

How Will New Urbanist Transect Zoning,  
Integrated with Sustainable and  
Economical Practices,  
Affect Where and How We Build in the Future?



Photo Credit: Tom Low, DPZ Charlotte.

## LIGHT IMPRINT

Integrating sustainability  
and community design

dpz  
CHARLOTTE

ARCHITECTS AND TOWN PLANNERS

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## How Will New Urbanist Transect Zoning, Integrated with Sustainable and Economical Practices, Affect Where and How We Build in the Future?

Our desire for community is clearly shifting away from the conventional, auto-centric suburban model towards a more walkable, compact, connected, mixed-use, mixed-income, human-scale neighborhood model. As this transformation takes place, how will we give added consideration to environmental and preservation factors without comprising urban design priorities such as connectivity and the public realm? Additionally, what design approaches will enable us to respect terrain, natural drainage, topography, and other geographical conditions, while giving priority to public space? How can we draw on ideas from history and apply them to our future? How can we balance climate concerns and increased population and still create great places to live?

Well-designed urbanism, along with more sustainable infrastructure as part of a community, is key, especially when considering current demographic trends. Baby Boomers (born 1946-1964) and Millennials (born 1977-1996) comprise the two largest American generations. Both of these generations are entering life stages in which the desire for urban living is growing. In a recent study, those over fifty-five were three times more likely than those in their thirties to downsize and choose a townhouse as a housing option. This market growth whether village center or reviving a downtown core is an increasingly attractive way to downsize and respond to a stronger commitment to the environment. It is also a more economical way to live. This rapid change in preference, combined with the convergence of the Baby Boomers and Millennials, is unprecedented.

Metropolitan regions across the country

must begin to address these market trends. The Atlanta Regional Commission (ARC) recognizes that if Atlanta is to remain an attractive region in the 21st Century, it must proactively provide choices for Baby Boomers and Millennials. These choices must expand to include age-appropriate dwelling units within pedestrian-oriented, mixed-use, sustainable, light imprint environments. It is within this framework that the ARC, working with the AARP and the EPA, initiated a massive regional planning design charrette in February 2009. This charrette developed models that will steer Atlanta's outward sprawl inward towards existing urban and suburban locations adjacent to urban centers.

Balancing housing density with environmental needs can be complicated, but there are abundant examples to follow. Lessons from older civilizations, such as the Romans, provide examples in water delivery and drainage as it relates to city building. The Romans' systems for delivery and drainage are sophisticated due to the intrinsically green early construction methods for paving, channeling, storage, and filtration. More recent history from the late nineteenth-century and early twentieth-century offers civic design lessons from the City Beautiful and City Practical. The City Beautiful Movement built on the practices discovered during the Renaissance. The City Beautiful daylighted water and celebrated it through civic public works projects such as public fountains. The Progressive Era's City Practical introduced modern engineering methods for efficiency and sanitation. Of course, today's New Urbanism offers many examples and lessons on towns and town making principles.

### Light Imprint: Integrating Sustainability and Community Design

One ecological solution that is compatible with successful urban design is Light Imprint New Urbanism, a planning and development strategy that emphasizes compact, mixed-use, pedestrian-oriented design, and environmental efficiency. At the same time, this stormwater management system reduces the anticipated infrastructure costs of a community.

Light Imprint is based on the rural-to-urban transect, and therefore uses environmental metrics not found in other conventional storm

water management strategies. [The Light Imprint Handbook: Integrating Sustainability and Community Design](#), written by a group of urban designers, organizes more than 60 tools and resources in a simple, useful form.

Light Imprint can easily calibrate appropriate stormwater management tools for projects across the Transect, from T-1 to T-6. For example, for a new urbanist multifamily building in a town center T-5, pervious pavement and underground storage are two solutions that

can form a treatment train. The result is not only less environmental impact, but also more efficient land use, and cost savings to the bottom line when factored into the entire project. In one recent case study, the implementation of a natural drainage system on a 300-acre Phase

I project, with T-2 through T-4 zones, reduced engineering expenses by 31 percent. Savings to the more expensive, yet small, T-5 section make economical sense when considered as part of the overall infrastructure design.

### Jumpstarting Sustainability through a Light Imprint Transect Matrix

To jumpstart new urbanism projects toward more sustainable infrastructure we have put together an interactive database at <http://www.lightimprint.org>. The database includes case studies and provides a method to analyze savings realized from Light Imprint techniques. Also, the database allows municipal staffs, land planners, architects, property owners, environmentalists, development teams, engineers, and land conservationists to select different variables. These variables include the T-zones, soil hydrologies, slope conditions, climate, initial costs, and long-term maintenance factors. Submitting variables to the database produces a customized list of tools specific to the project's needs. This valuable database provides a simple solution for session participants who are overwhelmed by the massive surge of green information.

A New Urbanist development team interested in incorporating sustainable practices using Transect zoning can benefit from a combination of Light Imprint and New Urbanism because they fit hand in glove. Other planning and environmental approaches may not be as compatible. Light Imprint projects are designed to use

natural drainage, traditional engineering infrastructure, and infiltration practices. The Light Imprint tool set offers a range of environmental benefits while significantly lowering construction and engineering costs. Light Imprint is not limited to a single approach for an environmentally sensitive development. Rather, it offers a set of context-sensitive design solutions that ultimately work together on the community level. Light Imprint offers tools and stormwater treatment trains to address the infrastructure needs of standard size multifamily buildings, like the Mansion Flats, on infill lots in T-4 locations and mixed-use "6-pack" buildings in the town center at Habersham, South Carolina. The same tools are equally effective in an overall community master plan, covering T-1 through T-5 zones, as in Griffin Park, Greenville, South Carolina.

In order for New Urbanism to remain competitive, it must provide solutions that help to create a high quality of community life, a more sustainable approach to development, and are less expensive to build. Light Imprint is part of a sustainable solution for providing livable, economical communities.

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Tom Low is the Director of Duany Plater-Zyberk & Company's Charlotte, North Carolina office, which he opened in 1995. Low has managed and completed more than 100 town planning projects over almost two decades with DPZ winning awards from the American Planning Association, the American Institute of Architects, the Sierra Club, the Environmental Protection Agency for Smart Growth Achievement, the American Busi-

ness Journal, the Downtown Development Association, and the United States Green Building Council. Low is actively involved with projects, research, and education. He gives lectures and conducts workshops on town planning, planning history, sustainability, light imprint, and school design. Since 2005 Low has been Chair of the Charlotte Regional Civic by Design Forum.



T-2 Housing feathered into a live-oak forest in the neighborhood edge of Habersham, Beaufort County, South Carolina. Photo credit: Tom Low, DPZ Charlotte.



T-2 Light Imprint tool: Vegetative/Stone Swale, Habersham, Beaufort County, South Carolina. Photo credit: Tom Low, DPZ Charlotte.



T-3 Cottages form walkable urbanism in the neighborhood general of Habersham, Beaufort County, South Carolina. Photo credit: Habersham Land Company.



T-4 Mansion Flats on infill lots in the neighborhood center of Habersham, Beaufort County, South Carolina. Photo credit: Tom Low, DPZ Charlotte.



T-5 Town Center internal block parking lot showing the use of pervious pavement for Habersham, Beaufort County, South Carolina. Photo credit: Patrick Kelly, Habersham Land Company.



T-4 Village Center on new Main Street (formerly State Highway 9) in the Village of Cheshire, Black Mountain, North Carolina. Photo credit: Tom Low, DPZ Charlotte.



T-3 Cottages form walkable urbanism in the village of Cheshire, Black Mountain, North Carolina. Photo credit: Tom Low, DPZ Charlotte.



T-3 Sloping green and outdoor stage framed with houses in the Village of Cheshire, Black Mountain, North Carolina. Photo credit: Tom Low, DPZ Charlotte.



Conventional TND Storm Water Plan



Light Imprint TND Storm Water Plan

**KEY**

- Stormwater Inlet
- Manhole
- Stormwater Pipe
- ▶ Storm Water Discharge
- ▣ Underground Stormwater Storage
- Rain Garden

The second two plates (of six) show the engineering infrastructure for each of these plans.

T-2 through T-4 Light Imprint case study of Griffin Park, Greenville County, South Carolina. Source: Light Imprint Handbook version 1.3. Master plan comparison of conventional new urbanism infrastructure.

Conventional TND Engineering				
Material	Quantity	Unit	Cost/Unit	Total
<b>Erosion Control</b>				
Silt Fence	8,450	LF	\$4.00	\$33,800.00
Rip Rap	200	Tons	\$55.00	\$11,000.00
<b>Total</b>				<b>\$44,800.00</b>
<b>Stormwater</b>				
Inlets	101	Ed.	\$2,500.00	\$252,500.00
Pipes	9,434	LF	\$30.93	\$291,793.62
Retention Pond	1	Lump	\$48,400.00	\$48,400.00
<b>Total</b>				<b>\$592,693.62</b>
<b>Pavement</b>				
Curb & Gutter	18,910	LF	\$7.60	\$143,716.00
Sidewalk	8,276	SY	\$25.00	\$206,900.00
Paved Road	26,705	SY	\$18.64	\$497,781.20
Paved Alley	6,470	SY	\$13.36	\$86,439.20
<b>Total</b>				<b>\$934,836.40</b>
<b>Grand Total</b>				<b>\$1,572,330.02</b>
Cost per Lot	176			\$8,933.69

Light Imprint TND Engineering				
Material	Quantity	Unit	Cost/Unit	Total
<b>Erosion Control</b>				
Silt Fence	8,450	LF	\$4.00	\$33,800.00
Rip Rap	200	Tons	\$55.00	\$11,000.00
TPF	4,225	LF	\$4.00	\$16,900.00
<b>Total</b>				<b>\$61,700.00</b>
<b>Storm Water</b>				
Inlets	24	Ed.	\$2,500.00	\$60,000.00
Pipes	4,182	LF	\$30.93	\$129,349.26
Rain Gardens	20	Ed.	\$5,120.00	\$102,400.00
<b>Total</b>				<b>\$291,749.26</b>
<b>Pavement</b>				
Curb & Gutter	13,091	LF	\$8.00	\$104,728.00
Sidewalk	7,000	SY	\$25.00	\$175,000.00
Paved Road	20,515	SY	\$18.64	\$382,399.60
Crushed Stone Alley	5,765	SY	\$12.00	\$69,180.00
<b>Total</b>				<b>\$731,307.60</b>
<b>Grand Total</b>				<b>\$1,084,756.86</b>
Cost per Lot	174			\$6,234.23

**Engineering Comparison**

Project: Light Imprint New Urbanism Study  
 Date: December 06, 2006  
 Details: Phase 1, 42 Acres, 176 Lots

**Conclusions**

Overall 31% Savings  
 Per Lot 30% Savings

Comparison cost chart showing a 31% cost saving in the first phase by using Light Imprint tools for infrastructure.