



# **Sustainability: From Theory to Reality**

## **Pathways to Urban Sustainability: Lessons From the Atlanta Metropolitan Region**

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Global Learning Center, Georgia Institute of Technology**



## Talking Points

- **Connections (systems)**
- **Major drivers and solutions (interdisciplinary)**
- **Implementation: case studies and future trends**



- **Sustainability mandates interdisciplinary solutions to economic and social challenges and opportunities**
- **Sustainability mandates a “systems “approach**

Sustainability

- Greenhouse gas emissions are reduced
- Climate change mitigation and adaptation actions are implemented
- Urban sprawl is minimized
- Non-renewable resources are conserved
- Energy per unit consumption is reduced
- Waste is recycled or disposed in ways that do not damage the environment
- Ecological footprint of cities is reduced

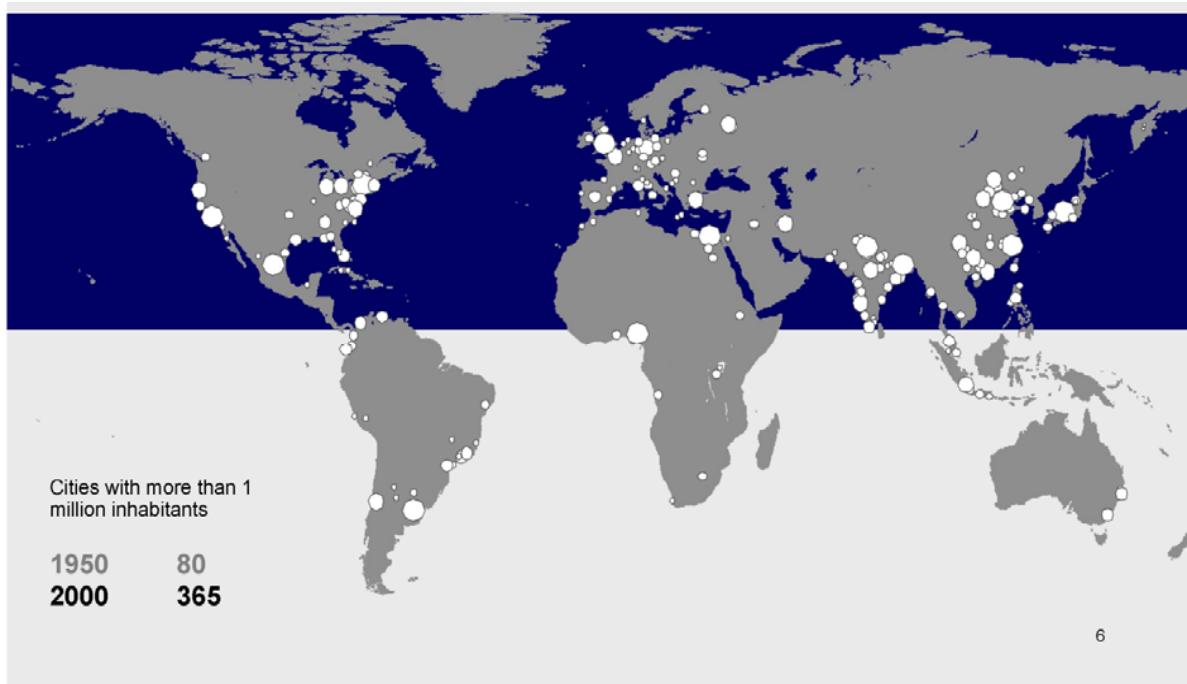
--UN Habitat (2002)

## GOALS

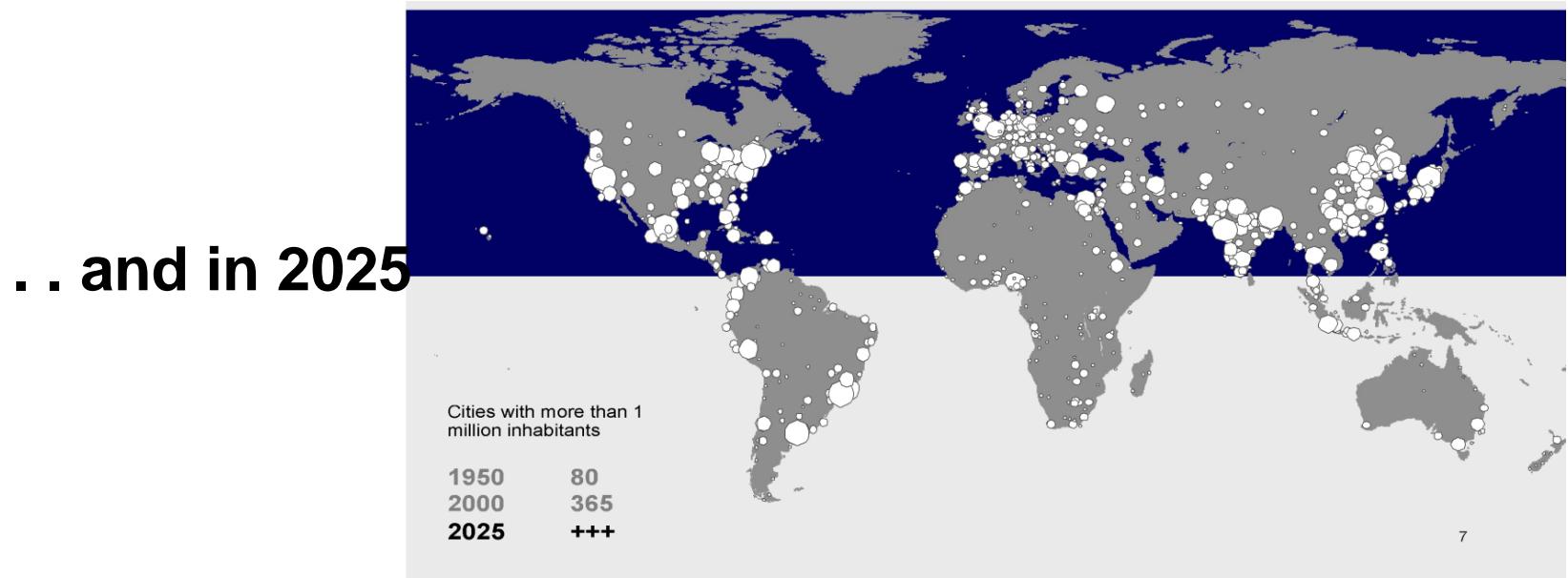
- Growing and balanced economy.
- Environmental, natural and cultural resources.
- Infrastructure and services to support efficient growth and development patterns.
- Access to adequate and affordable housing.
- Coordinate land use planning & transportation planning.
- Coordinate local planning with service providers, other communities and state and regional plans.

# WHY?

# Growth of Cities and Places



**Cities with  
more than 1  
million in  
2000 . . .**





# Systems Approach ?



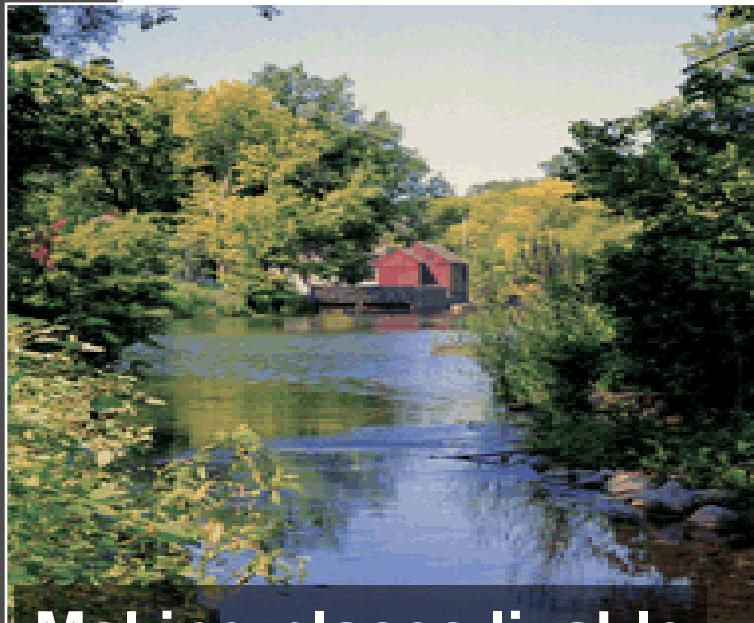
**A system is a group of interdependent and interrelated components that form a complex and unified whole to serve some purpose through the performance of its interacting parts.**



# Atlanta's Infrastructure Needs

Global Mobility Needs  
Megaregion Mobility Needs  
Regional Mobility Needs  
City and County Mobility Needs  
Community and Neighborhood Needs  
Personal Mobility Needs

# What is Infrastructure?



**Making places livable**



**Touching our lives  
everyday**



**Failing us**



**Connecting us to  
the world**

# Enabling Sustainable Mobility

The important questions are not about engineering, but about ways to live – health, education, housing, waste, and social needs.



# Infrastructure Needs in Atlanta

## Airport for the future

New runway? A second airport? Land side accessibility?



## Intermodal Transportation

### High Speed Rail

### Commuter Rail

### The BeltLine

Where mobility, active living and quality of life meet

### Livable Centers Initiative

Linking \$\$\$ to principles

### Midtown

# Infrastructure Needs in Atlanta

## Expand Marta

Construct the Multi-Modal Passenger Terminal



## Peachtree Streetcar

Expand Pedestrian Access throughout the City

Establish street design standards  
(pedestrians and alternative modes)

Connect Redevelopment Opportunities

# How to achieve transportation sustainability?

- Get the price right
- Integrate transit, cycling, and walking as viable alternatives
- Fully coordinate land use and transportation planning
- Public education and information
- Stage policies for the long term

Buehler, Pucher and Kunert 2009

# Enabling Sustainable Mobility

The mobility system is not only a system of transport... **it's the whole understanding of a city**



The future of mobility has to be considered in terms of **integrated systems**, for each piece – bikes, cars, taxis, subways, rail, buses.

# Cases and Trends



## PRODUCTION



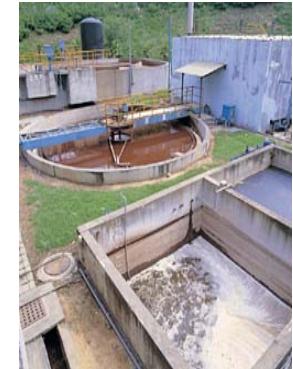
## PACKAGING



## DISTRIBUTION



## CONSUMPTION



## DISPOSAL

Farming Scale

Ethylene

Centralized Purchaser

Impulse Purchase

Crown Rot Diseases

Temperature Control

Small Market Share

High Production Costs

Humidity Control

Port to Purchase Center

Higher Price

Yield Loss

Increased Cargo Care

Local Distribution

Lower Sale

Production Standards

Cartons

Natural Pest Control

Pallets

Labor Standards

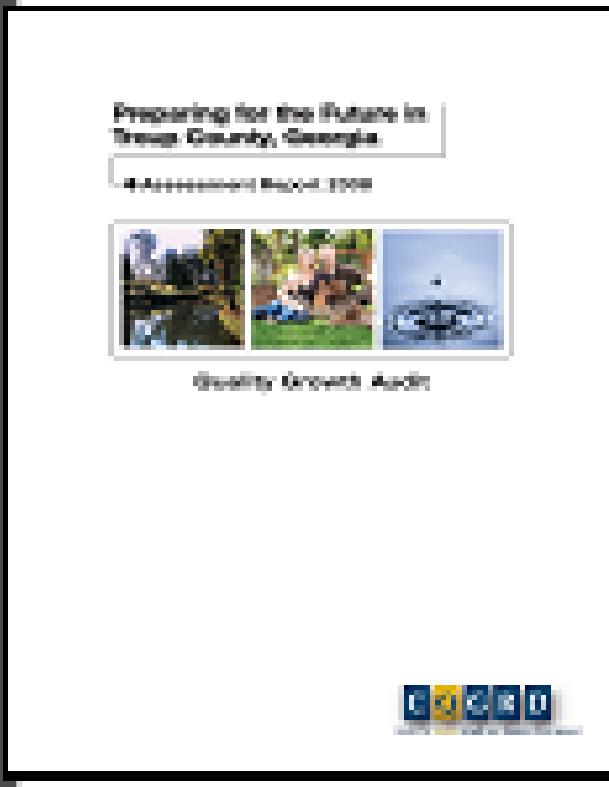
Trays

Certification

Plastics

Accreditation

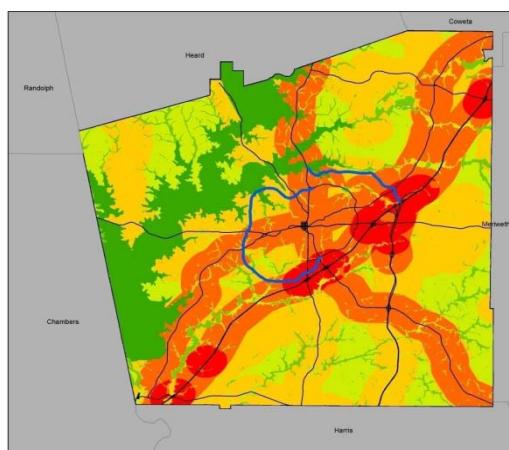




## Preparing for the Future in Troup County, GA: A Spatial Strategy for Sustainability

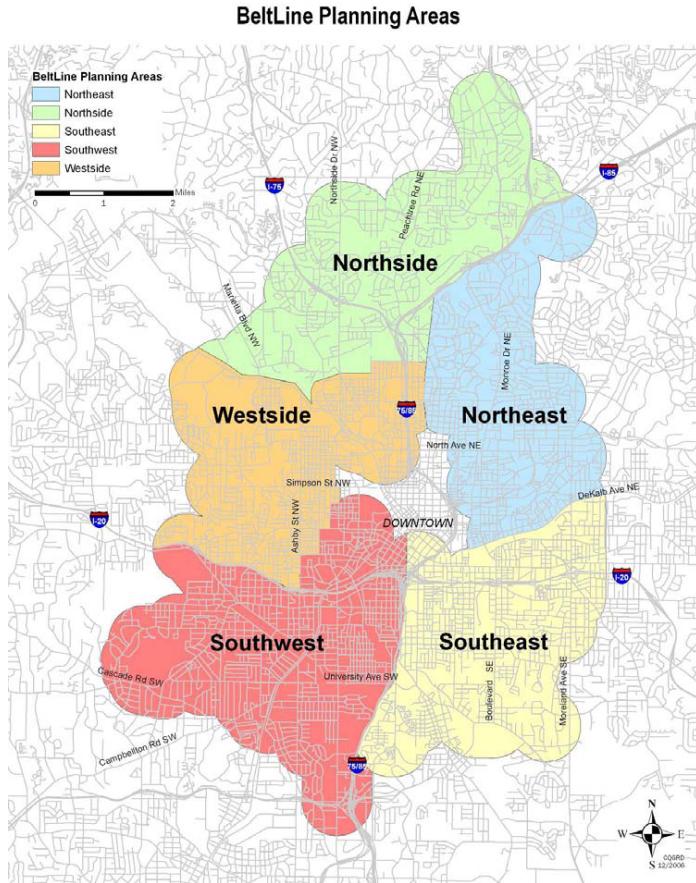
Troup County and the cities of Hogansville, LaGrange, and West Point have undertaken a two-year planning initiative (2007-2009) with Georgia Tech designed to set the course for a sustainable future.

Quality growth audit, population projections, transportation and land use analysis and land suitability analysis ,community input (A systems approach).



Recommended changes to codes, ordinances, and development review processes. Troup County and the Cities adopted a development review scorecard and have created a non-profit entity designed to implement the recommendations of the study.

*Ricky Wolfe, Chairman, Board of Commissioners, Troup County, GA*



## Atlanta BeltLine Health Impact Assessment: HIA study areas Image source : CQGRD

# Atlanta BeltLine Health Impact Assessment (HIA)

The primary goal of the project was to measure the health impacts of the project on affected populations, especially disadvantaged and vulnerable groups, through both quantitative and qualitative analyses and metrics. It has been hailed as one of the best efforts undertaken to date.

# Sustainability and Planning : A Matter of Scale

# Megaregions represent a new context for American planning.

- Funding
- economic competitiveness,
- environmental issues
- policy and project selection
- Multi-jurisdictional Planning

# Sustainability

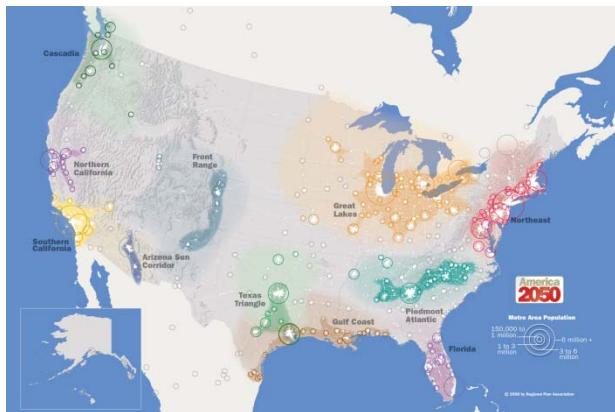


Image source : CQGRD

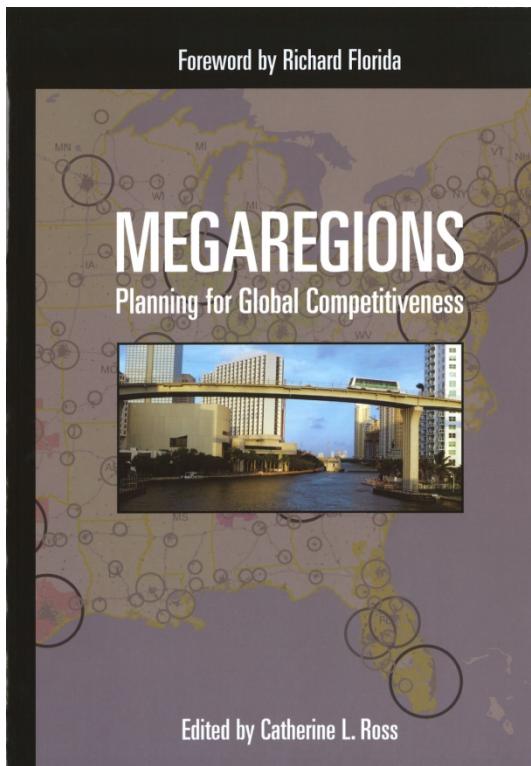
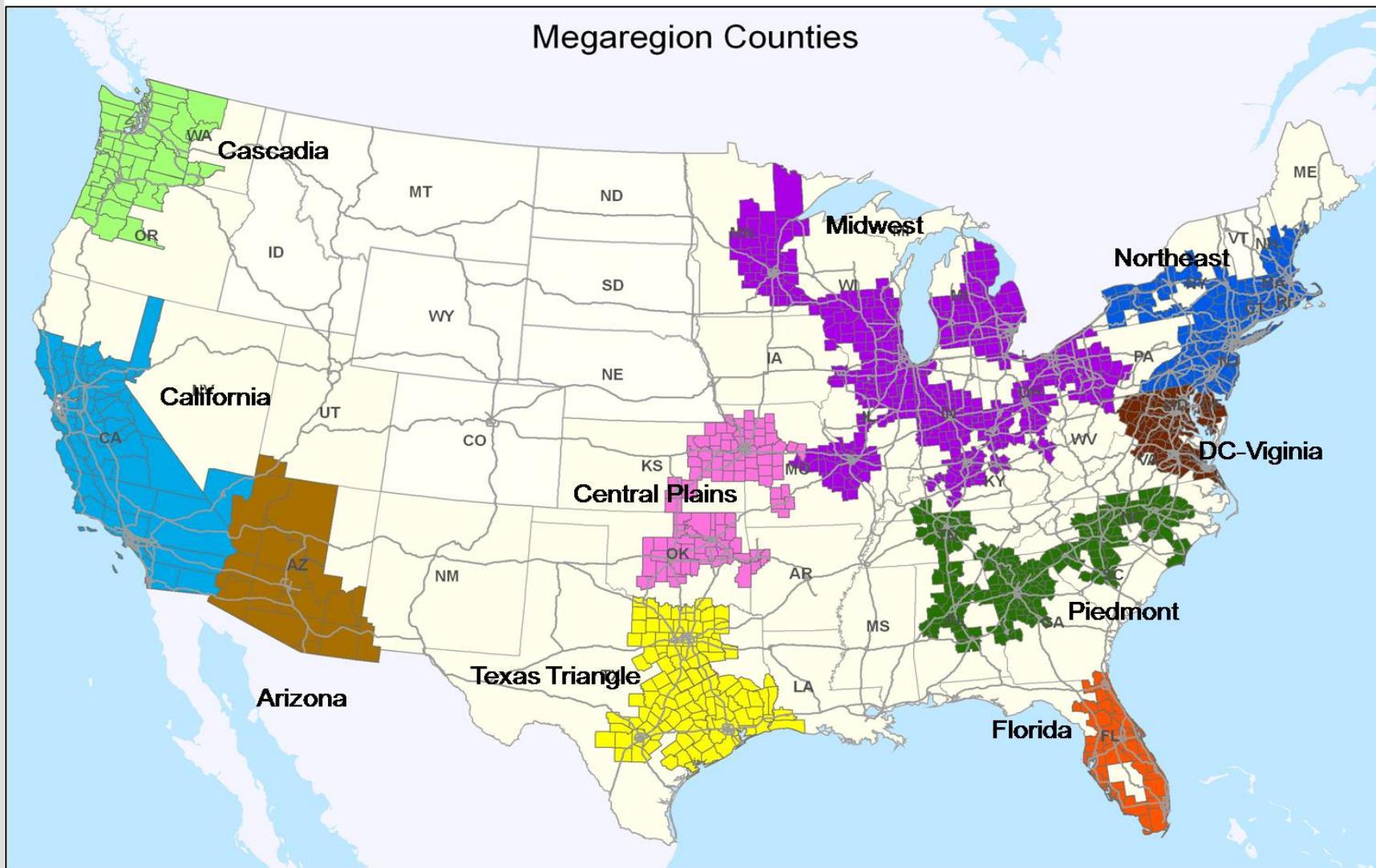


Image source : CQGRD

- Megaregions are extended networks of metropolitan centers and surrounding areas of influence.
- A framework for cooperation, planning and development encompassing economic sustainability and competitiveness, efficient competition, economies of scale and product and service differentiation.
- Megaregions provide a sustainable framework enabling coordinated transportation, housing, energy policy and natural resource management in cities and regions.

- Synchronize transportation policies with policies for housing, land use, energy, the economy and the environment.
- Encouraging land-use patterns that contribute to higher density
- Implementation of megaregion freight and person transport planning
- Explore the implications of multi-sectoral planning integrating housing, transportation and sustainability
- Promulgate climate change policy focused on reducing carbon emissions in megaregions, cities, towns (cap and trade)

# Final Map of Megaregions



Source: Ross, Catherine, Delineating Existing and Emerging Megaregions, July, 2009

Funded by the Federal Highway Administration, USDOT

CENTER FOR QUALITY GROWTH AND REGIONAL DEVELOPMENT

# Megaregion Statistics

	Area	Population (2008)	Employment (2008)	GRP (2008)	CO <sub>2</sub> emission (2002)	Fortune 500 companies' revenue (2008)	Patent (1999)
Megaregion	29.60%	76.54%	76.98%	81.47%	67.82%	92.07%	86.77%
Non-megaregion	70.40%	23.46%	23.02%	18.53%	32.18%	7.93%	13.23%
TOTAL	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Funded by the Federal Highway Administration, USDOT

## 21<sup>st</sup> Century Requires

.....a web of seamless connectivity, metropolitan centers **linked** by roads, high-speed rail, commuter rail, water resources, alternative technologies, regional economic initiatives, connected international gateways a more perfect union.

### Mayor's **Megaregion Forum**

- Starting Small

### Piedmont Alliance for Quality Growth

- MOU
- Implementation Focus
- WET

# **Piedmont Alliance for Quality Growth HUD Community Challenge Planning Grant**

**\$2,000,000.00**

**Applicant City of Macon**

Project Title: Piedmont Alliance for Quality Growth (PAQG): Multi-jurisdictional Smart Growth Models for the I-85/75 Corridor

Georgia Tech  
Clemson  
UNC Charlotte Urban Institute & RENCI at UNC Charlotte)

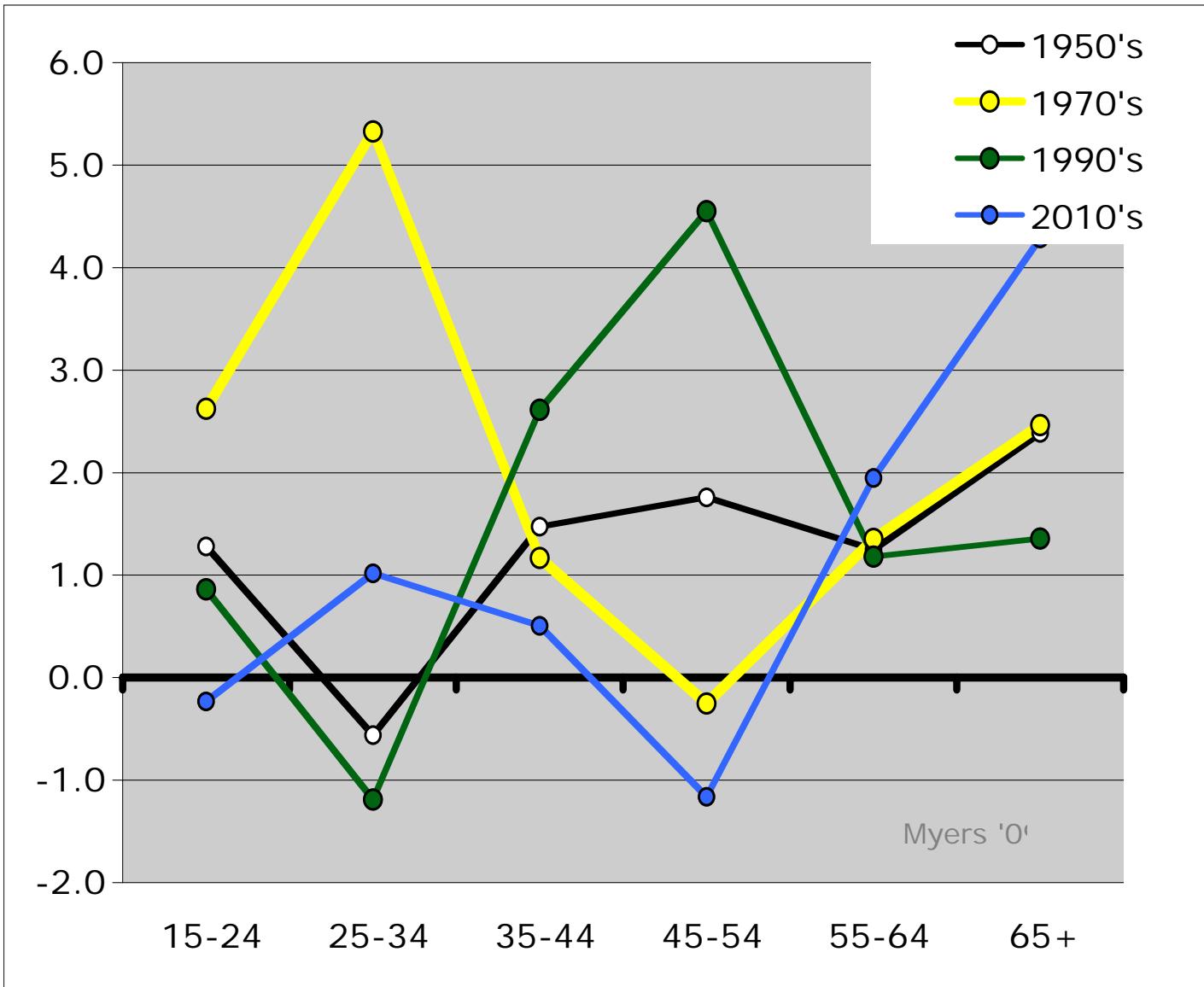
Six state area connected by a corridor

- The Demographic Driver

# The Baby Boomers Surge Forward

Age Group Increase as Percent of US Population at End of Each Decade

Myers, USC



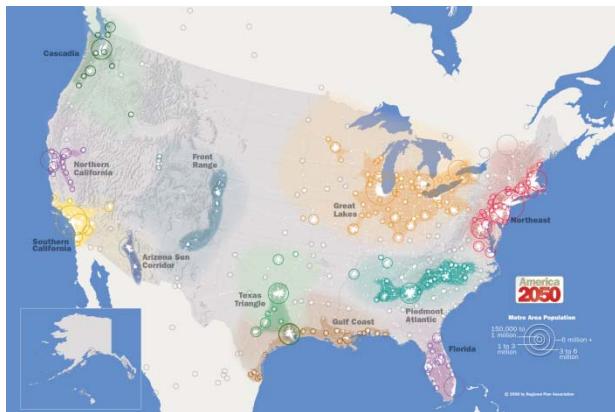


Image source : CQGRD

- **Future directions for developers:**
  - Compact development and need for more green infrastructure to preserve the natural environment.
  - Public/private partnerships at the federal, regional and local level especially in implementing financial options and framing policy.
  - Smart Growth and Transit oriented development
  - Design focused on diversity, linkages to public space, building social capital, access to green space to promote physical activity and climate change mitigation.

Image source : CQGRD

- Allow county zoning power exclusively in areas within specified proximity of state transport facilities.
- Limit zoning powers to building heights, number of stories, or size of buildings, lot coverage, yard size, population density, building location, building use, and land use
- Develop financing and tax strategies to create “communities of opportunity” in partnership with developers
  - good schools,
  - affordable housing,
  - transportation,
  - employment
  - supermarkets
  - public space

## Transit Oriented Development



**Transit-Oriented Development, Sacramento, California**  
SOURCE: Sacramento Regional Transit District



**Transit-Oriented Development, Portland, Oregon**  
SOURCE: Cool Town Studios

Compact, walkable communities centered around high quality transit systems offering a high quality live-in environment without complete dependence on a car for mobility.

**Figure 7. Combining the Benefits of Diverse Neighborhoods with Transit Orientation**

### Benefits of TOD

- Provides Housing and Mobility Choices
- Delivers Riders to Transit
- Helps Support Healthy Lifestyles
- Creates Lasting Value
- Opportunity to Create High Quality Urbanism

### Benefits of Diverse Neighborhoods

- Provides Needed Housing
- De-concentrate Poverty
- Provides Low Income Households Access to Different Social Networks and Jobs
- Helps Workforce Stability
- Keeps Extended Families Together
- Allows Elderly to Age in Place

### Benefits of Diverse Transit-Oriented Neighborhoods

- Increases Affordability and Wealth Creation Opportunities for Residents
- Builds Stable Ridership for Transit
- Supports Regional Job Market
- Provides more Sustainable Real Estate Investments



**Blue Reef Cottages**  
SOURCE: Harley Haddow

Construction and durability of residential and commercial buildings will have different impacts in cities that are growing versus those that are declining.

The development community will construct buildings that require less energy to heat and cool as the possibility of a carbon tax under consideration.



Eco-city of Dongtan on Chongming Island, China (Image source: [http://images.usatoday.com/news/\\_photos/2007/02/16/ecocity-topper1.jpg](http://images.usatoday.com/news/_photos/2007/02/16/ecocity-topper1.jpg))



Hammarby Sjostad: A community in Stockholm, Sweden (Image source: <http://www.cooltownstudios.com/images/sweden-stockholm-hammarby.jpg>)

Ecological cities and regions have the following characteristics:

- Different agricultural systems such as agricultural plots within the city (suburbs or centre). This reduces the distance food has to travel from field to fork.
- Renewable energy sources, such as wind turbines, solar panels, or bio-gas created from sewage. Cities provide economies of scale that make such energy sources viable.
- Various methods to reduce the need for air conditioning (a massive energy demand), such as planting trees and lightening surface colors, natural ventilation systems, an increase in water features, and green spaces equaling at least 20% of the city's surface. These measures counter the "heat island effect".



Eco-city of Dongtan on Chongming Island, China (Image source: [http://images.usatoday.com/news/\\_photos/2007/02/16/ecocity-topper1.jpg](http://images.usatoday.com/news/_photos/2007/02/16/ecocity-topper1.jpg))



Hammarby Sjostad: A community in Stockholm, Sweden (Image source: <http://www.cooltownstudios.com/images/sweden-stockholm-hammarby.jpg>)

Ecological cities and regions have the following characteristics:

- Improved public transport and land-use integration to increase pedestrianization and reduce car emissions.
- Optimal building density to make public transport viable but avoid the creation of urban heat islands.
- (Smart Growth ).
- Green roofs
- Zero-emission transport
- Zero-energy building
- Sustainable urban drainage systems or SUDS
- energy conservation systems/devices
- Xeriscaping - garden and landscape design for water conservation

# Smart Corridor Ways

Exempt status

Charging stations, utilities along roadways and integrated into smart intersections

Enhanced mobility zones

Large intermodal distribution logistics centers

Variable Metropolitan Planning Organizations (MPO Designations)

Climate change (Cap and Trade Greenhouse Emissions Markets and Financial Tools)



Serenbe Community: Chattahoochee Hill Country, Georgia

Image source

<http://www.serenb社區.com/newsletters/2007-11/nav/header.jpg>

- Land development respects natural topography
- Extensive use of native plant species to promote sustainable landscaping
- Home building standards include energy efficiency, low maintenance, air quality, water conservation, and resource-efficient building materials and systems
- Collection, treatment and re-use of waste water for irrigation
- Natural storm-water management through the use of pervious surfaces
- Organic farming on-site through a 25-acre farm to promote community supported agriculture
- Land conservation with 80% of the 40,000 acres preserved for green space

# Thank you

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