Planning for the Atlanta Region: Thinking Big & Taking The Long View

Jane Hayse
Director, Center for Livable Communities
Atlanta Regional Commission
What is the Atlanta Region?
Longevity

Video

www.gapminder.org
Demographics: Fast-Growing and Fast-Changing Population

7th
236,000 new residents since 2010, 7th highest growth in the nation

13%
More than 13 percent of metro Atlanta's population was born in a different country

About 29 percent of metro Atlanta’s population is under the age of 20, one of the highest concentrations in the nation

29%
7.9 AND 4.6

Forecast Summary – Total (in Thousands)

Source: ARC The Region’s Plan Forecast (2015) Series 15 DRAFT
The Region Still Becoming More Diverse

Source: ARC The Region’s Plan Forecast (2015) Series 15 DRAFT
### 2015 Age Comparison (% of tot pop)

<table>
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<th>Nation</th>
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**Source:** ARC The Region’s Plan Forecast (2015) Series 15 DRAFT
2040 Age Comparison (% of tot pop)

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Source: ARC The Region’s Plan Forecast (2015) Series 15 DRAFT
What’s in Store: Tripling of the 65+ Population

Number of metro Atlanta residents 65+ in 2010: 471,000 (9%)

1.5 million (19%) Number of metro Atlanta residents 65+ in 2040
What is the Biggest Problem Facing Metro Atlanta?

- **DK**: 4% (2014), 4% (2013)
- **Other**: 4% (2014), 6% (2013)
- **Taxes**: 6% (2014), 6% (2013)
- **Human Services**: 7% (2014), 3% (2013)
- **Public Education**: 14% (2014), 13% (2013)
- **Public Health**: 4% (2014), 4% (2013)
- **Crime**: 14% (2014), 17% (2013)
- **Economy**: 20% (2014), 24% (2013)
- **Race Relations**: 3% (2014), 2% (2013)
- **Trans**: 24% (2014), 21% (2013)

DK = I don’t Know
World-Class Infrastructure
- Comprehensive transportation network, incorporating regional transit and 21st Century technology
- Secured, long-term water supply

Innovation Economy
- Building the region as a globally recognized hub of innovation
- Developing a highly educated and desired workforce, able to meet the needs of 21st Century employers

Healthy, Livable Communities
- Promoting health, arts and other aspects of a high quality of life
- Developing additional walkable, vibrant centers, that support people of all ages and abilities

Winning The Future

Regional impact + local relevance
World-Class Infrastructure
CHALLENGE: Traffic Congestion

What residents told us!

“Transportation” supplanted “Economy” as the #1 issue when compared to the 2013 survey

24%

2014 Metro Atlanta Speaks survey respondents said that “Transportation” was the #1 issue facing the region
CHALLENGE: Traffic Congestion

$1,100

Amount metro Atlanta commuters spend sitting in traffic (2011)

Metro Atlanta ranks 7th in the nation for the amount of money spent sitting in traffic
How important is improved public transportation for the future?

71%

Some 71% of respondents thought that improved public transportation was “Very Important”.

Best long-term solution to traffic problems?

- Improvements to Public Transportation (40.9%)
- Better Roads & Highways (30%)
- Develop communities where people can live closer to jobs (21.9%)
CHALLENGE: Constrained resources

Georgia at crossroads on transportation funding
by Edward Lindsey

Georgia’s tanking transportation
© November 24, 2014 | Filed in: Uncategorized

Ga. weighs funding for $1B in transportation needs
By - Associated Press - Friday, November 21, 2014

The Gas Tax Is Running on Empty
By Matthew Philips | July 17, 2014
Regional Transportation Plan
$58.6 billion investment through 2040...

- System Preservation & Optimization
- System Expansion
- Demand Management

$41.5 B  $15.2 B  $1.9 B
Transportation Improvement Program

... including $7.1 billion in new transportation investments over the next six years
State Transportation Funding

• 26 cents/gallon on Gasoline, 29 cents/gallon on Diesel, Indexed to CAFÉ Standards and CPI
• Highway Impact Fees on Heavy Duty Trucks
• $5/night Hotel/Motel Fee
• 10-Year Strategic Plan updated annually by GDOT
CHALLENGE: Safe, Secure Water Supply

What residents told us!

How important is it for people to take steps to conserve water in their home?

69%

Some 69% of survey respondents said that it was “Very Important” to conserve water in your homes.
Solution: **Water Conservation**

Since 2000, per capita water usage in the Atlanta region has dropped by more than 20 percent.
Innovation Economy
Innovation Economy: What residents told us!

Rate the availability of job opportunities in metro Atlanta...

43%

43% said that job opportunities in metro Atlanta are “Excellent” or “Good”

2014 2013
43% 36%

In last year’s survey, only 36% of respondents rated job availability as ‘Excellent” or “Good”.
CHALLENGE: Employer Demand

Software Development Jobs Per Capita

6th!

11,000

Over the last six months, there have been more than 11,000 job openings in metro Atlanta for software developers.
Regional Economic Competitive Strategy

Goal Areas:

- Educated Workforce
- Prosperous Businesses
- Innovative Entrepreneurs
- Livable Communities

More than 200 regional leaders are involved in the Regional Economic Competitiveness Strategy
Atlanta Aerotropolis Alliance

$34 Billion

$50,000

Hartsfield-Jackson Atlanta International Airport:

• $34 billion in direct business revenue to metro Atlanta

• Home to more than 50,000 jobs
REGIONAL LABOR FORCE PARTICIPATION FORECAST

Labor Force Participation Rates – All Ages

Source: ARC The Region’s Plan Forecast (2015) Series 15 DRAFT
Employment Forecast
Total Private Sector Employment (in Thousands) by Industry
Job Change [1990-2040]

Source: ARC The Region’s Plan Forecast (2015) Series 15 DRAFT
Occupation Forecast

Source: ARC The Region’s Plan Forecast (2015) Series 15 DRAFT

http://www.bls.gov/ooh/sales/home.htm
Healthy, Livable Communities
Healthy, Livable Communities: What residents told us!

What is the best way to accommodate future growth?

- 77% Redevelop older areas
- 82% “availability of arts” - (77% either “very” or “somewhat” satisfied)
- 82% “availability of parks” (82% either “very” or “somewhat” satisfied)
- 66% Continue to build new suburbs
CHALLENGE: Access and Affordability

The average moderate-income household spends 63 percent of their income on housing and transportation costs – 6th highest in the nation.

Metro Atlanta has the 6th highest combined housing and transportation costs in the nation for moderate-income households.
Walkable Urban Places

Walkable Urban Places, or WalkUPs, for short, have greater densities and have a greater variety of real estate and commercial offerings than do other places.

0.6%

• 0.6 percent of the region’s land area is in Current or Emerging WalkUP

60%

• 60 percent of recent real estate investment have occurred in these WalkUPs
The Region’s Plan: Our Plan for the Future

To be adopted in 2016
We Need to Know What You Think!

www.atlantaregional.com/theregionalplan
Jane Hayse
Director, Center for Livable Communities
Atlanta Regional Commission
Energy and Emissions Implications of Transportation Modes

Yanzhi Ann Xu, Ph.D.
School of Civil and Environmental Engineering
Georgia Institute of Technology

GT Energy Series: Energy and Urbanization
April 29, 2015
Mirror, mirror, on the wall,
What’s the best mode of them all?
Level of Influence

- Individual mode choice
- Policy making
  - Transportation
  - Fuel production and distribution
  - Utilities
- Multi-criteria evaluation at multiple scales
  - Energy
  - Emissions
  - Health
Question 1

DRIVE OR FLY?
Long-Distance Travel

Legend

- Trips
- Cities
- U.S. States

Scale: 0, 375, 750, 1,500 KM
Single Aisle (SA) Jet vs. SUV: GHGs
Question 2

CAR, BUS, OR TRAIN?

Vehicle and Propulsion Systems

Blogs.discovermagazine.com

Wikipedia.org

Greencar.com

Valleymetro.org
Surface Modes:
Emissions per Passenger Mile

Passenger loading assumptions:

- Buses and vans: Peak—40; average—9; off-peak—5.
- AE heavy rail: Peak—80% full; average—37% full; off-peak—10% full.
- DE commuter rail: Peak—80% full; average—32% full; off-peak—10% full.

Number of cars per train:
- Buses and vans: 10. Capacity per car: 45.
- DE commuter rail: 15. Capacity per car: 90.
Question 3

WHICH BUS?

Type of Bus Operations
Urban Transit Route Duty Cycle

![Graph showing speed in miles per hour over number of seconds elapsed. The x-axis represents the number of seconds elapsed, ranging from 0 to 2500, while the y-axis represents speed in miles per hour, ranging from 0 to 80. The data points are scattered across the graph, indicating variability in speed throughout the duty cycle.]
Comparison for Local Bus: GHGs

- Diesel
- CNG
- B20
- Parallel
- Series
- BEV
- FCV

ICE
HEV
EV

Atlanta, GA
San Francisco, CA
Phoenix, AZ

Emission Rate (kg/km)

Well-to-pump
Pump-to-wheel
Comparison for Local Bus: NOx

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<tr>
<th></th>
<th>ICE</th>
<th>CNG</th>
<th>B20</th>
<th>Parallel</th>
<th>Series</th>
<th>BEV</th>
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Atlanta, GA
San Francisco, CA
Phoenix, AZ
Comparison for Local Bus: PM$_{2.5}$

- Well-to-pump
- Pump-to-wheel

**Emission Rate (g/km)**

- Diesel
- CNG
- B20
- Series
- BEV
- FCV

**Locations**
- Atlanta, GA
- San Francisco, CA
- Phoenix, AZ
Express Bus Route Duty Cycle

![Graph showing the relationship between speed in miles per hour and number of seconds elapsed. The graph demonstrates the dynamic nature of the bus route, with varying speeds throughout the duty cycle.](image-url)
Comparison for Express Bus: GHGs

Emission Rate (kg/km)

- Well-to-pump
- Pump-to-wheel

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<tr>
<th>City</th>
<th>Diesel</th>
<th>CNG</th>
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Comparison for Express Bus: NOx

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Comparison for Express Bus: PM$_{2.5}$

- Well-to-pump:
  - Atlanta, GA: Diesel (0.01), CNG (0.06), B20 (0.01)
  - San Francisco, CA: Diesel (0.02), CNG (0.08), B20 (0.02)
  - Phoenix, AZ: Diesel (0.02), CNG (0.08), B20 (0.02)

- Pump-to-wheel:
  - Atlanta, GA: Diesel (0.09), CNG (0.10), B20 (0.11)
  - San Francisco, CA: Diesel (0.11), CNG (0.08), B20 (0.13)
  - Phoenix, AZ: Diesel (0.11), CNG (0.08), B20 (0.12)
Geographic Context
Geographic Comparison

Duty cycle used in example: New York Bus Cycle
So...

WHAT’S THE ANSWER?
Summary

- Complexity and uncertainty
  - Type of application
  - Operational characteristics
  - Geographic context
  - Optimization objectives

- The broader picture: Sustainability & Resilience

- Need for decision support tools
  - Policy support tools
    - Fuel and Emissions Calculator (FEC)
  - Individual decision support tools
Questions and comments?
Please email yanzhi.xu@ce.gatech.edu
Model website: fec.ce.gatech.edu

THANK YOU!
Managing Energy Consumption and Greenhouse Gas Emissions in Urban Buildings

Presented by Dr. Matt Cox, Office of Sustainability
April 2015
EIA Projection of South Atlantic Energy Consumption
Commercial Energy Use in MSAs

Figure A.3 Energy and Carbon Intensity in Commercial Buildings, 2000-2010
Energy and Carbon, Commercial Sector, 2000-2010
Network Collaboration
Buildings are responsible for 66% of energy consumption within the City

Buildings are responsible for 59% of GHG emissions

Commercial buildings are the single biggest emitter/consumer in the City
A TALE OF TWO CITIES

2015 ENERGY STAR TOP CITIES

TOP 25 CITIES

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<th>Rank</th>
<th>Metro area</th>
<th>Building Count</th>
<th>Total Floor Area (Million Sq ft)</th>
<th>Cost savings (million $)</th>
<th>Equivalent Homes’ Electricity Use for 1 Year</th>
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<td>42.1</td>
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</tr>
</tbody>
</table>

Profile B.6 Atlanta

Table B.11 Atlanta MSA Energy and Carbon Dashboard

<table>
<thead>
<tr>
<th>2010 Ranks</th>
<th>Energy Intensity*</th>
<th>Carbon Intensity*</th>
<th>Energy Improvement*</th>
<th>Carbon Improvement*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>59</td>
<td>69</td>
<td>89</td>
<td>68</td>
</tr>
<tr>
<td>Commercial</td>
<td>37</td>
<td>63</td>
<td>93</td>
<td>81</td>
</tr>
<tr>
<td>Industrial</td>
<td>78</td>
<td>77</td>
<td>83</td>
<td>65</td>
</tr>
<tr>
<td>Transportation^</td>
<td>69</td>
<td>69</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>All Buildings</td>
<td>67</td>
<td>64</td>
<td>91</td>
<td>86</td>
</tr>
</tbody>
</table>

*Intensity rankings shown as per-capita for residential and transportation, and per-GDP for commercial, industrial and all buildings footprints.

^Improvement rankings show what rank the MSA scored; a “1” would be the “most improved” MSA on a percentage basis.

*Only 1.4% LEED or EnergyStar certified
Part I: Benchmarking

1. What is benchmarking?
   Tracking energy and water consumption on site for properties over 25,000 sqft

2. How do you benchmark?
   Utilize EnergyStar Portfolio Manager
   *Free web-based platform
   *13 cities currently follow this process nationwide; others are considering

3. Who benchmarks in Atlanta?
   Currently over 500 buildings in ESPM
Part II: Transparency

1. What is transparency?
   Reporting energy and water consumption characteristics of a property.

2. How does it work?
   Properties will send a benchmarking submission using a two-step process in ESPM.
   The City of Atlanta will check the data and make it publicly available.
**Part III: Energy Audits**

1. **What is an energy audit?**
   A professional walk-through of a facility to check for opportunities to improve energy performance, focusing on equipment retrofits.

2. **How does it work?**
   Property owners use a certified professional to perform the work and produce an itemized list of opportunities. Owners then choose which opportunities to pursue.

3. **Who uses Energy Audits in Atlanta?**
   Currently, Georgia Power offers no-cost energy audits for commercial customers; GPC provided 1,400 state-wide last year.
Part IV: Retrocommissioning

1. What is Retrocommissioning?
   Retrocommissioning is the process of improving the efficiency of existing building systems through repair and maintenance; it is a voluntary component of this proposal.

2. How does it work?
   Property owners use a certified professional to perform the work and produce an itemized list of opportunities. Owners then choose which opportunities to pursue.
Other Cities’ Coverage

Totaling approximately 5.8 billion SF of floor space in major real estate markets

Building Area (in Square Feet) Covered Annually

- Chicago: 900 million SF
- Montgomery County: 68 million SF
- Boston: 250 million SF
- Philadelphia: 300 million SF
- Seattle: 281 million SF
- Washington State: 247 million SF
- Austin: 113 million SF
- California: 347 million SF
- Minneapolis: 110 million SF
- Washington, DC: 357 million SF
- San Francisco: 205 million SF

Source: IMT
### Context - Commercial Buildings Energy Efficiency

<table>
<thead>
<tr>
<th>Category</th>
<th>Figures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Commercial Buildings</td>
<td>17,000</td>
</tr>
<tr>
<td>Buildings Subject to Proposal</td>
<td>2,400</td>
</tr>
<tr>
<td>Unique Building Owners</td>
<td>1,300</td>
</tr>
<tr>
<td>Largest Building Owner: CoA</td>
<td>111</td>
</tr>
<tr>
<td>Total Square Footage</td>
<td>402 M</td>
</tr>
</tbody>
</table>

Atlanta is the:
- 1st City in CEP
- 1st in the Southeast
- 2nd largest w/ Audits
- 3rd largest with Benchmarking
- 6th with all 4 policies
- 12th to pass Benchmarking
ATLANTA’S POWER 2 CHANGE AND THE CITY ENERGY PROJECT
Next Steps and Goals

Implementation
Education and training events
Municipal benchmarking and transparency report in 2015

P2C goals
Reduce commercial energy consumption 20% by 2020 (2009 baseline)
Anticipation that CEP will get us 50% of the way through overcoming information barriers
Continue to engage through ABBC, ACBI, and the AMFH
Questions or Comments?
Contact Dr. Matt Cox
Building Energy Efficiency Project Manager
Mayor’s Office of Sustainability
wmcox@atlantaga.gov
404-335-1959