REPAIR SPRAWL
GREENING INFRASTRUCTURE
CIVILIZING TRANSIT

THOMAS E. LOW AIA CNU LEED AICP ASLA

DPZ

www.sprawlrepair.com
www.lightimprint.org
www.dpz.com
• Sprawl growth –
• 1850 = 3.2% of population
• Today = over 50%

Figure I-1 The Growth of Metropolitan and Suburban Areas in the United States, 1850–2000
Population in Thousands

<table>
<thead>
<tr>
<th>Date</th>
<th>U.S. Population</th>
<th>Metropolitan Area Population (includes city and suburbs)</th>
<th>% of U.S. Population</th>
<th>Suburban Area Population</th>
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Sprawl remains the prevailing growth pattern across the United States.

Even though experts in planning, economics and environmental issues have long denounced it as wasteful, inefficient, and unsustainable.

Sprawl is a principal cause of lost open space and natural habitat as well as increases in air and water pollution, greenhouse gas emissions, infrastructure costs, and even obesity.
• Sprawl also plays a primary role in the housing meltdown plaguing the nation.
• **COMPLETE COMMUNITIES:**
  - def. — diverse in terms of uses, transportation options, and population. They are walkable, with most daily needs close by.

• **SPRAWL:**
  - def. — characterized by an abundance of congested highways, strip development, and gated cul-de-sac subdivisions —
Sprawl Repair Manual

- provides a step-by-step design, regulatory, and implementation process.

- Many of the techniques are derived from the work and built projects of Duany Plater-Zyberk & Company.
The Sprawl Repair Method

(Five) Planning Scales:
Region, Community, Street, Block, Building

(Three) Types of Techniques:
Design, Regulation and Implementation
First-Generation Pre-War Suburbs


- Traditional urban core
- First generation suburbs
- Railroad or streetcar lines
- Undeveloped land
Second-Generation Post-War Suburbs

1-10. Levittown, New York

- Decline in urban core
- Second generation suburbs
- Highways and interchanges
- Undeveloped land
Third-Generation
The Exurbs

1-12. Tyson’s Corner, Virginia

- Black: Decline in urban core
- Tan: Third generation suburbs
- Beige: Highways and interchanges
- Off white: Undeveloped land
Sprawl Repair Targets

2-1. Sprawl repair targets: commercial, employment and transportation nodes with the best potential for redevelopment.
• Sprawl Types vs. Community

“Our goal is to equip professional planners, designers, and developers to regulators and concerned citizens – with polemical as well as practical strategies drawn from two decades of successful repair projects by DPZ.”

Galina Tachieva  DPZ

FORM—BASED CODE MODULE
• Complete Communities vs. Suburban Sprawl

Green Infrastructure — Which choice is right for you?

<table>
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<tr>
<th></th>
<th>Light Imprint</th>
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<th>Green Urbanism</th>
<th>Conventional Engineering</th>
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<td>Compact</td>
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<tr>
<td>Connected</td>
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LID Methodology
• Low Impact vs. Light Imprint: Which choice is right for you?
Charlotte Streetcar “Cool Spots” Methodology
HOW TO USE LIGHT IMPRINT

You can use Light Imprint

» to develop a strategy for sustainability and pedestrian oriented design in an economical way

» to change the mindset of your community from a suburban model towards a New Urban and traditional neighborhood model.

» to reduce costs associated with conventional engineering practices

» to provide an organizational framework to complement and expand the effectiveness of Leadership in Energy Efficient Design for Neighborhood Development (LEED-ND)

» to complement other land planning approaches, including conventional suburban development, Low Impact Development, and Best Management Practices.
Charlotte Streetcar Stop Location Assessment
Legend
- CATS Bus Stops
- Streetcar Stops
- 1/4 Mile Radius
- 1/2 Mile Radius
- CATS Bus Routes

Future Land Use
- Greenway/Park
- Civic/Institutional
- Special District
- T6 - Urban Core
- T5 - Urban Center
- T4 - General Urban
- T3 - Sub-urban
- T2 - Rural
- Parking

Charlotte Streetcar Corridor
Form-Based Code Overlay
Charlotte Streetcar “Cool Spots” Methodology
Charlotte Streetcar “Cool Spots” Methodology
# Streetcar vs. BRT plus a Green Diet

## Comparison of Cost to Benefits

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<th>Unit</th>
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<td>$21.83%***</td>
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Nordahl’s “My Kind of Transit”
The Journey vs. the Efficiency

Essential Design Considerations that can Enrich the Passenger Experience

Route
- The most efficient may not be the most pleasurable.
- Richness of experience.

Headway
- A 30 minute headway is more economical than a 10 minute headway, but people shun transit with large headways - out of sight, out of mind.

Form
- Efficiency and economics are key considerations but transportation decision makers should also consider the passenger’s desire. Seek and modern or nostalgic.

Scale
- Smaller is better, should be scaled to the pedestrian.
- As vehicle size increases they demand a larger turning radius which threatens the pedestrian scale curb radius.

Operation
- Transit operators can provide a feeling of comfort and security, answer questions, keep order, a welcome familiar face, make change.
- More human, less robotic.
- The source of locomotion can be memorable.

Pace
- Speed and efficiency should not be the sole criteria — pedestrian life ceases, businesses suffer, overall quality declines.
- A slow pace allows for people watching, window shopping, sight seeing, pleasure of sights, sounds and smells, animates the street, safety minded appeal to pedestrians.

Style
- Provides a valued memorable experience, if it looks like a bus then it lacks panache.
- Eye-catching interiors create tranquility and warmth instead of sterile.

Transparency
- Tinted window dull our experience, window should be high as the stainless get a view out and they should be operable.

Seating
- Location and orientation of composed seating can be the single greatest component to successful transit.

Color
- Color adds fancy and can give transit cars distinction.
- Should reinforce the landscape of which it is a part.

Lighting
- Seat to use warm soft incandescent vs. sterile fluorescent lighting of buses.

Quotes From Book
- “Is something as simple as joy the easiest way to change people’s behavior for the better?”
- “Can we get more people to choose the stairs over the escalator by making it fun to do?”
- “Can we get more people to choose transit over the automobile if it can offer them an enjoyable experience?”
- “Quirky, colorful, and intricately detailed.”
- “People are often drawn to places that offer rich experiences: beautiful landscapes, glittering theater districts, tranquil neighborhoods.”
- “Intimacy is compelling, and transit vehicles should aim on the small side. Transit planning today, unfortunately, seems to favor the behemoth.”
- “Double-deckers provide two more intimate cabins, with the top cabin offering a unique perspective.”
- “Shorter headways offer convenience, help animate the street, and provide frequent reminders of our transit options.”
- “Let transit set the pace of the street. And ensure that the pace is closer to a cyclist’s rather than a motorist’s.”
- “At the very least, transit should have a sense of authenticity, and reflect the unique environment in which it travels.”
- “Seldom does one find a transit vehicle today without tinted windows, some so heavily shaded that nobody on the outside can see in.”
- “Most transit vehicles require passengers to face forward, rewarding them with the immediate view of the back of someone’s head.”
- “Color adds fancy and can give transit cars distinction, and it can reinforce the landscape of which it is a part.”
Charlotte as the Transit Metropolis
Charlotte Streetcar Custom Design

Streetcar Schematic Design

Using the context of “My Kind of Transit,” the workshop team built on the idea of focusing on the quality of our skyline and on traditions in Southern Culture. Applying the traditions of front porches and verandahs to the streetcar, as well as giving riders an opportunity to look up and see the skyline and the first two-three stories of a building would be a streetcar experience unique to Charlotte. This streetcar design, the sketches shown at right, would have a raised roof with seating facing towards the buildings versus the front. An example of this experience is traveling down Elizabeth Avenue. As the Streetcar heads towards Center City, the raised roof on the front would allow passengers to see the beautiful skyline of Charlotte. Along the side facing the street, passengers would see the shop fronts, which are usually two stories high. Seeing the beautiful skyline in the distance would let passengers see their destination. The back of the streetcar could potentially have a balcony, similar to an old train car. The balcony would allow the rider to see the route already traveled.
Charlotte Streetcar “Skyliner Series” Front Porch

The “Skyliner” shown at right is a single car version of the Streetcar. This nostalgic name is reminiscent of older streetcars and appeals to riders. This version of the Streetcar would have removable windows and would travel slow enough to stand on the runner board and jump on and off the streetcar. The “Skyliner” would also have a breezeway to shield from the sun and glare. The high roof would only open to one side as well, giving people a roofline/skyline view only towards the street on one side.

Stan Thompson, Chairman of the Hydrogen Economy Advancement Team (HEAT)

Stan Thompson, Chairman of the Hydrogen Economy Advancement Team (HEAT), provided input on the Skyliner Streetcar Series design and offer the following thoughts. The Skyliner Streetcar Series hydroliner is designed for safety and comfort. Utilizing proposed hydrogen hybrid propulsion technology, the Skyliner Series Streetcar will offer substantial operational cost savings over buses.

Employing the green fuel cell/hybrid technology, the Skyliner Series Streetcar offers a quiet urban and community experience by its use of a non-polluting, no-odor propulsion unit. In addition, hydroliners need no external stationary power infrastructure.

Street trees, a signature characteristic of Charlotte, can line the streetcar corridor without interfering with service and operations associated with wind and ice-storms. There are numerous studies identifying the economic development benefits of passive green spaces, including higher premium rents and resale rates.
The "Veranda"

The "Veranda" is a larger three car model of the streetcar that can accommodate more passengers and handles capacity similar to the Portland Streetcar. The "Veranda" would have similar qualities as the "Skyliner" and includes the angled roof to allow passengers to view the buildings and skyline, while also feeling welcomed on Charlotte's "Front Porch." The sketch at right shows the "Veranda" along Central Avenue at the Plaza-Midwood neighborhood center.

Darrin Nordahl, author of the book "My Kind of Transit", writes:

These sketches are impressive, and if something like these proposals get built in Charlotte, I believe it will change how people think about public transportation forever. The designs seem to incorporate most everything I advocate for — form, scale, style, transparency, seating and others — but most importantly, a strong connection to place. Without knowing where this potential streetcar would run, it just feels like it belongs in the South. The rationale for the clearstory - views of the Uptown skyline - the materials, removable windows, and even the porch and potential swing, fit Charlotte's environment as few transit vehicles do.

I've tried to persuade many transit engineers and planners that the transit car is more akin to a building than a vehicle. When done right, transit can literally be architecture on wheels. This proposal illustrates that point very well.

I believe folks in Charlotte will be so impressed with this vehicle that they will lobby on its behalf. It is amazing how strongly people will support a project if they can fall in love with it. It seems the streetcar proposal is certainly something that Charlotteans can relate to and be proud of.

Please keep me informed of the Charlotte's streetcar progress. The inspiring sketches alone have justified the writing of my book, "My Kind of Transit" — and has ignited great excitement in the potential future greatness of public transportation in America.
Design and engineering that considers the journey of transit, prioritizes multi-modal over single mode, and provides a vision for repairing and civilizing places.

The Charlotte Streetcar
Civilizing Places
Potential for Repair and Redevelopment in Louisiana i.e. The Mall at Cortana
Mega Structure Surrounded by Parking Lots
Repair Strategy: Retain Main Structure and Redevelop Parking Lots
Repair Strategy: Retain Anchors and Create a Main Street
Repair Strategy: Devolution of the Mall into an Agricultural Village
### SHOPPING MALL

<table>
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<tr>
<th>TRANSFORMATION</th>
<th>CATEGORIES</th>
<th>BEFORE</th>
<th>AFTER</th>
<th>IMPROVEMENT OF URBAN INDICATORS</th>
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</table>

1 Total built area comprises all construction, including buildings, parking, and thoroughfares.
2 Total building footprint comprises all building footprints, regardless of use.
3 Total building area comprises all building square footage. Parking decks are included.

2-4. Quantitative comparison of urban indicators in a shopping mall
• Form-Based Code Module

• From the scale of the region to the building - turning subdivisions into walkable neighborhoods, shopping centers and malls into town centers, and more!
Repetitive Pattern of Single-Family Houses and Cul-de-Sacs
Step 1 – Identify the Deficiencies

4-16. Single building type and use

4-17. Lack of walkable block structure

4-18. Residual open space
Step 2 - Introduce New Building Types and Mixed Uses

**Deficiency:** Single building type and use

**Remedial Techniques:**
Introduce new building types and mix of uses: retail, office and civic

- Add townhouses
- Add market structure
- Adapt houses into duplexes or multifamily
- Add mews units
- Add apartment villas
- Add office buildings
- Add mixed-use buildings
- Remove single-family houses

**Outcome:** Variety of building types and mix of uses to support neighborhood center
Step 3 - Connect and Repair Thoroughfares

Deficiency: Lack of walkable block structure

Remedial Techniques: Connect and repair thoroughfares
- Connect cul-de-sacs (see chapter five)
- Connect streets
- Introduce mews lanes
- Introduce alleys
- Introduce mid-block pedestrian passages
- Create external connections
- Repair thoroughfares (see chapter five)

Outcome: Walkable network and block structure
Step 4 - Define Open and Civic Space

**Deficiency:** Residual open space

**Remedial Techniques:** Define open and civic space
- Create a neighborhood green/playground
- Repair the collector into an avenue
- Create a market square
- Locate a bus stop coordinated with municipality

**Outcome:** Hierarchy and spatial definition of public realm
Step 5 - Integrate Local Food Production Spaces

**Deficiency:** Lack of local food production

**Remedial Techniques:** Integrate local food production spaces in all urban scales

- Introduce gardens on private lots
- Create community gardens in public spaces
- Create allotment gardens in residual spaces
- Create community gardens within blocks

**Outcome:** A variety of local food production options
Step 6 - Rezoning

4-27. Conventional single-use zoning
- Open Space
- R1 - Single-family Residential
- Existing buildings

4-28. Transect-based zoning
- T1 - Natural Zone
- T3 - Sub-Urban Zone
- T4 - General Urban Zone
- T5 - Urban Center Zone
- CS - Civic Space
- CB - Civic Building
- Existing and proposed buildings
### SINGLE-FAMILY SUBDIVISION

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<td>Thoroughfare area per capita, sq. ft. per occupant</td>
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<td>157</td>
<td>73</td>
<td>0.5</td>
</tr>
<tr>
<td>Thoroughfare length per capita, ft. per occupant</td>
<td></td>
<td>1.2</td>
<td>0.8</td>
<td>0.6</td>
</tr>
</tbody>
</table>

1 Total built area comprises all construction, including buildings, parking, and thoroughfares.
2 Total building footprint comprises all building footprints, regardless of use.
3 Total building area comprises all building square footage. Garages of single-family residences are included.

2-2. Quantitative comparison of urban indicators in a single-family subdivision
2-1. Conceptual representation of possible paths of sprawl repair and their effects on resource use and quality of life

1. Direct process of sprawl repair
2. Phased process of sprawl repair
3. Indirect process of sprawl repair
### BUSINESS PARK

<table>
<thead>
<tr>
<th>TRANSFORMATION</th>
<th>CATEGORIES</th>
<th>BEFORE</th>
<th>AFTER</th>
<th>IMPROVEMENT OF URBAN INDICATORS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site acreage, acres</td>
<td></td>
<td>126</td>
<td>126</td>
<td>1.0</td>
</tr>
<tr>
<td>Total built area,¹ sq. ft.</td>
<td></td>
<td>3,490,000</td>
<td>6,780,000</td>
<td>1.9</td>
</tr>
<tr>
<td>Total building footprint,² sq. ft.</td>
<td></td>
<td>530,000</td>
<td>1,610,000</td>
<td>3.0</td>
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<tr>
<td>Total building area,³ sq. ft.</td>
<td></td>
<td>1,450,000</td>
<td>5,440,000</td>
<td>3.8</td>
</tr>
<tr>
<td>Total occupant load, occupants</td>
<td></td>
<td>15,000</td>
<td>29,000</td>
<td>2.0</td>
</tr>
<tr>
<td>Occupant density, occupants per acre</td>
<td></td>
<td>115</td>
<td>235</td>
<td>2.0</td>
</tr>
<tr>
<td>Parking area per capita, sq. ft. per occupant</td>
<td></td>
<td>88</td>
<td>57</td>
<td>0.6</td>
</tr>
<tr>
<td>Thoroughfare area per capita, sq. ft. per occupant</td>
<td></td>
<td>52</td>
<td>33</td>
<td>0.6</td>
</tr>
<tr>
<td>Thoroughfare length per capita, ft. per occupant</td>
<td></td>
<td>0.7</td>
<td>0.5</td>
<td>0.7</td>
</tr>
</tbody>
</table>

¹ Total built area comprises all construction, including buildings, parking, and thoroughfares.
² Total building footprint comprises all building footprints, regardless of use.
³ Total building area comprises all building square footage. Parking decks are included.

Dispersed Building and Parking Layout
Office Park Repaired into a Transit-Oriented Town Center
Existing Strip Center
Conversion into a Renewable Energy Center