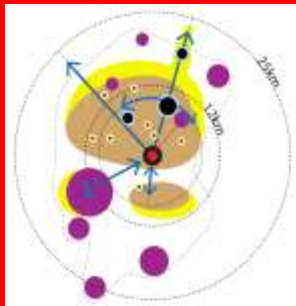



Transforming Johannesburg

Towards a low carbon and inclusive metropolis

Public Policies / Scenarios / Strategies

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Wits University, July 2014

SCHOOL of ARCHITECTURE & PLANNING

URBAN MORPHOLOGY & COMPLEX SYSTEMS INSTITUTE

Institut Français d'Afrique du Sud Recherche

AGENCE FRANÇAISE DE DÉVELOPPEMENT

The objectives of

energy efficiency, climate change mitigation, economic growth & social inclusion

are reinforcing and can be simultaneously achieved

by compact, connected and resilient communities centered around the transit nodes of corridors of freedom

Economic geography, Infrastructure and Urban Forms are the Major Policy Leverages for Urban Energy/GHG Decrease and Climate Mitigation

Economic Geography (trade, economic structure)

Income (consumption)

Technology: efficiency of energy end-use

(buildings, processes, vehicles, appliances)

Infrastructure and Urban Form

(energy supply infrastructure, transportation network, density, land use mix, accessibility)

Transportation modes and buildings

(choice of transport modes, building and site design)

Fuel substitution (imports)

Energy systems integration (co-generation, heat-cascading)

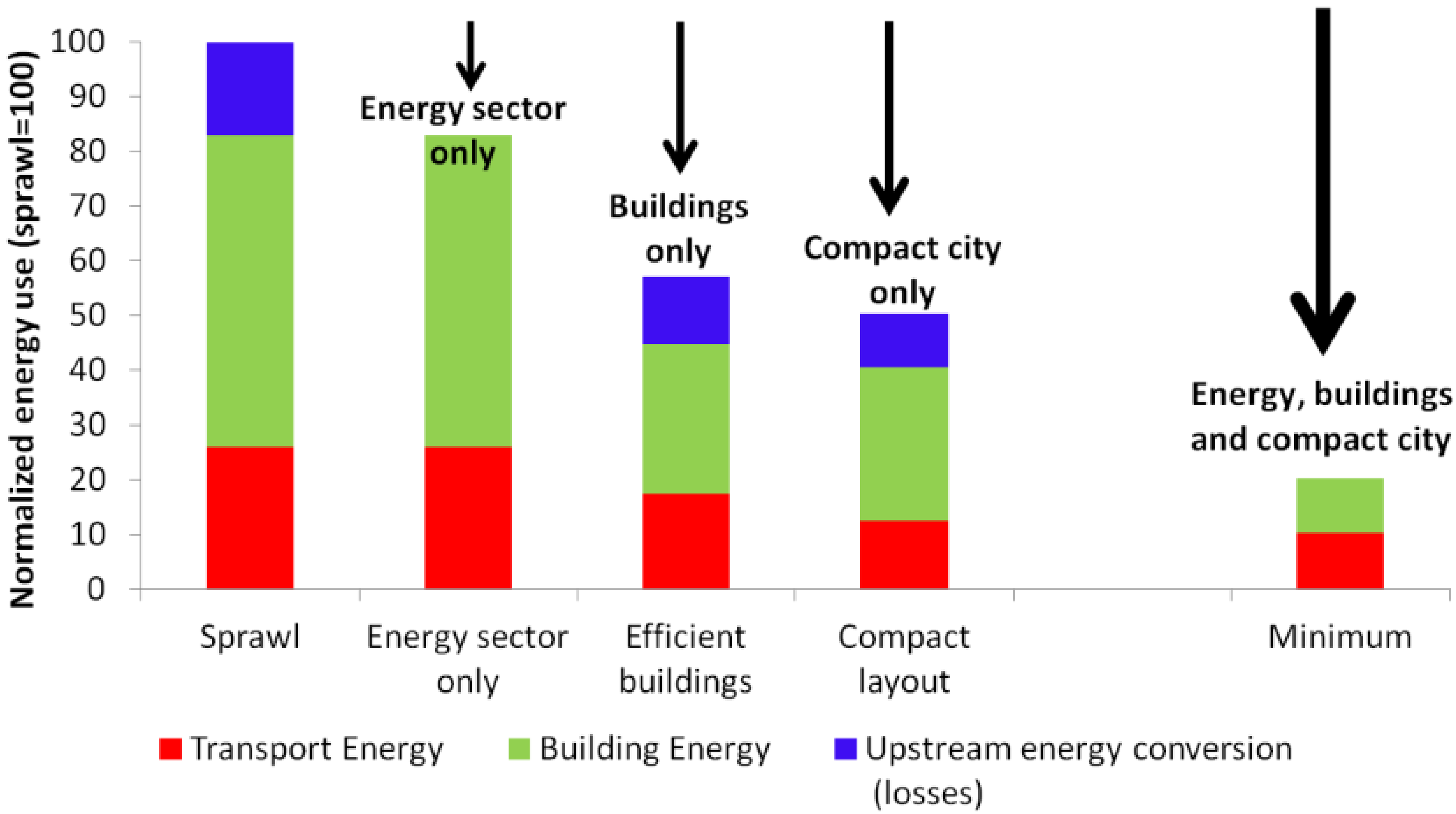
Urban renewables, urban afforestation

Decreasing order of impact

Increasing level of urban policy leverage

Adapted from GEA, 2013

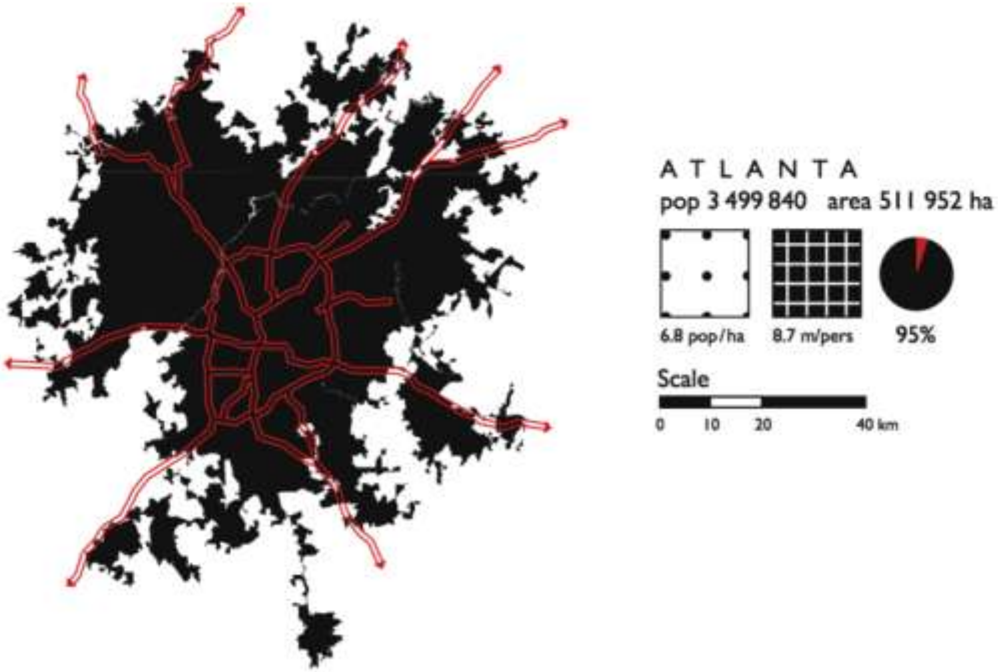
When compared to sectoral policies
Compact urban form is the most powerful leverage

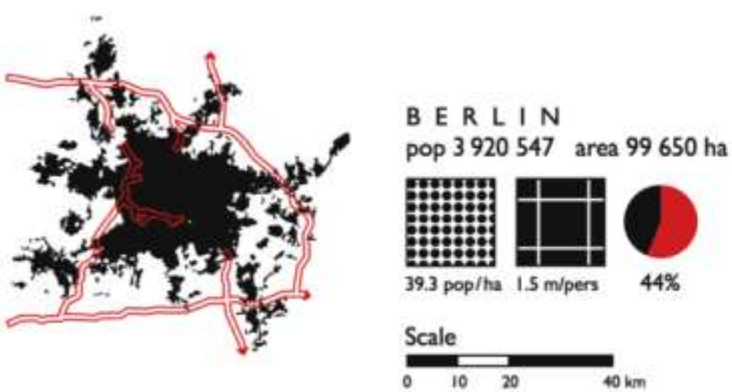


Adapted from GEA, 2013

Infrastructure costs of different urban forms

Low density induces high per capita infrastructure costs and car dependency

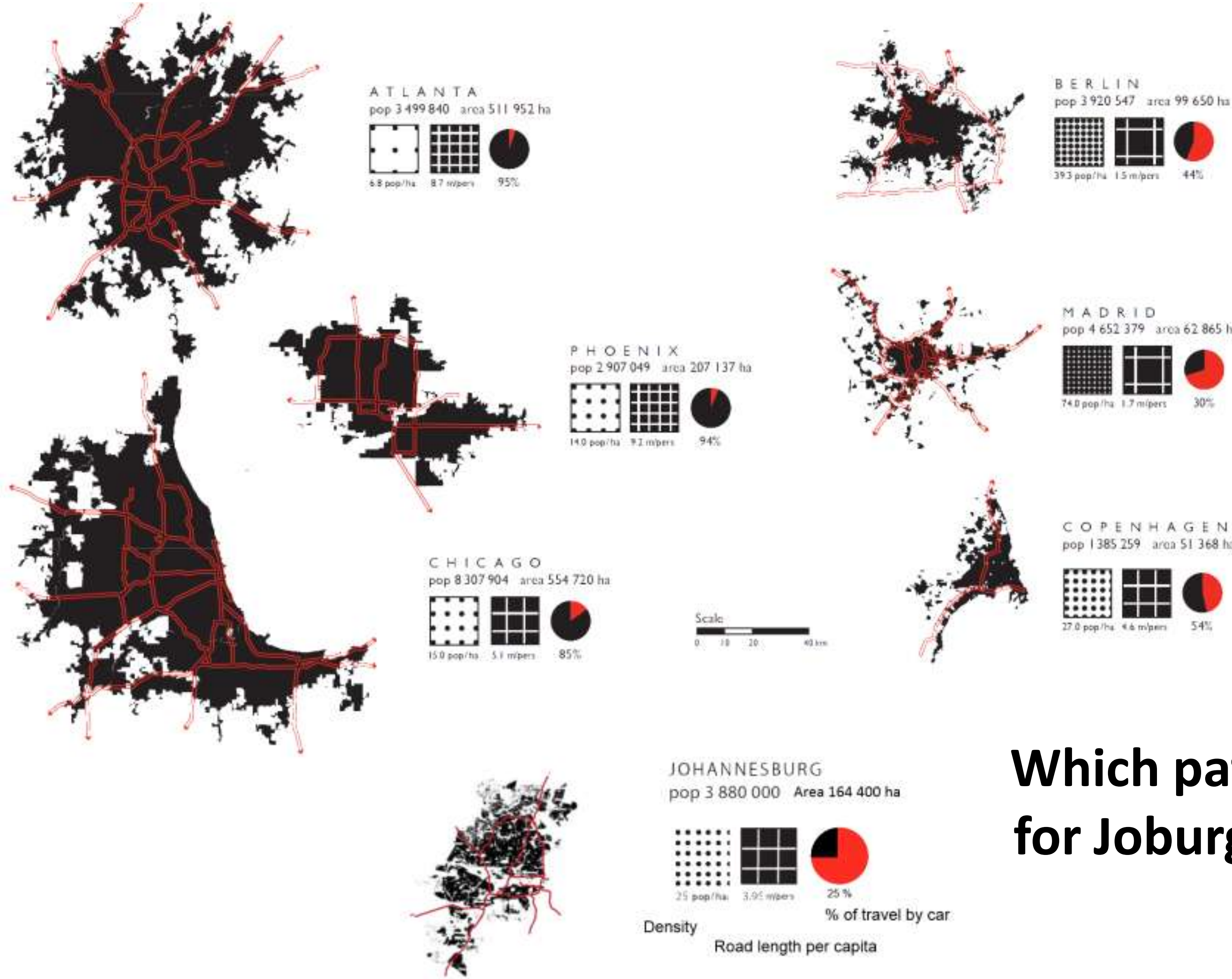




With a similar population, Atlanta is 6 times less dense than Berlin

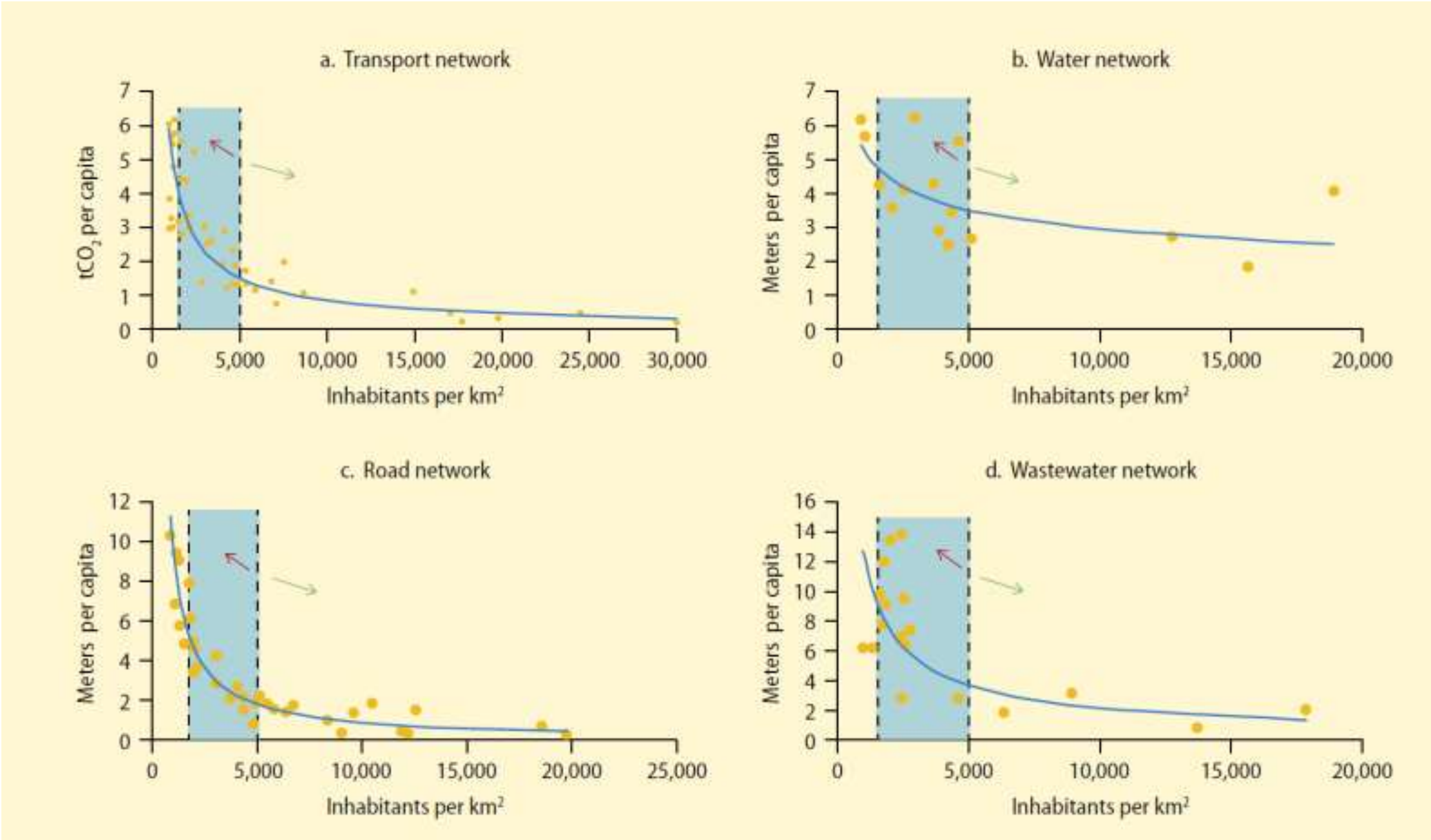
Infrastructure costs are 6 times higher in Atlanta than in Berlin

95% of people use a car in Atlanta, 44% in Berlin



Which path for Joburg?

Low density increases infrastructure costs, energy consumption and carbon emissions



From Paris or Manhattan (≈20,000 inhab/km²) to an average density of 5,000 inhab/km²

- Road network investment cost per capita **is multiplied by 4**
- Water network investment cost per capita increases **+ 40%**
- Waste water network investment cost per capita **is multiplied by 3**
- Carbon emissions for transportation per capita **are multiplied by 2.5**

Impact of density on infrastructure costs

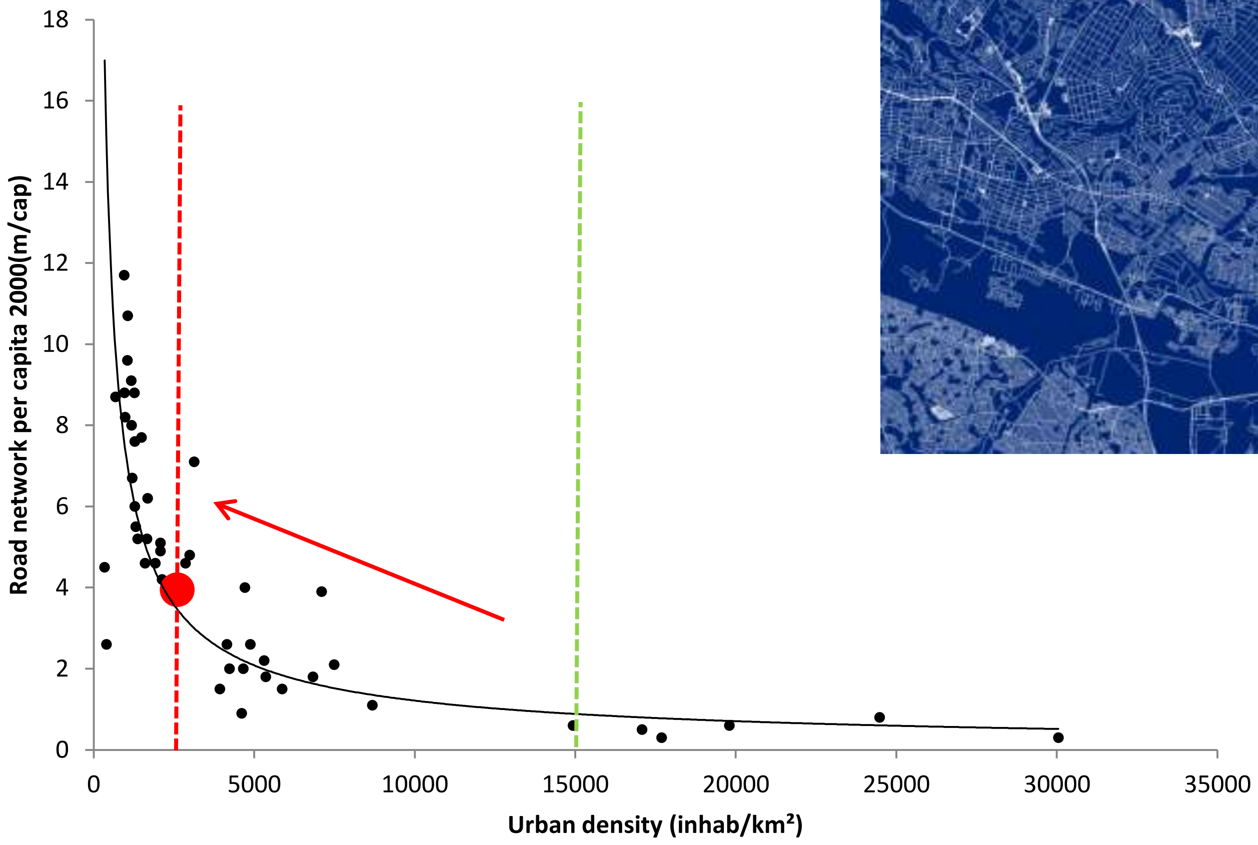
In the city of Johannesburg
15,343 km of roads
3.88 millions inhabitants

3.95 meters/cap

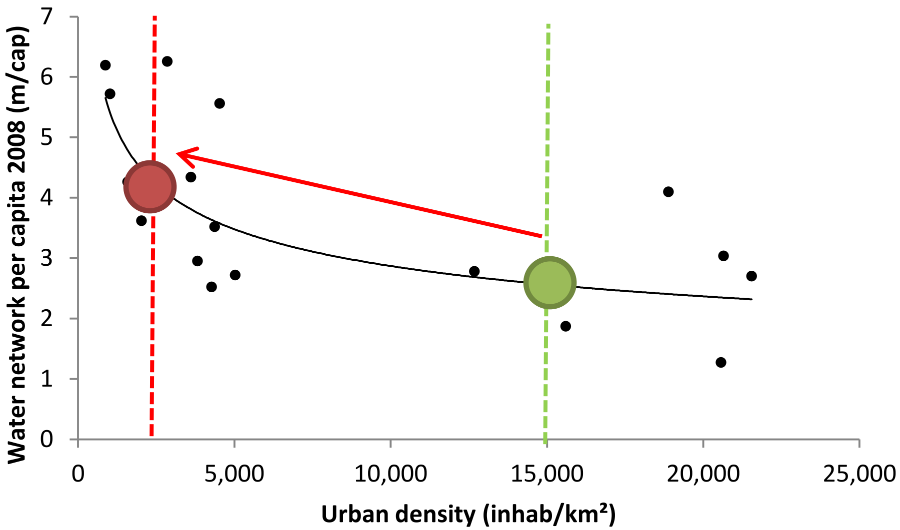
From a compact city (>15,000 inhab/km²) to Johannesburg (2,500 inhab/km²)

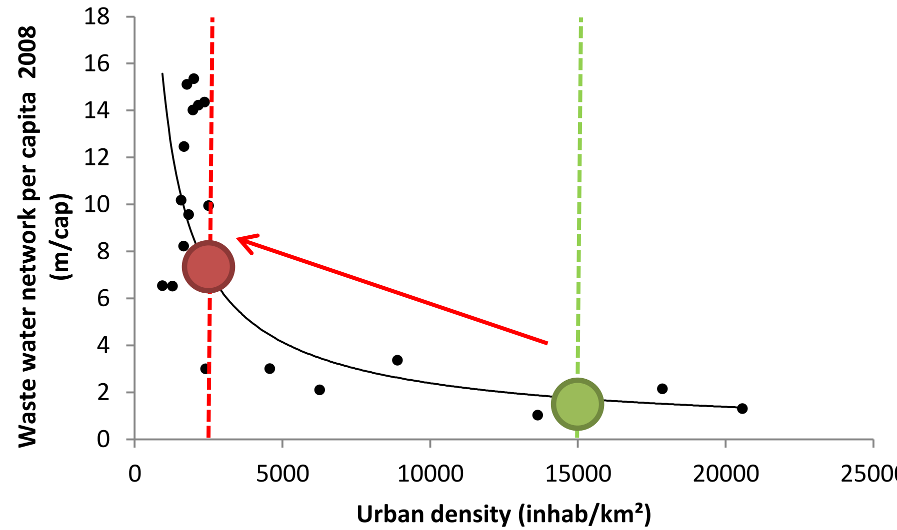
Road network investment length (and cost) per capita is multiplied by 6

Impact of density on infrastructure costs



Impact of density on infrastructure costs
The same holds for water and waste water networks

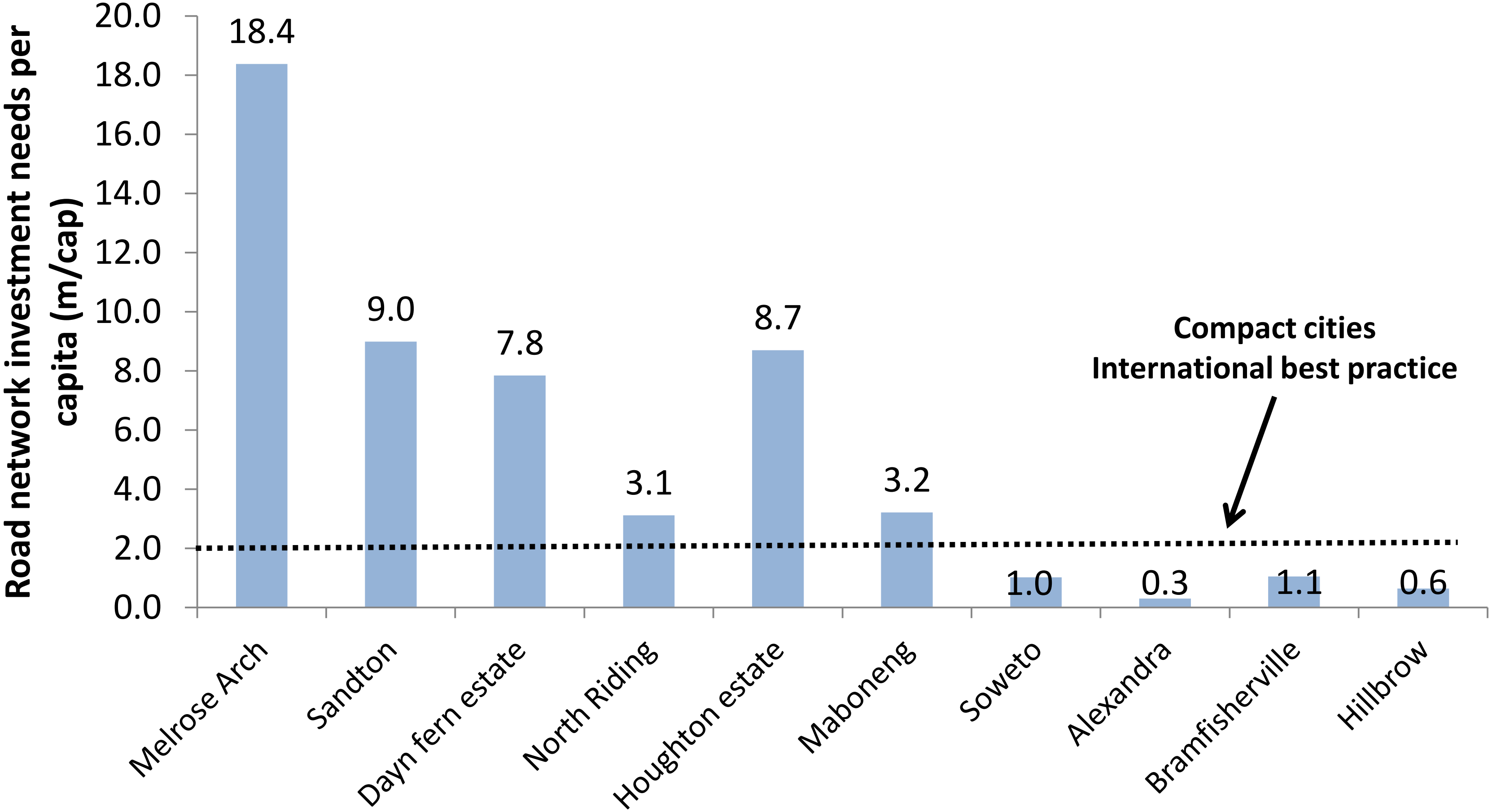


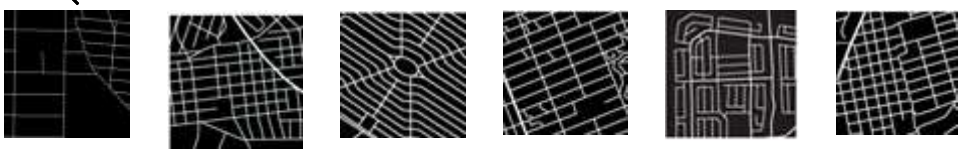


From a compact city (>15,000 inhab/km²) to Johannesburg (2,500 inhab/km²)

- **Water network length and costs: +50%**
- **Waste water network length and costs : x 3.5**

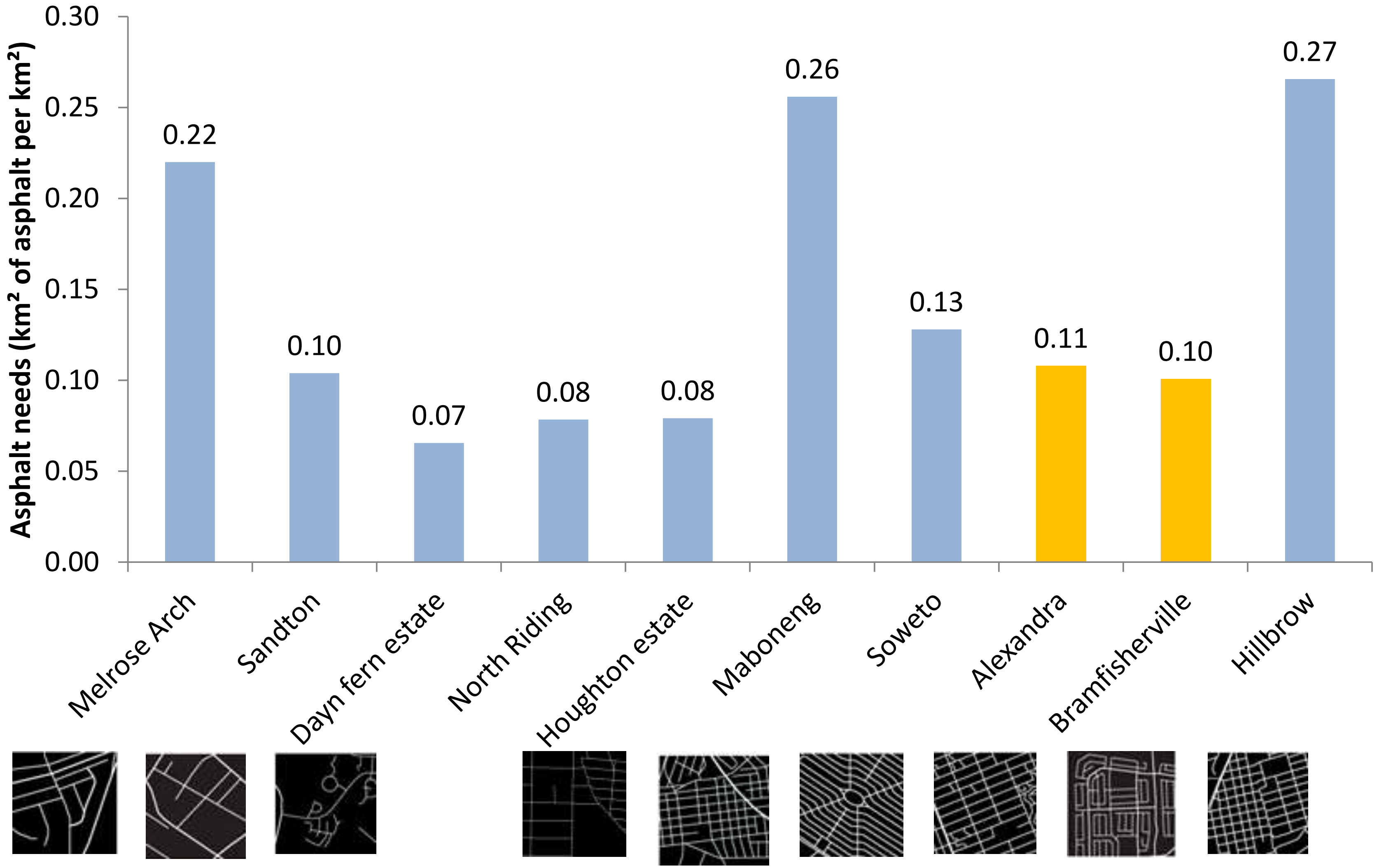
Joburg's street network model implies huge investment needs per capita, much higher than in best practice cities





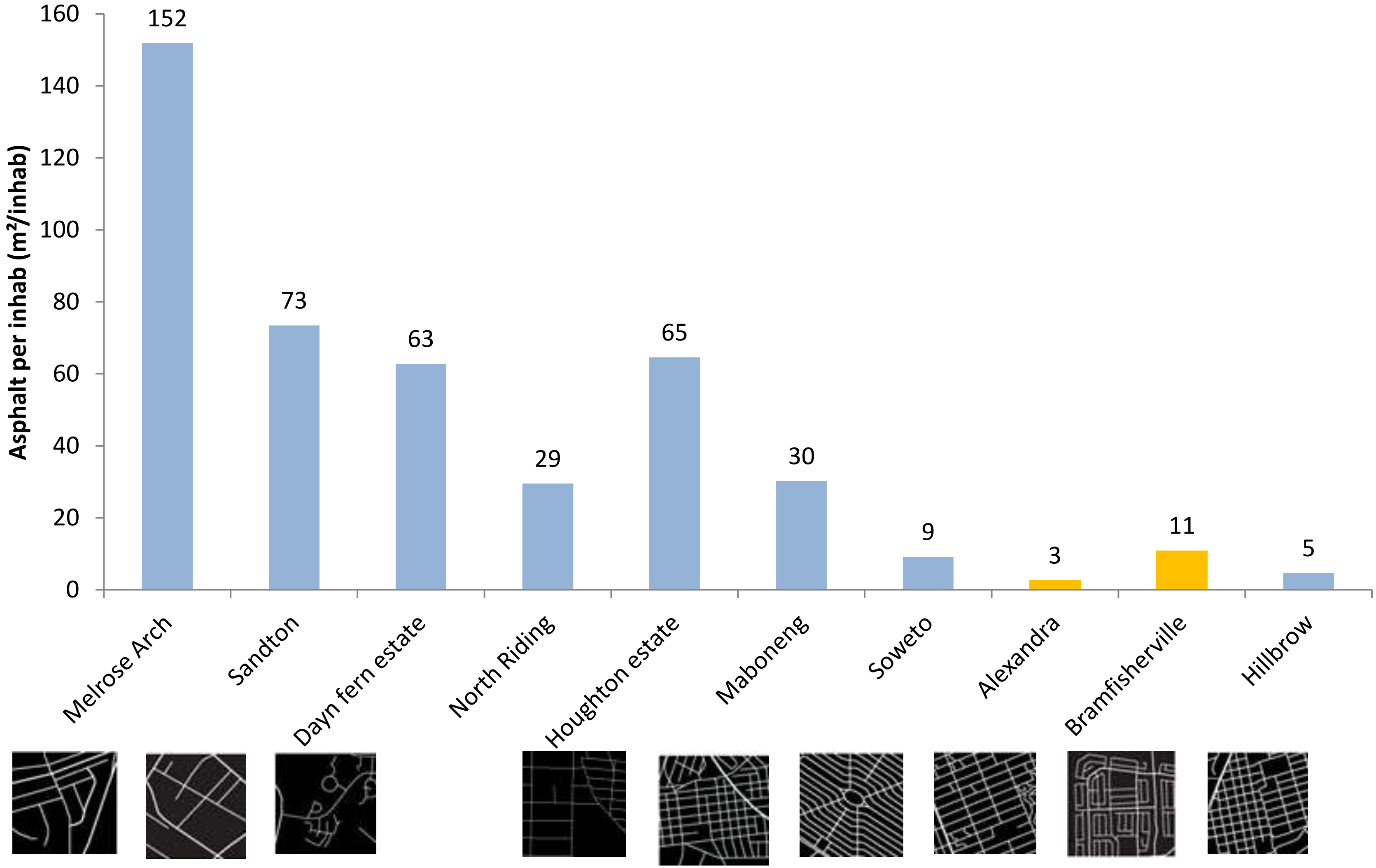
Asphalt needs per km²

*Districts in orange are only partially asphalted

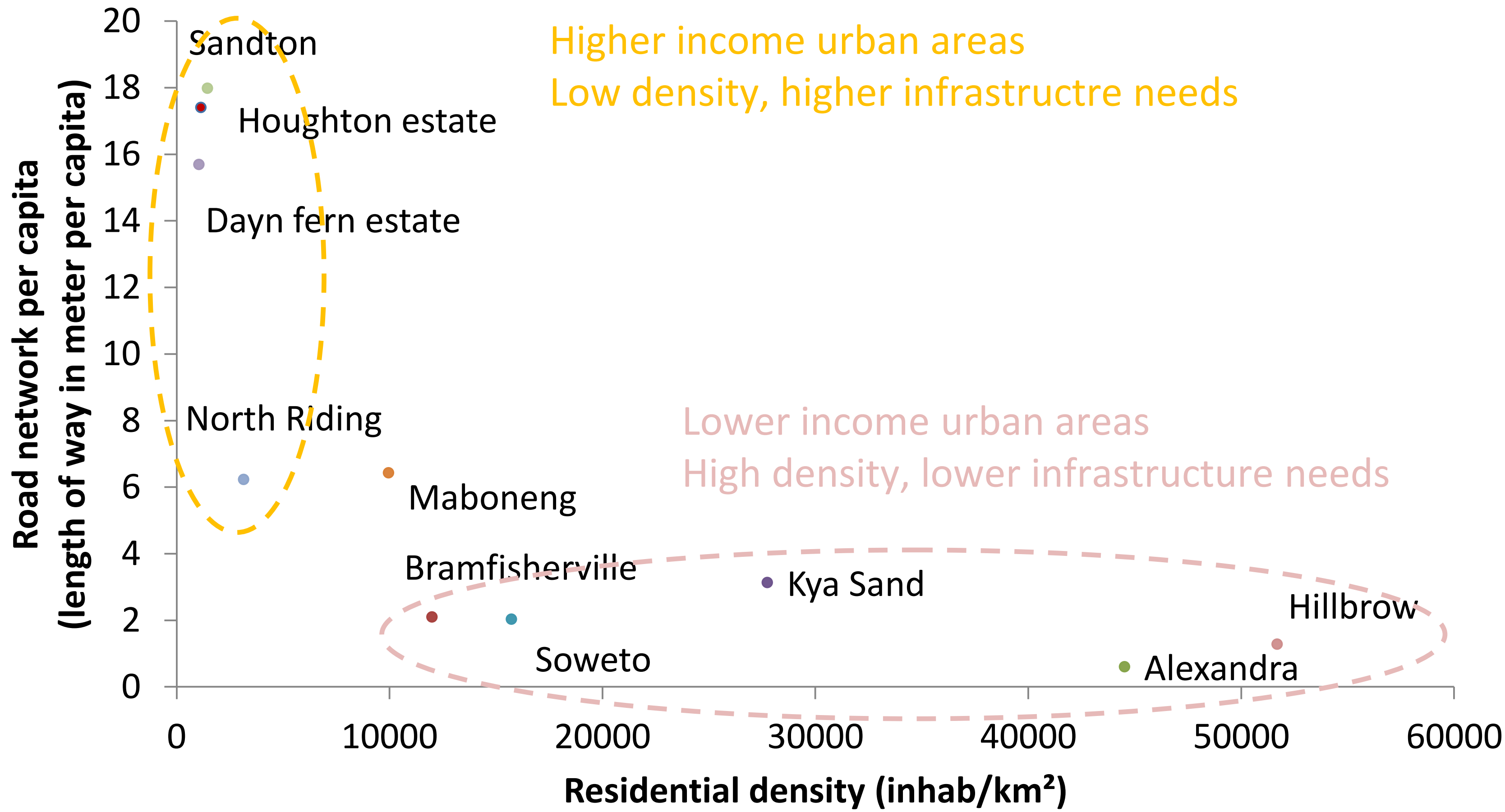


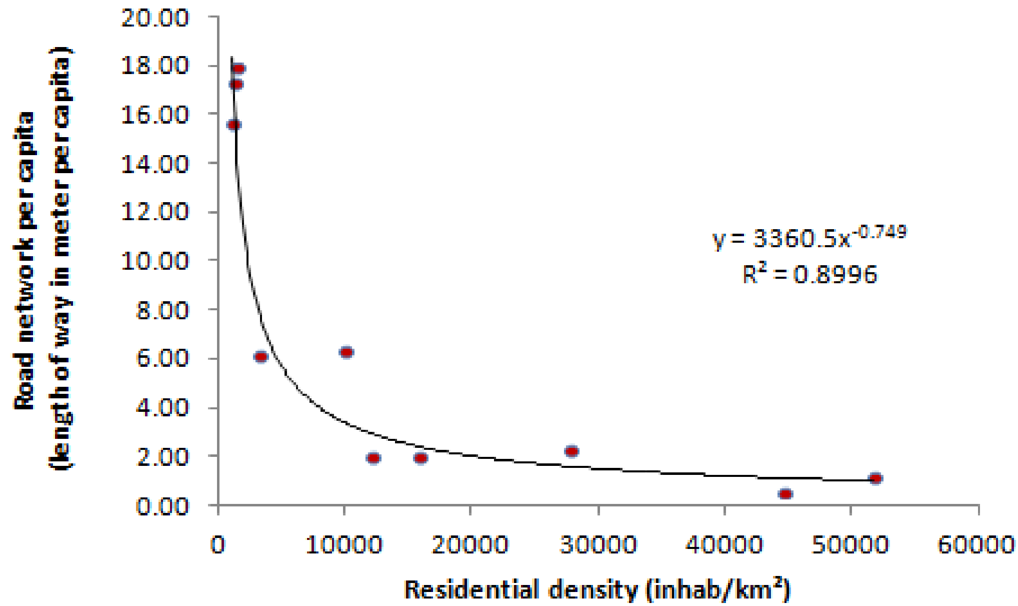
Asphalt needs per inhabitant

*Districts in orange are only partially asphalted



Infrastructure needs increase when residential density decreases





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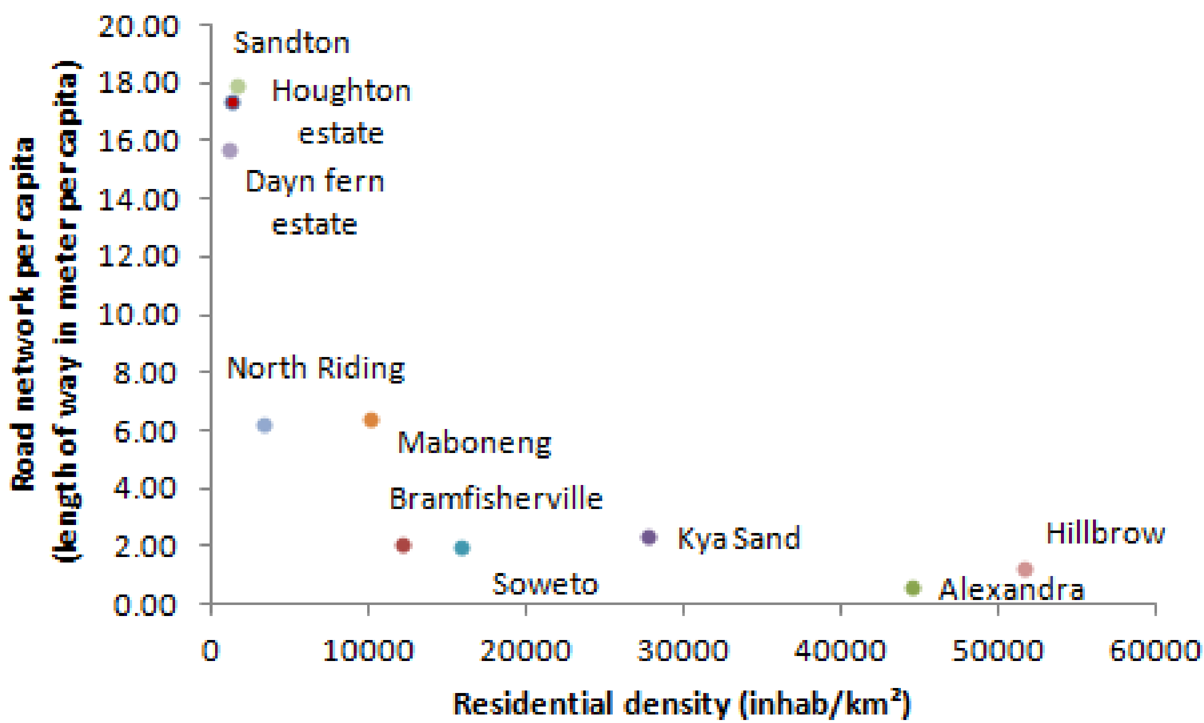
Road network per capita (length of way in meter per capita)
Residential density (inhab/km²)
y = 3360.5x^-0.749
R² = 0.8996



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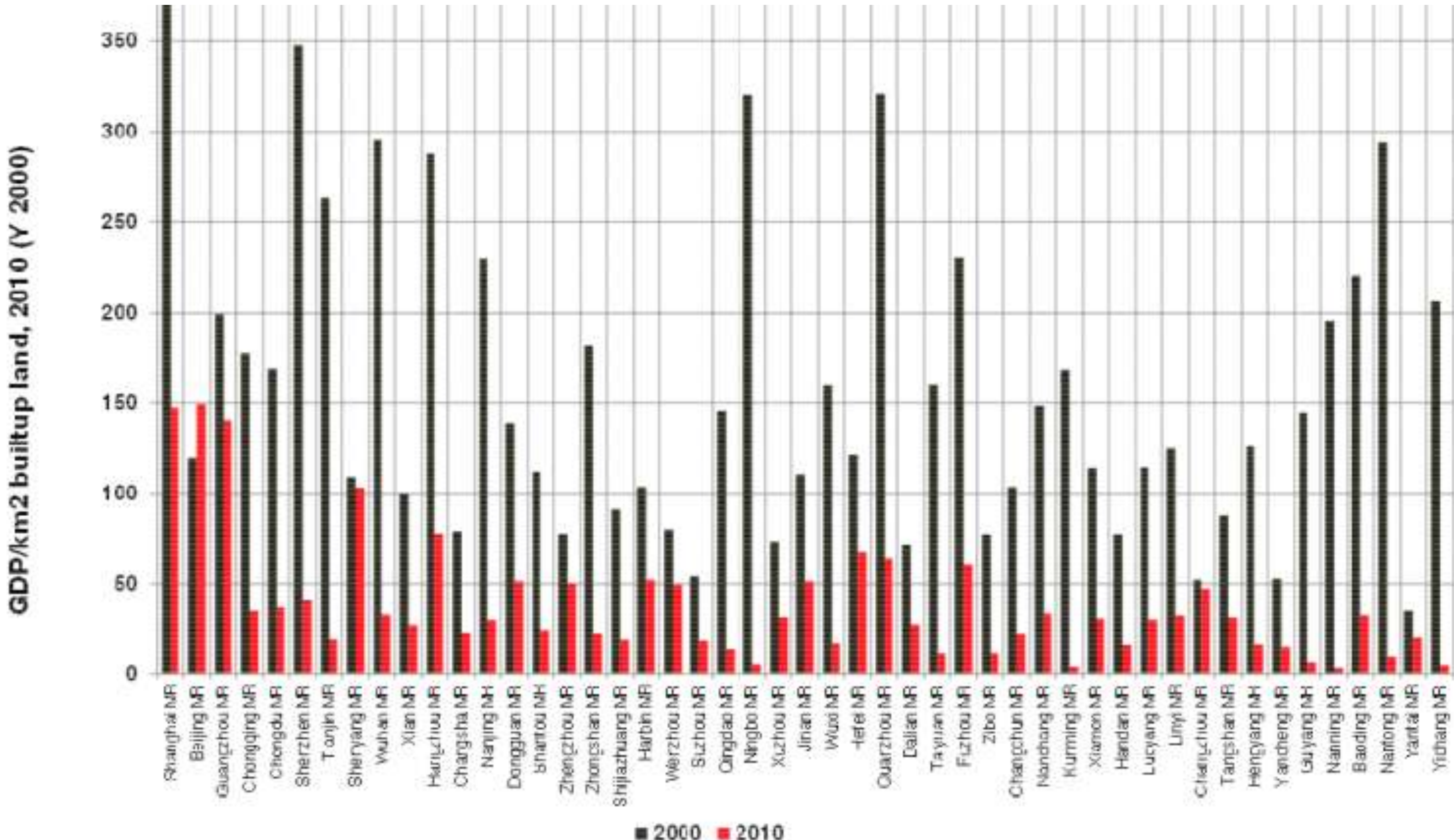
50000
60000
Road network per capita (length of way in meter per capita)
Residential density (inhab/km²)
Sandton
Houghton estate
Dayn fern estate
North Riding
Maboneng
Bramfisherville
Soweto
Kya Sand
Hillbrow
Alexandra

Land economic productivity

Marginal productivity of land use has fallen dramatically in almost all Chinese cities between 2000 and 2010
What happened in Joburg ?

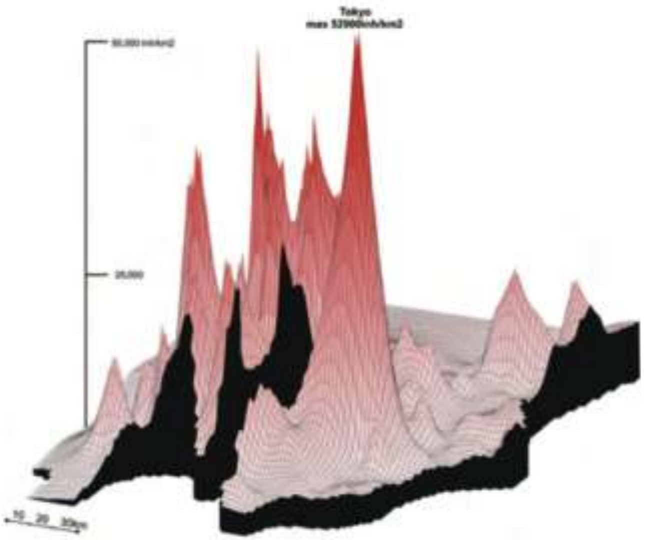


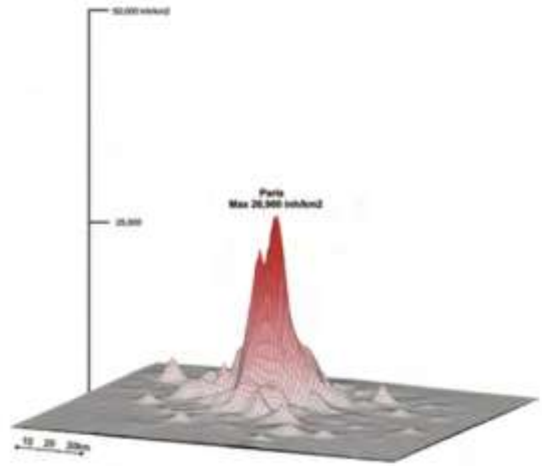
Source: Chreod 20113

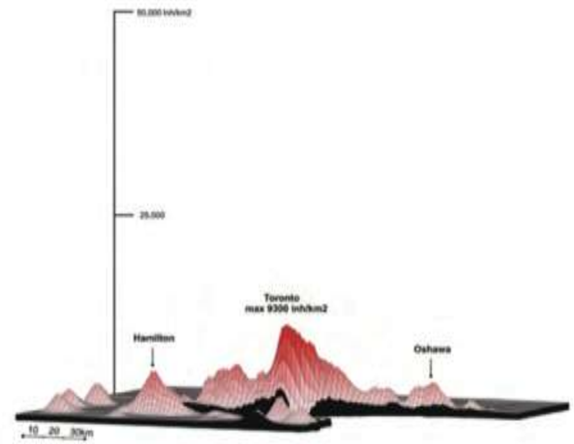
Additional GDP/Additional km² in Shenzhen | 深圳 divided by 10
Additional GDP/Additional km² in Shanghai | 上海 divided by 2.5

Energy consumption and carbon emissions are strongly affected by urban form and by the form of density distribution (hierarchy, entropy)

Articulated density with high variations reduces the emissions per capita and per unit of GDP







Tokyo
4.9 tCO2e/cap
146 ktCO2e/US$bn

Paris
5.2 tCO2e/cap
112 ktCO2e/US$bn

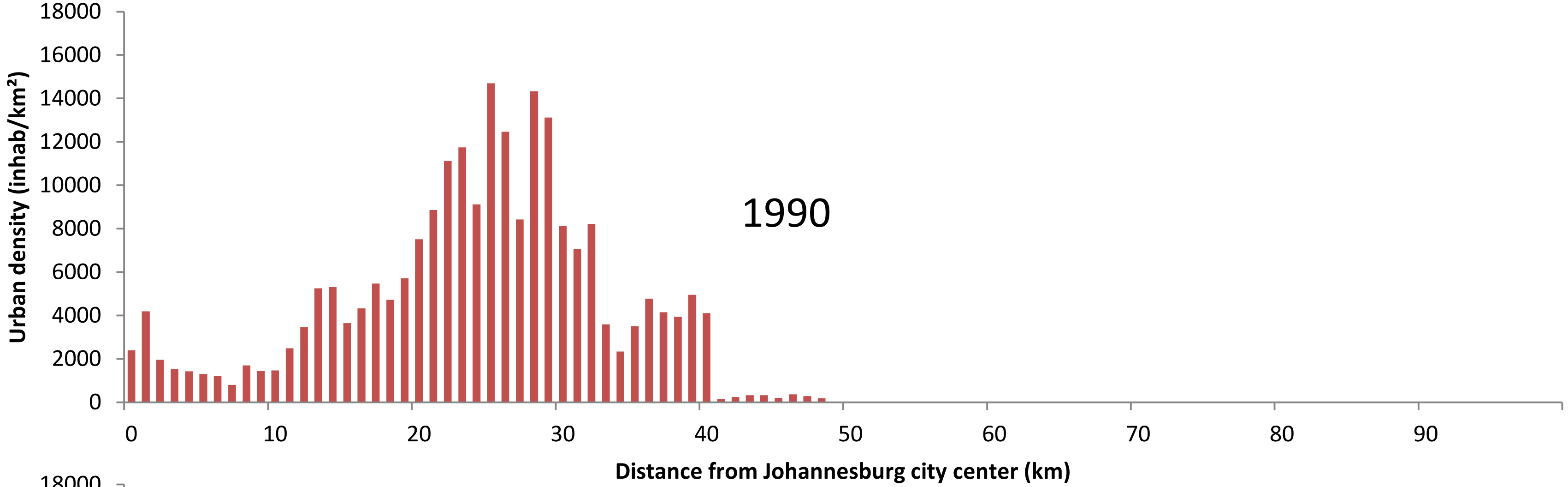
Toronto
11.6 tCO2e/cap
286 ktCO2e/US$bn

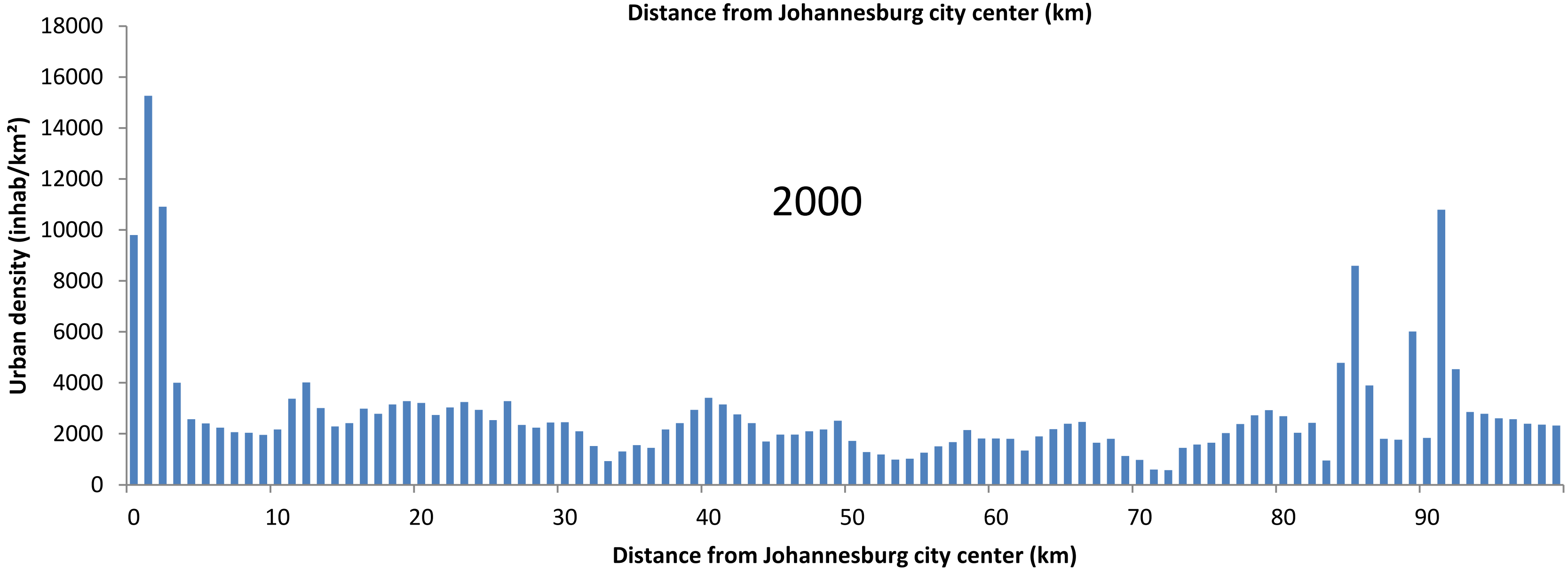
Beijing
10.1 tCO2e/cap
1,107 ktCO2e/US$bn

Shanghai
11.7 tCO2e/cap
1,063 ktCO2e/US$bn

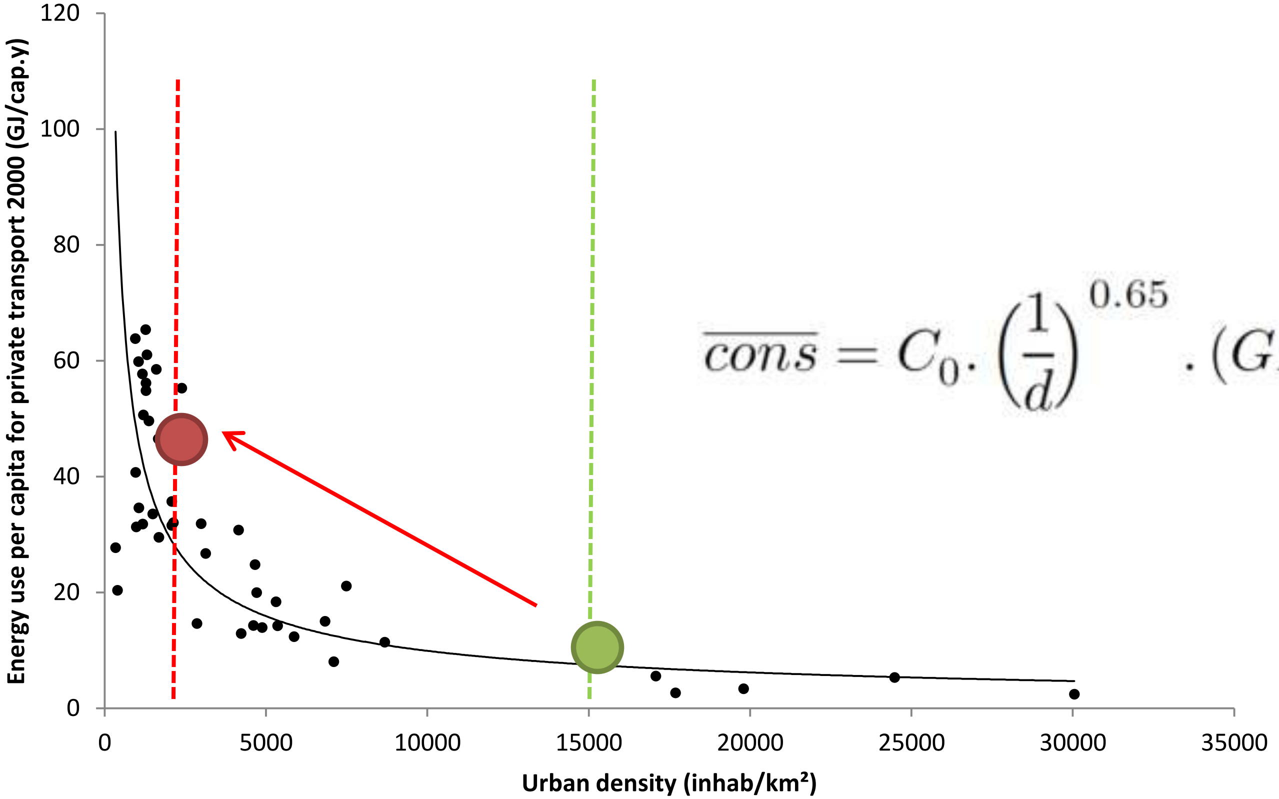
Tianjin
11.1 tCO2e/cap
2,316 ktCO2e/US$bn

Joburg shape has flattened
Radial density from Jobourg city center 1990 - 2000





Low density increases energy consumptions and carbon emissions per capita



$$\overline{cons} = C_0 . \left(\frac{1}{d}\right)^{0.65} . (GRP\ per\ capita)^{0.23}$$

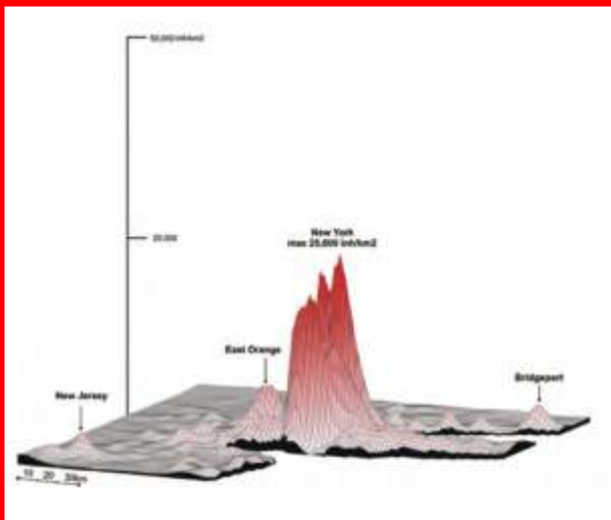
From a compact city (>15,000 inhab/km²) to Johannesburg (2,500 inhab/km²), **energy and carbon emissions for transport are multiplied by 3.**

	tCO_2/cap	tCO_2/$GDP
Paris	5.2	112
Seoul	4.1	179
Tokyo	4.9	146
Johannesburg	9.9	432
Los Angeles	13	249
Average Chinese city	10	1100

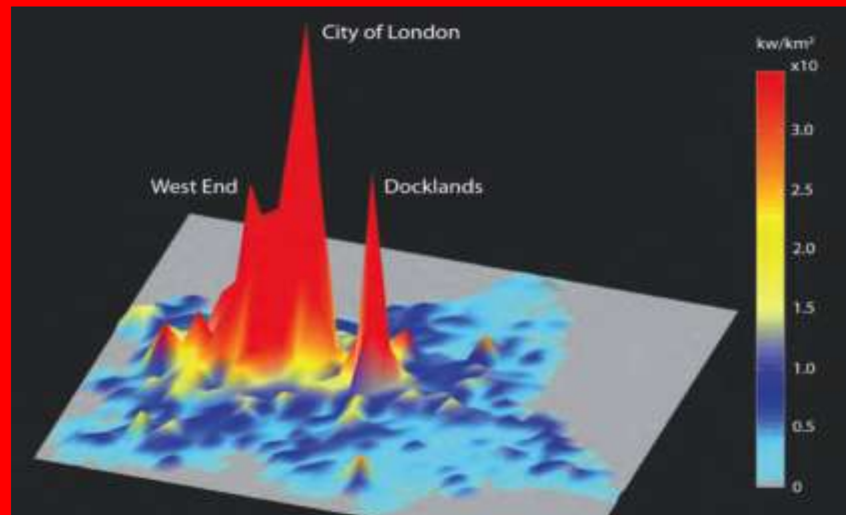
Johannesburg is already on an energy|carbon intensive pathway

Urban landscapes are Paretian multifractals :

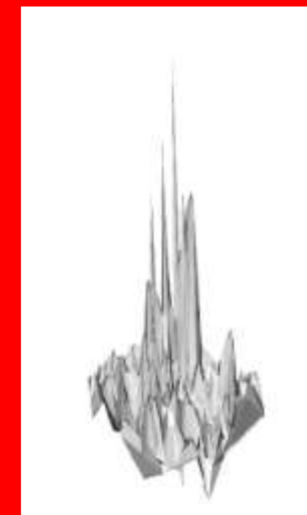
Demography

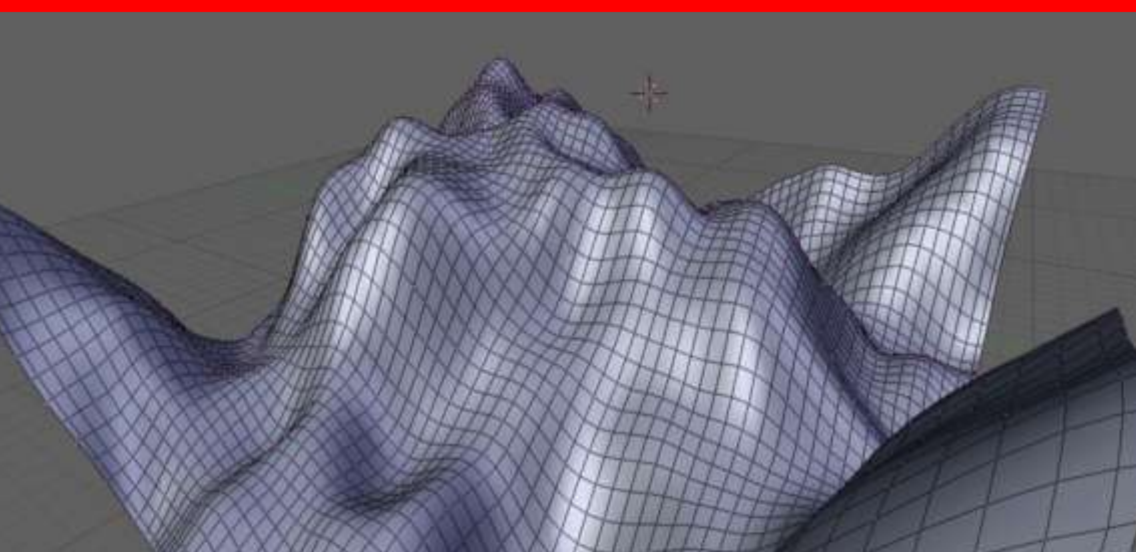


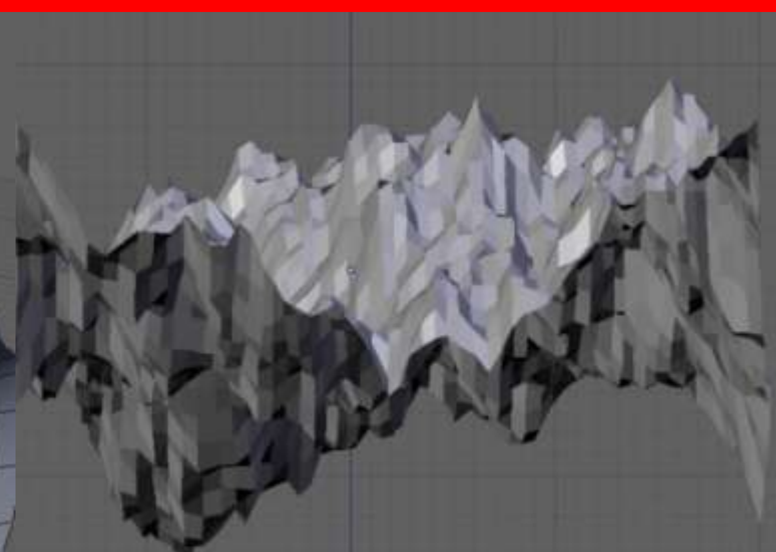
Energy

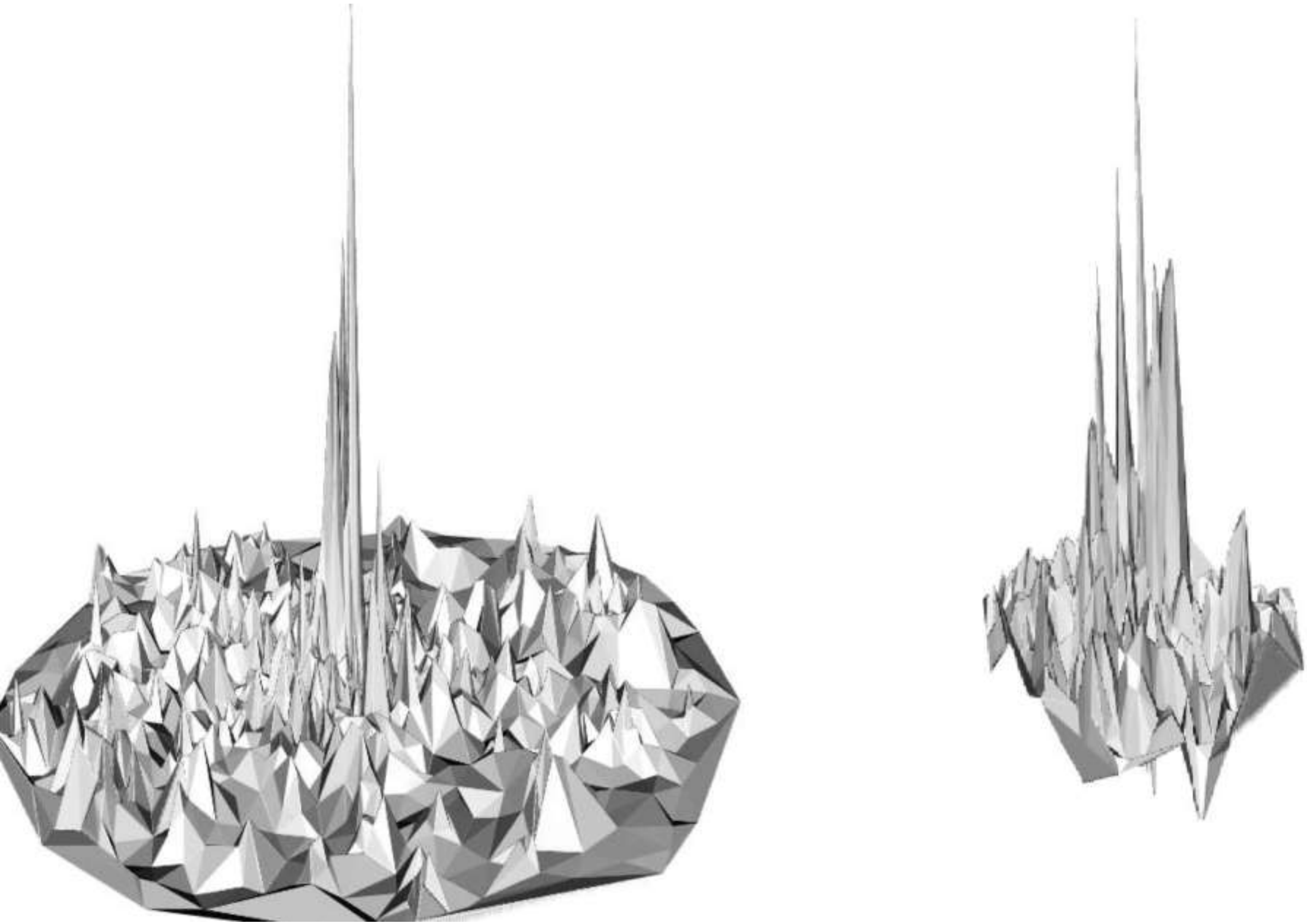


Land prices

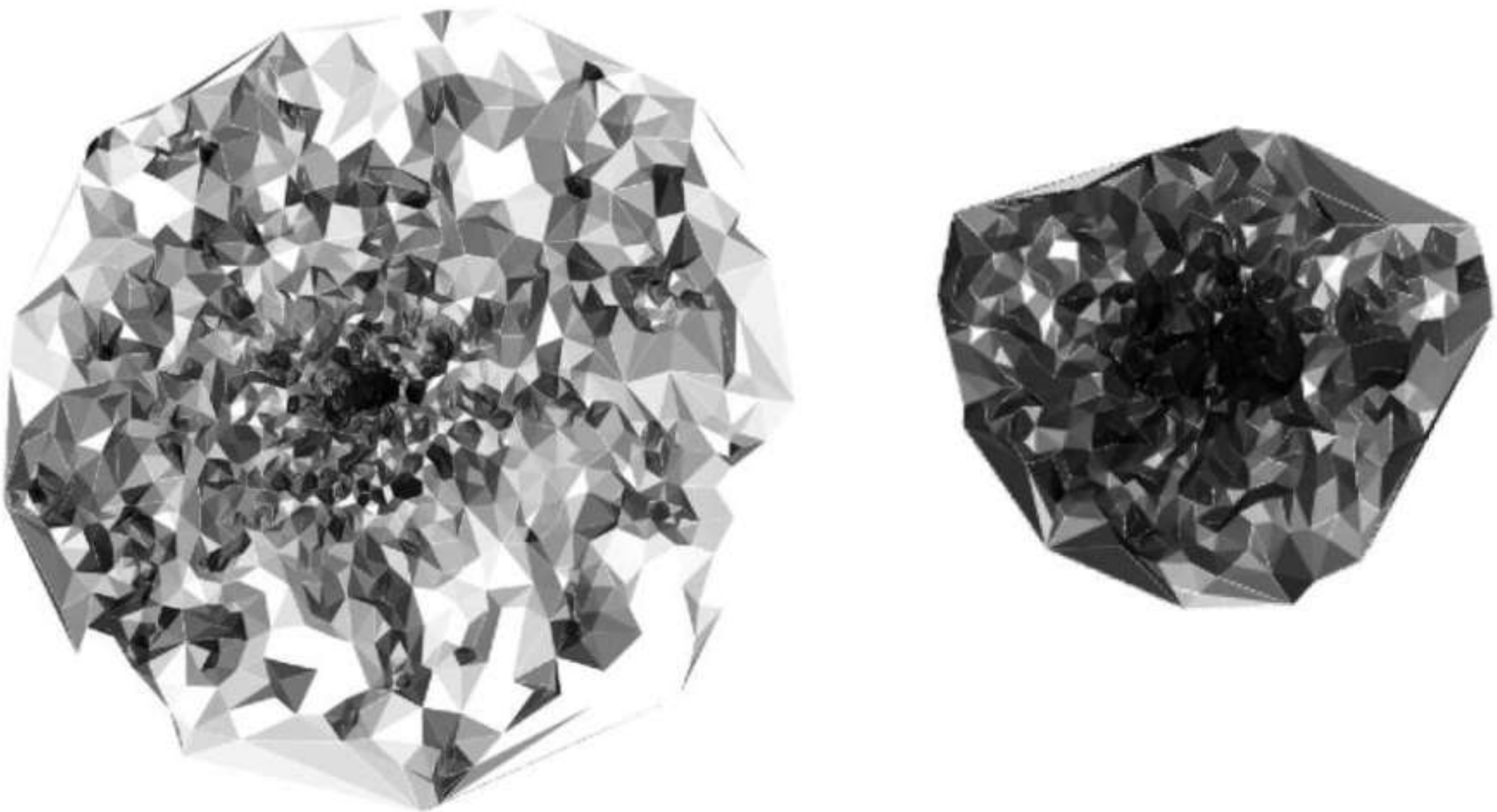






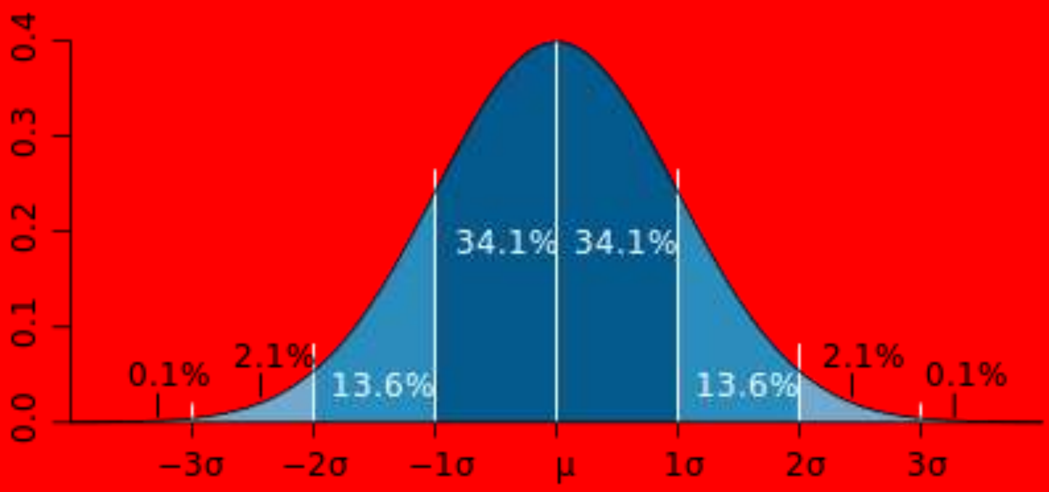


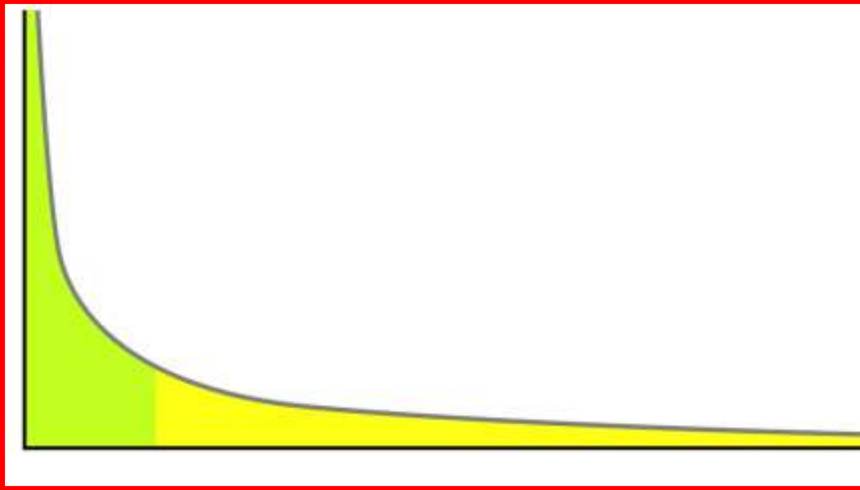
Rent values spatial distribution in London Source R Morphet CASA UCL



Rent values spatial distribution in London Source R Morphet CASA UCL

Do average values mean anything in urban studies ?

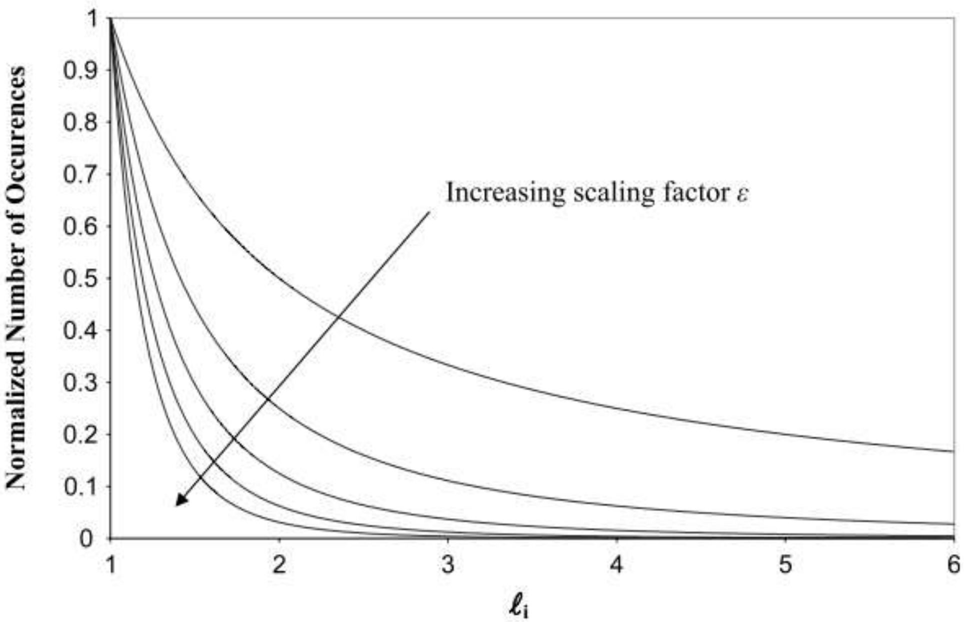




Is the urban world Gaussian or Paretian ?

In a Gaussian world 68% of the values are at one standard deviation from the average. Quite the opposite, a Paretian world is exremely inequal: a few extremely high values are juxtaposed to a "long tail" of very low values. In a Paretian world, series don't converge. For an infinite series of values, average and standard deviation are infinite for the exponent values characteristic of urban systems.

The urban world is not Gaussian. It follows inverse power laws with extreme inequalities in intensities.



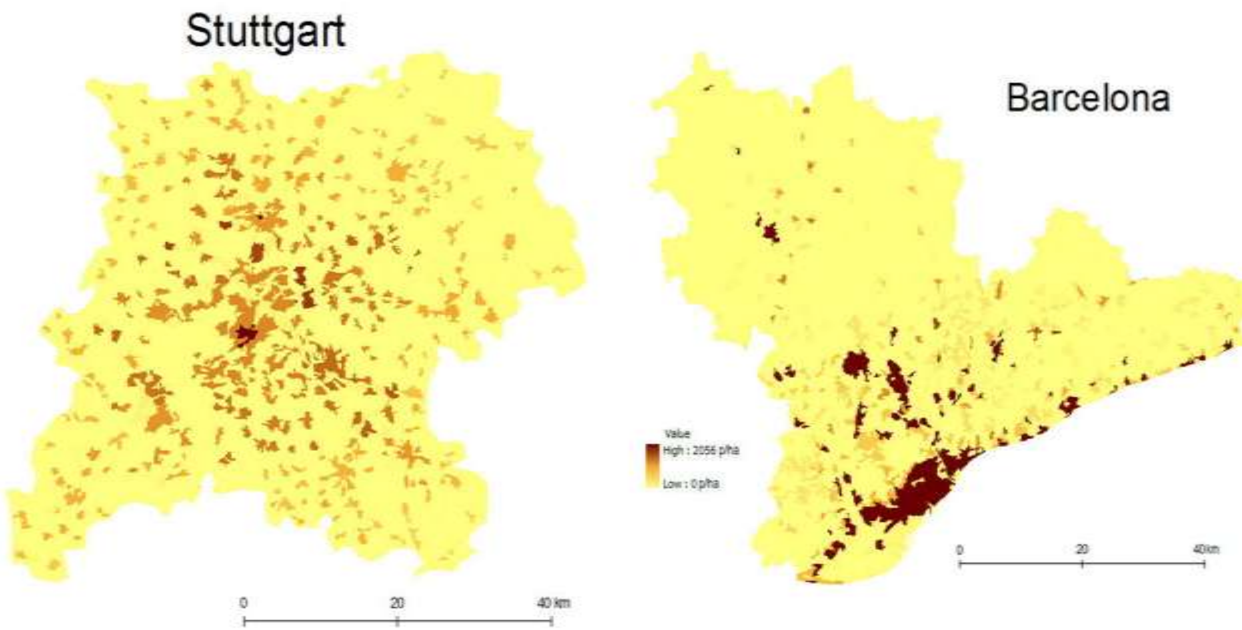
Relationship between scaling factor ε and normalized frequency distribution.

$$freq_i = \frac{A}{l_i^{\,e}}$$

Power law scaling consists of universal properties that characterize collective phenomena that emerge from complex systems composed of many interacting units. Power law scaling has been observed not only in physical systems, but also in economic, financial and urban systems, shedding new light on economics, and, in recent years, has led to the establishment of a new scientific field bridging economics and physics.

Scaling and entropy of intra urban density

- Analysis of the intra urban density scaling and entropy on cells of 200 m side and derivation of a formula



An example of urban structure with a low scaling hierarchy (Stuttgart) and with a high scaling hierarchy (Barcelona). What are the consequences on transportation energy consumption?

$$Energie = C_0\, PIB^{0.35}\, dens^{-0.14}\, hier^{-0.52} entrop^{0.86}$$

Based on the study of 34 European cities

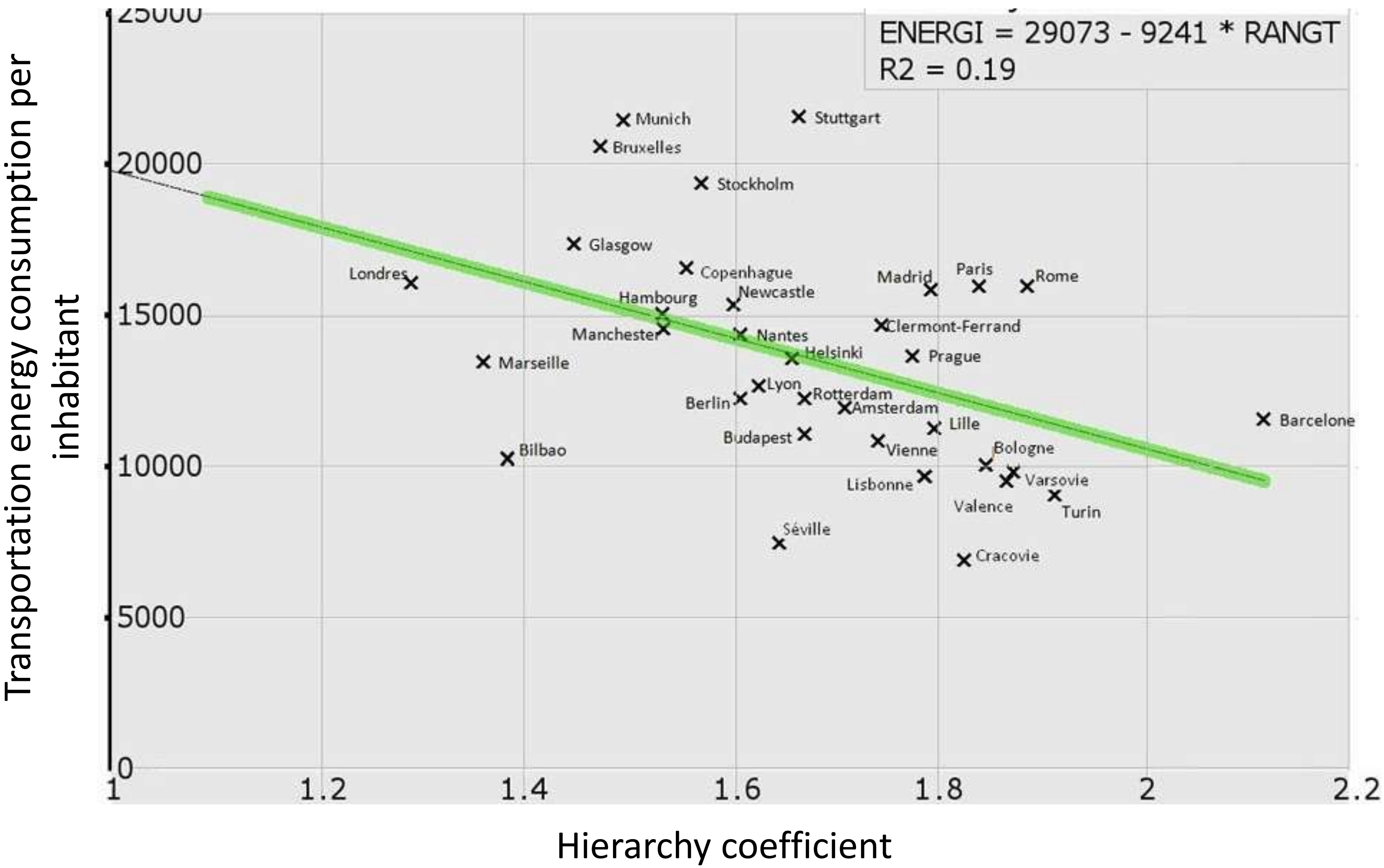
4 key factors impact on the transportation energy per inhabitant

- **The GDP per inhabitant** (elasticity 0.35)
- **The average density** (elasticity -0.14)
- **The entropy** of the density distribution, which corresponds to the degree of homogeneity in the distribution of the density (**elasticity 0.86**). The more a distribution of density is homogeneous, the more it requires transportation energy.
- **The hierarchy in the distribution of the density, captured by the exponent of a size-rank law** (**elasticity -0.52**). A weak value of this indicator reveals a weak hierarchy of the distribution. The highest the exponent, the highest is the hierarchy within the complex intra-urban order. A little number of cells concentrates the major part of the population

$$Entropie = \frac{\sum_{i=1}^{N} \frac{p_i}{P_N} \log\left(\frac{p_i}{P_N}\right)}{\log N}$$

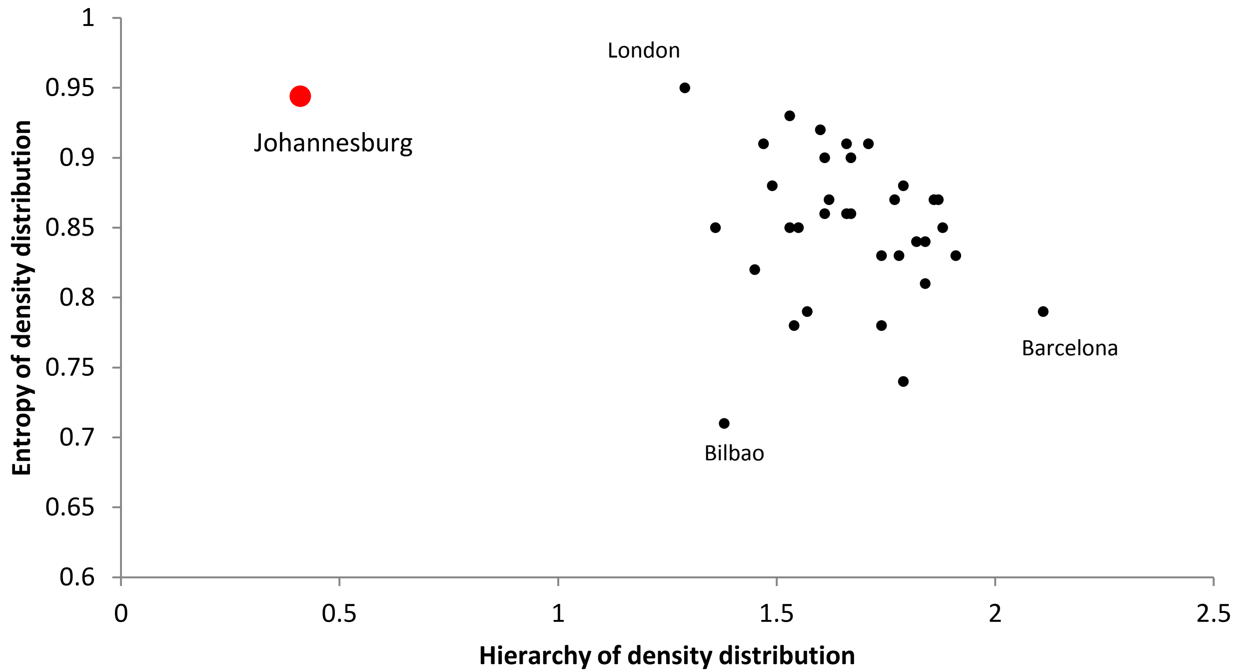
$$p_k = P_0 k^{-\alpha}$$

Main result: the scaling exponent and the entropy of the distribution are the key drivers of urban transportation consumption



Source: Le Néchet

Johannesburg compared to 34 European cities



Repetitive plots in Jobourg (see Soweto, Houghton estate…) are typically high entropy developments.

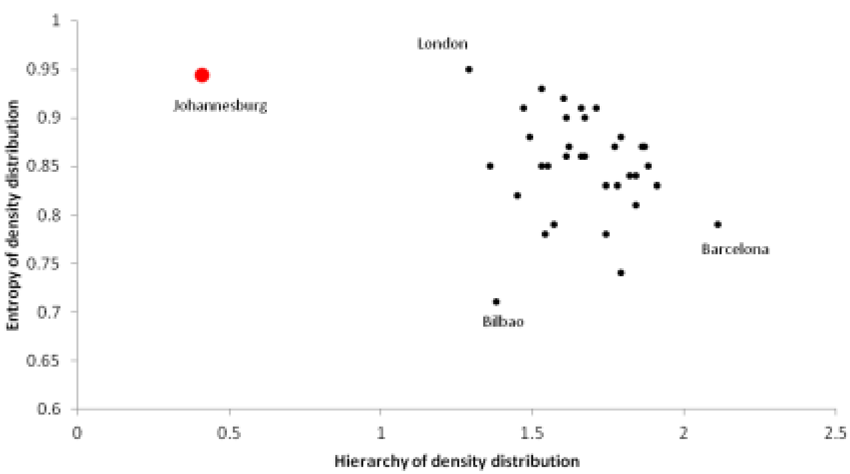
Jobourg is an heterogenous puzzle of homogenous areas.

GDP, density, entropy and hierarchy
Impact on energy consumption for transport

$$Energy\ per\ cap = C.\,GDP_{cap}^{0.35}.\,density^{-0.14}.\,hierarchy^{-0.52}.\,entropy^{0.86}$$

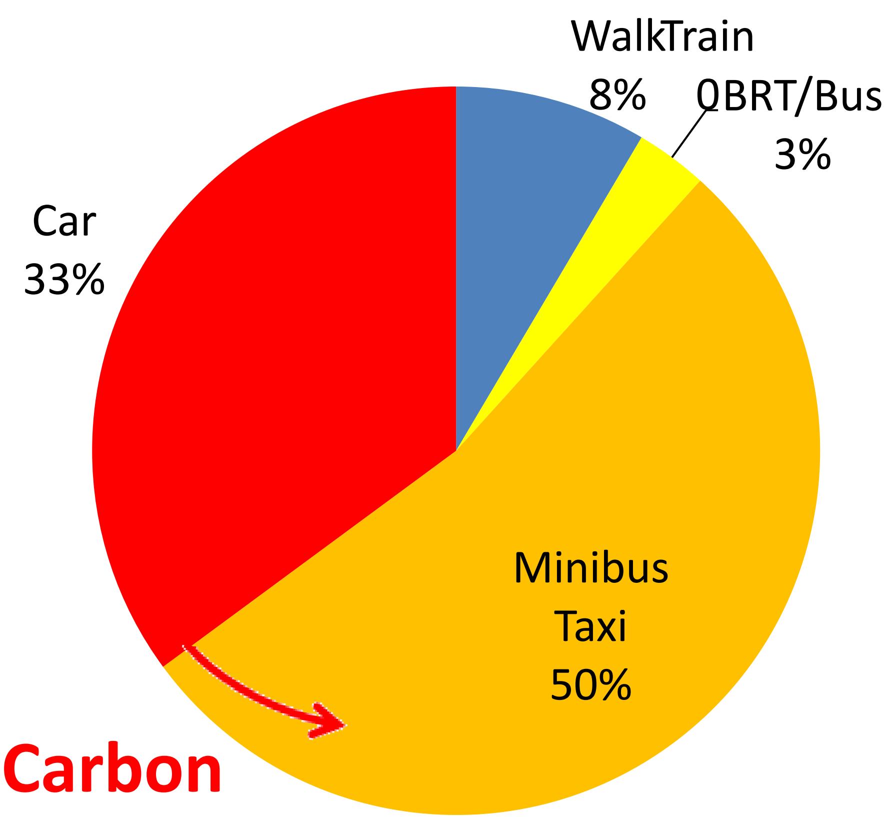
Much more than GDP/cap, much more than average density, what really matters is the way density is distributed.

Structured and articulated density (low density, high hierarchy) is a powerful lever to decrease transportation needs and associated energy consumption.



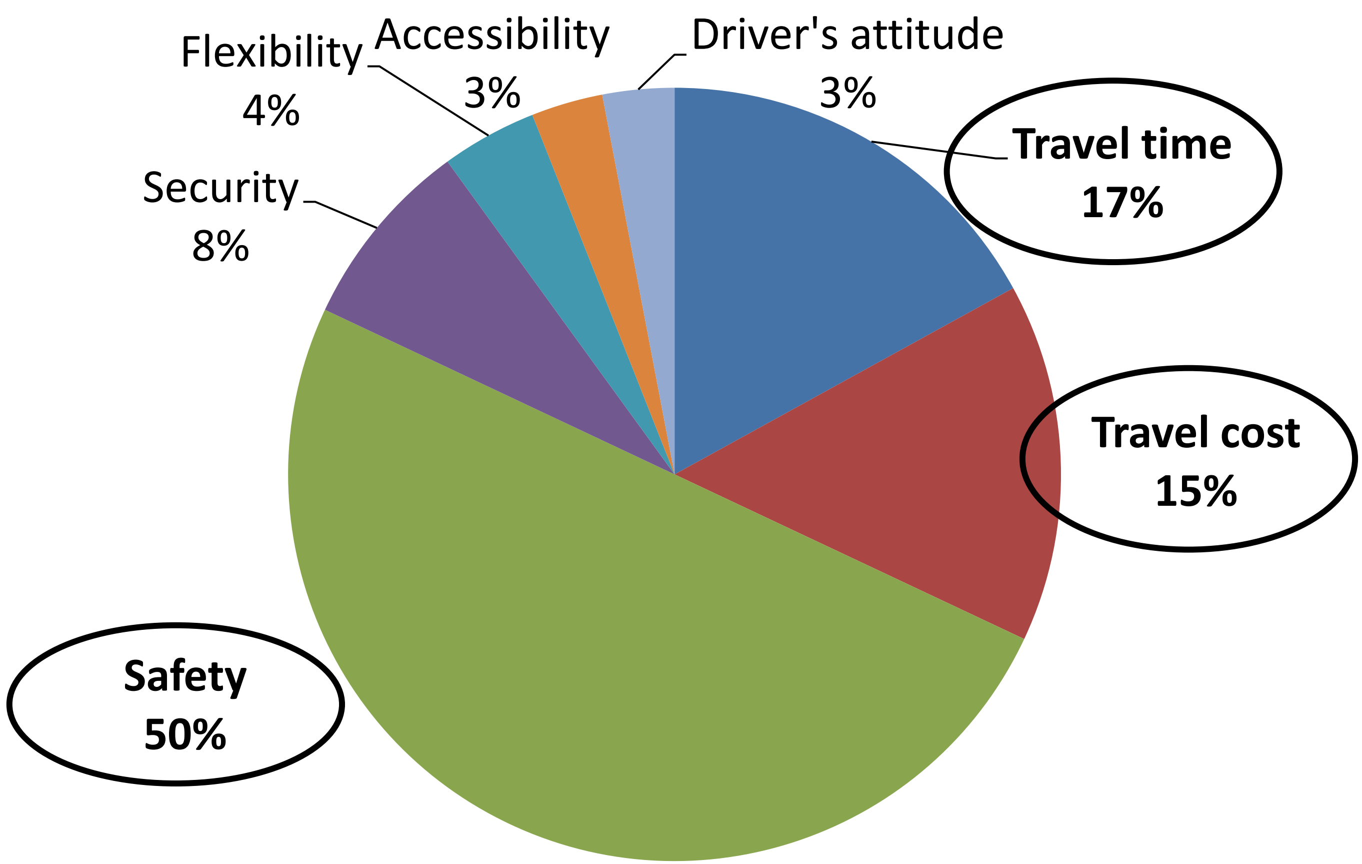
Energy consumption and carbon emissions: alternative scenarios for 2040

Modal split in Joburg



Energy|Carbon
Time-Bomb

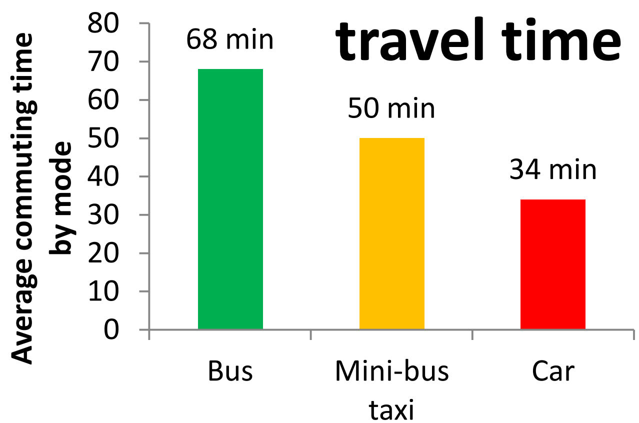
3 factors influence travel modes: safety | travel time | travel cost



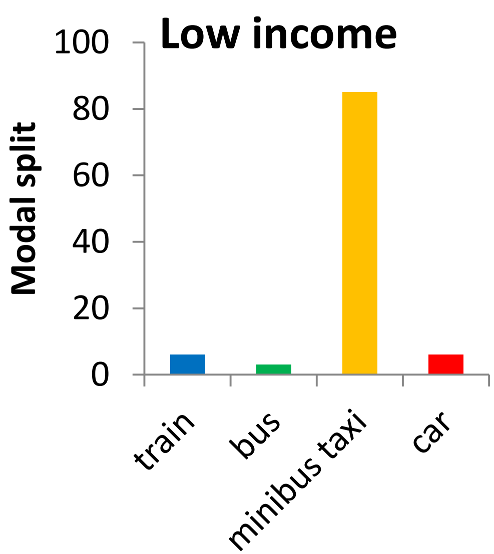
safety

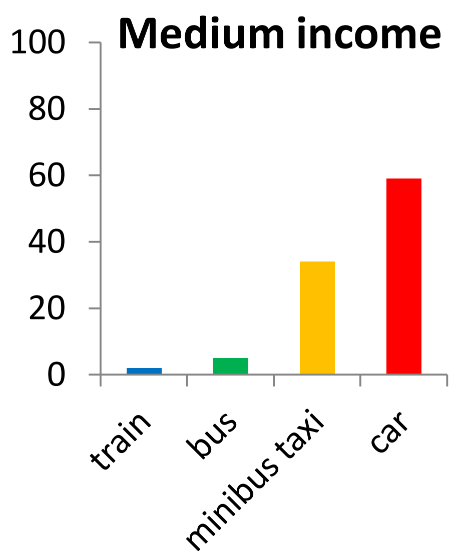
67% of the people find minibuses unsafe with regard to accidents
60% of the people do not trust the roadworthiness of minibuses

travel time



Money only still restrains a massive switch from minibuses to private cars

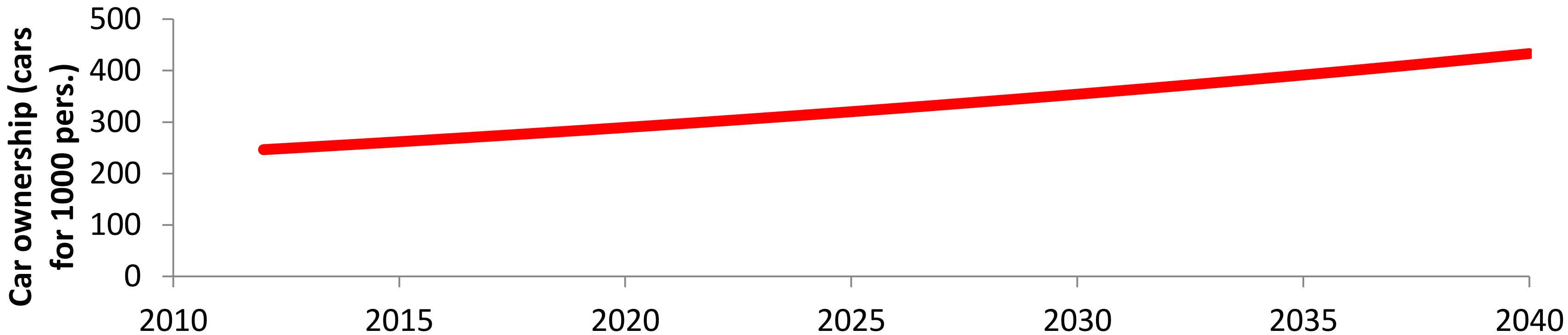


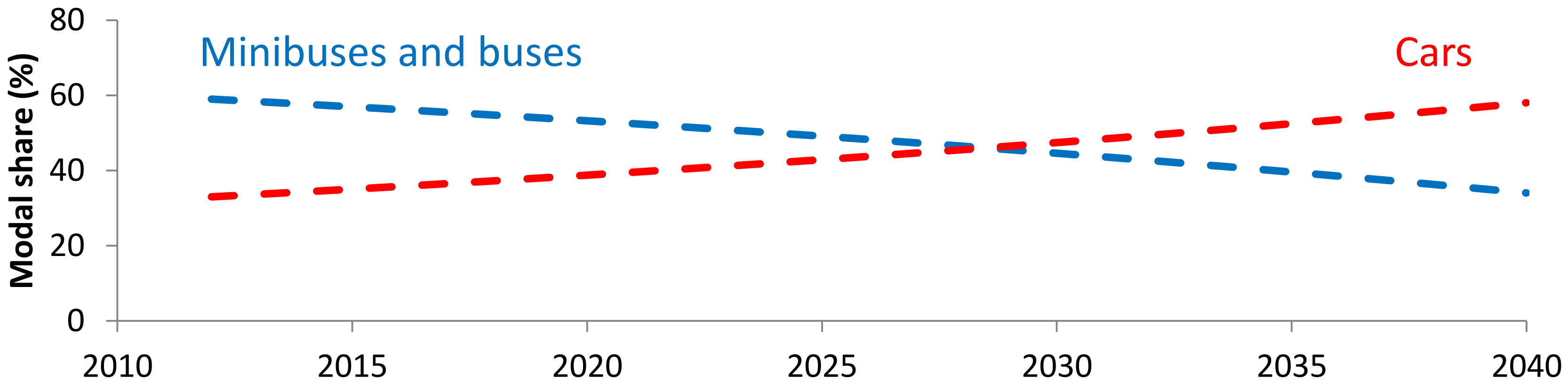


travel cost

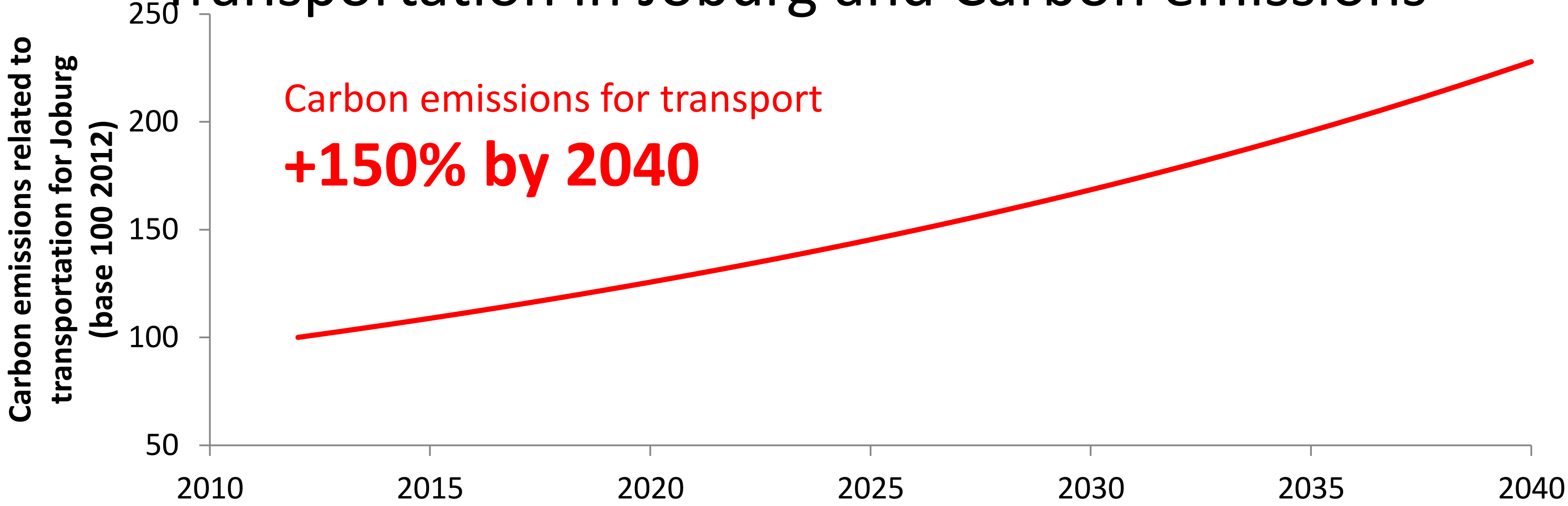
Business as usual scenario | Transportation in Joburg
Modal shares

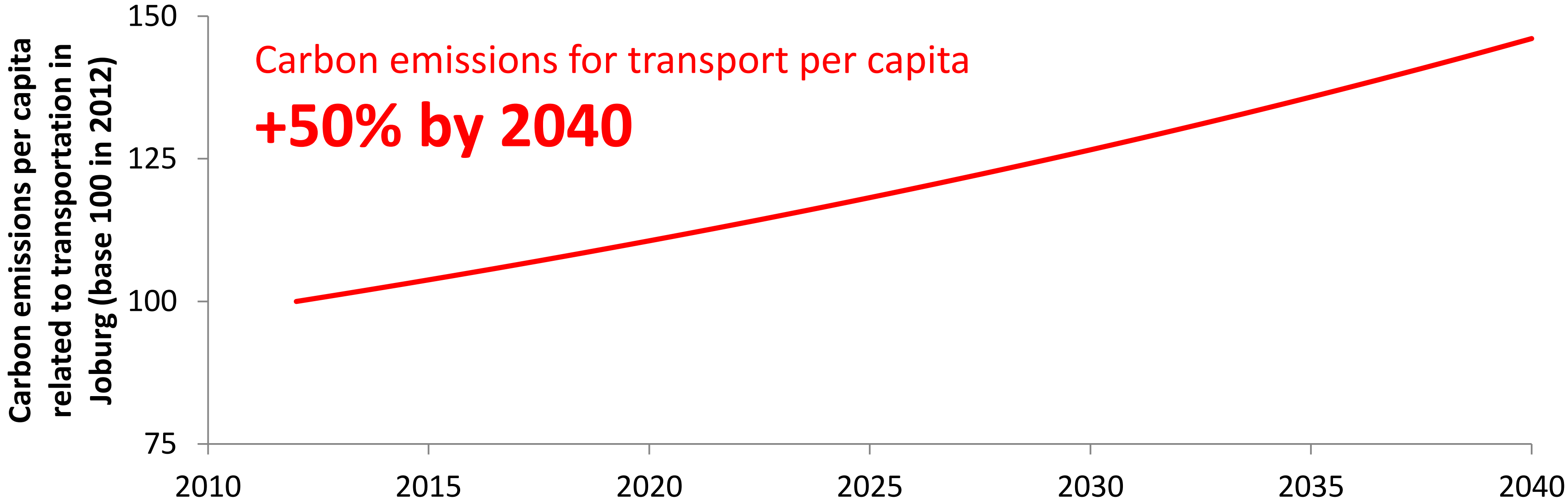
- Medium scenarios predict a yearly 1.6% demographic growh
- The number of private cars increases by 3.7% every year: doubling every 20 years



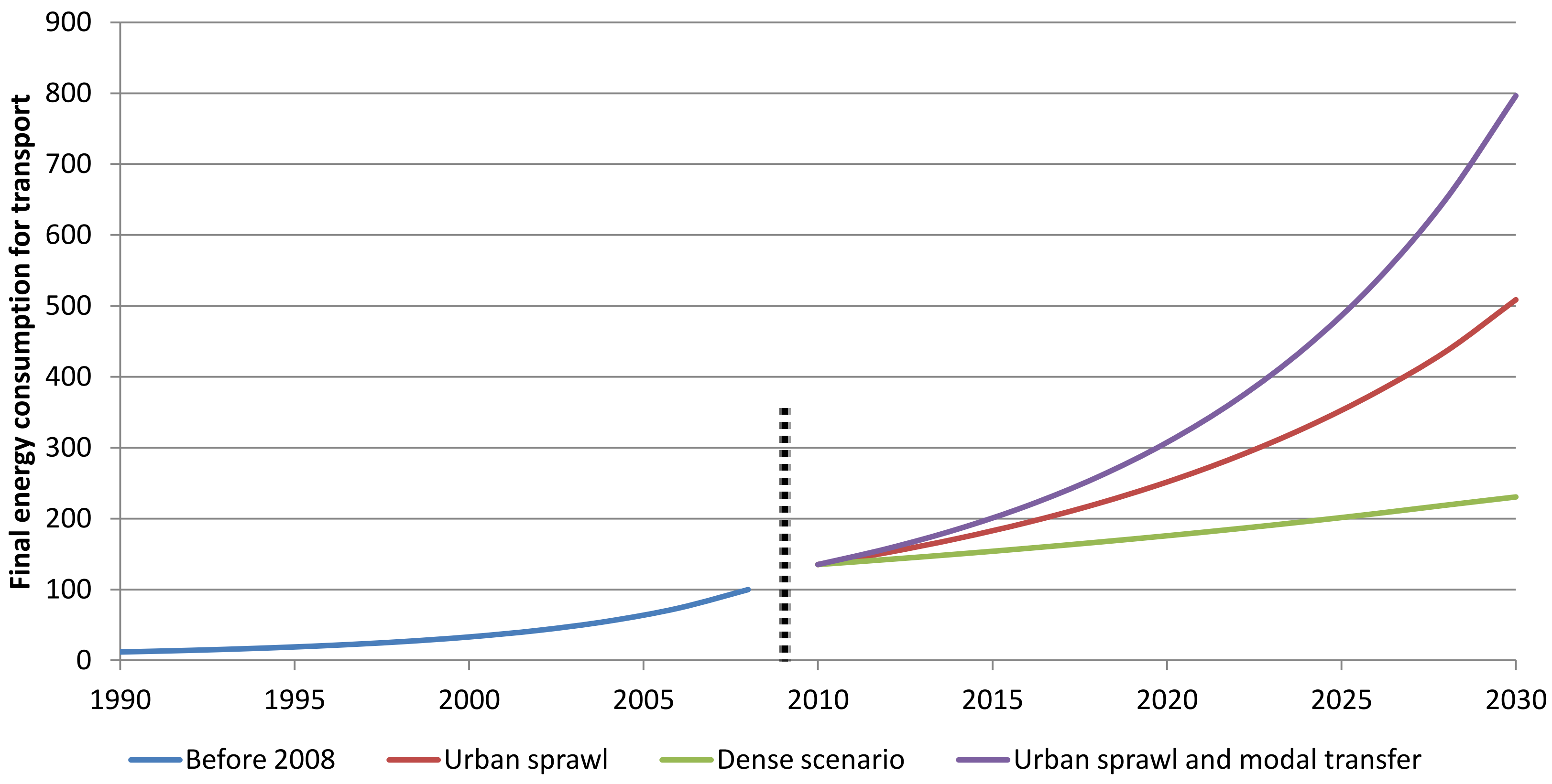


Business as usual scenario
Transportation in Joburg and Carbon emissions





Density trends and energy consumption



Worse congestion issues are to be expected

Congestion in Joburg during the peak period

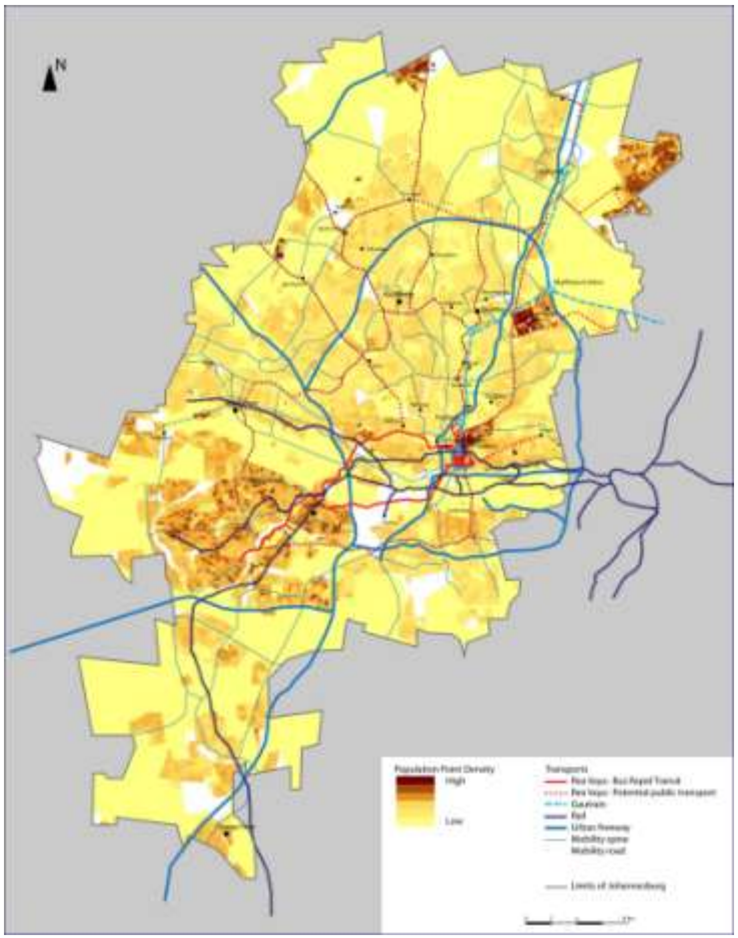
TOD
Urban form strategies

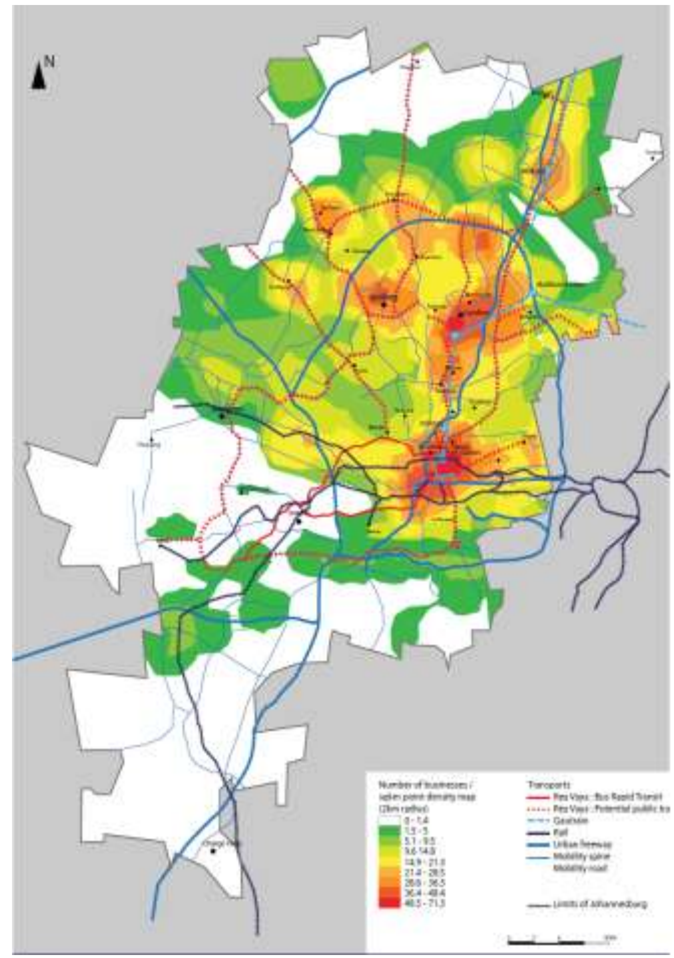
Articulating public transit
with housing, jobs,
activities and amenities
While making the best of
investment capacities

On the city scale

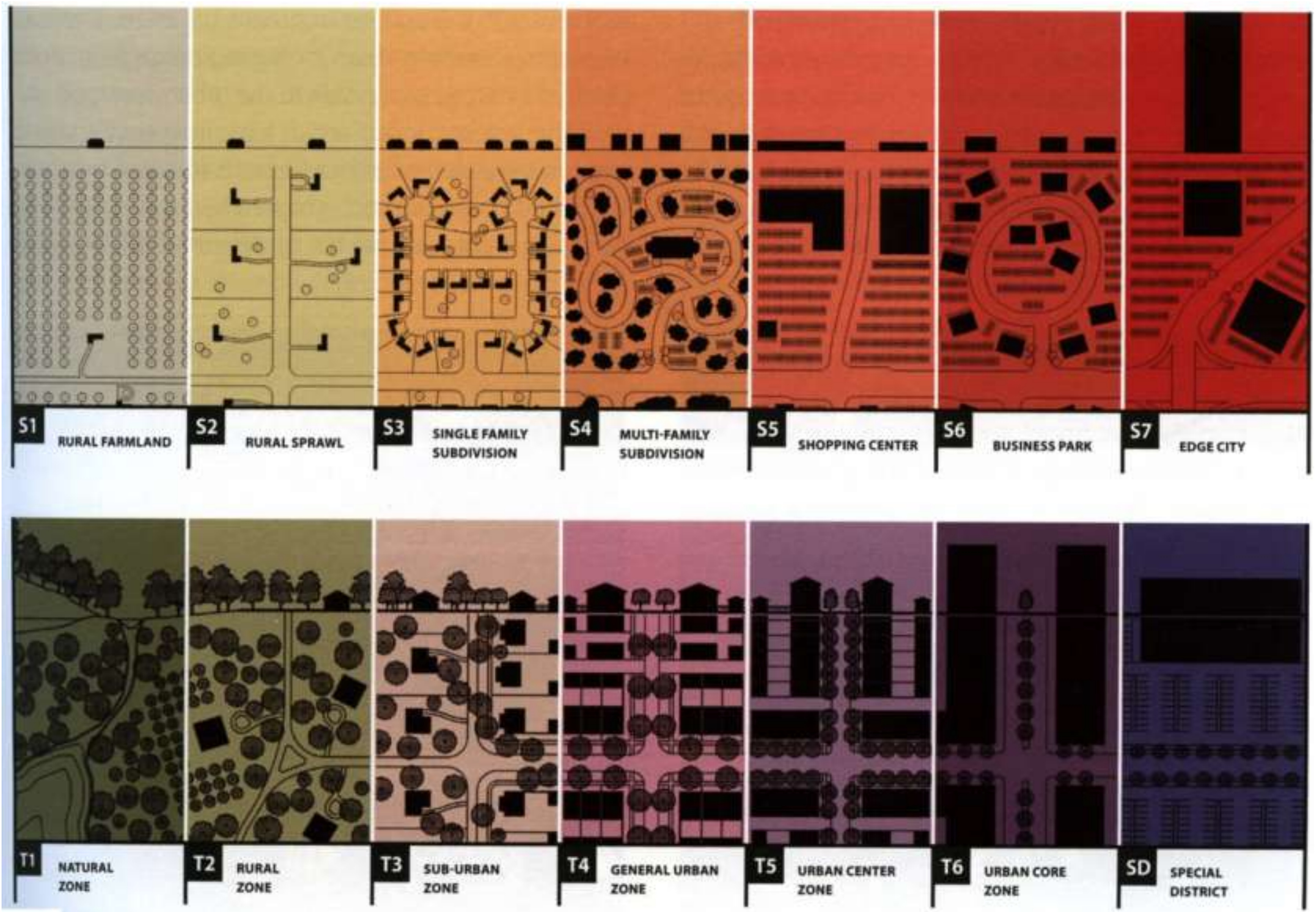
On the district scale

Articulating density on the city scale



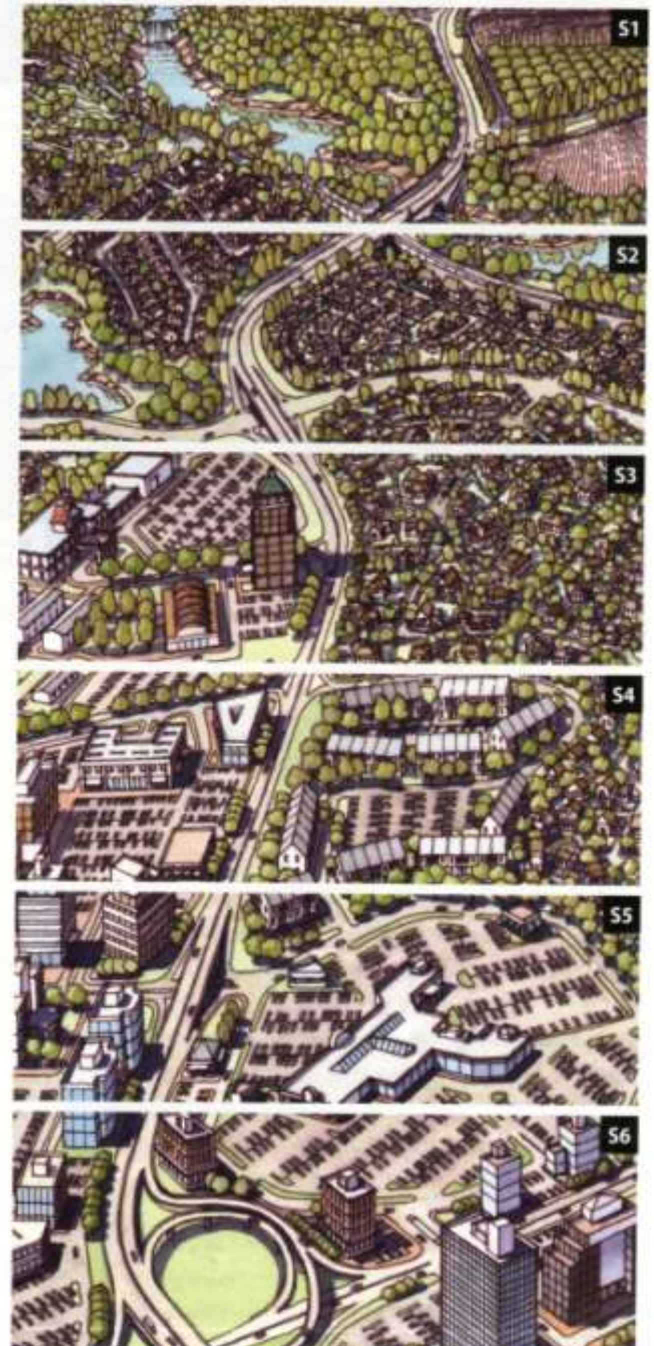


Transects along corridors of freedom are different from American sprawl transects and from traditional transects



Comparison of the Transect in sprawl and in traditional urbanism, showing the lack of direct correlation between the two

Transect of traditional urbanism

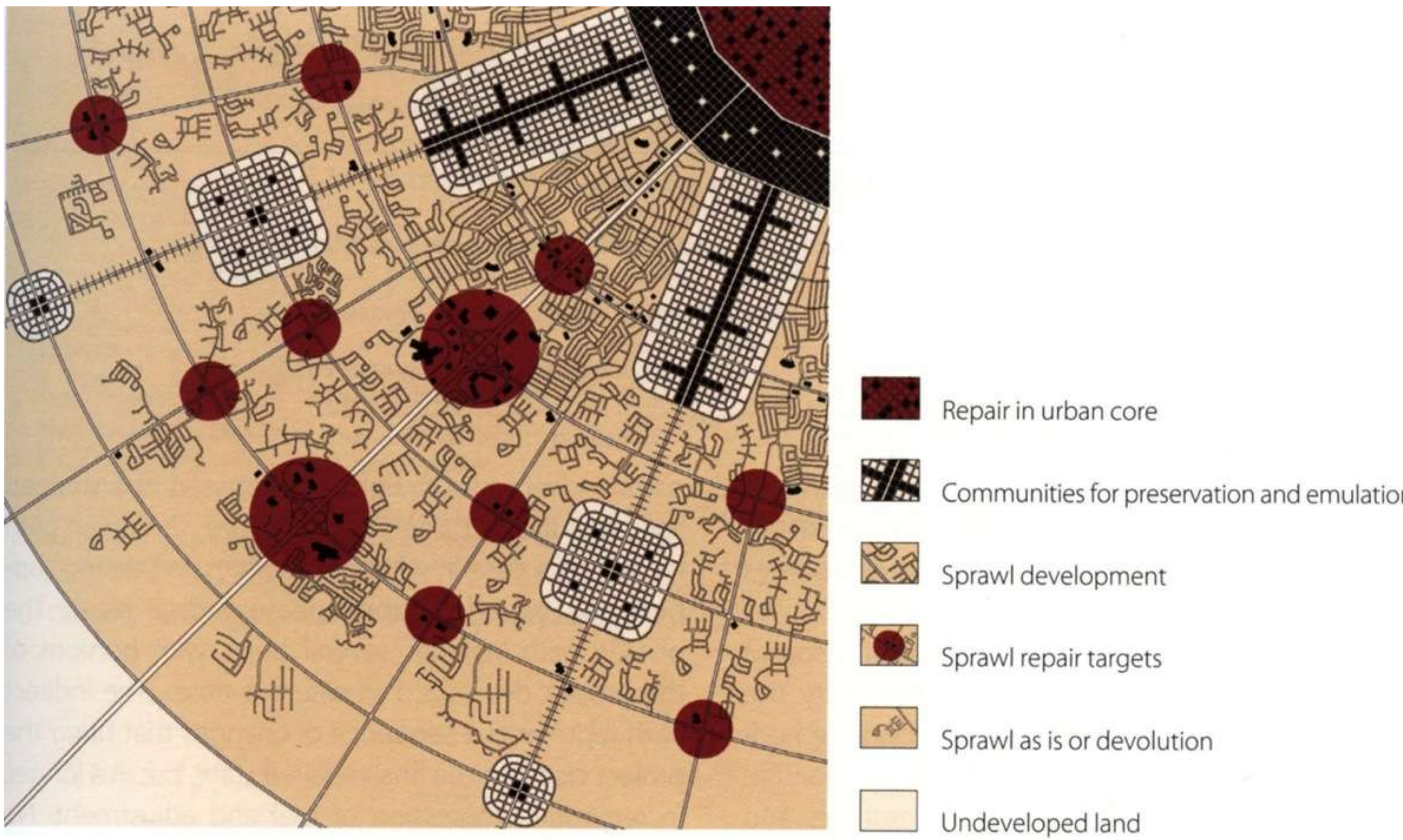


Transect of sprawl

Sector Mapping

To identify the logical places for TOD retrofit, the mapping of the city should integrate analysis of projected economic and demographic growth, existing transportation, infrastructure, commercial nodes, natural resources, housing, and jobs concentration. The resulting sector map identifies targets for TOD retrofit.

The targets will be the logical places for private development and public investment in services, utilities and green (open space and natural elements) and grey infrastructure (manmade infrastructure), as well as financial and permitting incentives.



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

Complete communities consist of distinct corridors, districts and neighborhoods

Complete communities consist of distinct corridors, districts, and neighborhoods

TOD retrofit steps at city scale

STEP 1: DETERMINE TOD RETROFIT DOMAINS
The domains for TOD retrofit are chosen for their potential to become mixed-use and transit-connected nodes for the city.

STEP 2: DELINEATE PRESERVATION AND CONSERVATION AREAS
Portions of open space networks that should have been preserved, but are damaged and in need for repair and restoration, will be allocated to the preservation areas.

STEP 3: PRIORITIZE THE COMMERCIAL AND EMPLOYMENT NODES
Commercial nodes and employment clusters are identified as they will become the neighborhood centers.

STEP 4: PRIORITIZE THE POTENTIAL TRANSIT AND INFRASTRUCTURE NETWORKS
Adapting auto-oriented thoroughfare networks to rational, multimodal transportation systems is fundamental to TOD retrofit.

STEP 5: IDENTIFY THE TOD RETROFIT TARGETS
The targets selected for TOD retrofit are the ones where transit and job potential overlap, with the possibility for achieving residential density to support transit.

STEP 6: TRANSFER OF DEVELOPMENT RIGHTS

STEP 7: SECTOR MAP ASSSEMBLED

Step One: Determination of sprawl repair domains

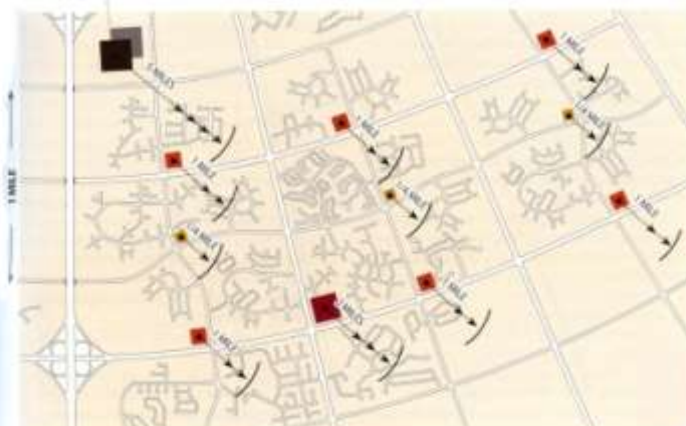
- Freeway
- Arterial
- Collector
- Local
- Cul-de-sac

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

Step Two: Delineation of preservation and reservation areas

- Preservation Area
- Reservation Area

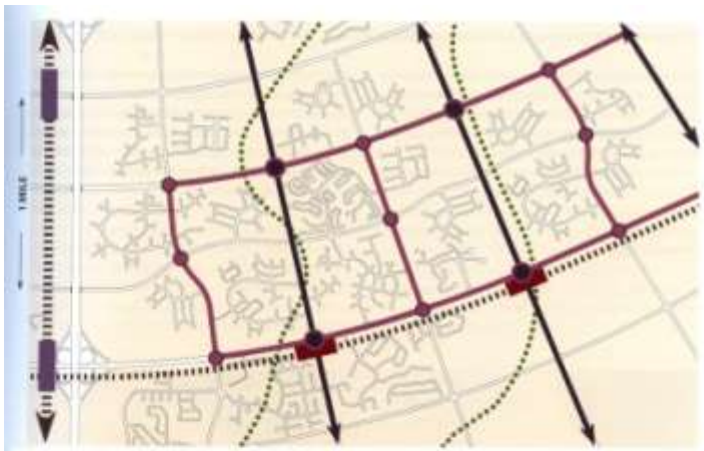
- Identify areas where development should not occur.
- Analyze open space for potential watershed restoration, daylighting of bodies of water, and other retrofitting strategies.



Step Three: Classification of retail types and ranking of priority for sprawl repair

- Service Area Radius (not to scale)
- Convenience Store
- Convenience Center
- "Neighborhood Center"
- Community Center / Regional Center
- Power Center / Employment Center

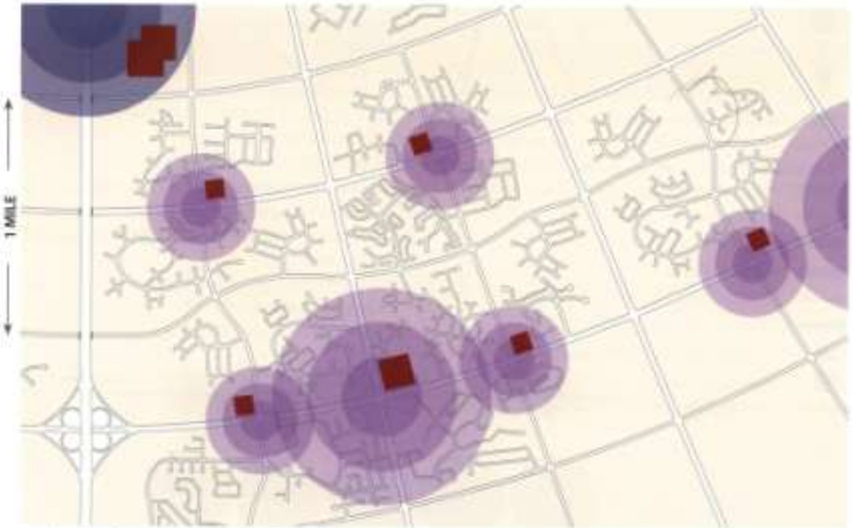
- Analyze the existing system of commercial and employment nodes, including service areas.
- Identify the high-priority targets for redevelopment and repair: employment hubs and regional shopping centers that can be transformed into regional urban cores and town centers.
- Identify the moderate-priority 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: Future transit and infrastructure networks prioritized

- Heavy Rail Line
- Light Rail Line
- Rail Stop
- Intermodal Facility
- Bus Rapid Transit Route (BRT)
- Tram / Circulator Bus Route
- Tram / Circulator Bus Stop / Walk-up Station
- Shared Stop / Sub-Regional Destination
- Trail System / Pedestrian and Bike Paths

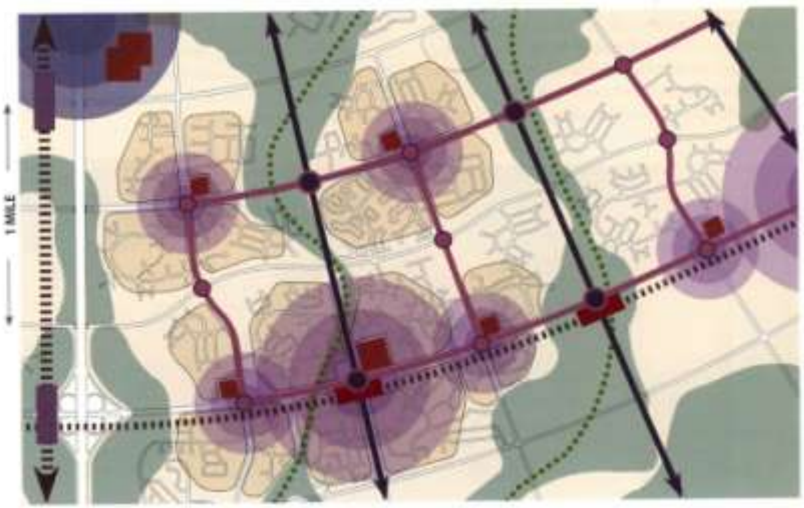
- Analyze the existing thoroughfare and transit network.
- Propose new connections and new thoroughfares that would help to complete the sparse network and accommodate BRT and circulator buses.
- Propose possible routes for heavy and light rail system based on density and destinations.
- Propose possible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



Step Five: Sprawl repair targets identified

- Neighborhood Center
- Town Center
- Regional Urban Core
- Commercial Node
- Employment Hub

- Identify locations for sprawl repair targets in the form of neighborhood centers, town centers, and regional urban cores to coincide with commercial and transit nodes.



Step Seven: Sector map assembled

- Neighborhood Center
- Town Center
- Regional Urban Core
- Commercial Node
- Employment Hub
- Sprawl
- Heavy Rail Line
- Light Rail Line
- Rail Stop
- Intermodal Facility
- Bus Rapid Transit (BRT)
- Tram / Circulator Bus
- Circulator Bus Stop
- Sub-Regional Shared Stop

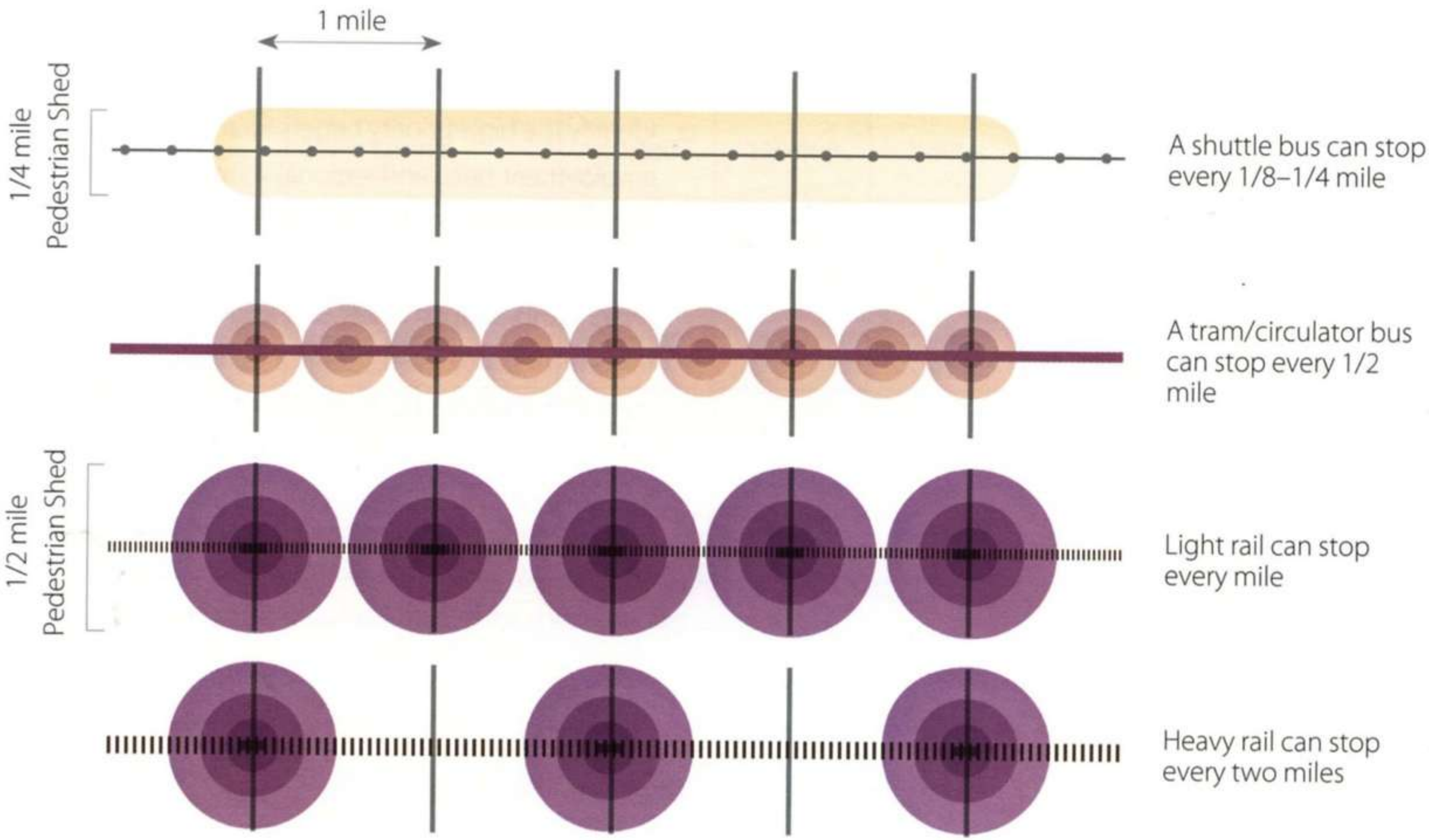
- Assemble the sector map with neighborhood centers, town centers, regional urban cores, transit networks, and preservation areas.
- Set aside areas that are not designated for preservation and not targeted for repair. These may remain as sprawl or devolve into agricultural lands or natural open space.

Step Six: Transfer of development rights

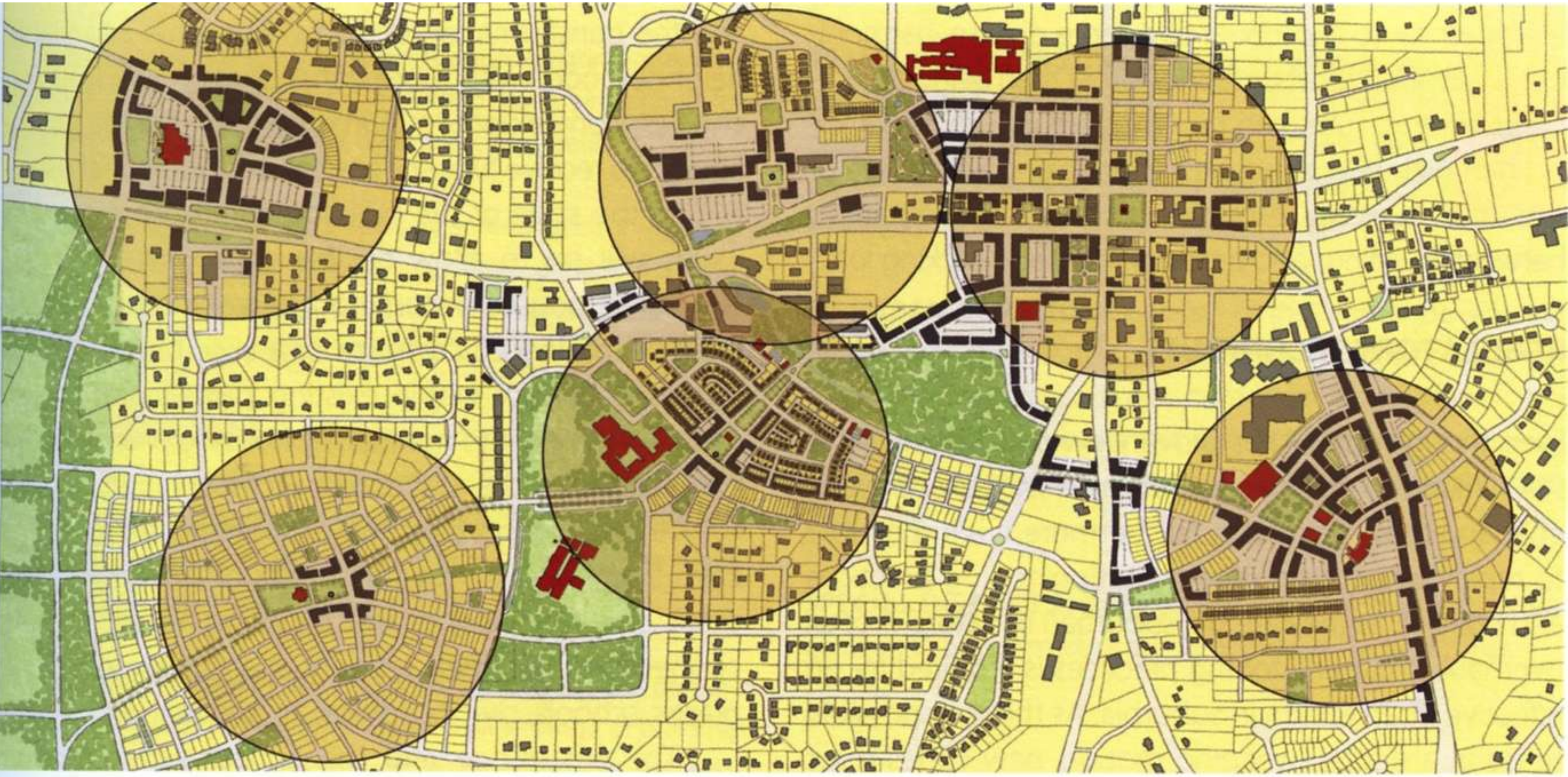
- Preservation and Reservation Areas

- Transfer development rights from the reservation areas to the sprawl repair sector – specifically to the town centers and regional urban cores.
- Reservation areas become preservation areas once they are protected.

Pedestrian sheds and intervals of transit stops



Pedestrian sheds and intervals of transit stops



The sprawl repair method uses pedestrian sheds to delineate neighborhoods and town centers, which should be connected by transit

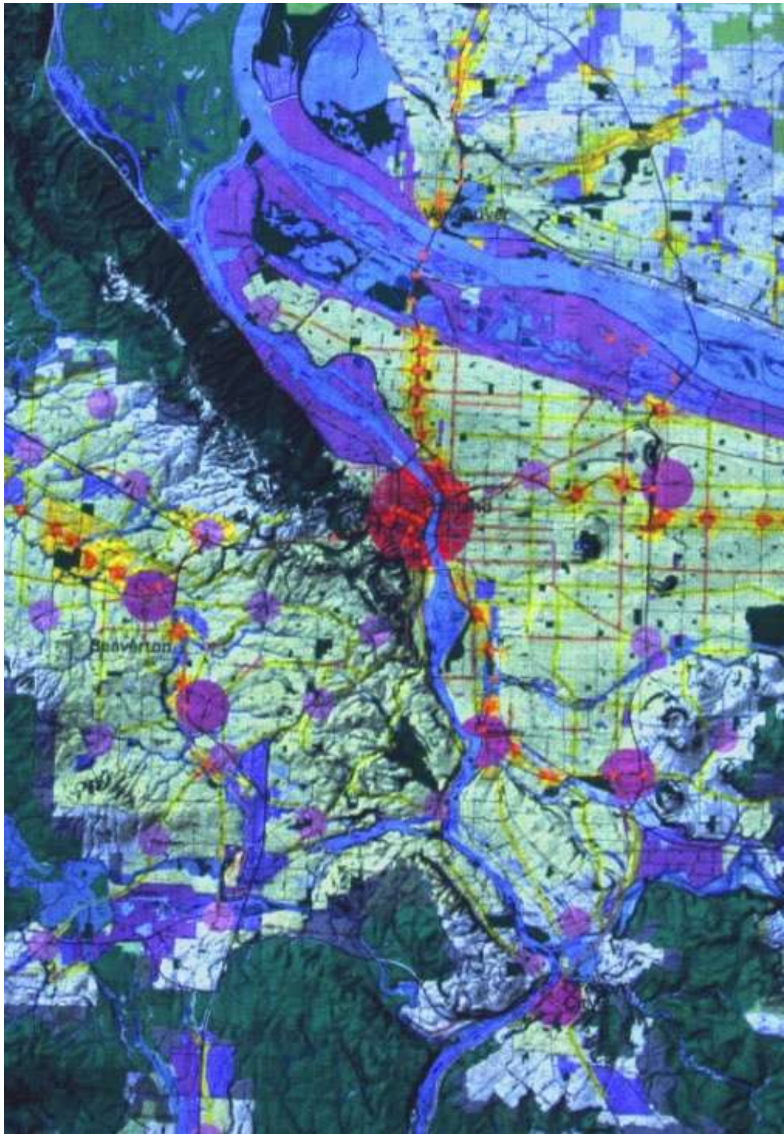
Corridors of Freedom

How to implement a successful Transit Oriented Development Strategy?

Create a hierarchy of Transit-Oriented Centers
All the hubs and nodes do not have the same potential for TOD

Focus on urban environment
Create compact, mixed use, walkable environments
Plan civic spaces and urban amenities

Leverage investment oportunities
Land use reforms, public-private partnerships, land value capture



TOD design challenge
The conflict between places and nodes

Place

Community Hub
Modern-day "Agora"

Attractive Milieu
Comfortable, Memorable, Accent on Aesthetics & Amenities, Connectivity, Legibility, Natural Surveillance

Design Perspective
Architecture/Planning

TOD design challenge
The conflict between places and nodes

Node

Logistical Points
Interchange for Train, Bus, Taxi, Bikes, Scooters, parking, delivery, pedestrians

Conflict points
Safety

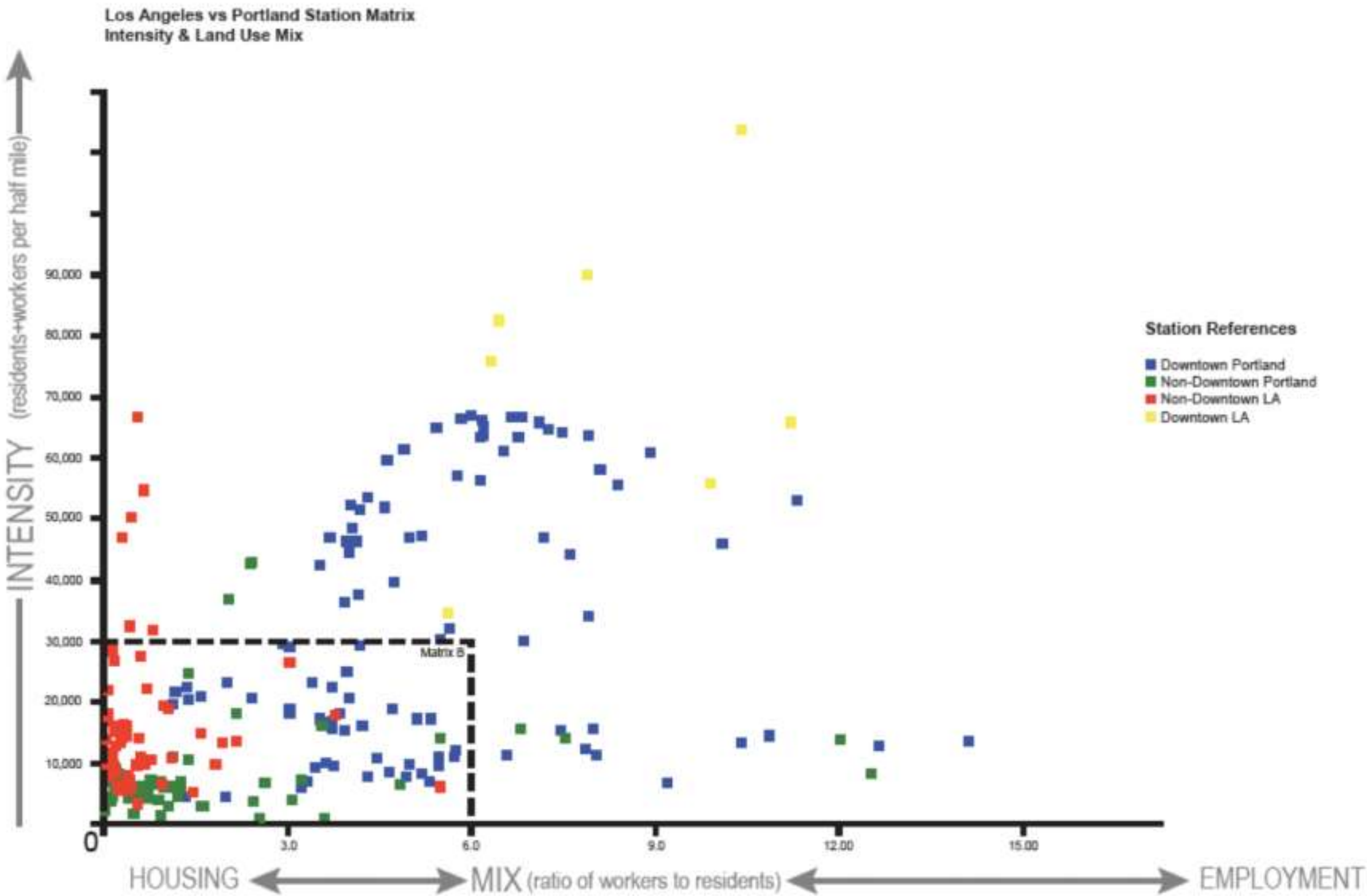
Design Perspective
Engineering

A successful regional transit oriented development

Portland Case Study

A model for Joburg ?
Or should be completed by social inclusion priorities ?

Comparison of Portland and Los Angeles station areas based on intensity and land use mix



A series of metrics to reshape the metropolis

Transit Connectivity

Proximity to Light Rail

Proximity to Frequent Bus

Pedestrian and Bicycle Connectivity

Intersection Density

Proximity to Trails

Low Traffic Streets

Dedicated Bicycle Lanes

Sidewalk Density

Overall Pedestrian and Bicycle Safety at Intersection Crossings

Land Use Characteristics

Presence of Key Retail Amenities

Presence of Grocery Stores

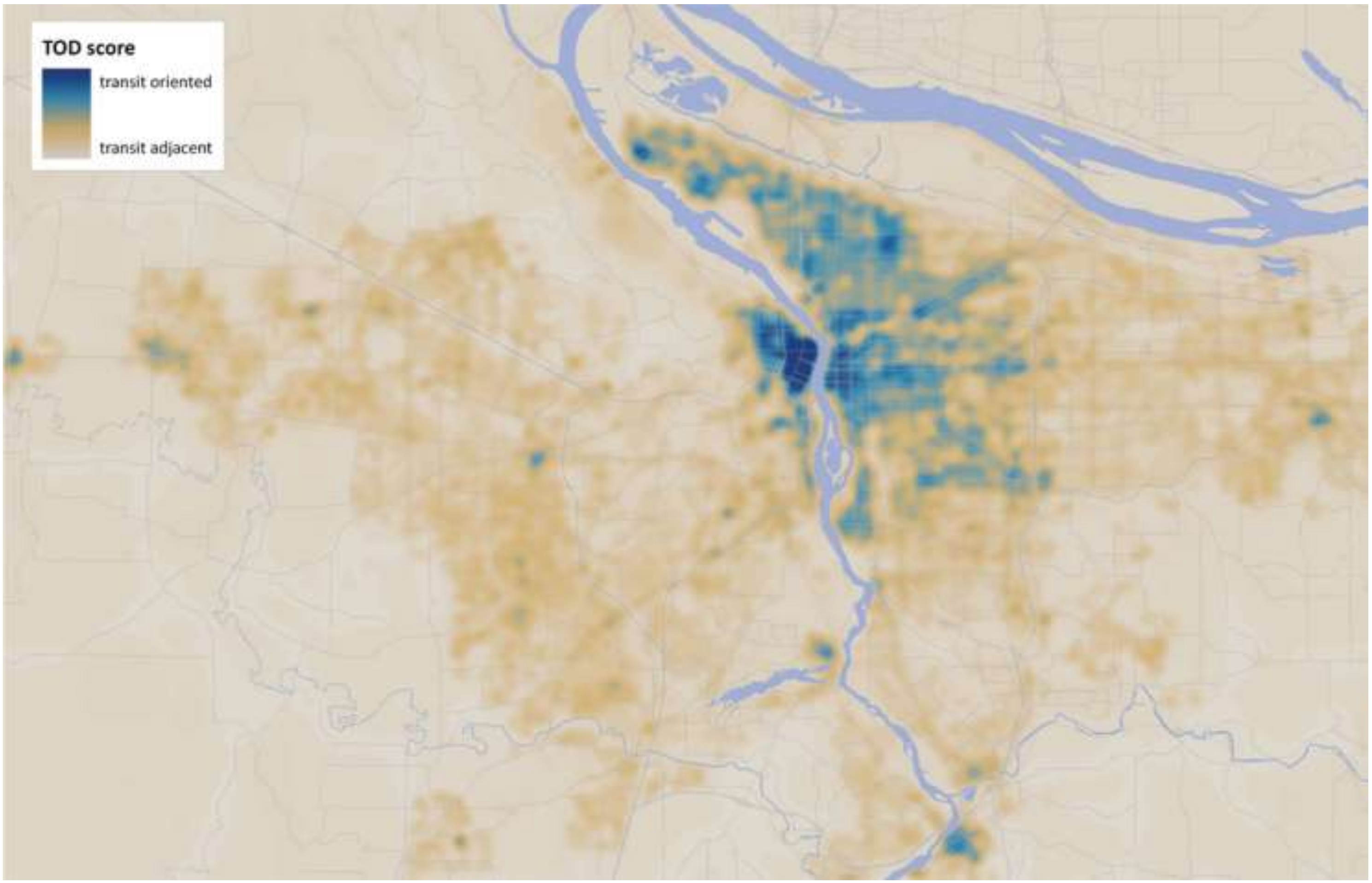
Population Density

Building Height and Massing

Vegetation

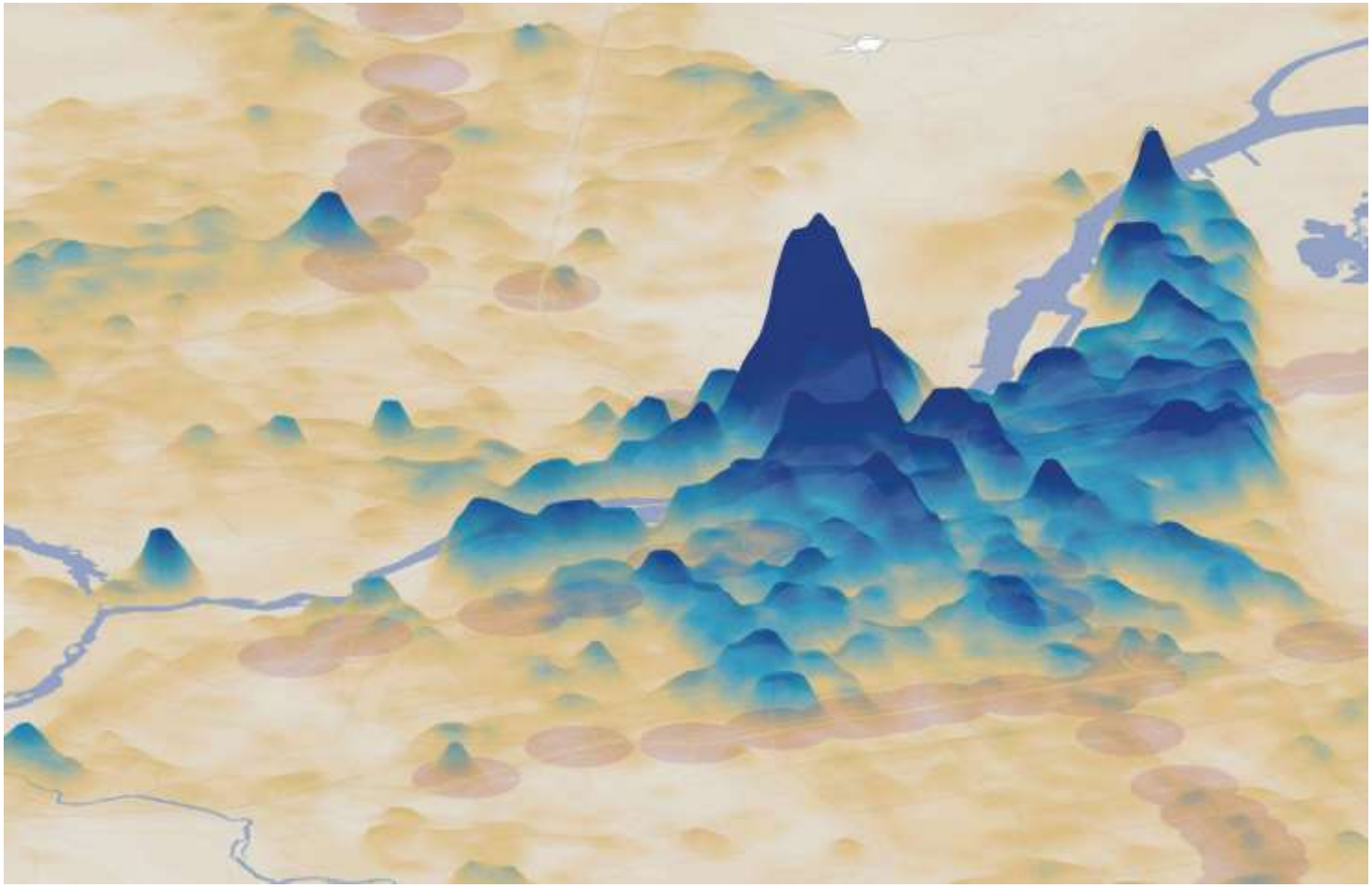
Transit orientation scores in Portland

Resting upon the series of metrics



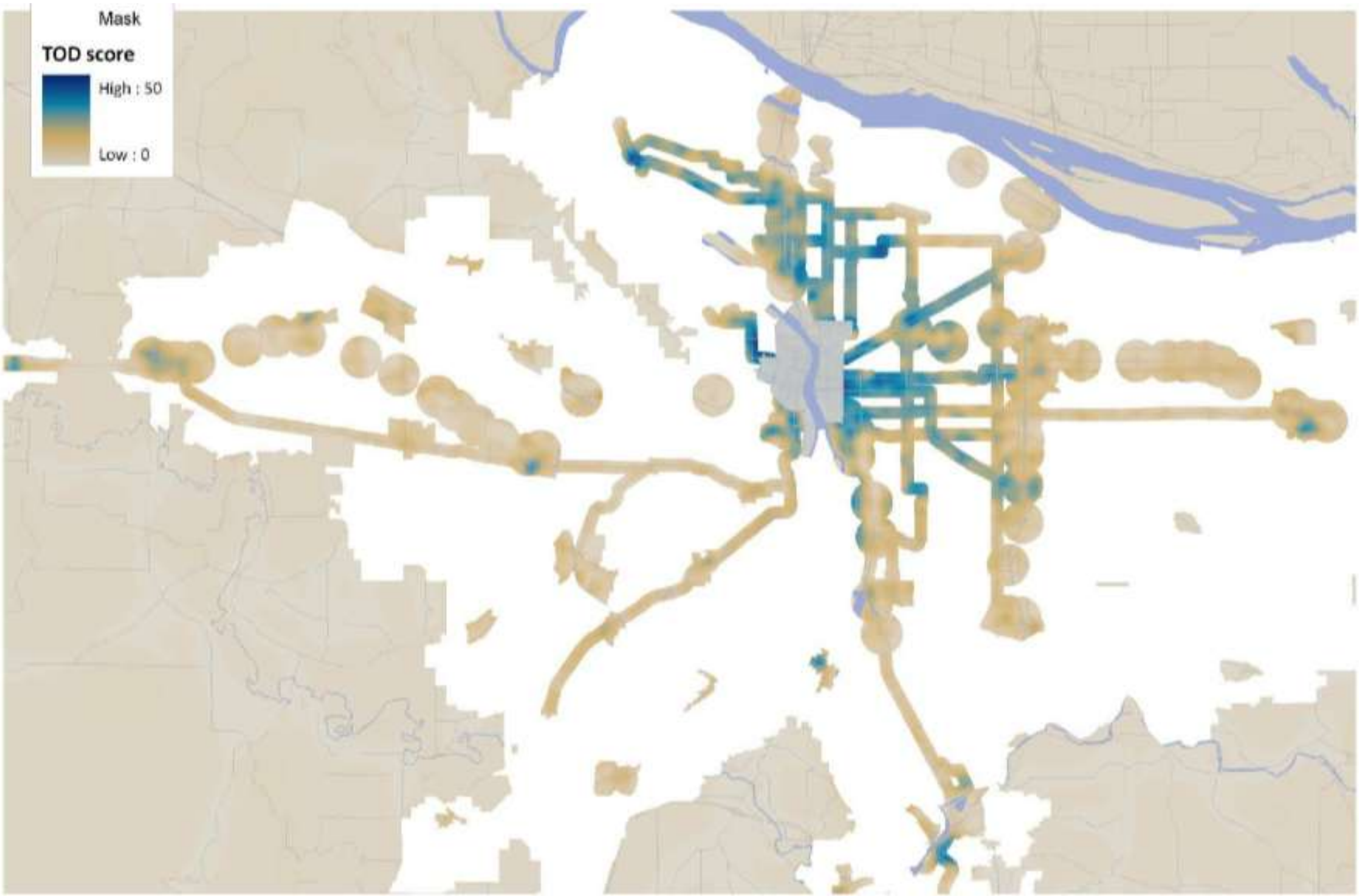
Transit orientation scores in Portland

Resting upon the series of metrics

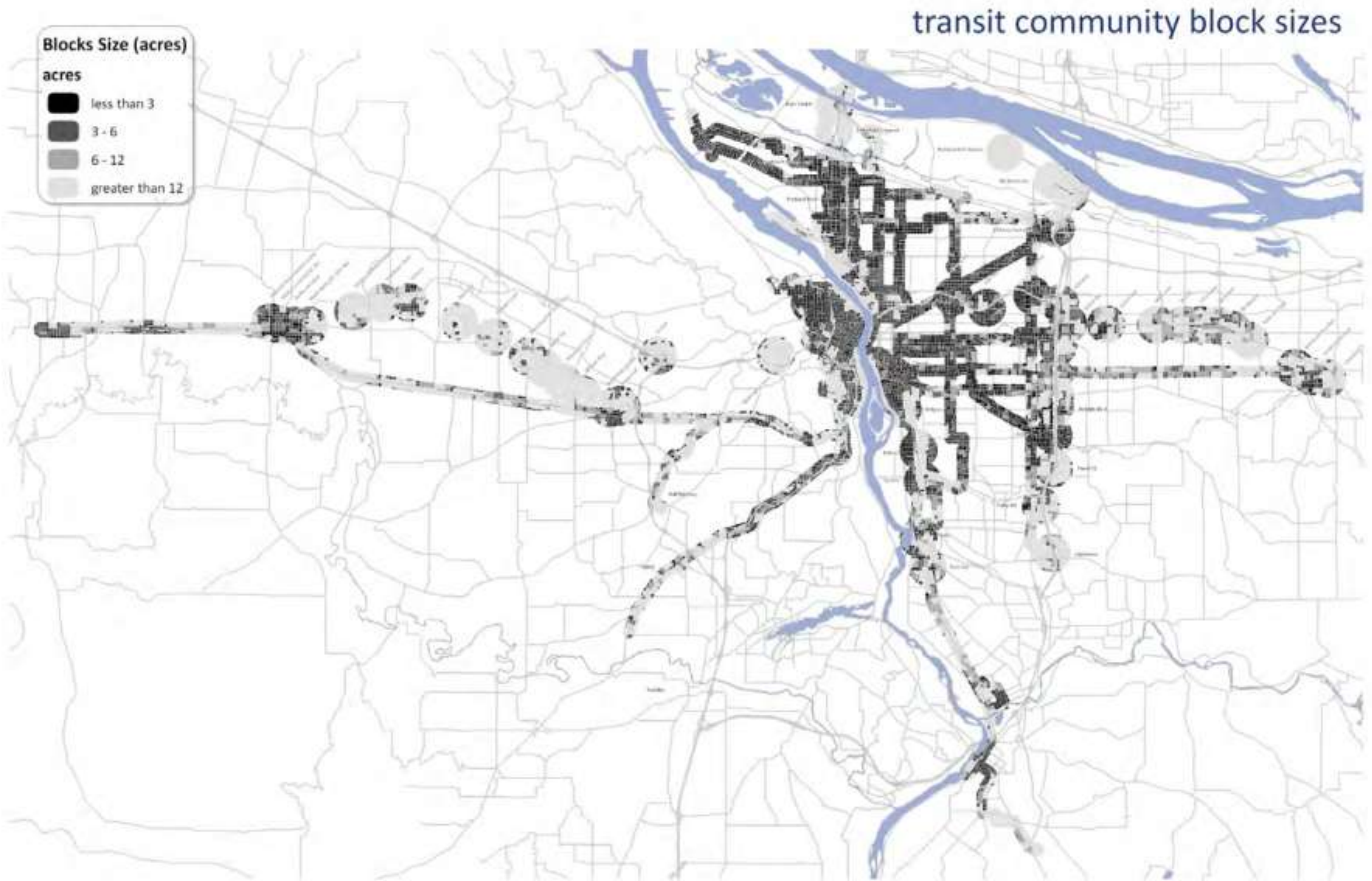


Transit orientation scores in Portland

Resting upon the series of metrics



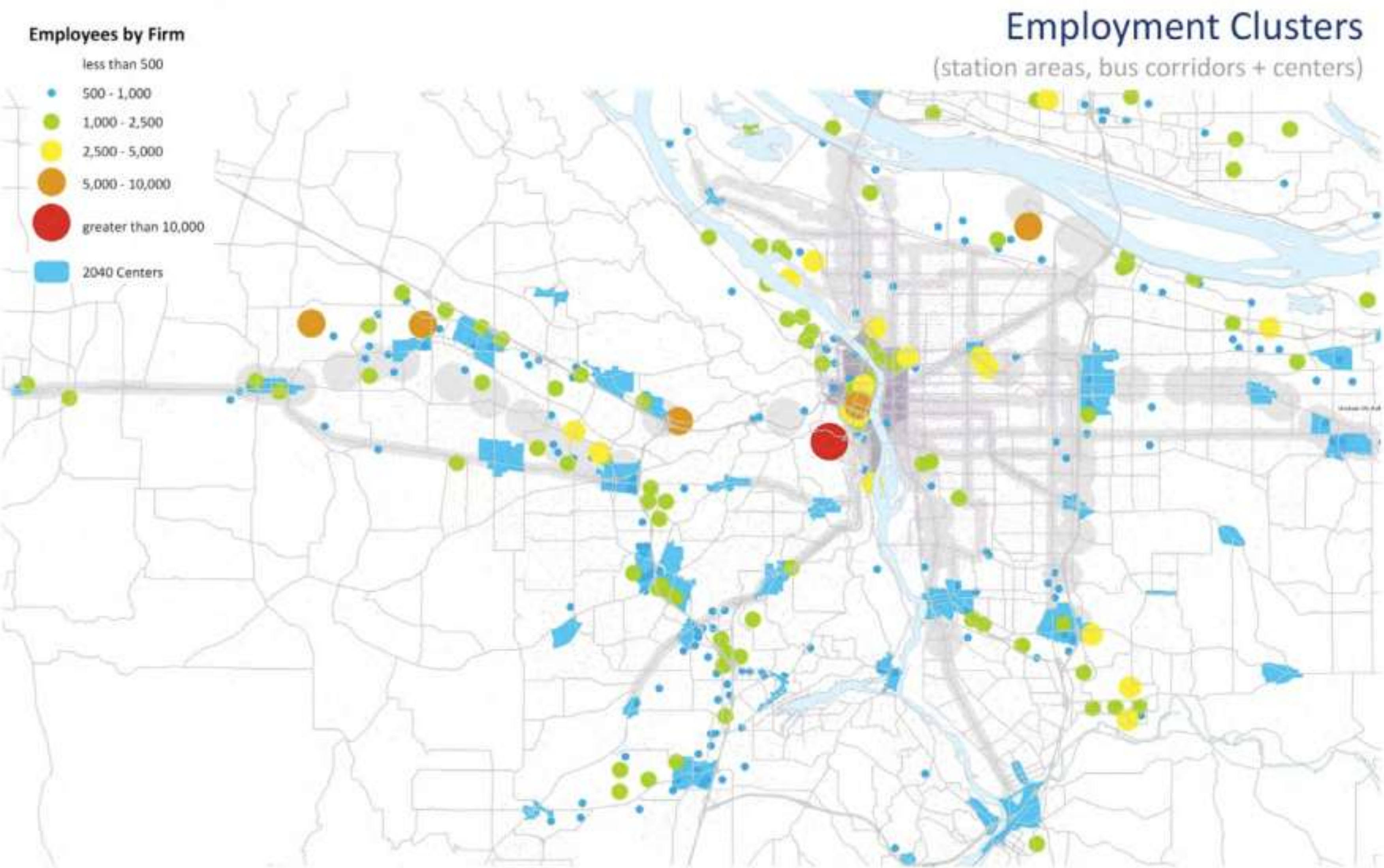
Local metrics around the transit stations
Small blocks increase walkability



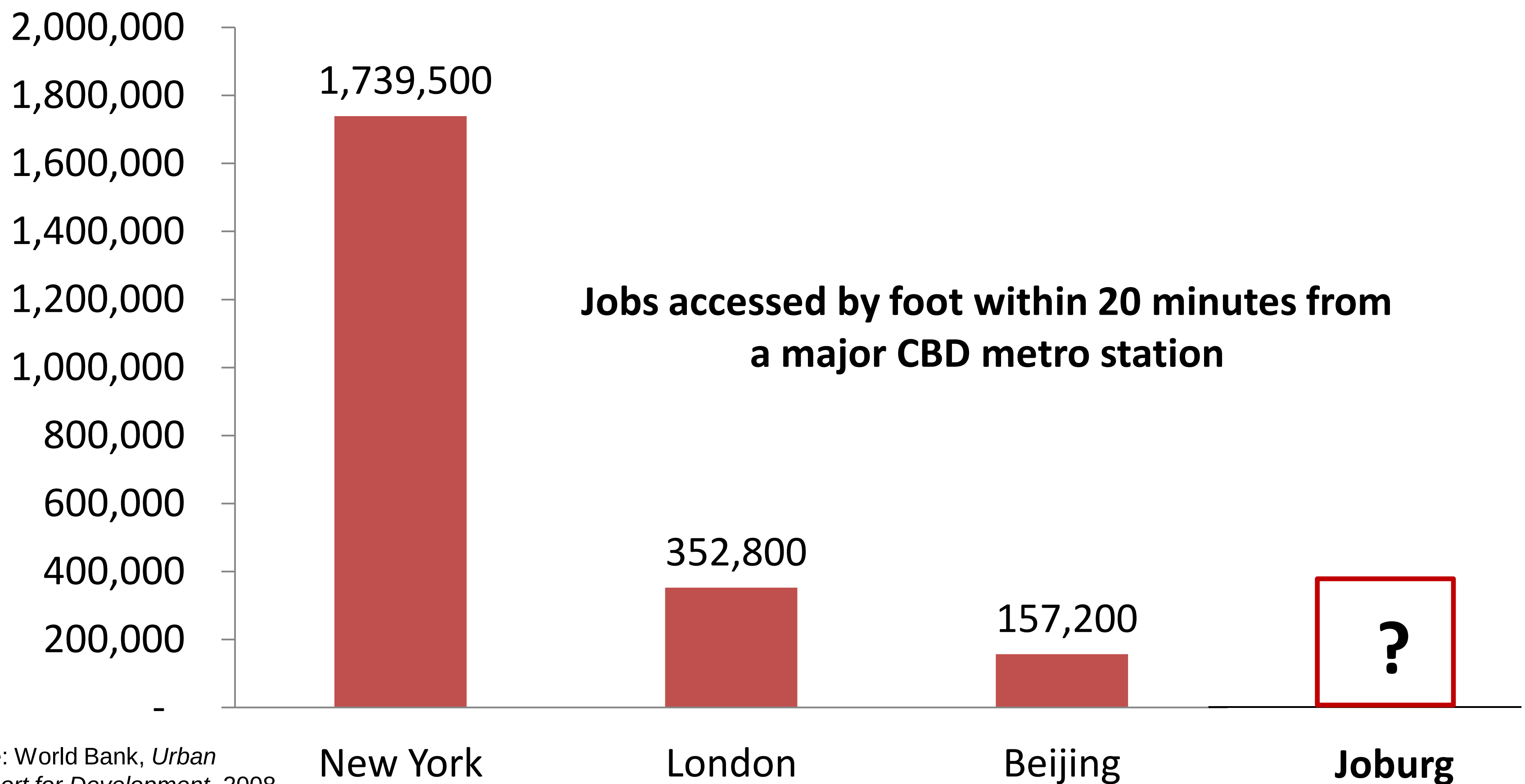
Local metrics around the transit stations

Land value helps leveraging investment opportunities

Local metrics around the transit stations
Jobs and employment

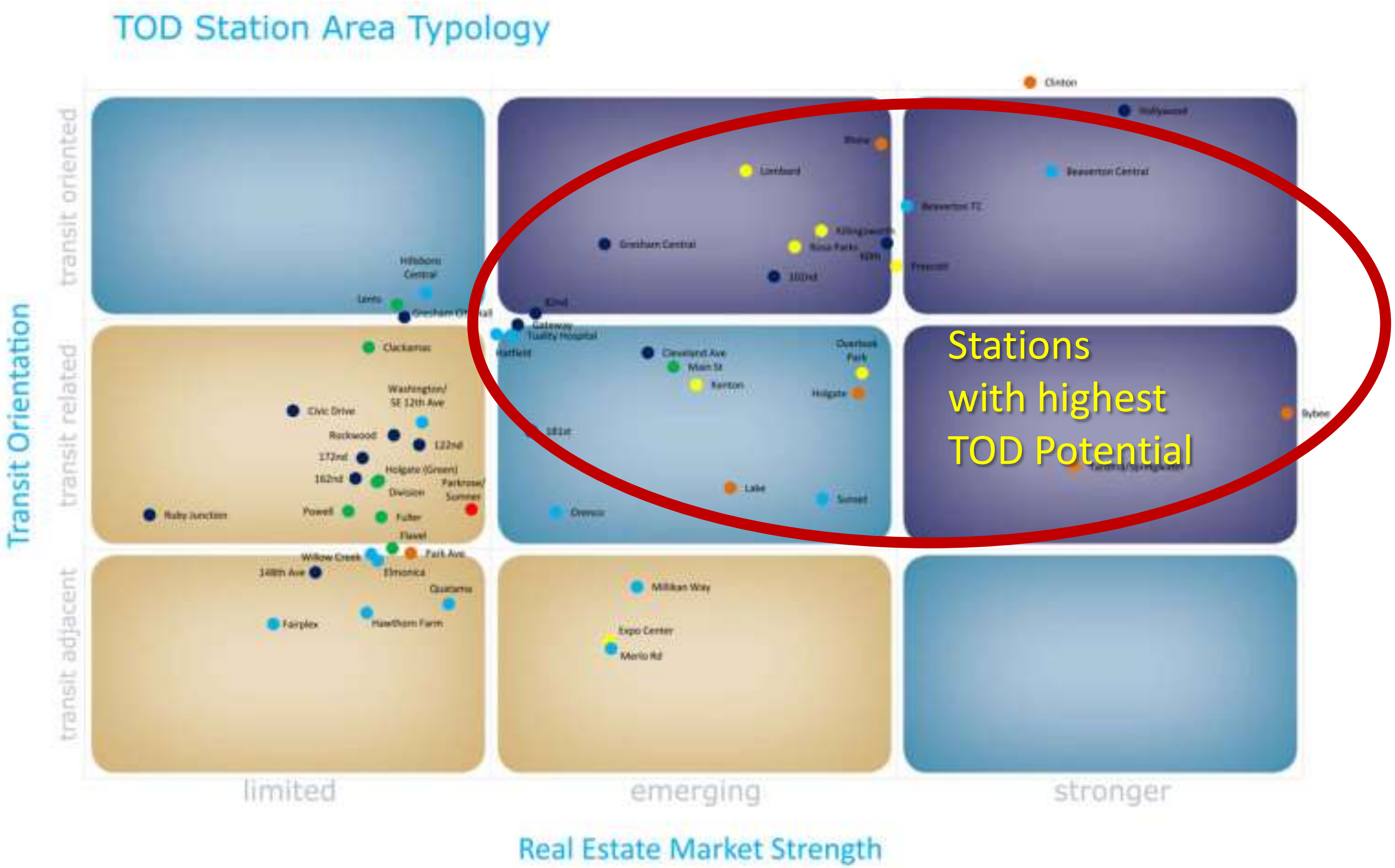


Local metrics around the transit stations
Jobs and employment



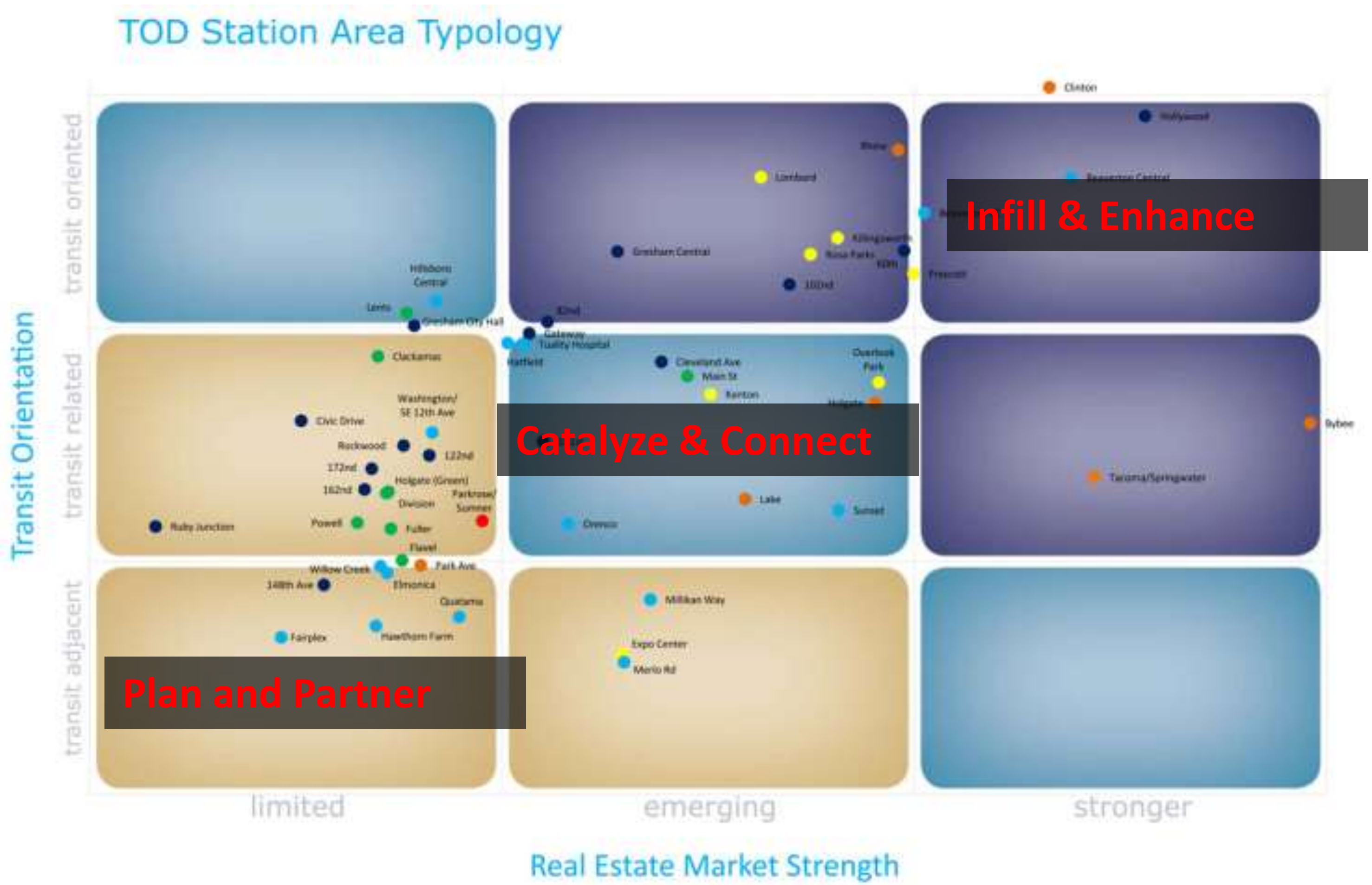
Source: World Bank, *Urban Transport for Development*, 2008

Combining Transit Orientation with Market Strength



3 differentiated strategies

infill+enhance | catalyze+connect | plan+partner



3 differentiated strategies

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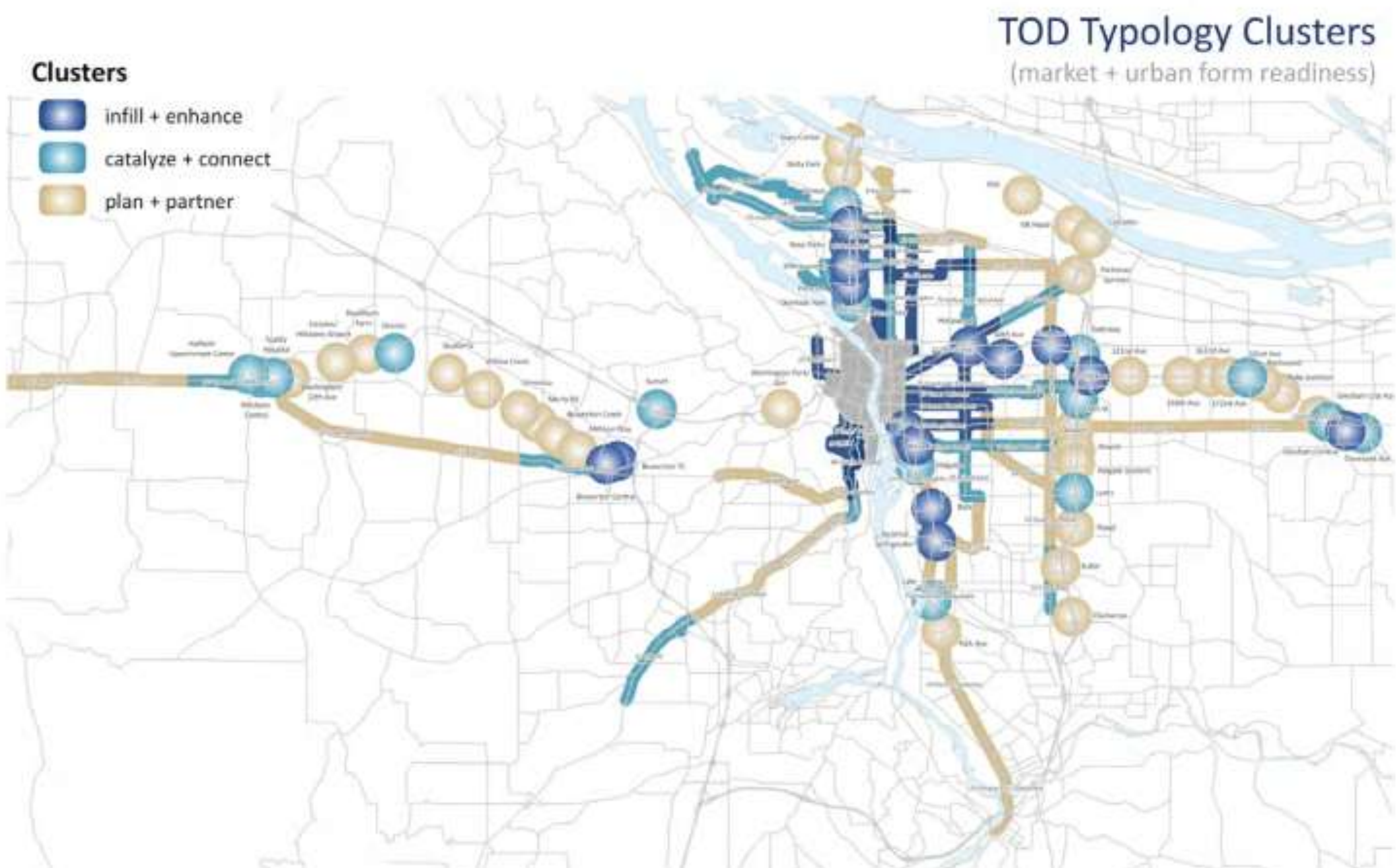
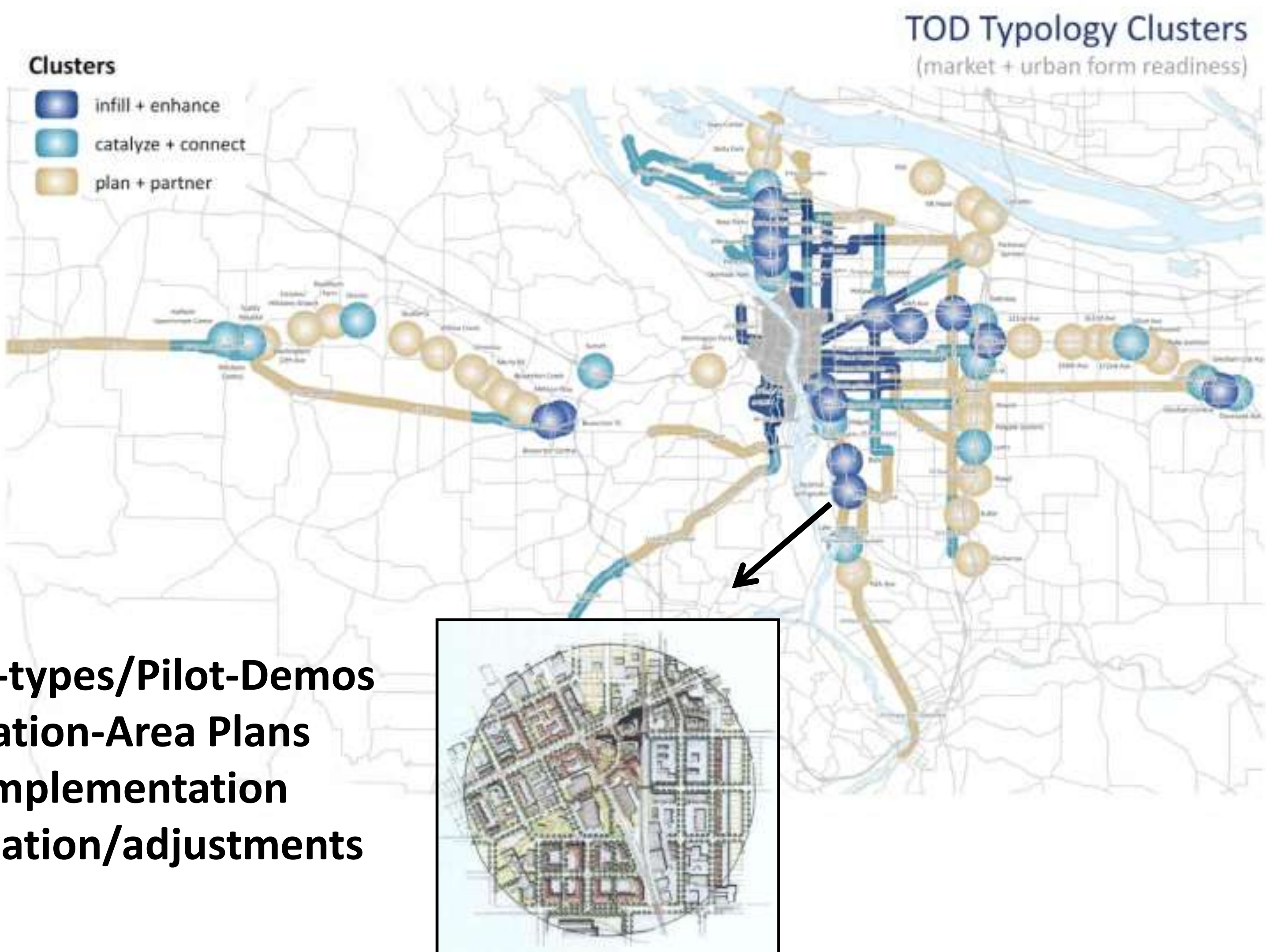


TOD Execution
Local implementation



Proto-types/Pilot-Demos
Station-Area Plans
Implementation
Evaluation/adjustments

TOD
Urban form strategies

Infill, connectedness, and higher density development

Creation of more walkable, livable neighborhoods

On the district scale

How to complete these strategies for American transects by specific strategies for Townships and for informal settlements ?

TOD retrofit steps at neighborhood scale

STEP 1: ANALYSE SITE FEASIBILITY

- A survey of the ownership structure
- Demographic analysis and other marketing studies
- A void analysis of the local market identifies the uses required to rebalance the existing ones
- The potential for new job creation
- Analysis of the existing building stock includes determining which buildings will be retained, renovated, and repurposed, and which will be partially or entirely demolished. The goal should be a range of flexible and affordable building types that can easily adapt to a variety of uses and activities as market changes
- Analysis of thoroughfare connectivity, street and traffic patterns
- Develop a new parking strategy
- Decontamination and remediation procedures

STEP 2: APPLY URBAN DESIGN TECHNIQUES

Johannesburg urban developments exhibit a range of shared defects such as car dependence, lack of neighborhood structure and mixed use, lack of connectivity and block organization, and scarcity of defined public realm

The summary of the main deficiencies and the remedial urban design techniques are as follows:

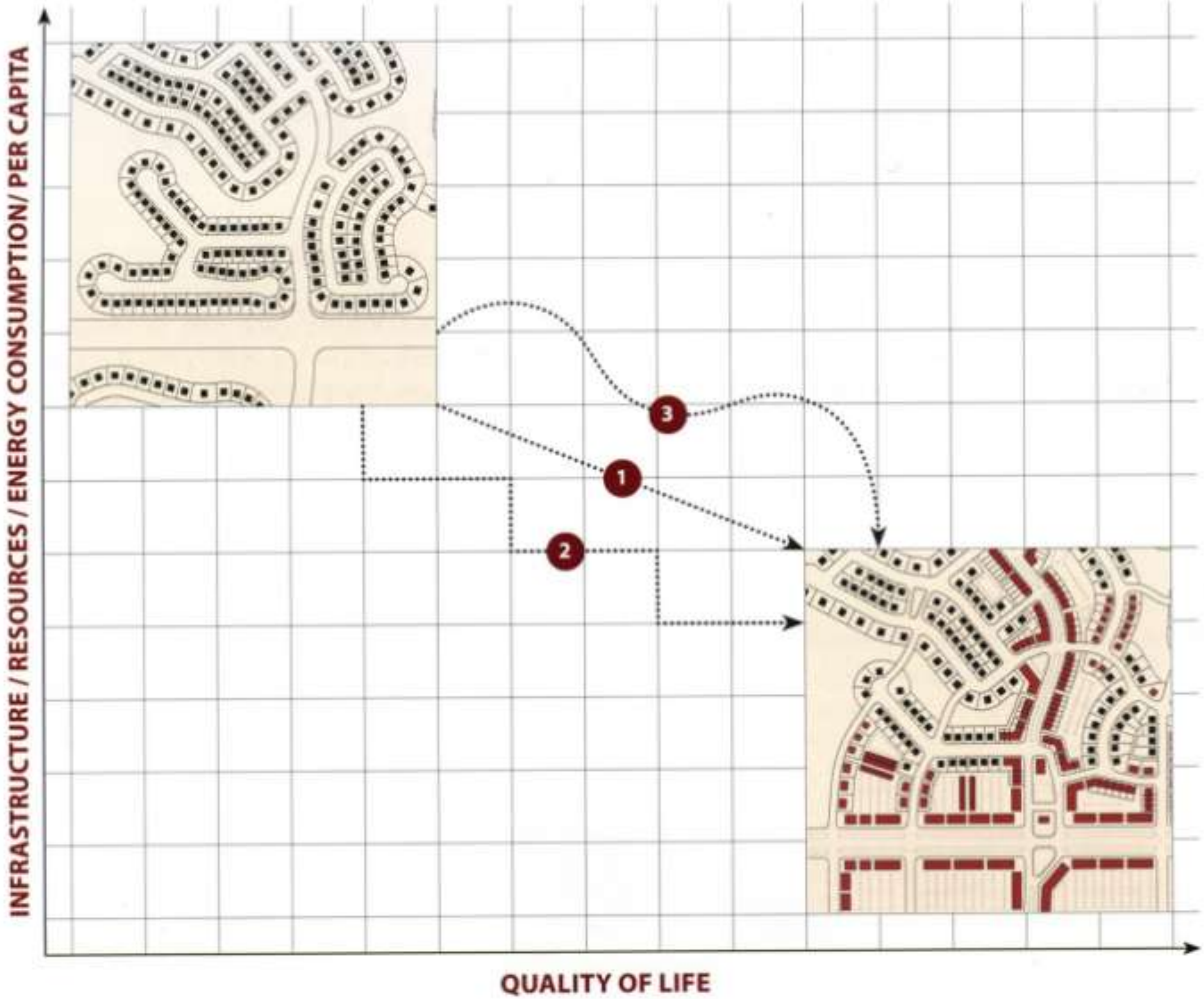
Deficiency: Single Building type and use
Remedial technique: Introduce new building types to accommodate a mix of uses

Deficiency: Lack of walkable neighborhood structure
Remedial technique: introduce a finer grain connective street network inside and across neighborhoods.

Deficiency: Residual open space/ Lack of civic space
Remedial technique: Define open and civic space

STEP 3: INTRODUCE REGULATORY AND MANAGEMENT TECHNIQUES

STEP 4: SECURE INCENTIVES FOR IMPLEMENTATION

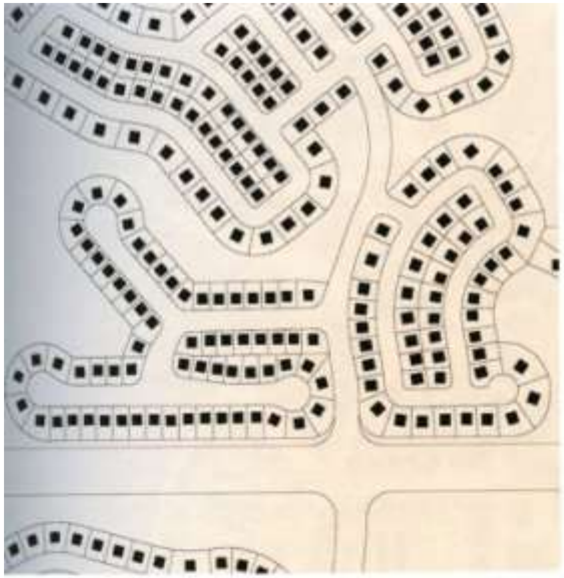


Conceptual representation of possible paths of sprawl repair and their effects on resource use and quality of life

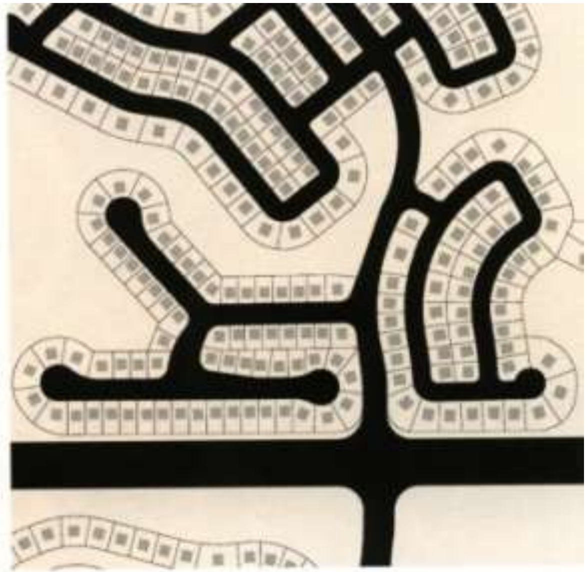
1. Direct process of sprawl repair
2. Phased process of sprawl repair
3. Indirect process of sprawl repair

Deficiencies

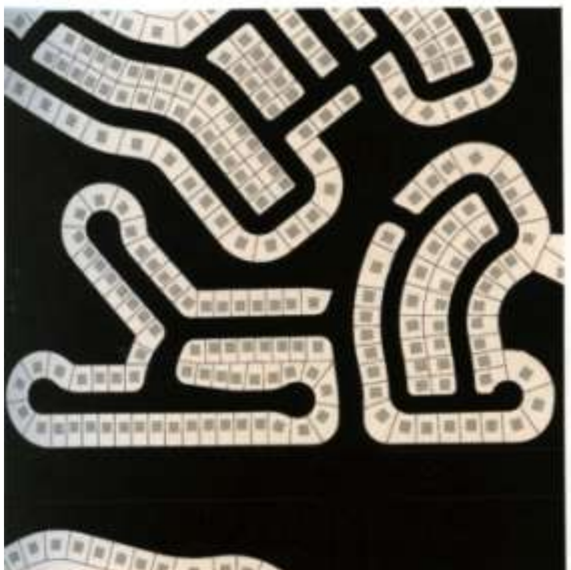
SINGLE FAMILY HOUSES TOD RETROFIT



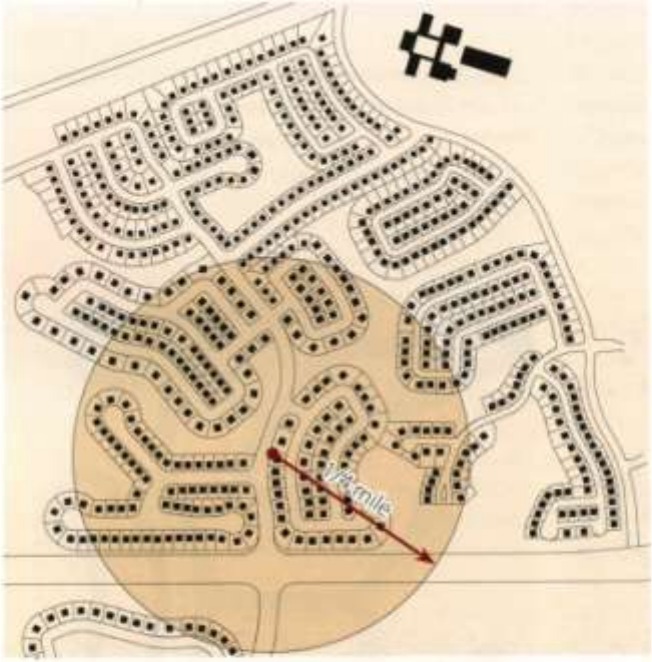
Single building type and use



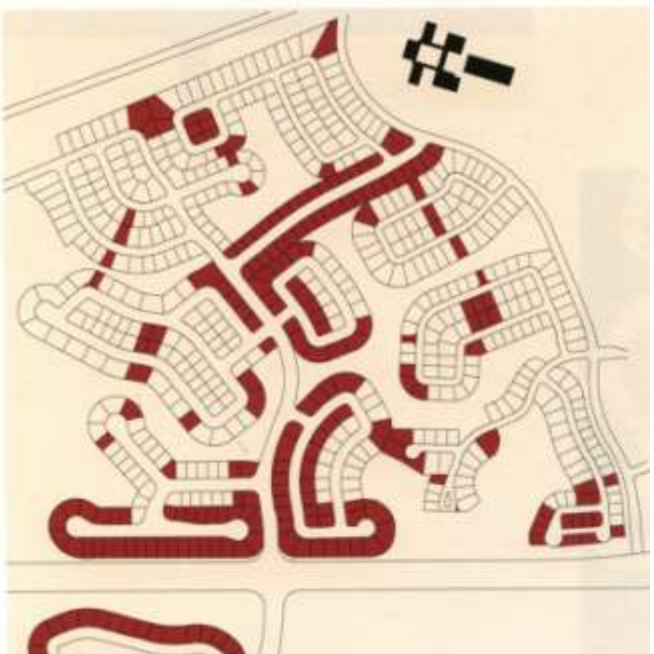
Lack of walkable block structure



Residual open space



Existing subdivision

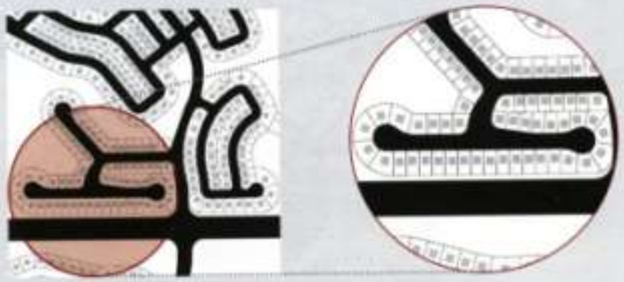


Areas of intervention

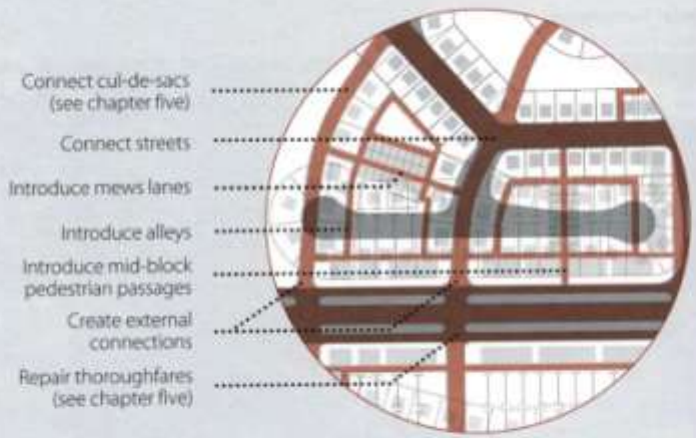
Outcome

1. New square
2. Green
3. Main spine
4. New connections
5. Arterial repaired into boulevard

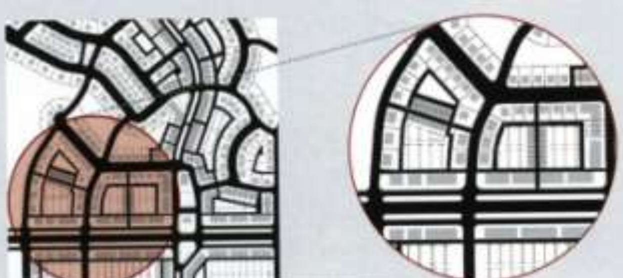
Deficiency: Lack of walkable block structure



Remedial Techniques: Connect and repair thoroughfares



Outcome: Walkable network and block structure



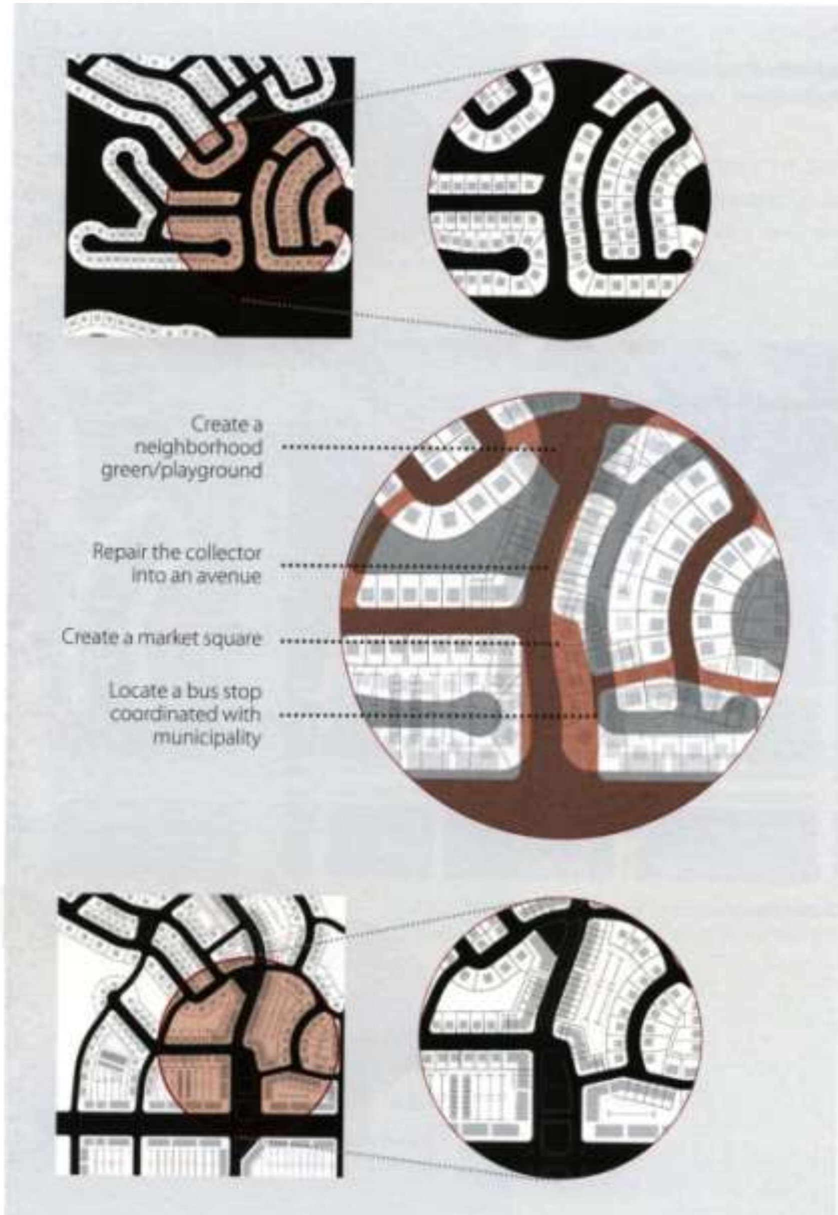
Repetitive pattern of single-family houses and cul-de-sacs

A new neighborhood center for the surrounding residential sprawl

Deficiency: Residual open space

Remedial Techniques: Define open and civic space

Outcome: Hierarchy and spatial definition of public realm



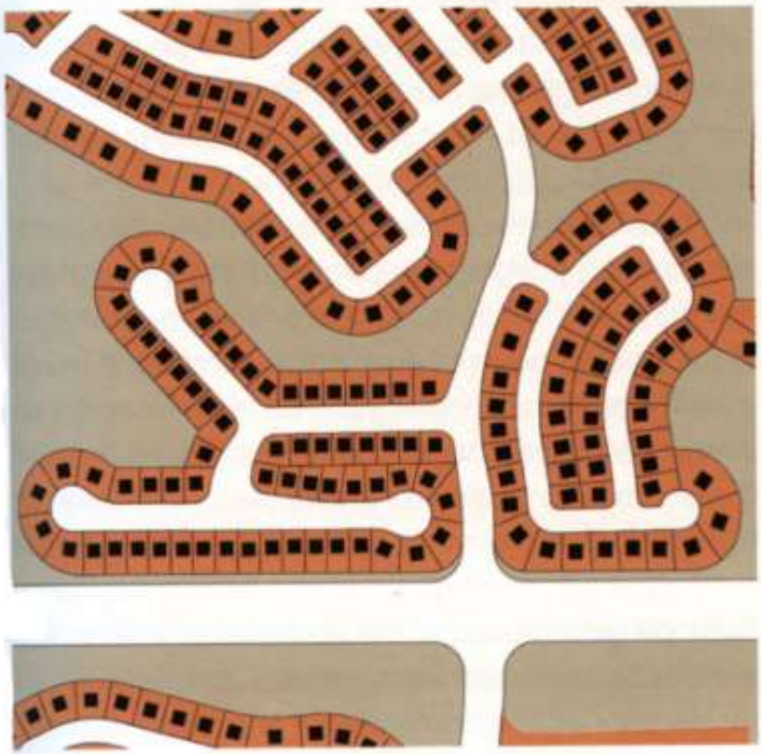
PHASING

Existing single-family subdivision

Short-term repair: Creating an entry square

Medium-term repair: Adding mixed-use blocks

Long-term repair: Completing the urban fabric



Conventional single-use zoning

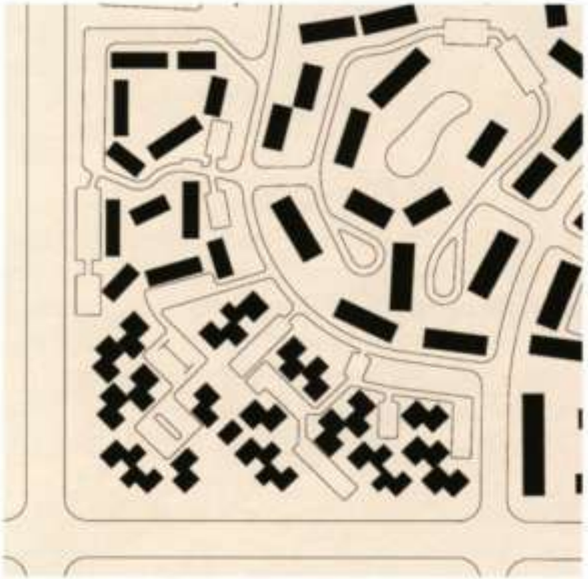
- Open Space
- R1 - Single-family Residential
- Existing buildings

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

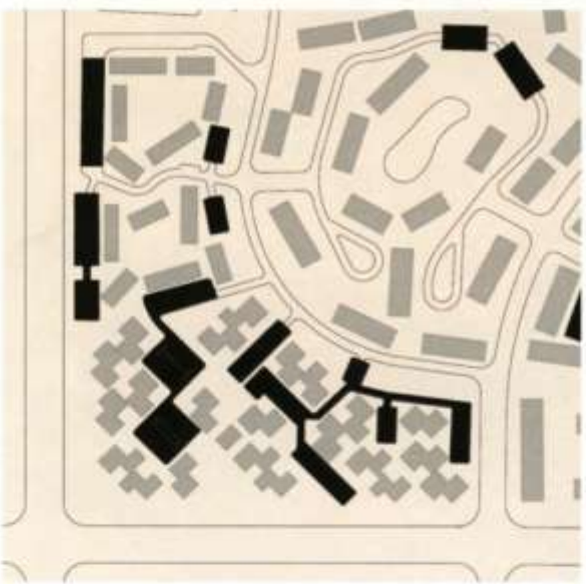
MULTI-FAMILY SUBDIVISION TOD RETROFIT

DEFICIENCIES

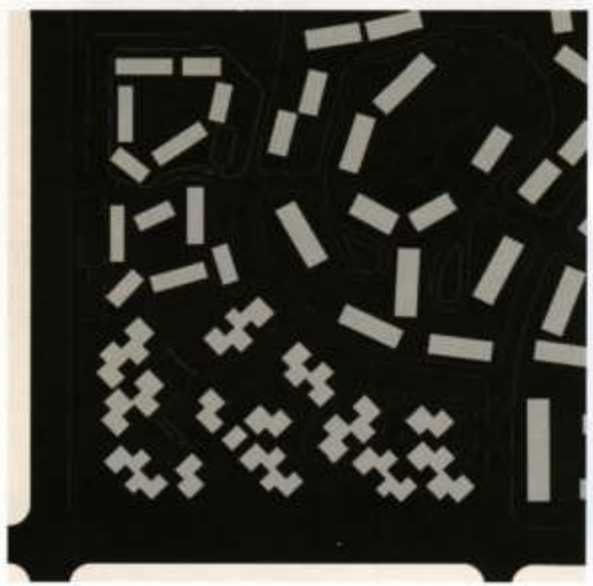


Single building type and use

Lack of walkable block structure

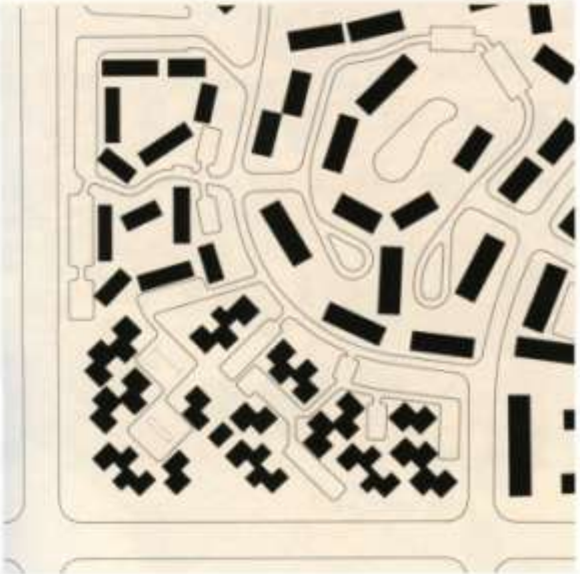


Dispersed and exposed parking



Residual open space

TRANSFORMATION INTO A TOWN CENTER



Existing buildings

Existing multifamily subdivision

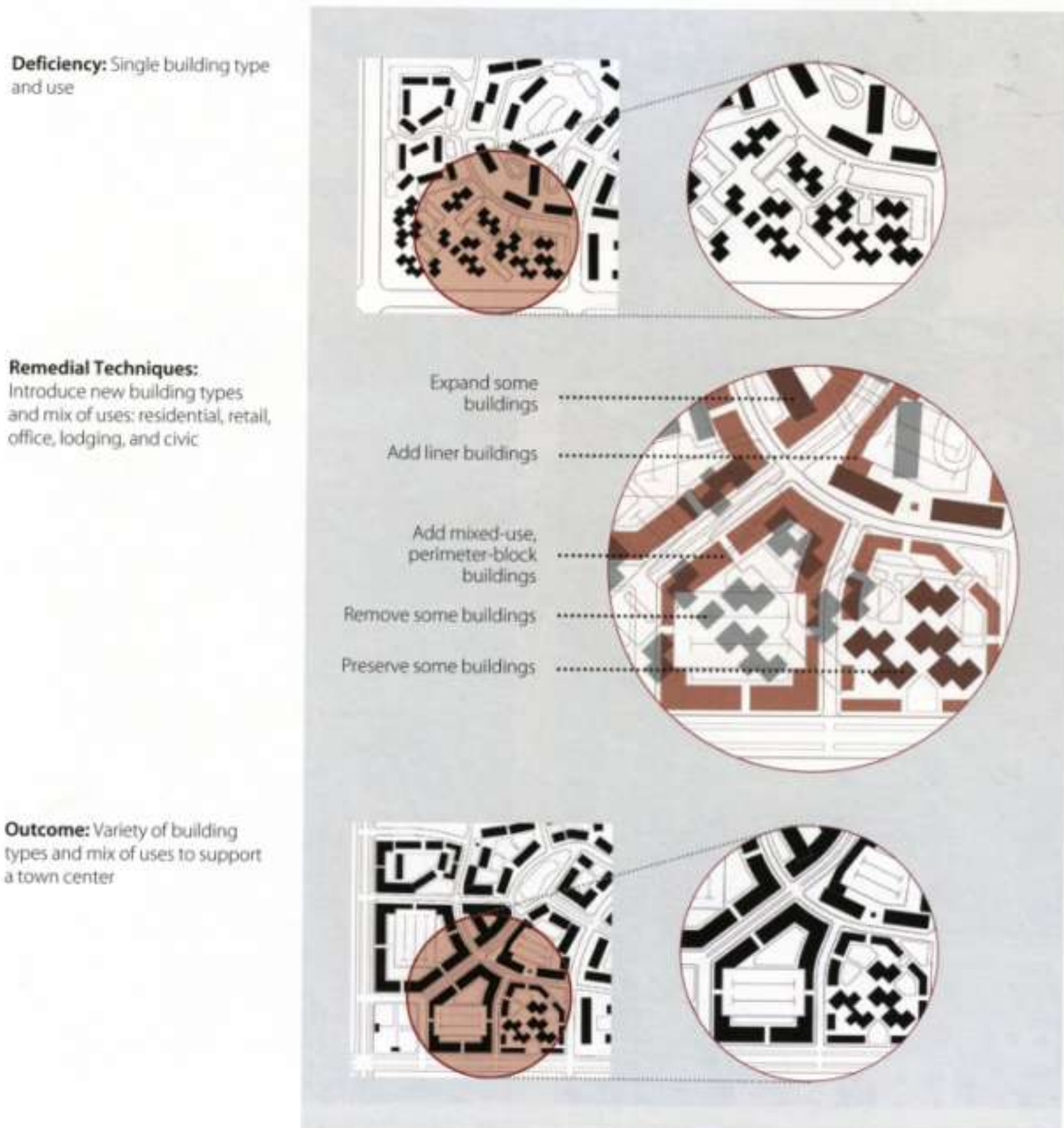
Proposed buildings

Existing buildings

Multifamily subdivision repaired into a town center

Dispersed and unstructured disposition of buildings in a multifamily subdivision

The transit-oriented, high-density town center will be used by the surrounding communities



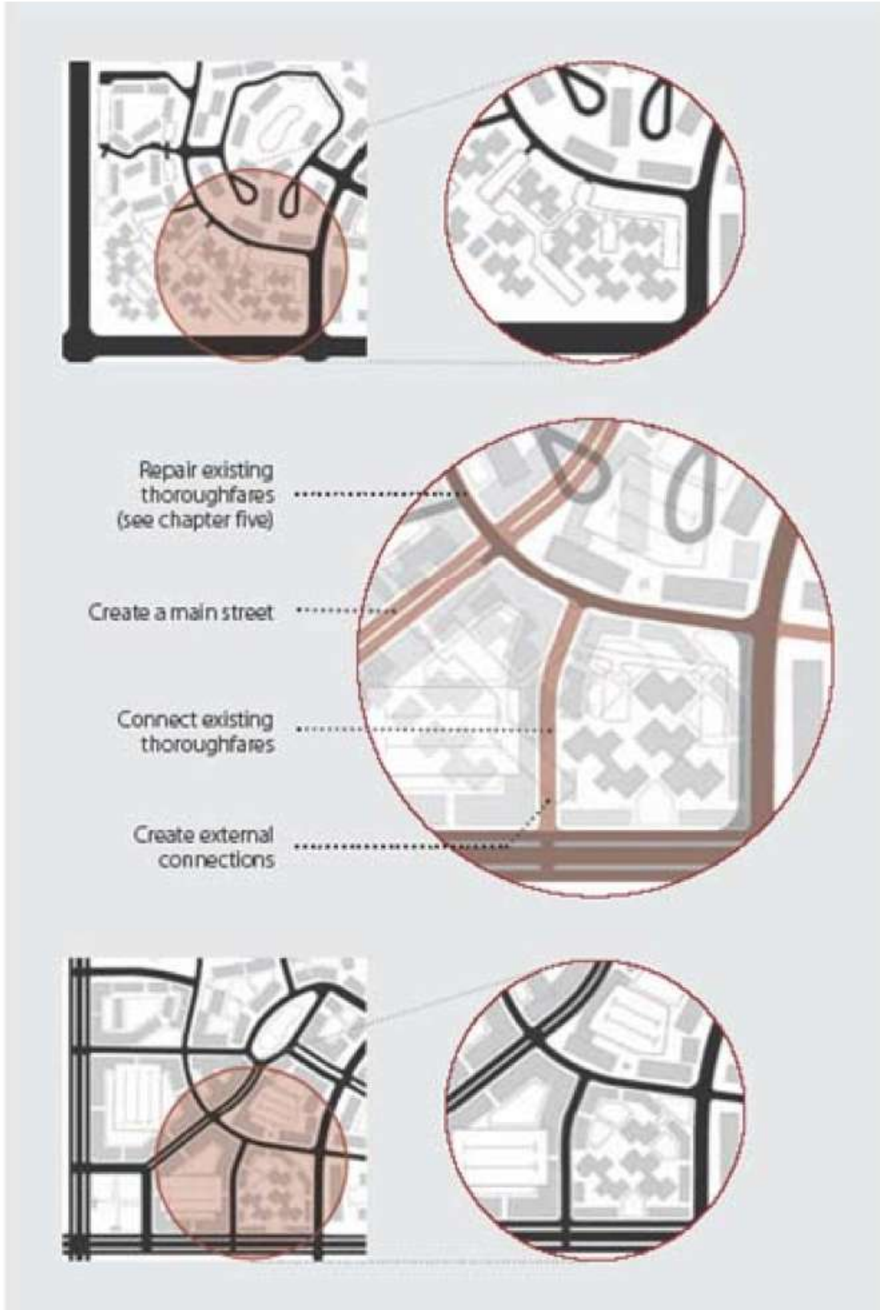
Introduce new building types and mixed use

Re-connect street network

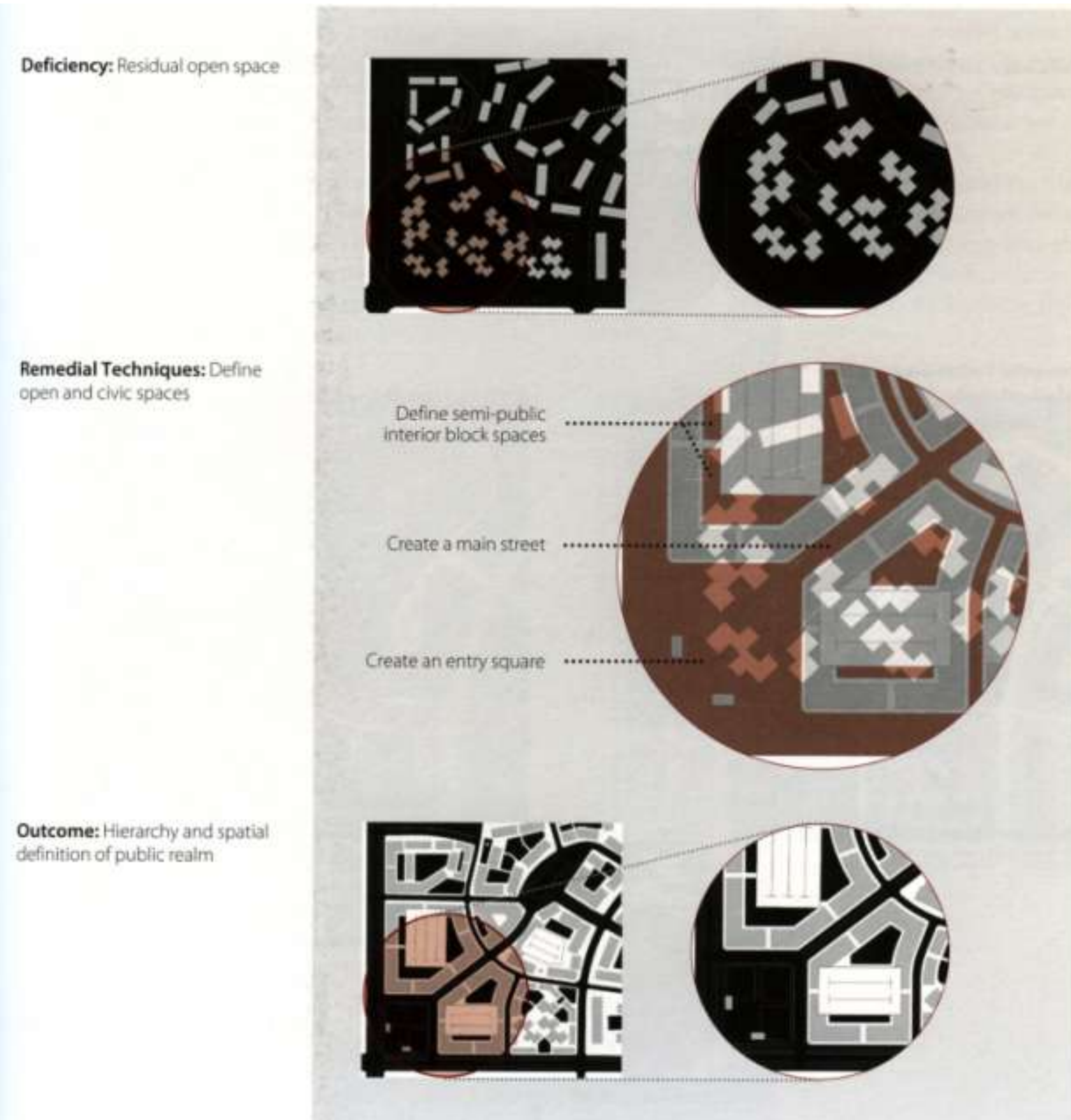
Deficiency: Lack of walkable block structure

Remedial Techniques: Connect and repair thoroughfares

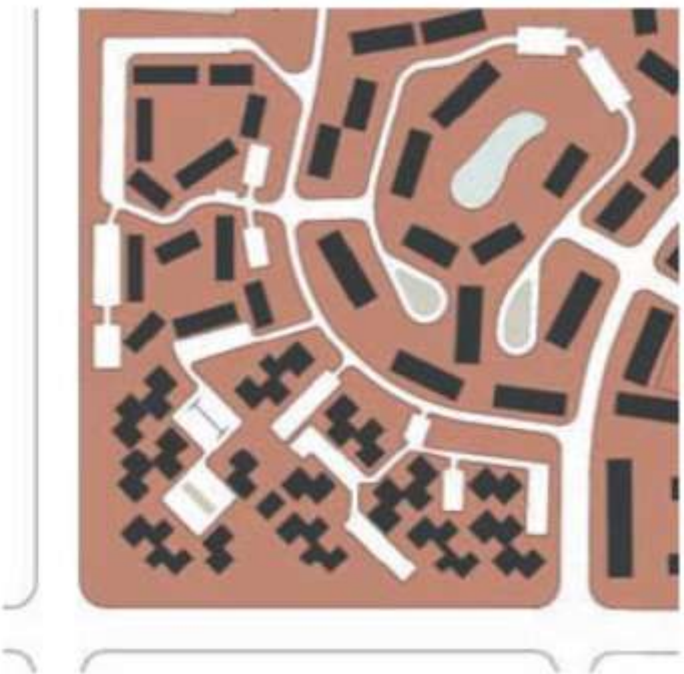
Outcome: Walkable network and block structure



Define open and civic space



Re-Zoning



Conventional single-use zoning

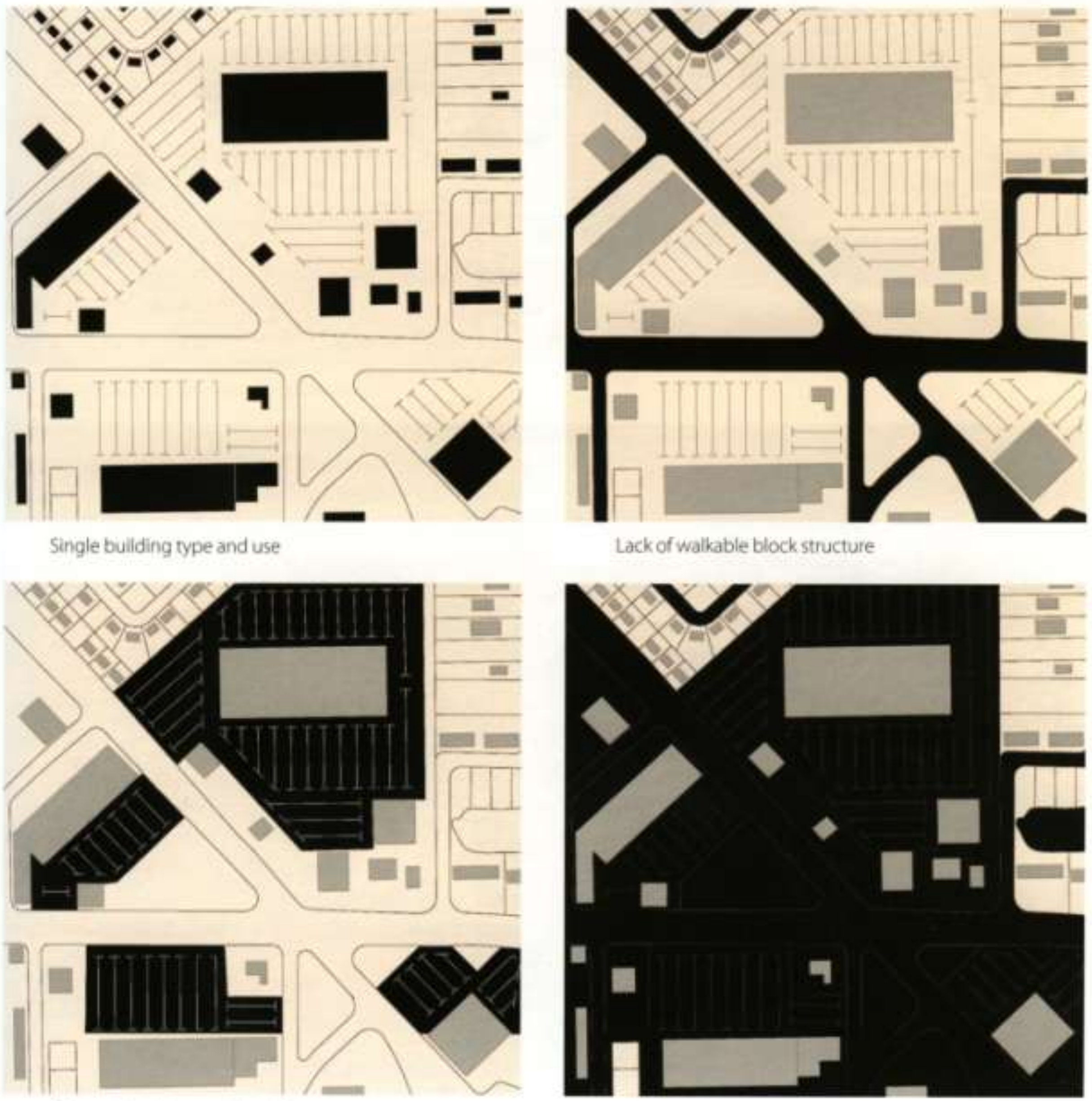
- Open Space
- R3 - Multifamily Residential
- Existing buildings

Transect-based zoning

- T3 - Sub-Urban zone
- T4 - General Urban zone
- T5 - Urban Center zone
- CS - Civic Space
- CB - Civic Building
- Existing and proposed buildings

Deficiencies

A SHOPPING CENTER TOD RETROFIT



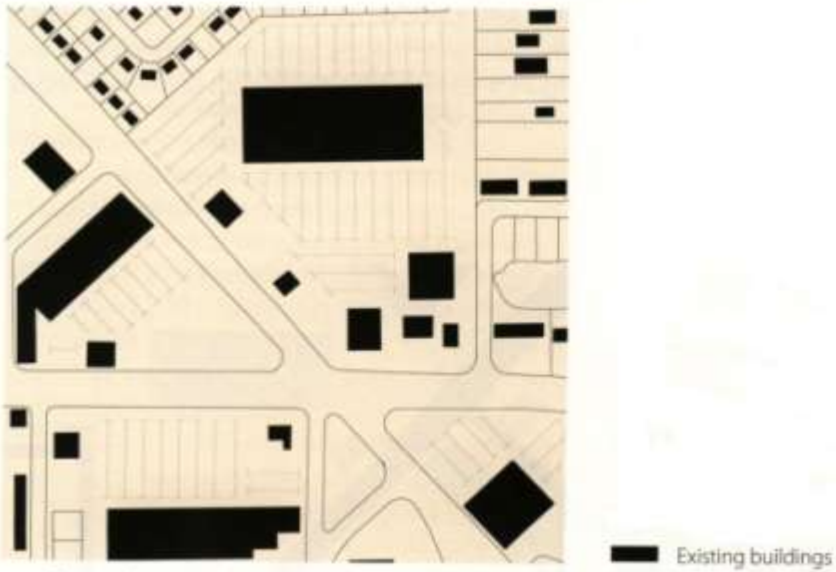
Single building type and use

Lack of walkable block structure

Dispersed and exposed parking

Lack of civic space

TRANSFORMATION INTO A TOWN CENTER



Existing shopping center

Parking lots dominating the public realm

Shopping center repaired into a mixed-use town center

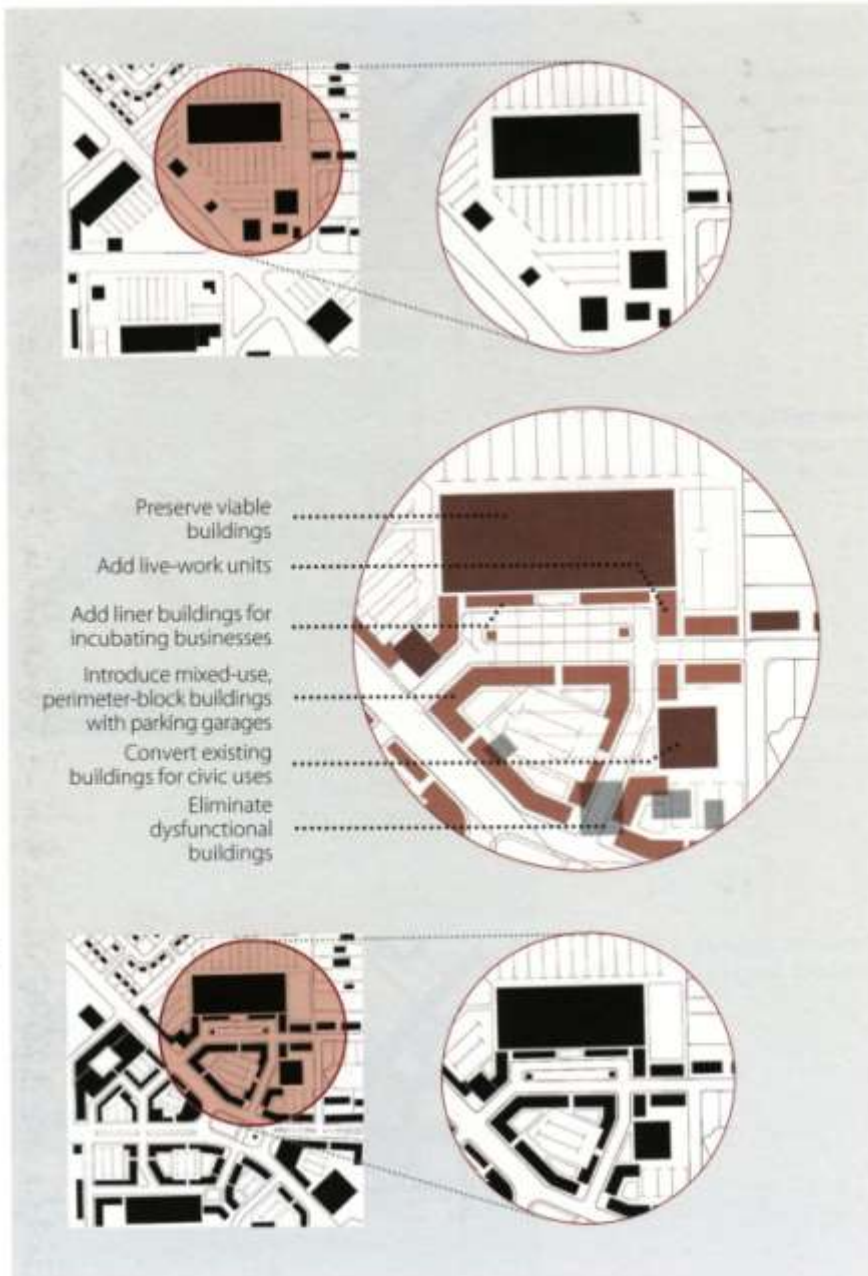
Parking lots redeveloped into mixed-use, walkable fabric

Introduce new building types and mixed uses

Deficiency: Single building type and use

Remedial Techniques: Introduce new building types and mixed uses: residential, office, lodging, and civic

Outcome: Variety of building types and mix of uses to support a town center

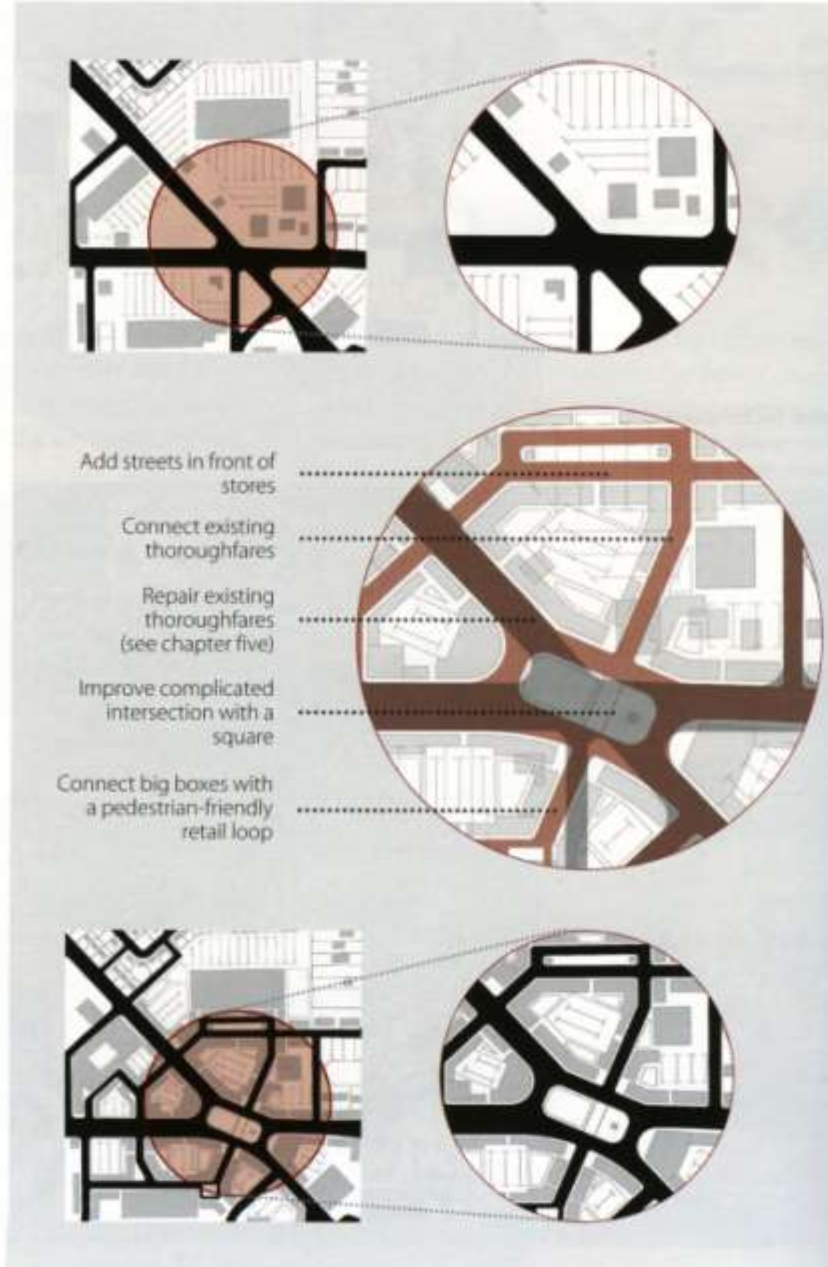


Connect and repair thoroughfares

Deficiency: Lack of walkable block structure

Remedial Techniques: Connect and repair thoroughfares; add streets in front of stores

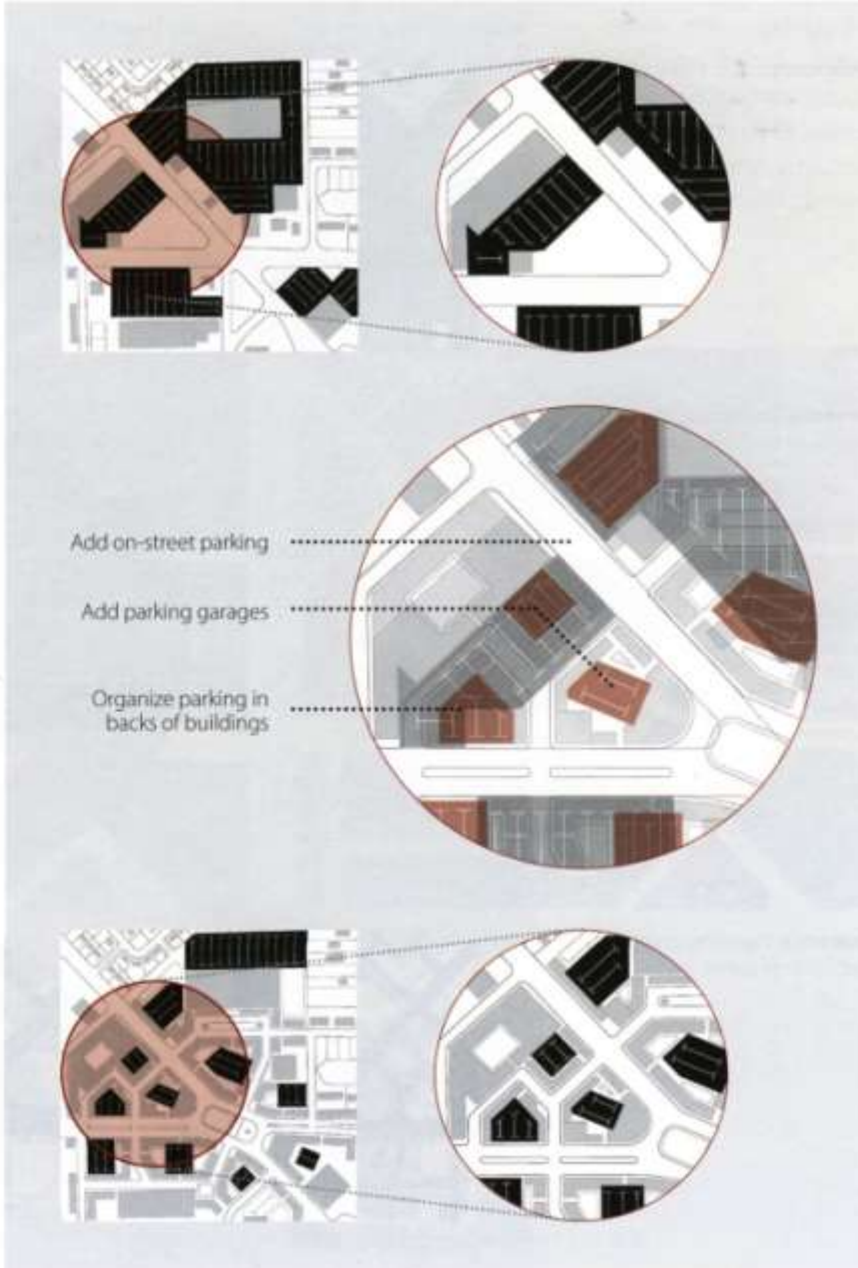
Outcome: Walkable network and block structure



Rationalize parking

Deficiency: Underutilized and exposed parking

Remedial Techniques:
Rationalize parking; add garages



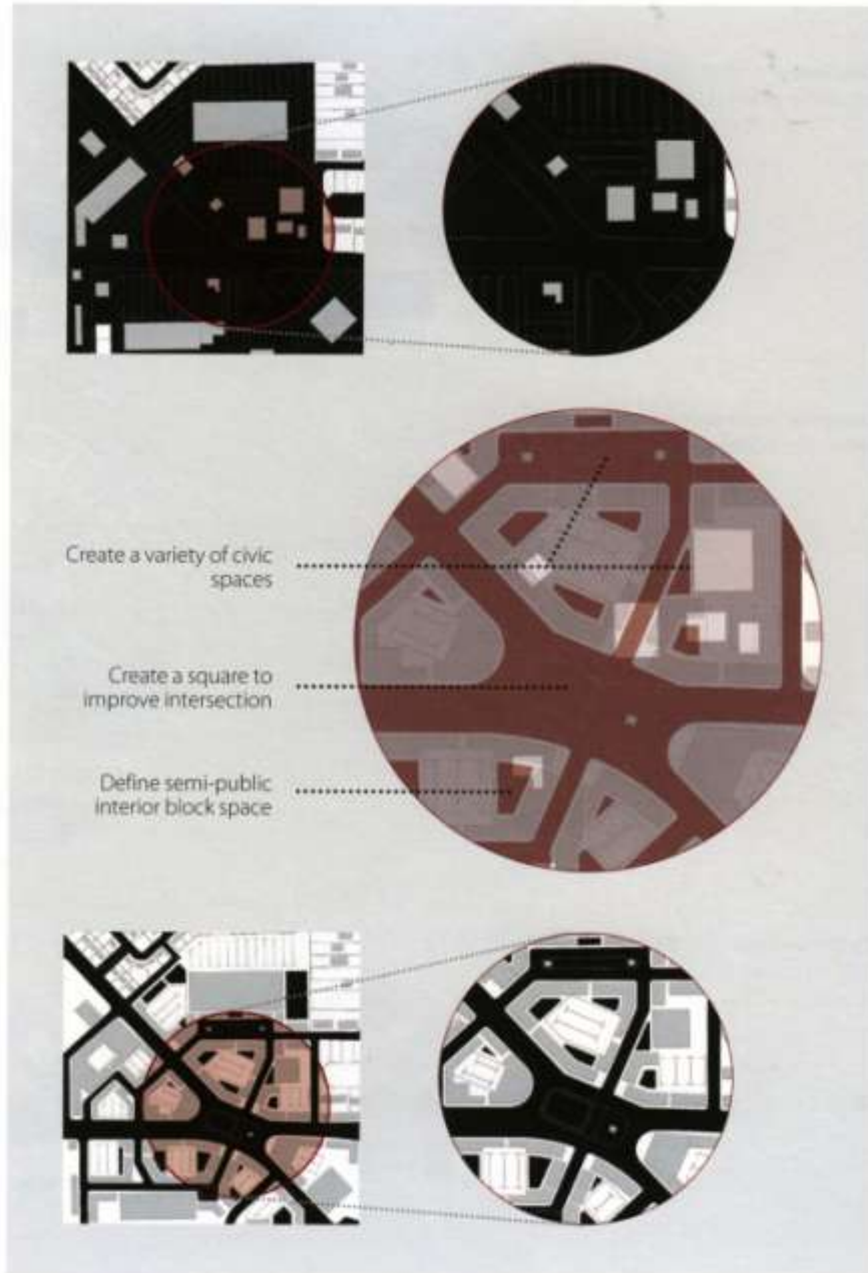
Outcome: Parking strategy to support higher density and mix of uses

Define open and civic space

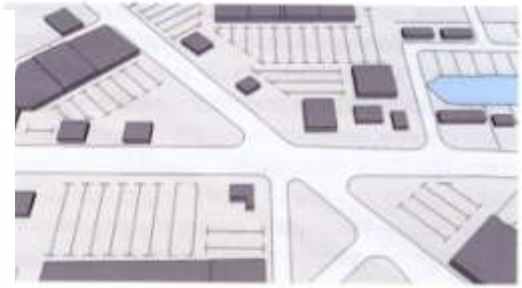
Deficiency: Lack of civic space

Remedial Techniques: Define open and civic spaces

Outcome: Hierarchy and spatial definition of public realm



PHASING



Existing shopping center

Short-term repair: Transforming the intersection into a square

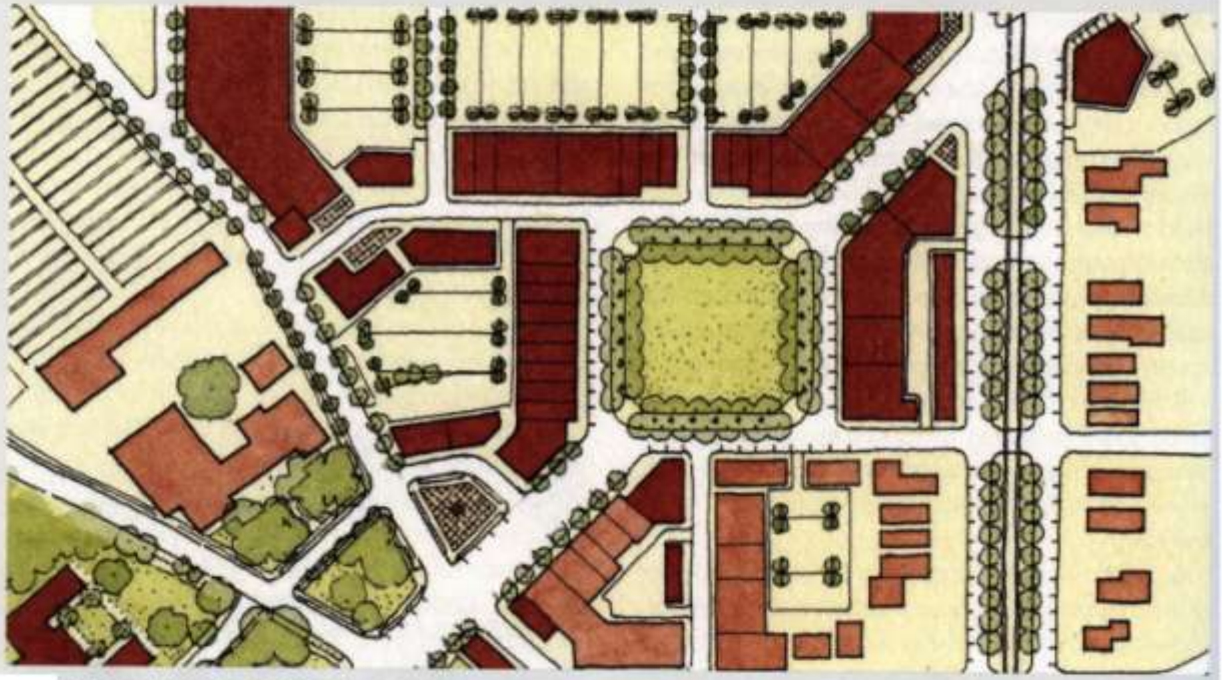
Medium-term repair: Creating a retail loop

Long-term repair: Completing the urban fabric

APPLICATION: RECLAIMING A SQUARE OUT OF PARKING LOTS

Car-oriented environment of a blighted shopping center

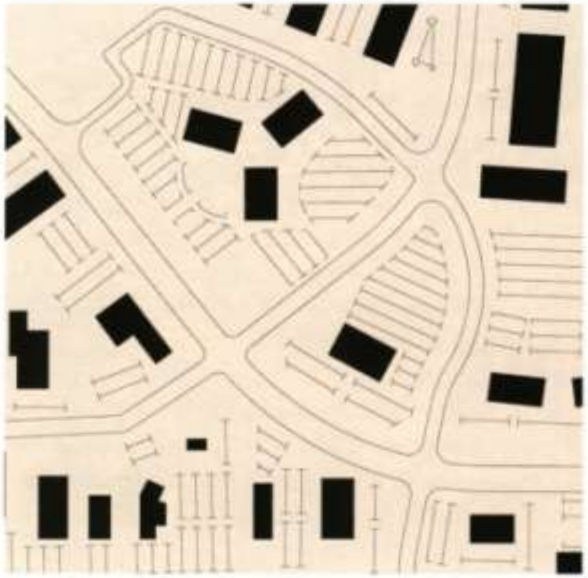
Public square as a traffic-calming and place-making device



Parking lots transformed into a town center

Deficiencies

BUSINESS PARK TOD RETROFIT

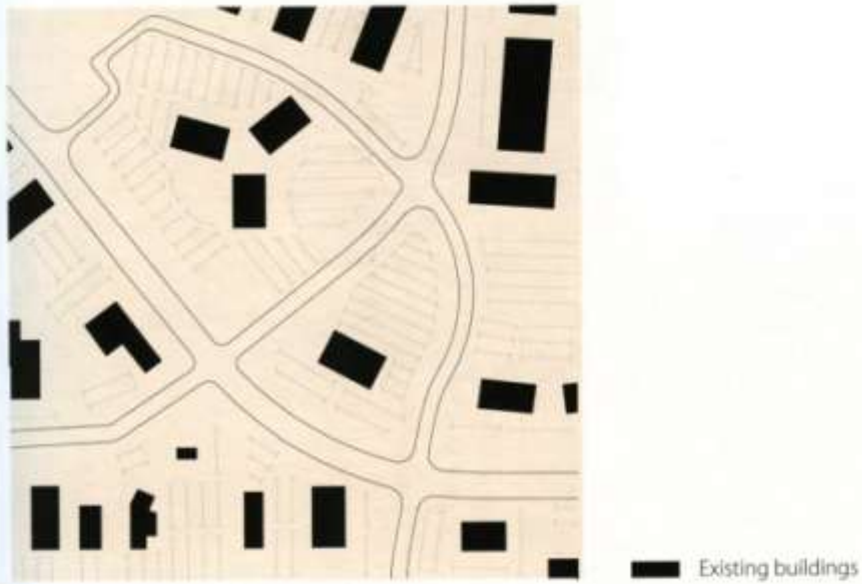


Single building type and use

Lack of walkable block structure

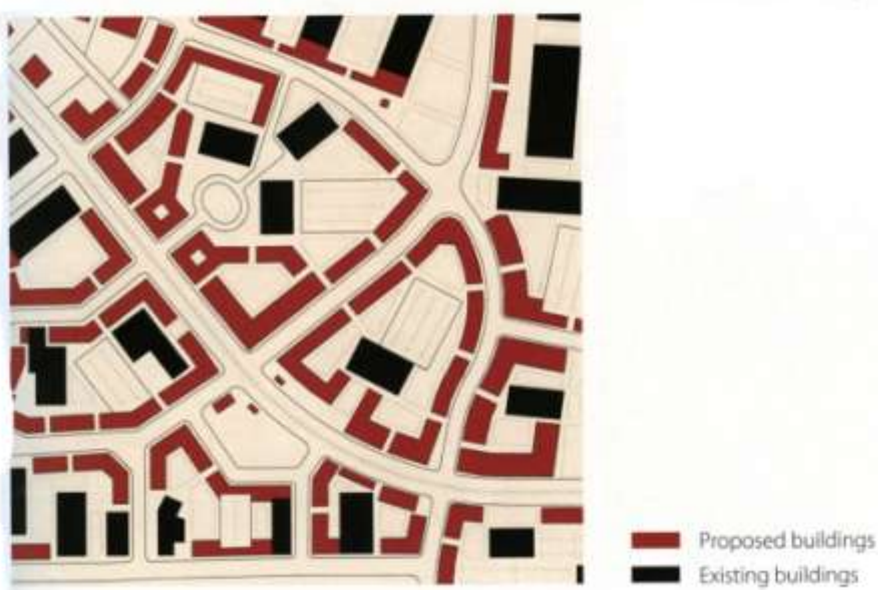
Dispersed and exposed parking

Lack of civic space



Existing suburban business park

Dispersed building and parking layout in existing office park



Business park repaired into a town center

Office park repaired into a transit-oriented town center

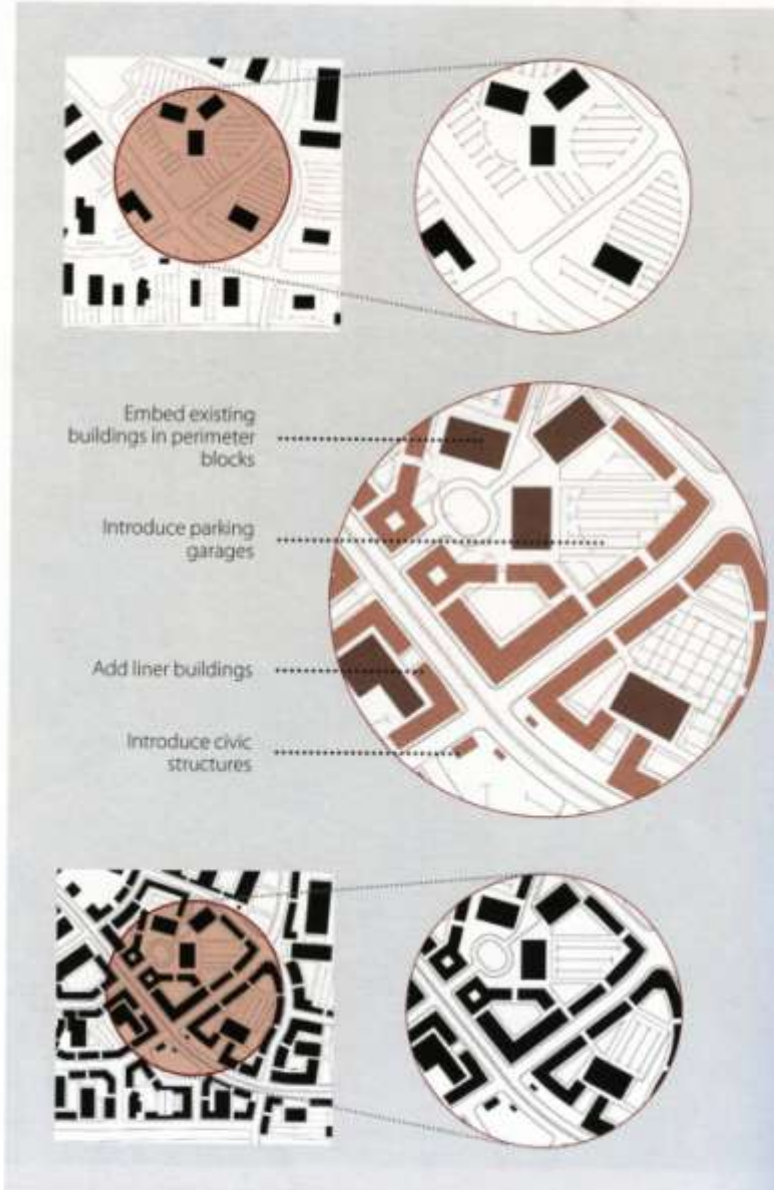
Transformation into a town center

Introduce new building types and mixed uses

Deficiency: Single building type and use

Remedial Techniques:
Introduce new building types and mix of uses: residential, retail, lodging, and civic

Outcome: Variety of building types and mix of uses to support a town center



BUSINESS PARK

Dispersed building and parking layout in existing office park

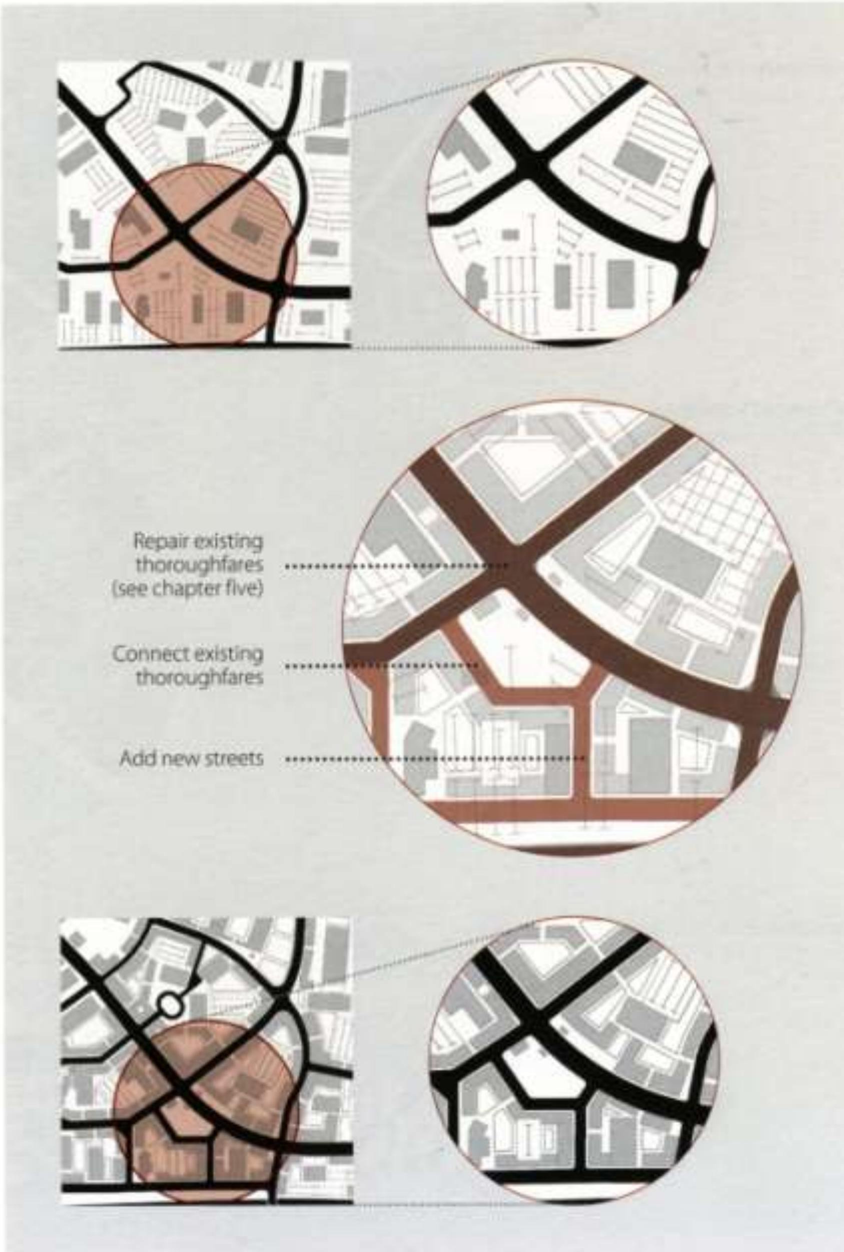
Office park repaired into a transit-oriented town center

Connect and repair thoroughfares

Deficiency: Lack of walkable block structure

Remedial Techniques: Connect and repair thoroughfares; create urban blocks

Outcome: Walkable network and block structure




Existing buildings in the office park

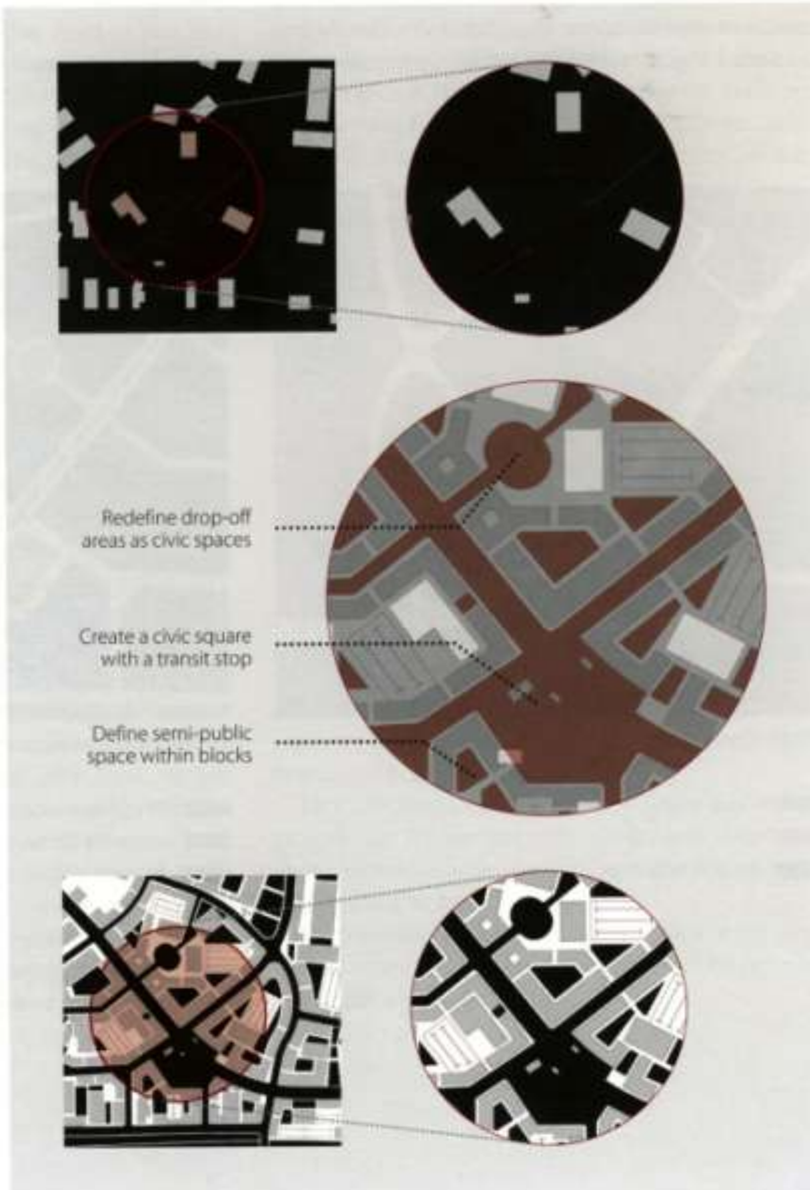

Green buildings and green urbanism in the new town center

Define open and civic space

Deficiency: Lack of civic space

Remedial Techniques: Define open and civic space

Outcome: Hierarchy and spatial definition of public realm



147. Existing buildings in the office park

148. Green buildings and green urbanism in the new town center

Re-Zoning

Conventional single-use zoning

Transect-based zoning

- Open Space
- C - Commercial
- Existing buildings

- T4 - General Urban zone
- T5 - Urban Center zone
- T6 - Urban Core zone
- CS - Civic Space
- CB - Civic Building
- Existing and proposed buildings

DEFICIENCIES

The three most important deficiencies of a strip corridor are the lack of neighborhood structure , no variety of uses , and underutilized open space . The inefficient use of the land makes redevelopment efforts challenging.

COMMERCIAL STRIP TOD RETROFIT

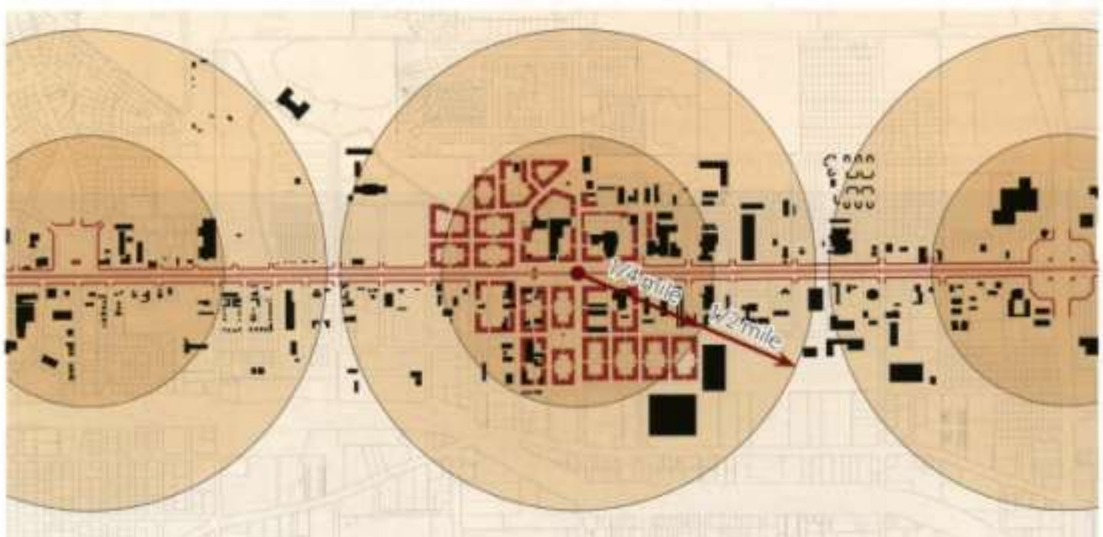
Lack of neighborhood structure and transit

Lack of urban building types and mixed uses

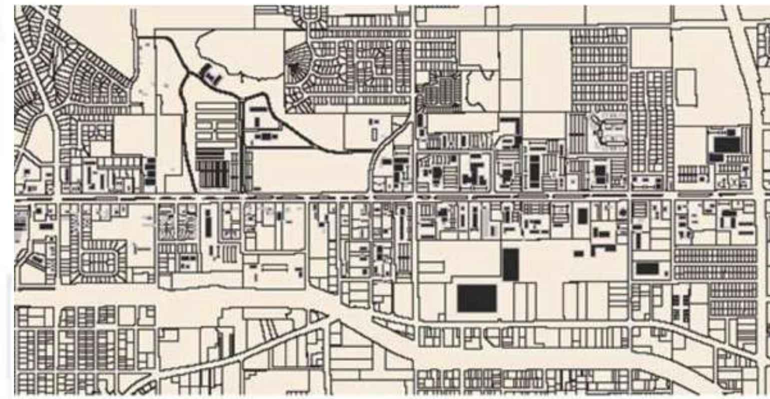
Underutilized open space

Transformation into a nodal transit boulevard

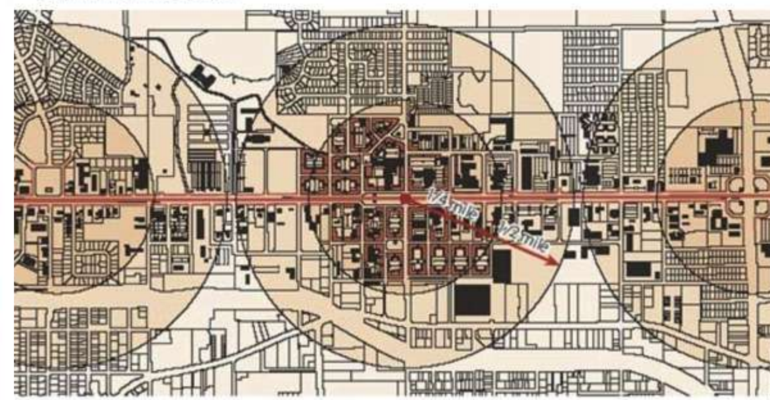
Existing strip commercial corridor



Interventions along the commercial strip. The circles show the transit nodes, located every mile, with quarter-mile pedestrian sheds

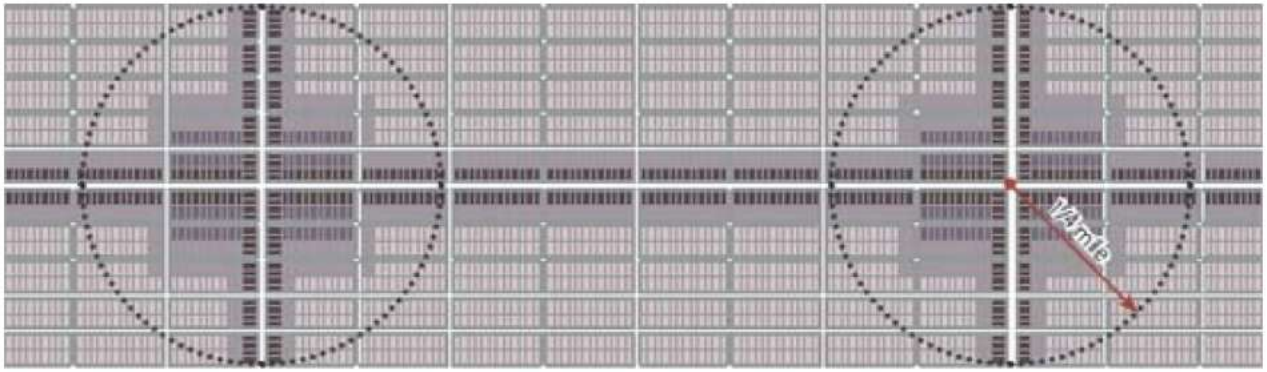


Existing strip commercial corridor



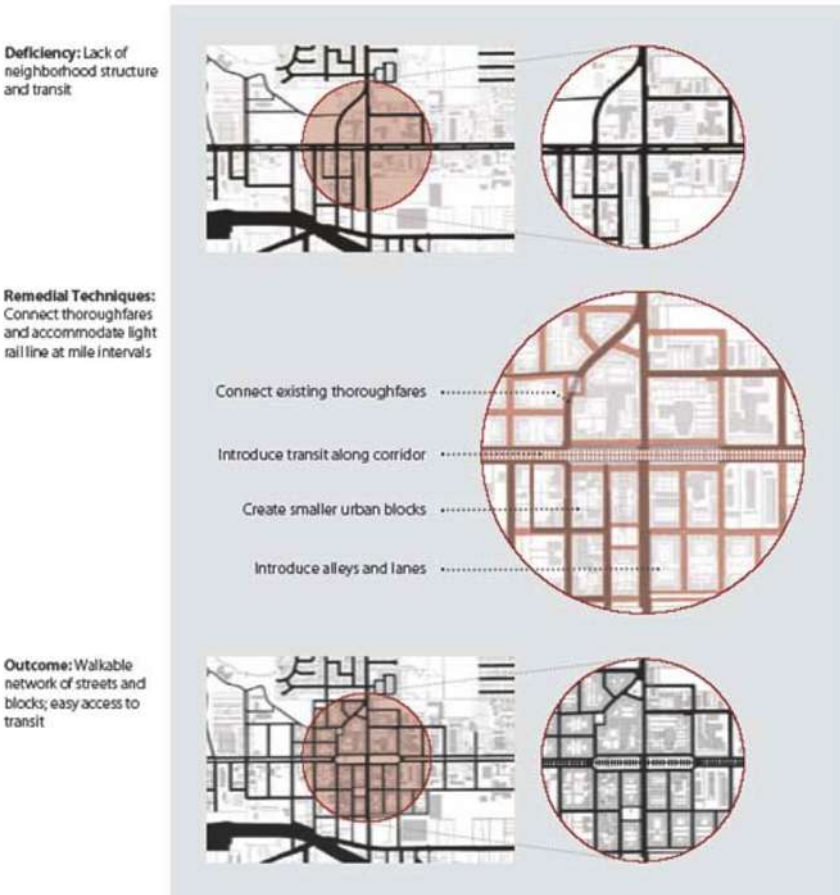
Interventions along the commercial strip. The circles show the transit nodes, located every mile, with quarter-mile pedestrian
eds

Linear commercial corridors that encourage uncontrolled strip development

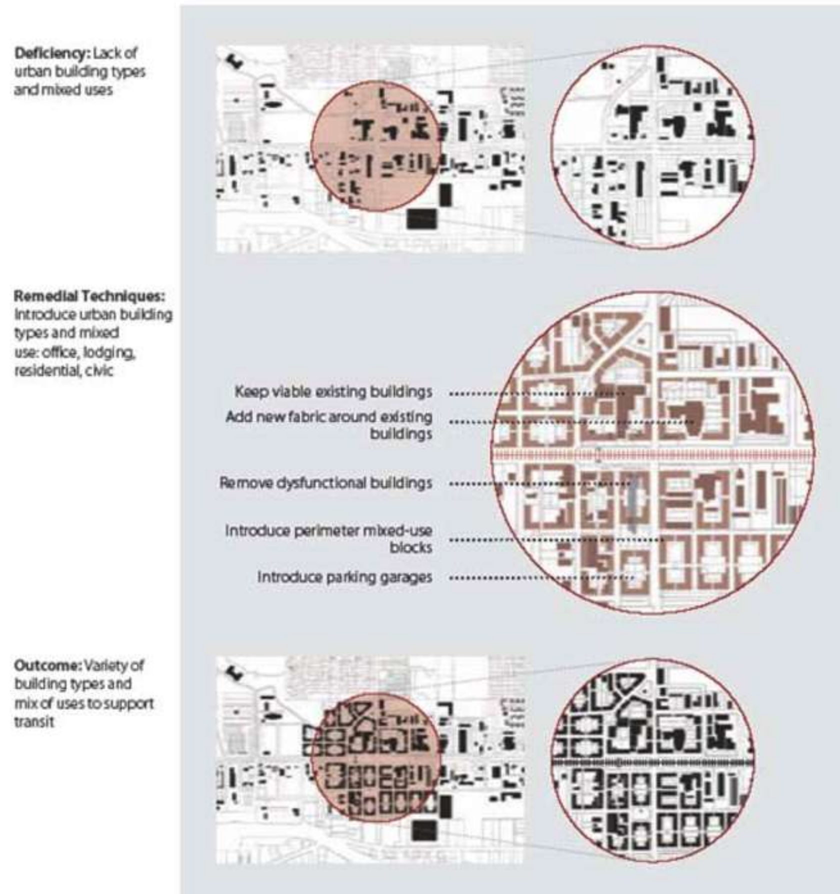


Higher density at the intersections form transit-oriented nodes at every one-mile intersection

Connect thoroughfares and accommodate transit



Introduce urban building types and mixed-use

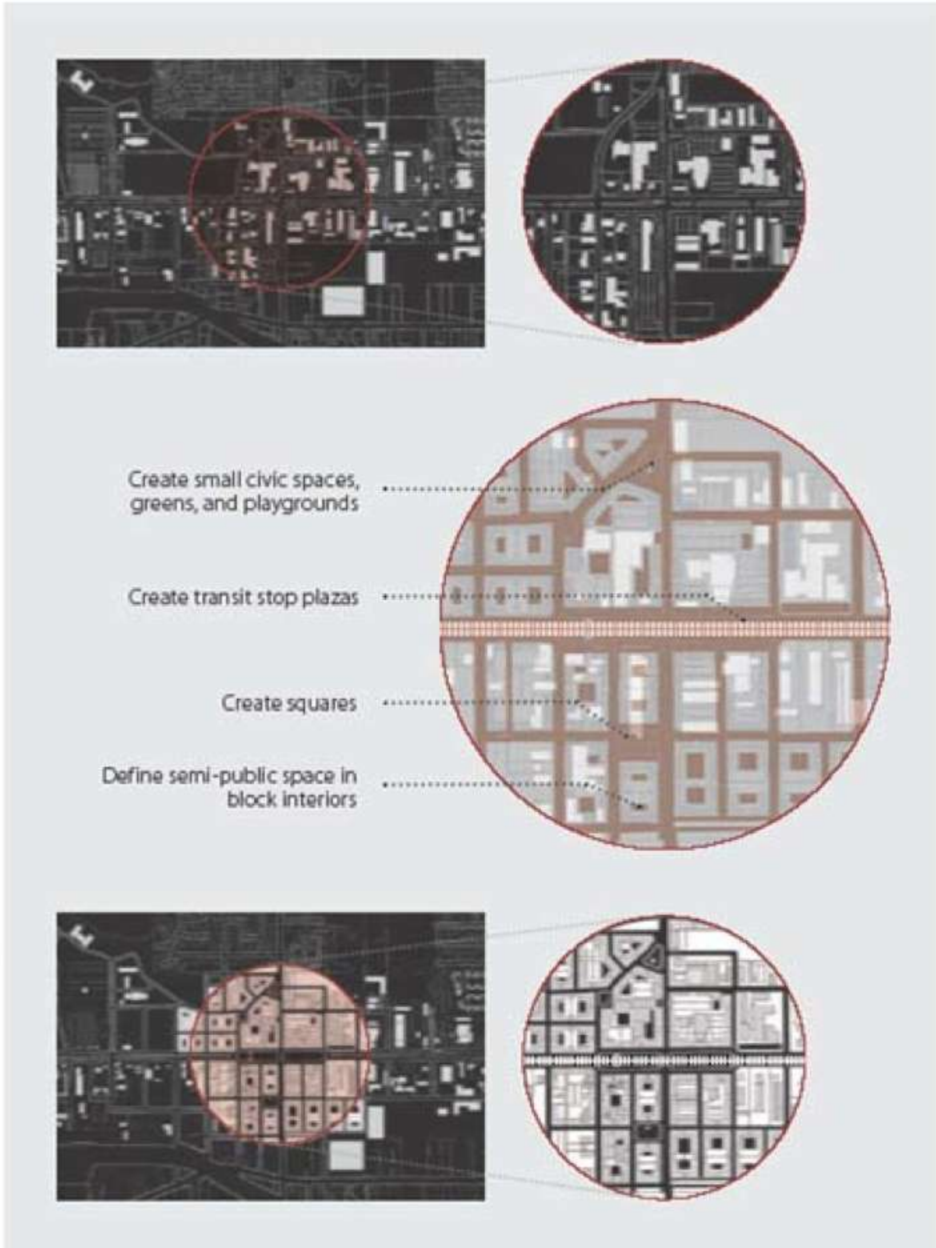


Define open and civic space

Deficiency: Underutilized open space

Remedial Techniques: Define open and civic spaces

Outcome: Mixed-use corridor of urban nodes and a variety of civic spaces



Next Steps

Design a strategic plan to guide future investment

- An evaluation of regional existing conditions influencing the ability of TOD as a strategy to achieve Metro's 2040 Growth Concept goals.
- A typology framework that classifies station areas and corridors based on their "TOD readiness" and on their social inclusiveness potential
- Guidelines for phasing of TOD Program activities based on this typology.

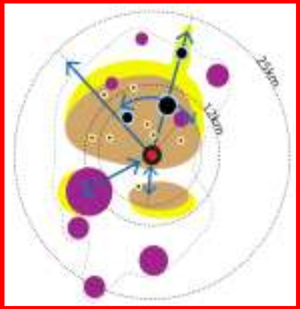
Strategies for maximizing TOD potential

- Contributing to local identity through multi-year investments in catalyst proj-ects and place-making elements.

- Creating market for higher-density mixed-use development near transit and in centers.

- Cultivating developers with expertise in higher-density and mixed-use development in suburban settings.

- Building community acceptance of urban style building types in suburban communities.

Thank you for your attention

SCHOOL OF ARCHITECTURE & PLANNING

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