Conflict Between Two Scales
WE NEED:

- wide streets for heavy traffic
- big parking plots for public buildings
- large plots for public and private functions
- freedom for new designs

WE HAVE:

- narrow streets
- very small parking facilities
- very small irregular plots
- no room to move

freedom for expropriation

the largest investment and the highest prices
From Sprawl to Complete Communities
Fragmentation, Car-dependence, Single Use Versus Compactness, Connectivity and Complexity

From Sprawl to Complete Communities
From Sprawl to Complete Communities
From Sprawl to Complete Communities

Repair with Parking Lots Developed and Buildings Replaced
First-Generation, Pre-War Suburbs

From Sprawl to Complete Communities
Second-Generation, Post-War Suburbs

From Sprawl to Complete Communities
Third-Generation Suburbs, the Exurbs

From Sprawl to Complete Communities
Sprawl Repair Targets

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

The Sprawl Repair Method
The Sprawl Repair Method

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

(Three) Types of Techniques:
Design, Regulation and Implementation
The Two Models: Traditional - Complete Communities
The Two Models: Sprawl - Incomplete Communities

The Sprawl Repair Method
Urban Design Techniques: the Scale of the Region, Community, Block and Building

The Sprawl Repair Method
The Sprawl Repair Method

Possible Paths of Sprawl Repair – Direct, Phased and Indirect Process
## Quantitative Comparison of Urban Indicators Before and After Sprawl Repair

<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>Single-Family Subdivision</td>
<td>Site acreage, acres</td>
<td>131</td>
<td>131</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>Total built area,(^1) sq. ft.</td>
<td>2,305,196</td>
<td>3,218,863</td>
<td>1.4</td>
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<tr>
<td></td>
<td>Total building footprint,(^2) sq. ft.</td>
<td>432,768</td>
<td>807,382</td>
<td>1.9</td>
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<tr>
<td></td>
<td>Total building area,(^3) sq. ft.</td>
<td>548,688</td>
<td>1,248,841</td>
<td>2.3</td>
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<tr>
<td></td>
<td>Total occupant load, occupants</td>
<td>2,098</td>
<td>7,169</td>
<td>3.4</td>
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<tr>
<td></td>
<td>Occupant density, occupants per acre</td>
<td>16</td>
<td>55</td>
<td>3.4</td>
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<tr>
<td></td>
<td>Parking area per capita, sq. ft. per occupant</td>
<td>64</td>
<td>66</td>
<td>1.0</td>
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<tr>
<td></td>
<td>Thoroughfare area per capita, sq. ft. per occupant</td>
<td>773</td>
<td>216</td>
<td>0.3</td>
</tr>
<tr>
<td></td>
<td>Thoroughfare length per capita, ft. per occupant</td>
<td>6</td>
<td>2.2</td>
<td>0.4</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.

---

The Sprawl Repair Method
Regulatory Techniques - The Transect

The Sprawl Repair Method
This is a Transect that has been calibrated for Washington D.C. by Dhiru Thadani.

The Sprawl Repair Method
Regulatory Techniques – The Need for Form-Based Zoning

The Sprawl Repair Method
Regulatory Techniques – Reverse Transition

The Sprawl Repair Method
Repair at the Regional Scale
Regional Plan Using Natural Boundaries to Control Sprawl

Repair at the Regional Scale
Step One: Determine Sprawl Repair Domains

Identify the regional domain with its geographical boundaries and its potential growth areas.
Identify the sprawl repair sector as a target for regional redevelopment.

Repair at the Regional Scale
Step Two: Delineate Preservation and Reservation Areas

3-4. Step Two: Delineation of preservation and reservation areas

- Preservation Area
- Reservation Area

- Identify areas where development should not occur.
- Analyze open space for potential watershed restoration, daylighting of bodies of water, and other retrofitting strategies.

Repair at the Regional Scale
Step Three: Prioritize the Commercial and Employment Nodes

- Analyze the existing system of commercial and employment nodes, including service areas.
- Identify the high-priority targets for redevelopment and repair: employment hubs and regional shopping centers that can be transformed into regional urban cores and town centers.
- Identify the moderate-priority nodes for redevelopment and repair: strip shopping centers and office parks that can be transformed into main streets and neighborhood centers.
- Identify targets to be given low priority for redevelopment and repair: convenience stores, gas stations, subdivision entrances that can be transformed into corner stores.
Step Four: Prioritize the Potential Transit and Infrastructure Networks

- Analyze the existing thoroughfare and transit network.
- Propose new connections and new thoroughfares that would help to complete the sparse network and accommodate BRT and circulator buses.
- Propose possible routes for heavy and light rail system based on density and destinations.
- Propose possible routes for biking and pedestrian trail networks.
- Analyze and prioritize other operational infrastructure networks.

Repair at the Regional Scale
Step Seven: Assemble the Sector Map

Assembly of the sector map involves depicting neighborhood centers, town centers, regional urban cores, transit networks, and preservation areas. Separate areas that are not designated for preservation and not targeted for repair. These may remain as sprawl or devolve into agricultural lands or natural open space.

Repair at the Regional Scale
Repair at the Community Scale
Transformation of a Single-Family Subdivision into a Neighborhood Center

Repair at the Community Scale
Repair at the Community Scale

Repetitive Pattern of Single-Family Houses and Cul-de-Sacs
New Neighborhood Center

Repair at the Community Scale
Deficiencies

4-16. Single building type and use
4-17. Lack of walkable block structure
4-18. Residual open space

Repair at the Community Scale
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

Repair at the Community Scale
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

Repair at the Community Scale
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

Repair at the Community Scale
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
Repair at the Community Scale

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

Repair at the Community Scale
## Comparison of Carbon Footprint by Settlement Pattern

<table>
<thead>
<tr>
<th>Sprawl Composition</th>
<th>Complete Community Composition</th>
<th>Co2 Emissions Per Person</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CSD Zone</strong></td>
<td><strong>Transect Zone</strong></td>
<td><strong>Mixed Use and Housing Type</strong></td>
</tr>
<tr>
<td>CSD 1 - Single-family</td>
<td>T1 0</td>
<td>40% Single-family Housing</td>
</tr>
<tr>
<td></td>
<td>T2 0</td>
<td>60% Multi-family Housing</td>
</tr>
<tr>
<td></td>
<td>T3 40</td>
<td>9% Retail, Office and Lodging</td>
</tr>
<tr>
<td></td>
<td>T4 20.5</td>
<td>0% Single-family Housing</td>
</tr>
<tr>
<td></td>
<td>T5 40.5</td>
<td>100% Multi-family Housing</td>
</tr>
<tr>
<td></td>
<td>T6 0</td>
<td>12% Retail, Office and Lodging</td>
</tr>
<tr>
<td></td>
<td>CIVIC 29.8</td>
<td>0% Multi-family Housing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0% Retail, Office and Lodging</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Civic Space</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Civic Buildings</td>
</tr>
<tr>
<td><strong>Total Emissions</strong></td>
<td><strong>Total Emissions</strong></td>
<td><strong>Total Emissions</strong></td>
</tr>
<tr>
<td>Emissions per Person</td>
<td>6,345.7 mT CO2/yr</td>
<td>15,056 mT CO2/yr</td>
</tr>
<tr>
<td></td>
<td>10.94 mT CO2/yr</td>
<td>6.74 mT CO2/yr</td>
</tr>
</tbody>
</table>

### Repair at the Community Scale
Transformation of a Shopping Center into a Town Center

Repair at the Community Scale
Parking Lots Dominating Public Realm

Repair at the Community Scale
Parking Lots Redeveloped into a Walkable Fabric

Repair at the Community Scale
Greyfield Redevelopment

Repair at the Community Scale
Greyfield Redevelopment

Repair at the Community Scale
National and Local Tenant Mix, Live-Work Units

Repair at the Community Scale
Affordable Housing and Incubator Businesses
Transformation of a Shopping Mall into a Town Center

Repair at the Community Scale
Katy Mills Mall, Houston

Repair at the Community Scale
Existing Context: Shopping Centers, Office Parks, and Parking Lots

Repair at the Community Scale
Diagram: Pedestrian Sheds

Repair at the Community Scale
Mega Structure Surrounded by Parking Lots

Repair at the Community Scale
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

Repair at the Community Scale
Transformation of a Business Park into a Town Center

Repair at the Community Scale
Dispersed Building and Parking Layout

Repair at the Community Scale
Office Park Repaired into a Transit-Oriented Town Center

Repair at the Community Scale
Infill Repair Strategy for Corporate Campus
Legacy, Plano, Texas

Repair at the Community Scale
Infill Repair Strategy for Corporate Campus
Repair at the Community Scale

Mixed-Use Fabric
Mixed-Use Fabric

Repair at the Community Scale
Manmade Lake as a Community Amenity/ Rainwater Facility

Repair at the Community Scale
Residential Fabric

Repair at the Community Scale
Perimeter-Block Building Courtyard

Repair at the Community Scale
Transformation of an Edge City into a Regional Urban Core

Repair at the Community Scale
Edge City – Existing Conditions

Repair at the Community Scale
Edge City Repaired into a Regional Urban Core

Repair at the Community Scale
Transformation of a Suburban Campus into a Traditional Urban Campus

Repair at the Community Scale
Repair at the Community Scale

Underutilized Land and Parking Lots
New Organization of the Campus with Enhanced Principal Axes

Repair at the Community Scale
Repair at the Block Scale
Repair at the Block Scale

Existing Slab and Tower Block
Repair at the Block Scale

Repaired Block with Townhouses and Mixed-Use Buildings
Typical Suburban Residential Block

Repair at the Block Scale
Phase One: Introduction of Alleys and Outbuildings

Repair at the Block Scale
Phase Two: Introduction of Backbuildings and Corner Stores

Repair at the Block Scale
Repair at the Block Scale

Typical Suburban Residential Block
Outcome One: Agricultural Lots and Family Compounds

Repair at the Block Scale
Outcome Two: Civic Green as a Community Garden

Repair at the Block Scale
Repair at the Building Scale
Repair at the Building Scale

Transformation into Multifamily or Student/Senior Housing

7-3. Existing McMansion: First and second floor: five bedrooms, five bathrooms and three-car garage

7-4. Outcome One: McMansion converted into senior or student housing. First floor and second floors: ten bedrooms, nine bathrooms and a suite for a caretaker

7-5. Outcome Two: McMansion converted into multifamily. First floor: one 1-bedroom and one 2-bedroom apartment. Second floor: two 2-bedroom apartments

Repair at the Building Scale
Techniques to Infill Excessive Front Setbacks and Define Public Space

Repair at the Building Scale
Typical Suburban Gas Station

Repair at the Building Scale
Corner Store Addition

Repair at the Building Scale
Existing Strip Center

Repair at the Building Scale
Conversion into a Recycling Center

Repair at the Building Scale
Repair at the Building Scale

"The polycentric reorganization of towns, i.e., the transformation of underdeveloped suburbs into autonomous urban quarters and villages, will be the impetus for a process of territorial transformation, internal growth, and the flowering of the suburbs."

Léon Krier
The Architecture of Community

SmartCode v10
An Interdisciplinary Protocol For Sustainable Landscape Urbanism

Repair at the Building Scale
<table>
<thead>
<tr>
<th>Sprawl Types</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
<th>Techniques</th>
<th>Incentives/Benefits</th>
<th>Repaired</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural Subdivisions</td>
<td>60%</td>
<td>10-20%</td>
<td>20-40%</td>
<td></td>
<td></td>
<td></td>
<td>Cluster at intersections through TDR; modified PDRs; purchase of conservation easement; concentrate infrastructure; create a rural Green; introduce live-works, farmers market</td>
<td>Deferred taxation, higher Density; permitting By Right; packaged sewer service within 1/4 square mile; Hamlet growing into a village</td>
<td>QLD</td>
</tr>
<tr>
<td>Single Family Subdivisions</td>
<td>No Minimum</td>
<td>10-20%</td>
<td>30-60%</td>
<td>10-20%</td>
<td></td>
<td></td>
<td>Introduce new building types and Retail/Office/Lodging/Civic uses; Connect Thoroughfares; add pedestrian and bike paths</td>
<td>Higher Density; additions; Outbuildings; permitting By Right; infrastructure incentives; Transit potential; Neighborhood/Town Square</td>
<td>TND</td>
</tr>
<tr>
<td>Multi Family Subdivisions</td>
<td>No Minimum</td>
<td>10-20%</td>
<td>30-60%</td>
<td>10-20%</td>
<td></td>
<td></td>
<td>Introduce new building types and Retail/Office/Lodging/Civic uses; Connect Thoroughfares; rationalize parking; add garages; Repair Thoroughfares; add pedestrian and bike paths; Define and make usable Open and Civic Space</td>
<td>Additional development potential; permitting By Right; incentives for infrastructure; incentives for garages; Transit potential; community gathering places</td>
<td>TND</td>
</tr>
<tr>
<td>Shopping Centers &amp; Sub Campuses</td>
<td>10-30%</td>
<td>40-80%</td>
<td>40-80%</td>
<td></td>
<td></td>
<td></td>
<td>Introduce new building types and Retail/Office/Lodging/Civic uses; Connect Thoroughfares; add streets in front of stores; rationalize parking; add garages; define and make usable Open and Civic Space</td>
<td>Additional development potential; permitting By Right; TIFs, CDBG; incentives for infrastructure; incentives for garages; Transit potential; community gathering places</td>
<td>RVCD, TND</td>
</tr>
<tr>
<td>Business Parks &amp; Sub Campuses</td>
<td>10-30%</td>
<td>40-80%</td>
<td>40-80%</td>
<td></td>
<td></td>
<td></td>
<td>Introduce new building types and Retail/Office/Lodging/Civic uses; Connect Thoroughfares; create urban blocks; rationalize parking; add garages; define and make usable Open and Civic Space</td>
<td>Additional development potential; permitting By Right; TIFs, CDBG; incentives for infrastructure; incentives for garages; Transit potential; community gathering places</td>
<td>RVCD, TND</td>
</tr>
<tr>
<td>Malls</td>
<td>10-30%</td>
<td>40-80%</td>
<td>40-80%</td>
<td></td>
<td></td>
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<td>Introduce new building types and Retail/Office/Lodging/Civic uses; Connect Thoroughfares; create urban blocks; rationalize parking; add garages; define and make usable Open and Civic Space</td>
<td>Additional development potential; permitting By Right; TIFs, CDBG; incentives for infrastructure; incentives for garages; Transit potential; community gathering places</td>
<td>RVCD</td>
</tr>
<tr>
<td>Edge Cities</td>
<td>10-30%</td>
<td>40-80%</td>
<td>40-80%</td>
<td></td>
<td></td>
<td></td>
<td>Introduce new building types and Retail/Office/Lodging/Civic uses; Connect Thoroughfares; create urban blocks; rationalize parking; add garages; repair thoroughfares; resolve complicated interchanges and intersections into urban types; define and make usable Open and Civic Space</td>
<td>Additional development potential; permitting By Right; TIFs, CDBG; incentives for infrastructure; incentives for garages; opening additional real estate for development; transit potential; community gathering places</td>
<td>RVCD</td>
</tr>
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</table>