which allow certain types of development, typically accessory uses/structures for agricultural, recreational, or transportation purposes By Special Permission.

2.3.3 Provides that "development and construction" within this Sector is determined on an individual project basis in the Legislative Body's public hearing. This may be clarified to focus on what is permitted to be built- roadside rest areas? agricultural buildings? sand and gravel processing plants?

2.4 (O-2) Reserved Open Sector

The O-2 Sector is casually called 'The Reserve." It is one of two Open Sectors (see 2.3). Building development permitted By Right in the O-2 Sector is generally limited to agricultural buildings, farmhouses, and accessory uses. The adopting jurisdiction should consider what other sorts of areas should be included in their Reserved Open Sectors, and provide for the same under paragraph 2.4.2.

2.4.3 The Reserved Sector is open space that is "not yet protected from development". Typically this would be true of a TDR sending area. Development would be precluded, but to provide economic compensation the sale of credits would be allowed. The TDR system may be carried out by the initiative of private-sector realtors for market-rate fees. The Transfer of Development Rights is an important tool for enabling land in the O-2 Reserve to become O-1 Preserve in perpetuity. However, in many jurisdictions there are more sending areas (O-2) than Growth areas available to receive these TDRs. If the likely sending area supply will vastly outstrip the receiving area demand, you may consider alternatives such as the following paragraph. The goal is to preserve as much O-2 as possible.

Sample of alternate or additional language for preserving open space in the Reserve Sector: "For each acre developed in the O-2 Reserve Sector a developer shall purchase 3 acres and permanently assign those acres to the O-1 Preserve Sector by conservation easement. The receiving area shall be located within 1.5 miles of the developed area."

2.4.4 Additional code insertion from the "Flood Hazard Mitigation SmartCode Module"

2.5 (G-1) Restricted Growth Sector

The Restricted Growth Sector is usually rural in nature and consists of existing open space/agricultural land that is valuable as open space, but is neither permanently protected from, nor could be permanently protected from development (i.e. either because the zoning has already been granted or because there is no legally defensible reason, in the long term, to deny it). Therefore, the Restricted Growth Sector generally consists of undeveloped areas within or adjacent to existing municipal boundaries, or existing rural subdivisions, that are appropriately suited for new residential development with a limited amount of business development which is compatible with residential development or agricultural uses. New community development is in the pattern of Clustered Land Development (CLD)s, defined as "incomplete neighborhood[s], standing free in the countryside, which by virtue of a location away from transportation, may have a weak center" and consisting of "no more than one Standard Pedestrian Shed with a high portion of its site initially assigned to the Transect Zone T-2 (General Agricultural).

2.6 (G-2) Controlled Growth Sector

The Controlled Growth Sector generally consists of undeveloped areas within or adjacent to existing municipal boundaries that are appropriately suited for new mixed-use development. In (G-2) the Controlled Growth Sector, communities in the pattern of Traditional Neighborhood Development (TND)s are permitted By Right, in addition to Clustered Land Development (CLD)s. A "Traditional Neighborhood Development (TND)" is defined as a "community consisting of one or more Pedestrian Sheds plus a mixed-use center or corridor."

2.7 (G-3) Intended Growth Sector

The Intended Growth Sector generally consists of undeveloped areas within or adjacent to existing municipal boundaries that encompass an existing or proposed transit stop or major thoroughfare and are intended for a greater mix of high density residential development and higher intensity business developments. In the Intended Growth Sector, Regional Centers (RCD) are permitted By Right, as are TNDs. Note, some cities within Dubuque County may find that the G-3 Intended Growth Sector does not fit within the context of their community at the time of adoption. If this is the case, local calibration of the Smart Code should eliminate references to the Intended Growth Sector, but should not renumber the Infill Growth Sector from G4 to G3, so as to maintain consistency with other Smart Codes in the County.

2.8 (G-4) Infill Growth Sector

The Infill Growth Sector generally consists of developed areas within existing municipal boundaries that could be redeveloped into higher intensity uses (from residential to commercial or mixed-use) or into higher density uses (single-family to multi-family residential). The lnfill Growth Sector may consist of traditional urbanism and/or conventional suburban developments. Both are subject to Infill or revitalization according to Article 4. Such areas may include conventional suburban developments, greyfield and brownfield sites, and historic urban areas.

2.9 (SD) Special District Sector

Some areas or structures may not conform to the normal requirements of any of the seven Sectors. These must be assigned Special District designations and coded on Table 16. Note that the Smart Code covers Special Districts at both the Sector scale and the Community scale. Conditions can be determined in a public hearing like a traditional Planned Unit Development (PUD).

ARTICLE 3. NEW COMMUNITY SCALE PLANS

3.1 Instructions

3.1.1 A developer may elect to proceed under Article 3 when the Smart Code is adopted as an overlay option or use the existing zoning ordinance. Refer to Section 1.2.

3.1.4 Although Incentives are covered in paragraphs 3.1.2 of the Code, one of the greatest incentives under the Code that is not listed as such is the following: If the Article 3 New Community Plan is of a Type that (a) is permitted by right under the Smart Code, (b) corresponds to the applicable Sector of the Regional Plan in which the subject property is located, and (c) complies with the provisions of the Smart Code, the Plan is entitled to be considered for administrative approval by the Consolidated Review Committee. That process expedites and simplifies Plan review because the public hearing process will already have been completed when the Smart Code was adopted by the Legislative Body

3.3 Community Unit Types

This section sets out the various specific requirements for New Community Plans for the three basic Types of Communities permitted by right in the four Growth Sectors. These requirements include the size parcels and the Pedestrian Shed types. See Article 2 and Table 2 in the Code, and Outline of the Code in the Appendix, for the Sector/Community relationships. Note that the Smart Code covers Special Districts at both the Sector scale and the Community scale. If, during the Community mapping phase, areas are identified that do not, should not, or cannot conform to one or more Transect Zones, assign them Special District status.

3.4 Transect Zones

The same Transect Zones can be used for both New and Existing (Infill) Communities. The Planning Office should determine the placement of these Zones, for approval by the Legislative Body. The Transects available for inclusion in a New Community Plan are:

- T-1 Natural - open space that is mostly natural or untended, generally without buildings
- T-2 General Agricultural - open space that is mostly cultivated, usually with a few scattered buildings
- T-3 Rural - the least dense of the residential areas (home occupations allowed)
- T-4 Rural Hamlet – a small area of mixed residential, commercial, and civic uses usually at a crossroads, surrounded by predominantly T-1 and T-2 Zones
- T-5 General Neighborhood – mostly single-family detached residential, mixed with higher density residential uses and detached residential buildings. Mixed uses are allowed along the periphery of the block or neighborhood along major thoroughfares.

- T-6 City Center - the more dense, primarily mixed use area (typically located near the center of a Pedestrian Shed or small community downtown business district)
- T-7 Urban Core - the most dense business, cultural and entertainment area of a large city.
- SD Special District - areas with buildings that by their function, disposition, or configuration cannot, or should not, conform to one or more of the seven normative Transect Zones

3.5 Civic Zones

Civic requirements proactively support the creation of a public realm, with the emphasis on the design of public space. Note that Civic Space and Civic Buildings are treated as Functions in this Code, not as a Civic Zone overlay. Standards should be written specifically for them, using Table 13 as a guide to Civic Space. The difference between Civic Space and a T-1 Natural Zone is that the former may be designed subject to community standards, while the latter is used to identify natural places that are not designed or tended, such as forest residual to developed areas. For example, Central Park in New York is a large Civic Space (a Park) within T-7, which was designed. It is not T-1 next to T-7. Thinking about natural areas in cities this way enables communities to guide the character of their parks, greens, plazas, squares, ball fields, and playgrounds. This section does provide for portions of the T-1 Zone within a development parcel to be counted as part of the 5% minimum Civic Space allocation.

3.5.1f Additional code insertion from the "Renewable Resources SmartCode Module"

3.5.2b Additional code insertion from the "Flood Hazard Mitigation SmartCode Module"

3.5.3i Additional code insertion from the "Renewable Resources SmartCode Module"

3.5.4b Typically the area of a school site will be set by state standards. Variance from the standards is sometimes up to a School Board and not the Legislative Body. Depending on the ages involved, playing fields may be required to be next to the school.

3.5.4d The Code limits Civic Building sites to a percentage of each Pedestrian Shed, not because such sites aren't important, but to maintain a diversity of uses within each Pedestrian Shed, to maintain walkability, and to better distribute Civic Building sites throughout the entire New Community Plan.

3.5.4e The recommendation that Civic Buildings be located either within or adjacent to Civic Spaces or at the axial termination of significant Thoroughfares reflects the importance of these places.

3.7 Thoroughfare Standards

Regulation of the Thoroughfare is crucial to the establishment of a vibrant public realm, one of the highest priorities of New Urbanism, Smart Growth and the Smart Code itself. This section applies to provisions specific to each Transect Zone. Again, the variables reflect the range of natural and urban conditions. The Thoroughfare element of streetscape planning is likewise essential to the creation of a walkable community. People will walk in an environment only to the extent that they feel comfortable doing so. For instance, if they perceive a street as being too wide to cross safely, they will not cross it. Nor will they walk into or next to a street that they feel endangers them because the traffic is moving too fast. Pedestrian concerns should take priority in the more urban Transect Zones (T5-7).

3.7.1b See Tables 3A-B and 4A-B for Thoroughfare standards. In each Transect Zone there may be several Types allowed (see also Table 14) depending on the character and Function of the buildings.

Designations such as Rural Boulevard and Urban Boulevard may change along a single Thoroughfare as its character changes. In the T6 and T7 Zones, curbs should be required to protect the pedestrian.

3.7.1f The Code encourages networks and discourages cul-de-sacs for two reasons, (1) to slow dangerous traffic and (2) to create multiple routes for moving through a neighborhood, which dramatically reduces traffic congestion. The street design of conventional suburban development, with its cul-de-sacs and collector roads, increases both congestion (as cars back up to exit onto the lone collector from a neighborhood) and high-speed driving on wide, curving streets and multi-lane collectors. Note it is advisable to work closely with public works and emergency officials before and during the public process to show that narrower streets can be safer streets, and that street networks are better than cul-de-sacs and collectors for the timely movement of emergency vehicles and street equipment. Cul-de-sacs are generally permitted only when natural features prevent the use of connecting streets.

3.7.3 The range of Public Frontages enabled by the Smart Code is greater than those allowed in conventional codes. This variety contributes to a more visually interesting public realm.

3.7.3c(iv-vii) Additional code insertion from the "Natural Drainage Standards SmartCode Module".

3.8 Density Calculations

This section operates by referencing Table 14 (Summary Table), and Tables 10 and 11 (Building Function/Parking Calculation), and Section 5.9 the Density requirements at the Building Scale. If the Plan calls for Lodging, Office, or Retail, they are exchanged for housing units in making the Density calculations (Section 3.8.4). The exchange is subject to approval as a Special Permission, and cannot exceed in any event 50% of the total number of housing units permitted for the applicable Transect Zone. The Density calculations, which are inherently complex, operate at the Community Scale, while a further determination of local Density occurs at the Building Scale in Section 5.9. These calculations reflect the necessary and desirable complexity of urbanism (as opposed to zoning). They allow adjustment according to the site and market conditions. The sequence of calculations is as follows:

1. In the process of preparing the Community Plan, allocate an area of land to each Transect Zone as permitted by Table 14. These parameters establish ranges which, once the plan is complete, become fixed allocations appearing on the permitting documents, both graphically on the plan and as the number of acres of each Transect Zone.

2. Using the acreage of these Transect Zones, calculate from Table 14 the Base Residential Density in terms of Residential units. Note that the "By-Right" Density is much lower than the "By TDR" Density. This encourages the purchase of Transferable Development Rights, if enabled, in order to achieve the higher allowable Density. (See Section 2.2.7 and 2.4.3 for more on TDR.)

3. Establish the requisite degree of mixed use by translating a ratio of the Base Residential Density to "Other Functions" as determined on Table 14 and Section 3.8.5. These Densities become part of the permit, appearing as fixed numbers and allocated by Transect Zones on the Community Plan.

4. Subsequently, when the lots and buildings are being designed according to Article 5, the localized Density is determined as follows:

a. The required parking for each category of Function appears on Table 10. These also apply to the subcategories of Table 12. For those Functions that are not covered, the parking is calculated by Special Permission.

b. Table 11 (Required Parking) summarizes the parking requirements of Table 10. This determines the amount of parking required for each site, or, conversely, the amount of buildings allowed on each site given the parking available.

c. In the event of mixed use (defined as two dissimilar Functions occurring within any two adjacent blocks), the actual parking required is calculated by adding the total number of spaces required by each separate Function and dividing the total by the appropriate factor from Table 11 (Sharing Factor).

An example of this calculation: The Residential Function requires 10 spaces while the Office portion requires 12 spaces. Independently they would require 22 spaces, which when divided by the sharing factor of 1.4, they would require the provision of only 16 spaces. Therefore, the actual number of spaces required is 16, while the effective number of spaces is 22. A second way to calculate: If there is a total of 22 spaces available for Residential and Office, multiplying this by the factor 1.4 gives the equivalent of 30 spaces. Then buildings are allowed that correspond to 30 parking spaces. In this second example, the actual number of spaces required is 22, while the effective number of spaces is 30. This might allow a mix of 10 residential units and 3,333 SF of office space.

3.9 Special Requirements

These are tools of greater refinement, including several to manage and reduce the negative environmental impacts of development. If included in an adopted code, they must appear in specific locations on Regulating Plans. These are recommended but not essential to the operation of the Smart Code; however, they are not usually controversial, so should not be difficult to include. If there is concern about the impact of these requirements on property owners, those requirements deemed onerous can be downgraded from requirements “shall” to recommendations “should”.

3.10 Zero Net Energy Buildings (Additional code insertion from the “Sustainable Urbanism SmartCode Module”)

This section activates Table SU1, Table SU2, and Table SU3. The Architecture 2030 Challenge, which has been put forward by the non-profit organization Architecture 2030 (www.architecture2030.org) is used in those tables as a benchmark goal for building energy use reduction. It proposes that all new buildings produce no greenhouse gas emissions by the year 2030. Buildings are responsible for 48% of all energy consumption in the United States, making them the single largest contributor to greenhouse gas emissions. The baseline to establish reductions should be taken from an established regional average by the applicable building type (e.g., edge yard house, rear yard building, mixed use building) from a set year, such as the year of the code adoption. These goals should be applied on the Building Scale per each Transect Zone. However, communities seeking a particular city-wide goal may consider requirements for District Energy Generation. For that reason Article 3 Standards are included.

See Table SU1 for additional standards and annotations.
See Table SU2 for details on Surface to Volume Ratio and Building Orientation.
See Table SU3 for details on Shading of Glazing.

3.11 Public Darkness (Additional code insertion from the "Sustainable Urbanism SmartCode Module")

This section activates Table SU4, which addresses standards at the light source to maintain desired general ambient light levels across the Transect. Lighting standards protect against glare, preserve the night sky, and reduce unnecessary energy use from overlighting. Rural zones tend to be darker, while higher levels of outdoor lighting may be more suitable in mixed use urban zones. See Table SU4 for additional standards and annotations.

3.12 Vehicle Miles Traveled (Additional code insertion from the "Sustainable Urbanism SmartCode Module")

This section activates Table SU5, which adapts the 2030 Community Campaign benchmarks to each Transect Zone for reduction in Vehicle Miles Traveled (VMT). The 2030 Community Campaign is based on sustaining us as "a nation of neighborhoods." The Intent section of the SmartCode spells this out. The average American family is dependent on cars to meet its daily needs, driving on average 21,500 miles a year. Vehicle miles traveled by Americans is expected to grow 2.5% per year, increasing energy consumption and carbon omissions contributing to climate change. Additionally, obesity and other side effects of inactive lifestyles are predicted to shorten life span as much as five years per American. Base VMT to establish the percentage decrease should be calculated from local or regional community data from 2005. (National baseline from 2005 per the American Planning Association, the Environmental and Energy Study Institute, and the 2030 Community Campaign, is 8,000 VMT per person). Methods recommended to achieve the goal are listed in Table SU5 as more appropriate or more efficient for some Transect Zones, though many of the methods may be utilized across the Transect. Development patterns contribute to reducing VMT as do policies and strategies for Transportation Demand Management (TDM). See Table SU5 for additional standards and annotations and the Thoroughfare Module and the Cycling Module available through the Center for Applied Transects.

3.13 Tree Canopy Cover (Additional code insertion from the "Sustainable Urbanism SmartCode Module")

This section activates Table SU6, which provides a goal for minimum tree canopy cover by Transect Zone as well as methods to achieve these goals. Tree canopy cover cools the urban environment, traps air pollutants, absorbs carbon dioxide, and intercepts rainwater to reduce stormwater runoff. The minimum tree canopy coverage goals for each zone in this table have been developed as a benchmark for the local community. The amounts should be calibrated to the community, based on the climate. The methods are standards to achieve these goals and promote tree health and survival. See Table SU6 for additional standards and annotations.

3.14 Stormwater Management

This section references the Dubuque County Erosion Control and Stormwater Management Ordinance. The ordinance includes a manual describing best practice for erosion control and stormwater management. The Manual establishes countywide standards for the quantity and quality of water that runs off land under construction in urban and rural areas, including farms. It also provides flexibility in meeting those standards, recognizing the unique characteristics of each project and site. The Manual sets countywide standards and gives the necessary flexibility to local governments and developers so they can administer and meet those standards effectively and efficiently. The Dubuque County stormwater ordinance is available for adoption to any city or municipality within Dubuque County.

The Smart Code reinforces the goals of the Dubuque County Erosion Control and Stormwater Management Ordinance by using site-planning techniques to control stormwater such as preserving specific natural areas; minimizing impervious surfaces; promoting the use of natural vegetation, rain gardens, and bioswales; and conservation subdivision design. Good stormwater management does not begin with site disturbance and construction. Decisions about lot layout, building density, location of public rights-of-way, protection of sensitive areas, and preservation of open space all have an impact on the quality and quantity of stormwater runoff.

A comprehensive guide to managing erosion on construction sites has been developed by the Iowa Department of Natural Resources. The "Iowa Construction Site Erosion Control Manual" can be found on the Internet at http://www.ctre.iastate.edu/erosion/

A comprehensive guide to managing stormwater on post-development sites has been developed by the Iowa Department of Natural Resources. The "Iowa Stormwater Management Manual" can be found on the Internet at http://www.intrans.iastate.edu/publications/posts/?publication=stormwater-management-manual. Additional information educational and technical resources can be found at the Iowa Storm Water Education Program http://www.iowastormwater.org/

ARTICLE 4. EXISTING COMMUNITY SCALE PLANS

Redevelopment, or Infill, of existing communities is an important component of planning policy. The character of many existing communities already reflects the ideals of the Intent of the Smart Code. Moreover, infrastructure is already in place in existing communities. Finally, existing communities typically lie close to the center of a region so that public services do not have to be extended to more distant places, land is conserved, and neglected urban areas are reinvigorated.

4.1 Instructions

It is sometimes said that the Smart Code is a voluntary overlay. Article 4 is the exception to that statement. In the Infill Growth Sector (which consists of those areas already developed) the Planning Office shall prepare Redevelopment (Infill) Community Plans. Once these go through public consultation and approval, they are mandatory. A New Community plan may remain optional because it is large enough to be internally consistent within a matrix of sprawl; but Infill work, by definition, must always be compatible in the context of other buildings. One cannot opt to apply the Smart Code on one building but not the one next door. The Infill Section is therefore applicable only to traditional urbanism, not conventional suburban development (CSD). Either the existing conventional ordinance shall continue to apply, or these single-use pod areas shall be considered unjustified Special Districts, subject to their own standards, to be assigned on Table 16.

4.2 Community Unit Types

These Infill community types correspond with those of the New Community Types of Article 3. The Transect provisions are therefore applicable to both. This differs from the common practice, where suburban codes are at odds with the traditional Infill conditions and cause a gradual suburbanization of the city. While the plans of the Transect Zones of New Communities tend to be relatively orderly, the assignment of Transect Zones to historic communities is more complex, tending to result in a mosaic plan pattern. The Code must be locally calibrated and the existing urban structure understood so that it can be supported or corrected by the Regulating Plan.

Infill development at the scale of the block (as opposed to a large greyfield or brownfield) requires close attention to the existing character of the surrounding neighborhood, which is not usually an issue with new Community development. We encourage all attempts to fortify the best/highest desired urban character of a block that doesn't measure up to the Intent of this Code.

4.3 Transect Zones

The same Transect Zones can be used for both New and Existing Communities. The Planning Office should determine the placement of these Zones, for approval by the Legislative Body. The first decision to be made in assigning a Transect Zone to an existing area is whether to match the Transect to the existing type of development, or evolve it to the next successional Transect Zone. The Transects available for inclusion in a New Community Plan are:

- T-1 Natural - open space that is mostly natural or untended, generally without buildings
- T-2 General Agricultural - open space that is mostly cultivated, usually with a few scattered buildings
- T-3 Rural - the least dense of the residential areas (home occupations allowed)
- T-4 Rural Hamlet – a small area of mixed residential, commercial, and civic uses usually at a crossroads, surrounded by predominantly T-1 and T-2 Zones
- T-5 General Neighborhood – mostly single-family detached residential, mixed with higher density residential uses and detached residential buildings. Mixed uses are allowed along the periphery of the block or neighborhood along major thoroughfares.
- T-6 City Center - the more dense, primarily mixed use area (typically located near the center of a Pedestrian Shed or small community downtown business district)
- T-7 Urban Core - the most dense business, cultural and entertainment area of a large city.
- SD Special District - areas with buildings that by their function, disposition, or configuration cannot, or should not, conform to one or more of the seven normative Transect Zones

4.4 Civic Zones

This section is a brief reprise of the standards for Civic Functions explained in detail in the notes for Section 3.5. It appears again in the Code here in the event that this section is used as a stand-alone document.

4.4.2b Additional code insertion from the "Flood Hazard Mitigation SmartCode Module"

4.4.2c Additional code insertion from the "Renewable Resources SmartCode Module"

4.4.3c Additional code insertion from the "Renewable Resources SmartCode Module"

4.5 Special Districts

Note that the Smart Code covers Special Districts at both the Sector Scale and the Community Scale. If, during the Community mapping phase, areas are identified that do not, should not, or cannot conform to one or more Transect Zones, assign them Special District status.

4.6 Pre-Existing Conditions

4.6.1 & 4.6.2 The Code makes an important concession regarding existing buildings to encourage their preservation and continued use rather than abandonment, demolition and replacement. This section, as well as Section 5.2, may have to address separate sources of authority for requiring compliance. Be sure to consult the American with Disabilities Act (ADA) and National Pollutant Discharge Elimination System (NPDES) as well as National Environmental Policy Act (NEPA) and the federal Historic Resources Laws (106). The decision as to whether to require upgrading to the standards of this Code when building renovations occur should be discussed prior to Code adoption.

4.7 Special Requirements

These are tools of greater refinement. They must appear in specific locations on Regulating Plans. These are recommended but not essential to an Infill plan; however, they are not usually controversial, so should not be difficult to include.

ARTICLE 5. BUILDING SCALE PLANS

Article 5 of the Smart Code contains plan requirements at the finest scale -the Site and Building. As the scale is smaller, the provisions are more detailed. Article 5 is available for adoption by a municipality as part of the entire Smart Code. In that case, Article 5 would be operational only upon a Community Plan created according to Article 3 or Article 4. In addition, the provisions of the Article may be used, with some modification, as a stand-alone private regulating plan by an owner or developer, an urban code, or building design code for a community. The latter may remain as private design standards activated by Home Owners Association (HOA) documents. Used in that manner in jurisdictions that have adopted other provisions of the Smart Code, the developer's documents and the Code would be integrated much as if Article 5 had been adopted along with the rest of the Code.

5.1.3 This list is coordinated with the requirements of Article 5 that appear in subsequent sections. Submissions under Article 5 are separated into two stages - - Preliminary Site and Building Approval and Final Approval. This particular section (5.1.3) may be removed if the existing permitting process is to remain intact.

5.2 Pre-Existing Conditions

5.2.2 The Code makes an important concession regarding existing buildings to encourage their preservation and continued use rather than abandonment, demolition and replacement. This section, as well as Section 5.2, may have to address separate sources of authority for requiring compliance. Be sure to consult the ADA and NPDES as well as NEPA and the federal Historic Resources Laws (106). The decision as to whether to require upgrading to the standards of this Code when building renovations occur should be discussed prior to Code adoption.

5.3 Special Requirements

This section is a reprise of the provisions of Section 4.7 of Article 4 on Infill Community Plans and Section 3.9 of Article 3 on New Community Plans. They are entered for the third time in 5.3 in case only Article 5 is used by the developer. If Article 3 or 4 is used, site designs would respond to their appearance on plans according to Sections 3.9 and 4.7.

5.4 Civic Zones

This section is a brief summary of the standards for Civic Zones explained in detail in the notes for Section 3.5.

5.5 Specific to T1 Natural Zone

By its nature the T1 Natural Transect should not include the development of new principle residential, office, retail or civic buildings. However, some accessory buildings (such as a recreational shelter or small shed) maybe permitted by Special Permission. In many cases these areas require compliance with local, state, and federal environmental regulations with which any Smart Code provision must be consistent if it is to be effective.

5.6 – 5.8 Building Disposition, Configuration, & Function

This section provides regulations for the placement of buildings on lots, the form of buildings, and their function for each Transect. Local calibration of the associated regulations in Table 14 should resist the temptation to match existing regulations, particularly when the Code is adopted as an alternative overlay. In general, most existing regulations will not match or promote the intent of the Smart Code. However, some of the metrics may be transferred from the pre-existing code if they reflect the intent of the Smart Code.

5.7.3d & 5.7.5g Additional code insertion from the "Flood Hazard Mitigation SmartCode Module"

FEMA Flood Insurance Rate Maps (FIRMs) and Advisory Base Flood Elevation (ABFE) maps affect and overlay the configuration of buildings, particularly regarding their elevation above sea level or ground level. These elevation requirements may be directly incorporated into the code and Regulating Plan, or alternatively may be permitted to be overlaid by reference to the FEMA standards, as is done in this provision.

5.8.1b-d Additional code insertion from the "Renewable Resources SmartCode Module"

5.9 – 5.10 Parking Density Calculations & Location Standards

This section provides regulations for calculating the required parking and for determining reductions for shared parking. Note the provisions which require that all parking on a lot other than Driveways or Garages must be at the Second or Third Layer (see Table 17D) and/or that parking access must be from a Rear Alley or Lane. These provisions are of paramount importance for urban settings and should be not be modified.

The Rural Model Smart Code does not assign maximum parking standards. The code attempts to achieve the same goals (reductions in unused parking and impervious areas) by using the Sharing Factor, which permits reductions in parking requirements by factoring parking within two adjacent blocks. In addition, the code establishes a lower minimum requirement for parking than traditional zoning ordinances. For example, traditional codes often require 4-6 spaces per 1,000 sq.ft. for office use. The Smart Code requires a minimum of 2-3 spaces per 1,000 sq.ft. Also, unlike traditional zoning ordinances which often set one standard for uses regardless of location, the Smart Code reduces the minimum parking requirements in more urban areas (T6 and T7). This is done to both limit the supply of free parking and encourage transit use and to maintain the desired form of development within the context of the transect. The Smart Code could be calibrated to include a maximum standard. There are a number of books and publications on the subject of maximum parking standards available through the American Planning Association http://www.planning.org/

5.11 Landscape Standards

5.11.1b Additional code insertion from the "Flood Hazard Mitigation SmartCode Module"

5.12 Signage Standards

As an alternative existing local signage requirements may be substituted for those listed here.

5.13 Natural Drainage Standards (Additional code insertion from the "Natural Drainage Standards SmartCode Module")

5.13.1a If this provision is included, make sure it does not conflict with any requirements for sloped (pitched) roofs in the same T-zone. If sloped roofs are required in the code, it is possible to incentivize green roofs by allowing flat roofs only if they are green roofs. Some green roofs are possible on roofs with gentle pitch. See the Sustainable Urbanism Module for pitch recommendations.

5.14 Zero Net Energy Buildings (Additional code insertion from the "Sustainable Urbanism SmartCode Module")

This section activates Table SU1, Table SU2, and Table SU3. It is also possible to use this text section, with some modification, without a table. The Architecture 2030 goals should be applied on the Building Scale per each Transect Zone. However, communities seeking a particular city-wide goal may consider requirements for District Energy Generation. For that reason Article 3 Standards are also included on Page M5.

See Table SU1 for additional standards and annotations.

See Table SU2 for details on Surface to Volume Ratio and Building Orientation.

See Table SU3 for details on Shading of Glazing

5.15 Public Darkness (Additional code insertion from the "Sustainable Urbanism SmartCode Module")

This section activates Table SU4, which addresses standards at the light source to maintain desired general ambient light levels across the Transect. Exterior lighting of the private frontage affects Public Darkness, so this brief Article 5 reference to Table SU4 is important. Lighting standards protect against glare, preserve the night sky, and reduce unnecessary energy use from overlighting. Rural zones tend to be darker, while higher levels of outdoor lighting may be more suitable in mixed use urban zones. This section and Table SU4 should replace the older SmartCode Lighting Module for Article 5 if used.

5.16 Vehicle Miles Traveled (Additional code insertion from the "Sustainable Urbanism SmartCode Module")

The 2030 Community Campaign provides a benchmark for reduction in Vehicle Miles Traveled (VMT). This section for Article 5 activates portions of Table SU5 that address the Building Scale.

5.17 Tree Canopy (Additional code insertion from the "Sustainable Urbanism SmartCode Module")

This section activates Table SU6, which provides a goal for minimum tree canopy cover by Transect Zone as well as methods to achieve these goals. Trees on private property are counted toward Community Scale canopy cover, therefore this Article 5 section is included. The amounts on the table should be calibrated to the community, based on the climate. The methods are standards to achieve these goals and promote tree health and survival. See Table SU6 for additional standards and annotations.

5.18 Stormwater Management
This section references the Dubuque County Erosion Control and Stormwater Management Ordinance. Refer to Section 3.14 for additional notes.

5.19 Compliance with Building Code and FEMA Requirements (Additional code insertion from the "Flood Hazard Mitigation SmartCode Module")

5.20 Special Emergency Provisions (Additional code insertion from the "Flood Hazard Mitigation SmartCode Module")

ARTICLE 6. STANDARDS & TABLES

The Tables and their associated metrics are an integral part of the Smart Code. Like the preceding text pages, they are meant to be law after calibration and adoption. During calibration, individual Tables may be removed if not needed, and individual metrics may be adjusted for local character and custom. Table 14 is a summary of the metrics of the other Tables. Table 15A-G provides individual summaries for each Transect. If the metrics are changed on Tables 1-13 during calibration, be sure to adjust Tables 14 and 15 accordingly, and vice versa.

Table 1 Transect Zone Descriptions
This table provides a general illustration and description of the character of each Transect Zone.

Table 2 Sector/Community Allocation
Table 2 defines the geography, including both natural and infrastructure elements, determining areas suitable for development at various intensities. Certain areas lend themselves to certain typical community patterns. This table also allocates the proportions of Transect Zones within each Community Type.

Table 3A & 3B Vehicular Lane Dimensions
These tables assign lane widths to Transect Zones. Table 3A assigns lane width based on design speed. The most typical assemblies are shown in Table 3B, with guidelines for the corresponding Design ADT (Average Daily Traffic). Specific requirements for truck and transit bus routes and truck loading shall be decided by Special Permission.

Table 4A Public Frontages - General
The Public Frontage is the area between the private lot line and the edge of the vehicular lanes. It usually includes walkways, vegetative terrace, planters, and lighting. Dimensions are given in Table 4B (Public Frontages - Specific).

Table 4B Public Frontages - Specific
This table assembles precise technical prescriptions and dimensions for the public frontage elements - curbs, walkways, and vegetative terraces - relative to specific thoroughfare types within Transect Zones. Table 4B-a assembles all of the elements for the various thoroughfare types. Locally appropriate planting species should be filled in to the calibrated Code.

Table 5 Public Lighting
Lighting varies in brightness (as shown in the text of the Code) and also in the character of the fixture according to the Transect. The table shows four common types and suggests those which are generally most appropriate to the context within each Transect.

Table 6 Public Planting
Street trees vary in their form and also in their suitability for urban use. The shape of the canopy must integrate with the degree of setback, uses, utilities, sidewalks, and planting area along the Transect. This table shows five common types of street tree shapes and their appropriateness within the Transect Zones. The local planning office selects species appropriate for the bioregion. The tree's performance regarding root pressure tolerance, urban soil types and other criteria are considered during this selection. If possible, for mixed-use areas especially, select a type with a high canopy so that, at maturity, it does not block the windows of buildings below two stories, or the retail facades in T-4-7. Ideally mature trees should provide a continuous shade canopy high above the street and sidewalk, allowing power lines to run below the branches rather than through them. Trees planted along sidewalks should not obscure vision between three and eight feet above ground at maturity to provide pedestrian visibility.

Table 7 Private Frontage
The Private Frontage is the area between the building and the lot lines. The way this area is designed is important because it dictates how the building affects the pedestrian. The relationship between this table and Tables 4A and 48 (Public Frontages) is diagrammed in Table 17 (Definitions Illustrated-Thoroughfares & Frontages).

Table 8 Building Configuration
This table shows prescribed building heights for each Transect Zone. The vertical extent of a building is measured by number of stories, not including a raised basement or an inhabited attic. Heights are measured from the average grade of the frontage line to the eave of a pitched roof or to the surface of a flat roof.

Table 9 Building Types
This table approximates the location of the structure relative to the boundaries of each individual lot, ranging from more rural to more urban types. This provides a rough approximation of the suitable building types for each Transect Zone. Types eligible for Specialized disposition may include hospitals, factories, airports, refineries, schools, colleges, and stadiums as well as Civic Buildings.

Table 10 Building Function
This table categorizes Building Functions within Transect Zones. These functional classifications are gradual, not categorical as in conventional use zoning. Residential, lodging, office and retail occur to varying degrees in all Transect Zones (T2-T7) in the declension of Restricted, Limited, and Open. For greater precision describing the functions, see Table 12.

Table 11 Parking Calculation
The Required Parking table summarizes the parking requirements of Table 10 for each site or, conversely, the amount of building allowed on each site given the parking available. Use the Sharing Factor in the event of mixed use (defined as two dissimilar functions occurring within any two adjacent blocks or a proximity determined by Special Permission). The actual parking required is calculated by adding the total number of spaces required by each separate function and dividing the total by the

appropriate factor from the Sharing Factor matrix. An example of this calculation: The residential function requires 10 spaces while the office portion requires 12 spaces. Independently they would require 22 spaces, but when divided by the sharing factor of 1.4, they would require only 16 spaces. A second way to calculate: If there is a total of 22 spaces available for residential and office, multiplying this by the factor 1.4 gives the equivalent of 30 spaces. Buildings may be designed to a functional density corresponding to 30 parking spaces. (Note: When three functions share parking, use the lowest factor so that enough parking is assured.)

Table 12 Specific Function

This table expands the building function categories of Table 10 to delegate specific functions within Transect Zones. Table 12 should be customized for local character and requirements. Some terms are not necessarily standardized to Smart Code terms.

Table 13 Civic Space

The intended types of Civic Space are diagrammed and described in this Table. The diagrams are only illustrative; specific designs would be prepared in accordance to the verbal descriptions on this Table, which include sizes. Designers of Civic Space should make a conceptual distinction between bounded (shaped) space and open space. The most urban types of Civic Space -- Square and Plaza – are bounded space, psychologically enclosed by the enfronting buildings and their public frontages (streets, sidewalks, and trees). This creates a volumetric void, or outdoor room. (Urban streets should also act as civic spaces, and feel like outdoor rooms.)

A Park or Green on the other hand, is "open space" because it is too large or too formless (or both) to have the characteristics of an urban volumetric void. A Park or Greenway may appear in any Transect Zone; the more urban zones T4-7 require variation by Special Permission. The form of these larger spaces may be linear, bounded, or open. Note that these large "natural" areas are Civic Spaces, not T-1 Zones. Even large Civic Spaces are designed and may have specific urban standards, including paths, streets, and structures. They are unlike T-1 Natural Zones, which may appear among the more urban Zones as remnants of undeveloped land or uncontrolled overgrowth. In Zones T-4-7 attention to bounded space is essential so that the overall urban form of blocks and streets is not unduly dissipated or severed by open or linear outdoor areas.

Table 14 Smart Code Summary

This table is a summary of all the statistics and other metrics that appear throughout the Smart Code, including those that appear on other tables. Table 14 may be considered a checklist, both by developers for design and by regulators for permit processing. Virtually all of the metrics should be considered for local calibration. Some of these metrics may also be transferred from the pre-existing code, if they reflect the intent of the Smart Code (see Section 1.3 Intent). When all the Sector and Community Plans have been prepared and only the lots and buildings are to be designed, the upper part of this Table (14A through 14E, which are equivalent to a Subdivision Ordinance) may be eliminated (along with the elimination of Smart Code Articles 2, 3, and 4 (which comprise the equivalent of a Zoning Ordinance).

Table 14 (Section B). If the TDR system is eliminated from the code, the base residential density may be adjusted within the parameters of the two given figures, or as in all these metrics, to the local density requirements.

Table 15A-G Transect Summary
These tables summarize all the statistics and other metrics that appear throughout the Smart Code, including those that appear on other tables, for each Transect.

Table 16 Special District Summary
Special Districts (SD) are those areas that are justified in not complying with this Code. Table 16 has seven columns for seven Special Districts. More pages can be added. A Special District may also be an area that is unjustified in form - a strip mall, for example - but that has nevertheless received permission to retain its current zoning. Both types of SD require Variances. The metrics for each column of this table (SD1, SD2, etc.) are to be filled out with the details of each Special District as they currently exist, or as they are permitted. This Table is the permanent record for each District. See Manual Section 2.2.6 for examples of Special Districts.

Table 17 Special District Summary
Table 17 provides illustrations of some of the key terms found in the Smart Code. Additional illustrations can be added during local calibration.

Table RR1 Renewable Resources – Food Production (Additional Insert)
This table shows ways of incorporating types of local food production along the Transect. Cities are increasingly allowing urban agriculture and the raising of animals for household use, to encourage lower-cost food supplies and reduction in the energy consumption for food transport. This code may be modified to require developers of infill projects to purchase vacant lots and make them available as community gardens for nearby residents.

A community garden, or allotment garden, provides a locus of recreation and sociability greater than that of the private yard, being one of the so-called third places. They are also welcome by apartment-dwellers who may enjoy gardening. Allotment gardens can be large enough to hold habitable shacks as affordable surrogates for rural weekend cottages. Allotment plots are not sold, but let under municipal or private administration.

Green roofs are also opportunities for food production, even as they mitigate carbon emissions and reduce storm water runoff. They may be incentivized by giving developers bonuses for installing them.
As tree preservation and planting regulations are introduced, fruit trees may be included and designated for local food production.

Table RR2 Renewable Resources – Solar Energy (Additional Insert)
This table shows opportunities for the placement of types of solar-powered devices within the Transect. Solar access should be protected in the T2-T4 zones; this may be more difficult in T5-T7 density. At the community scale, solar orientation should be considered when planning a hamlet or neighborhood, so that each lot receives optimum exposure. If this is not feasible, the code may require a percentage of lots, especially in the T3 zone, to be oriented for solar energy. A solar dish engine system utilizes collectors tracking the sun on two axes, while concentrating the energy at the focal point of a separate dish.

Table RR3 Renewable Resources – Wind Power (Additional Insert)
This table prescribes opportunities for the placement of types of wind-powered devices within the Transect. Wind turbines must be placed where there is wind. The best locations in general include shorelines and the edges of open plains. In the urban Transect Zones, T4-T7, this usually means they

must be placed quite high above the buildings. Care should be taken installing wind turbines near inhabited areas, as they tend to generate a steady white noise that is disturbing to some.

The horizontal axis wind turbine is suited for the more rural T-zones because it generally requires a large (up to 150-foot) radius for the rotating blades. In addition, the head must rotate in order to receive wind from any direction.

The vertical axis wind turbine is suited for the more urban T-zones because it is significantly smaller than the horizontal axis type, sometimes only 4-5 feet in diameter, and less noisy. These are designed to operate with non-directional wind current, which makes them easier to accommodate, and more attractive in urban areas when in proximity to buildings.

Table SU1 Zero Net Energy Buildings (Additional Insert)
The Architecture 2030 Challenge, which has been put forward by the non-profit organization Architecture 2030 (www.architecture2030.org) is used in this table as a benchmark goal for building energy use reduction. It proposes that all new buildings produce no greenhouse gas emissions by the year 2030. Buildings are responsible for 48% of all energy consumption in the United States, making them the single largest contributor to greenhouse gas emissions. The baseline to establish reductions should be taken from an established regional average by the applicable building type (e.g., edgeyard house, rearyard building, mixed use building) from a set year, such as the year of the code adoption.

These goals should be applied on the Building Scale per each Transect Zone. However, communities seeking a particular city-wide goal may consider requirements for District Energy Generation.

Methods recommended to achieve the goal are listed as more appropriate or more efficient for some Transect Zones, though many of the methods may be utilized across the Transect. The first step is to reduce the need for the energy through efficient building methods. Secondly, increase efficiencies by generating energy as close to the use as possible, through on-site energy generation or District Energy. Finally, utilize renewable energy sources to reduce, and eventually eliminate, the use of fossil fuels for energy generation. These methods are defined based on the typical central city in the United States and should be calibrated for the specific municipality's regional climate and character.

Method: Energy Demand Reduction
Building energy use reduction is achieved by combining traditional site specific building practices with current material technology. The passive building methods listed below need to be calibrated with building types to maximize energy savings.

Surface to Volume Ratio
Surface to Volume Ratio is the amount of surface exposed to the outside per volume of building unit. Fewer exterior wall surfaces per unit, or smaller surface-to-volume ratios, minimizes heat gain in the summer and heat loss in the winter. See Annotation for Table SU2.

Building Orientation
Building orientation describes buildings sited for passive energy use. See Table SU2.

Building Envelope Efficiency
A highly efficient building envelope significantly reduces the energy usage of a building. Efficiency is measured by its "R-value," which refers to the resistance to heat flow of the wall, roof, door, window,

floor, or foundation membrane. There are many methods for insulating against heat flow and these vary by region and structure type. Minimum R-Values for the parts of the building envelope should be determined for the location and established as part of the code.

Natural Cooling
Natural Cooling refers to the process of building design to allow cool air to enter the building during warm months and hot air to exhaust without mechanical means, i.e. through a thermal chimney.

Appropriate Glazing
Appropriate glazing refers to a regionally-appropriate amount of glazing per building face for optimum passive solar heating and cooling. Typically, a building with 40-50% of its glazing on the south building facade and less than 20% glazing on all other facades will optimize passive solar. Appropriate glazing can typically reduce energy use by up to 20% and is most applicable where southern light is not obstructed. Communities may consider more explicit glazing requirements according to their location.

Operable Windows
Natural ventilation through operable windows reduces energy use by approximately 15%. Typically, buildings should be required to have a minimum of 50% of the glazing to be operable, distributed to maximize use of prevailing breezes on the site.

Shading of Glazing
Shading of glazing should be utilized for preventing excess heat gain in warmer months. See Table SU3.

Daylighting
Daylighting refers to the use of daylight as a primary source of general illumination in a space, providing opportunities for energy savings. A minimum daylight factor of 2%, per United States Green Building Council Leadership in Energy and Environmental Design (USGBC LEED) for New Construction requirements, should be provided in 75% of regularly occupied interior areas as well as a direct line of sight to vision glazing from 90% of all regularly occupied spaces. The result of this practice will typically be narrower buildings. Daylighting techniques should be coordinated with Shading of Glazing techniques in warm climates so they do not conflict.

High Albedo Roofs
High albedo surfaces have both a light color for high solar reflectance and high emittance, an ability to reject heat back into the environment. High albedo roofs prevent heat absorption; this cooling effect can reduce energy use within the building by 13 -15%. In most US climates, flatter roofs should have a minimum Solar Reflective Index rating of 78. For sloped roofs, the Solar Reflective Index can be lower, with a minimum of 29.

High Albedo Pavement
Similar to high albedo roofs, high albedo pavement surrounding the building has a cooling affect on the environment, reducing the heat island effect and the energy required to cool buildings in the area. For most US climates, the Solar Reflective Index rating for pavement should be minimum of 29.

Landscape Siting
Landscape design can impact building energy use. Locating or maintaining existing evergreen vegetation on the north side of a building can block winter wind, reducing the need for additional heating. By the

same token, deciduous material that shades buildings from the summer sun reduces the need for additional cooling. Energy savings are site-specific and vary according to micro-climate and region.

Building/Lot Energy Generation

On-site energy generation is energy generated for the use of a single building. Excess energy can feed back into the grid, but a connection to the grid is not necessary for individual production. Lower Transect Zones tend to be more conducive to on-site energy systems where their use will not impose on, or be impeded by, neighboring uses and buildings.

Wind Energy Generation

On-site wind energy consists of one large or several smaller turbines, either pole mounted on a lot or mounted on the roof of a building. As a means of achieving reduction of fossil fuel use, on-site energy generation is currently best suited for larger lots with ample wind levels and less demand. In the higher Transect Zones where there is more density, the amount of energy generated from wind is in limited proportion to the energy used by the high number of multiple users in the building. As technology improves, on-site wind energy generation may become a more significant factor in the T-4 - T-7 zones. See the Wind Power sub-module by Jaime Correa and Associates at www.smartcodecentral.org.

Solar Photovoltaic / Solar Thermal

Solar Photovoltaic energy systems require access to solar radiation and the roof area, to install enough panels for the building's energy demands. This is most often the case in lower Transect Zones up to T-5. Solar Thermal for water heating does not require as many panels per user, and is therefore an option for some buildings with solar access and limited roof area, typically up to T-6.

Groundsource Heat Exchange (Geothermal)

A Groundsource Heat Exchange system or geothermal system uses the consistent temperatures below the earth's surface to provide heating and cooling services. In winter, pipes buried in the ground near the building bring heat from the relatively warmer ground into the house. In summer, hot air from the house is pulled into the relatively cooler ground and reduces the amount of energy needed to cool the already cooler air. This type of system can be utilized in any Transect Zone.

Biomass

On-site biomass energy is produced by burning organic matter, such as a woodchip burning stove. Biomass production is an alternative for lower T-zones and is most effective by burning waste products. In higher T-zones, on-site biomass energy generation is much less efficient than other forms of energy or district biomass energy generation.

District Energy Generation

District Energy systems produce thermal energy for heating, cooling and hot water at a central plant, for use in the immediately surrounding community. District Energy facilities, both renewable and non-renewable, have less carbon output because there is less energy loss due to shorter conveyance distances. District Energy systems typically consume 40% less fuel and produce 45% less air emissions than conventional energy generation. These systems can serve small developments or larger areas up to several miles; however, the energy demand must support the cost of construction and running the system. It is best utilized in higher T-zones where there are energy loads sufficient to justify the infrastructure installation, as well as both day and evening energy users.

Non-renewable Heat and Cool
Non-renewable fuels, such as natural gas, are the most common and traditional form of District Energy. As discussed above, the use of district generated heating and cooling, even non-renewable, significantly reduces energy consumption.

Combined Heat and Power
District Combined Heat and Power plants, also known as cogeneration plants, recover normally wasted heat from electrical generation processes to heat nearby buildings, doubling the efficiency of the facility. It is well suited to institutional, commercial, industrial, and large residential developments.

District Groundsource Heat Exchange (Geothermal)
A District Groundsource Heat Exchange system is similar to a building geothermal system, but serves more than one building or lot. A centrally located groundsource heat exchange system can serve several users. Other forms of geothermal energy, such as very deep wells tapping the hot rock or water below the earth's surface, are typically larger in scale, but can be utilized for District Energy generation in some areas of the country.

Biomass
Biomass District Energy, produced from burning organic matter, is best used where a fuel source is readily available. The fuel is typically a waste product such as urban or industrial wood waste and agricultural residues. District biomass plants can provide better filtration of emissions than individual systems. Biogas plants use methane released from decomposing organic garbage or manure.

Other Renewable Sources
New options for renewable District Energy sources are growing, including solar and micro-hydro facilities. Technology improvements in small scale plants make these rapidly developing renewable energy sources accessible to businesses and communities. They should always be considered to achieve the goal of Net Zero Energy development.

Method: Long Term Contracting
Long term contracting is a method for purchasing renewable energy from a large energy provider, where the renewable energy is not for that particular building or development, but is fed into the entire energy grid. At the present time, it can be difficult for buildings, especially in the T-7 zone, to achieve Zero Net Energy through energy use reductions and energy generation. Therefore, long term contracting helps these buildings achieve their goals, while encouraging large energy providers to utilize renewable energy sources. The contract should be long term, ensuring utilization of the renewable energy into the future. Should the contract expire, new methods should be incorporated to make up for the loss of savings. This portion of the table is intended to require that no more than a certain percentage of the annual electricity from renewable sources should be credited by such a contract. Percentages are allocated by Transect Zone.

Table SU2 Surface to Volume Ratio and Building Orientation (Additional Insert)
Surface to Volume Ratio and Building Orientation are most applicable at the Building Scale. On the Community Scale, however, lot and even block orientation can result directly in a particular building orientation, particularly in combination with the Smart Code's requirement for facades to be parallel to the thoroughfare in higher Transect Zones. In addition, lot dimensions combined with allowable numbers of stories and story heights can result in particular surface to volume ratios.

Surface to Volume Ratio

Surface to Volume Ratio is the amount of surface exposed to the outside per volume of building unit. Modeling performed by Alan Chalifoux has demonstrated that energy savings can be maximized by reducing the surface to volume ratio as much as possible. Energy use is decreased through each successive decrease in surface to volume ratio. Fewer exterior wall surfaces per unit, or smaller surface to volume ratios, minimizes heat gain in the summer and heat loss in the winter. A unit with two shared walls uses approximately 14-28% less energy (depending on the region) than a detached unit.

Building massing and stacking can reduce the number of exterior walls per unit; therefore, the multi-unit buildings in higher Transect Zones are typically more efficient than single-unit buildings. However, in high-rises the added systems such as elevators and water pumps may increase overall building energy use. This is one reason the model Smart Code caps T-7 at eight stories.

Building Orientation

Building orientation describes buildings sited for passive energy use. Typically, orienting the building or unit on an east-west axis provides smaller eastern and western exposures. The longer southern exposure allows passive heating in the winter, and shading the glazing from the higher summer sun reduces cooling needs.

Building orientation can reduce energy use by 15-30%. This method is most applicable in lower T-zones with larger lots and greater solar access, though orientation should be considered in all cases. New Community Plans should take thoroughfare and block orientation into account.

Table SU3 Shading of Glazing (Additional Insert)

The table illustrates multiple methods for shading glazing. Shading should be utilized to prevent excess heat gain in summer months. Southern facing windows should be shaded during summer months. However, shading should not interfere with walkability in mixed use areas by blocking views into shopfronts nor should they compromise safety by removing “eyes on the street.” Shading techniques should be coordinated with Daylighting techniques so they do not conflict.

Trees

Mature deciduous trees, grown in favorable conditions, can shade glazing, especially for one to three story buildings that would occur in the lower Transect Zones. While trees can provide shading of lower stories of buildings in higher Transect Zones, their impact on reducing energy consumption in these taller buildings is minimal. In the higher zones, species should be selected with high canopies that do not block visual access to shopfronts nor interfere with “eyes on the street.” In the base Smart Code, very narrow urban thoroughfares in T-6 and T-7 are exempted from tree requirements, so conflicts should be avoided in calibration of the code with this Module. See Section 3.7.3 and Section 5.11 of the base code for Public Frontages and Landscape Standards.

Awnings

Awnings provide levels of shading similar to trees, in that they have more impact on energy use of shorter buildings. Awnings are particularly helpful for shopfronts, reducing reflections in the windows and providing shelter for window-shoppers. Some types of awnings can be retracted in winter months to provide daylighting. See Section 5.7 of the model Smart Code for awning standards.

Porch
Porches, galleries, and arcades provide significant shading of windows on the ground floor. Balconies and double galleries can provide shading for upper story glazing. See Table 7 Private Frontages in the model Smart Code for Gallery and Arcade frontages.

Roof Overhang
Providing an appropriate roof overhang is a common method for providing shading of glazing. In most climates, the overhang should be designed to shade the angle of the sun during summer months, while allowing the sun to penetrate the glass during the winter months.

Exterior Shade
Exterior shades can be utilized in extreme circumstances on the upper floors of the building. Use of exterior shades on lower floors can result in a hostile pedestrian environment. See options above for more appropriate lower floor shading devices. Louvered exterior shades can also be used to provide a friendlier facade.
Light Shelf
Interior and exterior light shelves can be utilized to divert the rays of the sun from penetrating the glazing directly, while providing indirect daylighting.

Deep Windows
Setting windows in deep frames is a traditional method for providing shading of glazing. The depth of the window can reduce the amount light penetrating the window in summer months, while permitting lower sun angles to light and warm the interior during colder months. Deep windows may also add to visual interest and three-dimensionality on a facade.

Double Skin
Double-skinned buildings are used more widely in Europe; however, use of a double skin can provide unique passive heating and cooling opportunities. The cavity between the two building skins allows for trapped, solar heated air to be circulated into the interior space during winter months. During summer months, the cavity provides protection from solar heat gain on the interior to reduce cooling needs. Additionally, windows on the interior can be open without exposure concerns, such as wind and rain, and for safe nighttime cooling. Use of responsive controls also can optimize the thermal performance of this system.

Table SU4 Public Darkness
The Public Darkness table defines standards to maintain desired general ambient light levels across the Transect. Lighting standards protect against glare, preserve the night sky, and reduce unnecessary energy use from overlighting. Rural zones tend to be darker, while higher levels of outdoor lighting may be more suitable in mixed use urban zones. See Table 5 of the base Smart Code and the Lighting and Lighting Design Modules at www.transect.org.

Lighting is regulated by the type of lamp and the effective brightness, or lumens. A “full cutoff” luminaire does not allow light above a horizontal plane and directs light downward without allowing light to escape upwards where it is no longer useful. Dimmers and other similar methods of managing light output assist in reducing energy usage and lowering the impacts on the dark night sky.

“Initial lamp lumens” is a measure of how much light the lamp is emitting near the beginning of its life, as most high-efficiency light sources decline in light output over time. Shielded luminaires limit light

trespass beyond the property line and prevent the lamp from being directly visible. A lighting curfew promotes a dark night sky by restricting commercial lighting during late-night non-business hours. This may occur after the official close of business to allow employees to leave the building safely.

Table SU5 Vehicle Miles Traveled
The 2030 Community Campaign provides a benchmark for reduction in Vehicle Miles Traveled (VMT). This table adapts that benchmark to each Transect Zone.

The 2030 Community Campaign is based on sustaining us as "a nation of neighborhoods." The Intent section of the Smart Code spells this out. The average American family is dependent on cars to meet its daily needs, driving on average 21,500 miles a year. Vehicle miles traveled by Americans has increased dramatically since 1970, increasing energy consumption and carbon omissions contributing to climate change. Additionally, obesity and other side effects of inactive lifestyles are predicted to shorten life span as much as five years per American.

Base VMT to establish the percentage decrease should be calculated from local or regional community data from 2005. (National baseline from 2005 per the American Planning Association, the Environmental and Energy Study Institute, and the 2030 Community Campaign, is 8,000 VMT per person).

Methods recommended to achieve the goal are listed as more appropriate or more efficient for some Transect Zones, though many of the methods may be utilized across the Transect. Development patterns contribute to reducing VMT as do policies and strategies for Transportation Demand Management (TDM).

Methods: Built measures - Community Scale
(Article 2, Article 3, and Article 4)
Increase Transit and Provide Transit-Supportive Densities
Part of increasing mobility options is providing access to efficient public transportation. Each transit type requires some level of residential density to support an efficient, useful system. Appropriate "origin" Transect Zones are provided based on typical situations and industry studies, though their associated densities should be calibrated to the municipality. Local studies may take into account drivership or bus lines feeding to a rail station, but access from the pedestrian shed should be prioritized. A range of values is inclusive of varying levels of transit service. Though the table may designate a type of transit appropriate for the Transect Zone, in many cases other destination zones are required. For example, commuter rail is suitable at T-3 densities, but likely requires numerous stops and a T-6 destination. An origin station may also be a destination station if it is mixed use, thus changing the recommended densities. Commuter rail is even more difficult to prescribe by the Transect, as one rail line may stop in the T-6 zones of several towns and neighborhoods to collect riders for the ultimate destination. See the Transit Oriented Development (TOD) Smart Code Module at www.transect.org for more precise tools.

Create Walkable Neighborhoods
Small block sizes and high street connectivity, as defined by number of intersections in a square mile, are the basis for a walkable community. The number of intersections required per square mile should be calibrated by region and should be applied per quarter-section (160 acres) to correspond to Smart Code Community Unit sizes. Maximum block sizes are essential, because the Transect Zones are fine-grained and an average interpolated from a square mile may permit some overlong blocks. See Table 14c for model Smart Code maximums, to be locally calibrated if necessary. See Article 3 of the Smart Code for additional information on block configuration.

A mix of daily uses for complete neighborhoods, such as corner stores and child care, supports a pedestrian lifestyle by reducing the need for trips outside the neighborhood. Commercial nodes should be provided every quarter mile to serve each pedestrian shed or quarter-section.

Pedestrian oriented streetscape improvements increase the safety of pedestrians, contribute to a more pleasant walking environment, and encourage longer and more frequent trips on foot. The appropriate private frontages can provide transitional spaces between the public sidewalk and the private interior of the building. Buildings oriented to the pedestrian provide interest, accessibility, and "eyes on the street" for safety. See Table 7 Private Frontages, Section 5.6 Building Disposition, and Section 5.7 Building Configuration in the base code.

Transit-Oriented Development (TOD) is development located within a half mile of a rail or Bus Rapid Transit (BRT) station, typically with higher densities to support increased amounts of retail and services as well as ridership. Additionally, automobile parking should be significantly reduced, if not eliminated, in TODs. See Section 3.2 and Section 3.3.4 of the model Smart Code.

Create Bikable Neighborhoods
Neighborhoods, especially in the higher Transect Zones, should incorporate a system of bicycle lanes, trails, or routes into the larger regional system. Standards for bicycle parking along with bicycle amenities create bicycle friendly environments. See the Cycling for Complete Streets Module for bicycle parking standards, based on dwelling units or number of employees, and the Complete Streets Module for thoroughfare types and lane widths appropriate for each Transect Zone.

Methods: TDM Policy - Community Scale
Transit passes can be issued by a company or agency to cover transit costs at a discounted rate and to make using multiple modes more convenient.

Carshare rental programs are similar to a standard car rental except that use is scheduled by hour and not by day, allowing rental on a per trip basis. Many successful carshare programs have been implemented in major cities, becoming very popular in the higher Transect Zones.

Improvements in taxi service availability and reliability support transit options. They can be used for Guaranteed Ride Home programs or in case of emergencies.

Home occupations reduce vehicular trips substantially by eliminating the commute to the office. The Smart Code permits a variety of home occupations even in the more residential zones. See Table 10 and Table 12 in the base code.

Pricing parking on its availability has been shown to reduce the need for construction of additional parking spaces, especially in shopping areas.

TDM Policy - Building Scale
Provide Incentives for Transit Use
Transit passes can be issued by a company or agency to cover transit costs at a discounted rate and to make using multiple modes more convenient.

Guaranteed ride home programs support alternative transit by providing an occasional subsidized ride in the case of an emergency or when normal transit options are unavailable. This provides peace of mind to employees who might otherwise not want to sacrifice the flexibility of an individual car.

Convenient Park and Ride locations are part of a commuter rail system. These facilities should be accessible for drivers, cyclists, and pedestrians.

Support Ridesharing/Carpooling
Several people going to the same location, or nearby, can ride together in one car. Buildings or companies can encourage this with preferred parking spaces or parking fee discounts to rideshare/carpool vehicles. A system for ridesharing can be set up at the destination, to help riders connect with drivers.

Reduce Trips
Several methods have been shown to reduce overall trips in a community and can work across the Transect. Many of these methods would be tied to the user of a development. A compressed work week means that employees work fewer but longer days to make up the 40 hour work week, reducing the number of days of commuting.

Telework/Telelearning/Telecommute uses phone, internet, and fax connections to substitute for face-to-face interaction. Jobs that are information-based are ideal for telework options. In a five-day work week, two days of telework reduces commuting trips by 40 percent.

Manage & Reduce Parking
Efficient use of parking reduces driving and helps to maintain and incentivize compact building patterns. Where other types of transportation are available, car-free housing that does not require parking should be permitted and encouraged, and provided in conjunction with other TDM practices, such as a carshare program.

On-street parking should be counted towards minimum parking requirements to reduce the need for off-street parking and to cut down on unnecessary impervious surface and lighting. Parking maximums are recommended to prevent excess parking in higher Transect Zones where transit is an option. Allowing shared parking reduces redundant parking spaces for users who park at different times. These strategies have financial benefits to property owners and improve walkability by reducing curb cuts and the degradation of urban spatial definition from surface lots. See Table 11 in the model code for the Shared Parking Matrix.

Pricing parking on its availability reduces the need for additional parking spaces. Unbundling parking fees from rental payments, especially in higher Transect Zones, exposes the real cost of the parking and allows the user to opt for no parking, possibly living car-free. Workplace and shopping parking charges are similar, in that they shift the cost of parking to the driver and relieve or reimburse non-drivers. Parking cash-out programs are one form of this strategy, in which employers reimburse employees who choose not to use employer subsidized parking.

Table SU6 Tree Canopy Cover
This table provides a goal for minimum tree canopy cover by Transect Zone as well as methods to achieve these goals. Tree canopy cover cools the urban environment, traps air pollutants, absorbs carbon dioxide, and intercepts rainwater to reduce stormwater runoff. The minimum tree canopy

coverage goals for each zone in this table have been developed as a benchmark for the local community. The amounts should be calibrated to the community, based on the climate. The methods are standards to achieve these goals and promote tree health and survival.

Methods:
Canopy cover is a measurement of total mature tree canopy within a Transect Zone from trees located on all private lots, parking lots, open space, and street rights-of-way. Existing trees may be utilized to meet the canopy requirements, and when existing trees do not fulfill the requirements, new trees should be planted. Tree canopy is measured at mature size, established by regional growth patterns. See

Public Canopy Cover Standards - Community Scale (Article 2, Article 3 & Article 4)
Civic Space Minimum Canopy Cover
Public canopy requirements apply to civic open spaces and thoroughfares. Civic space often provides a large amount of tree canopy towards meeting the goal. The standards for these spaces are balanced to allow for sunny areas as well. See Table 13 of the model SmartCode for types of Civic Spaces.

Street Tree Requirements
Continuous street trees are an important component of the urban canopy. However, in the base SmartCode, very narrow urban thoroughfares in T-6 and T-7 are exempted from tree requirements, so conflicts should be avoided in calibration of the code with this Module. Visibility into shopfronts and "eyes on the street" should be considered when selecting tree species. See Section 3.7.3 and Section 5.11 of the base code for Public Frontages and Landscape Standards, and Table 5 Public Planting.

Private Canopy Cover Standards - Building Scale (Article 5)
Private Lot Minimum Canopy Cover
Each private lot shall also meet a minimum canopy cover requirement towards achieving the overall goal. The requirements are set to allow a balance between sun and shade on each parcel. The canopy requirements are for the lot as a whole and should be calibrated for each municipality. Tree canopy cover on green roofs may be utilized to meet this requirement, if mature canopy can be achieved by the planting method.

Street Tree Requirement
Parking lot canopy requirements are set to minimize the heat island effect of parking lots and shade a large portion of the paved area. On lots with buildings, yards, and parking lots, the parking lot should be calculated separately, per this section of the table.

Healthy Trees Standards
Canopy cover requirements are measured at mature growth, relying on a healthy planting method to achieve that maximum canopy size. While planting mix and pit size should be established based on local methods, two planting requirements are typically underutilized, especially in urban locations: permeable surface requirements and use of structural soil. See the Natural Drainage and Light Imprint Modules at www.smartcodecentral.org.

Minimum Permeable Surface per Tree
Permeable surfaces allow air and rainwater to permeate soils within the root zone of the tree. Permeable surface requirements have been set in the higher Transect Zones to accommodate trees in treewells with or without tree grates, though these levels are often below the ideal standard to foster healthy urban tree growth, recognizing the typical space constraints of an urban terrace, which is often

made up of intermittent permeable and impermeable surfaces. In T-5, the minimum of 270 square feet is the equivalent of a 9' wide planting strip with medium or large trees planted 30' on center. Highly permeable pavement adjacent to the tree well in walkways or on-street parking areas should be utilized in addition to both these areas, though not required in the table. In lower Transect Zones, where more space is available, the permeable surface required is equivalent to approximately 50% of the canopy area, or "drip zone," the minimum for healthy large tree growth.

Structural Soil Requirement per Tree

With reduced permeable surfaces, structural soil adjacent to the tree well can improve the health of the tree by providing areas for tree roots to penetrate, especially below pavement. Recommended surface areas for structural soils are minimal and should be calibrated to the community. These amounts are in addition to the permeable surface area required. At a minimum, structural soil should be provided adjacent to trees in tree wells in T-6 and T-7, though the municipality may elect to increase the structural soil area to a percentage of the mature canopy area, between 50% and 100%. Structural soil can be utilized below any pavement surface.

ARTICLE 7. DEFINITIONS

This Article provides definitions for terms in this Code that are technical in nature or that otherwise may not reflect a common usage of the term. If a term is not defined in this Article, then the CRC shall determine the correct definition. Items in italics refer to *Articles, Sections,* or *Tables* in the Smart Code.