

# The Impact of Community Design on Greenhouse Gas Emissions

MSTRS – Ann Arbor

June 16, 2016

David D'Onofrio


[ddonofrio@atlantaregional.com](mailto:ddonofrio@atlantaregional.com)

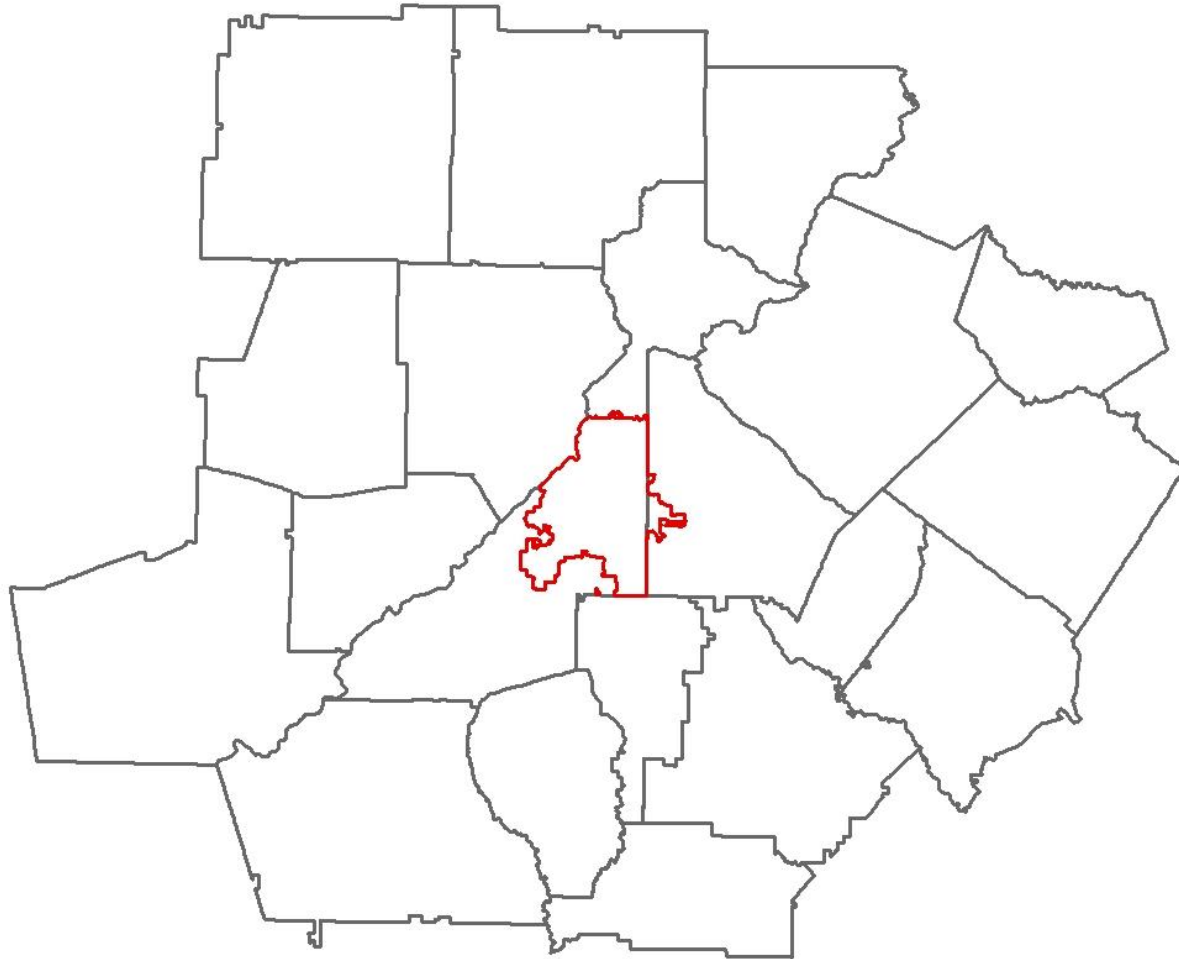
# Outline

- Intro to the Atlanta Region
- ARC's Past Work on Climate Change
- Community Design and Greenhouse Gases

# The Atlanta Region


## Legend

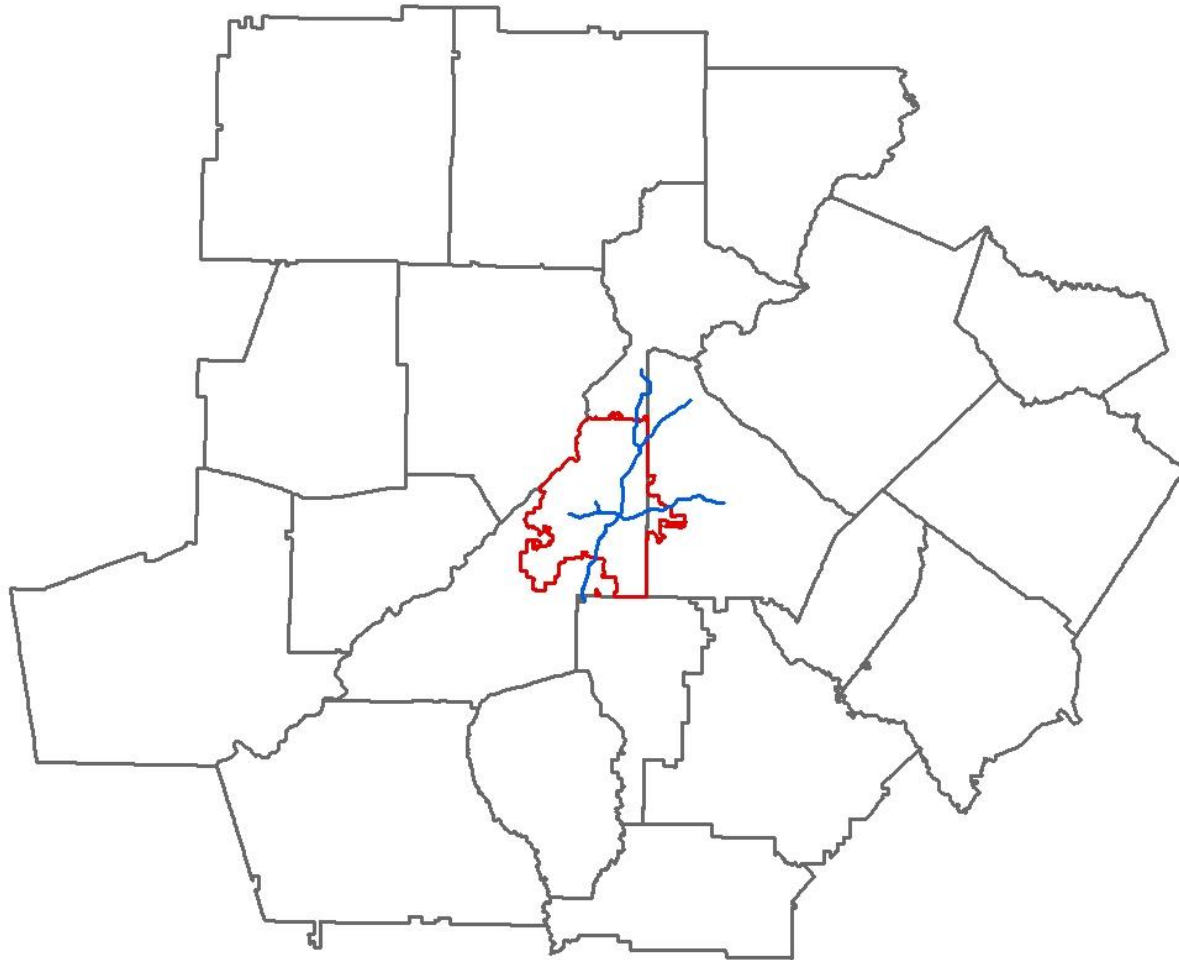
 City of Atlanta



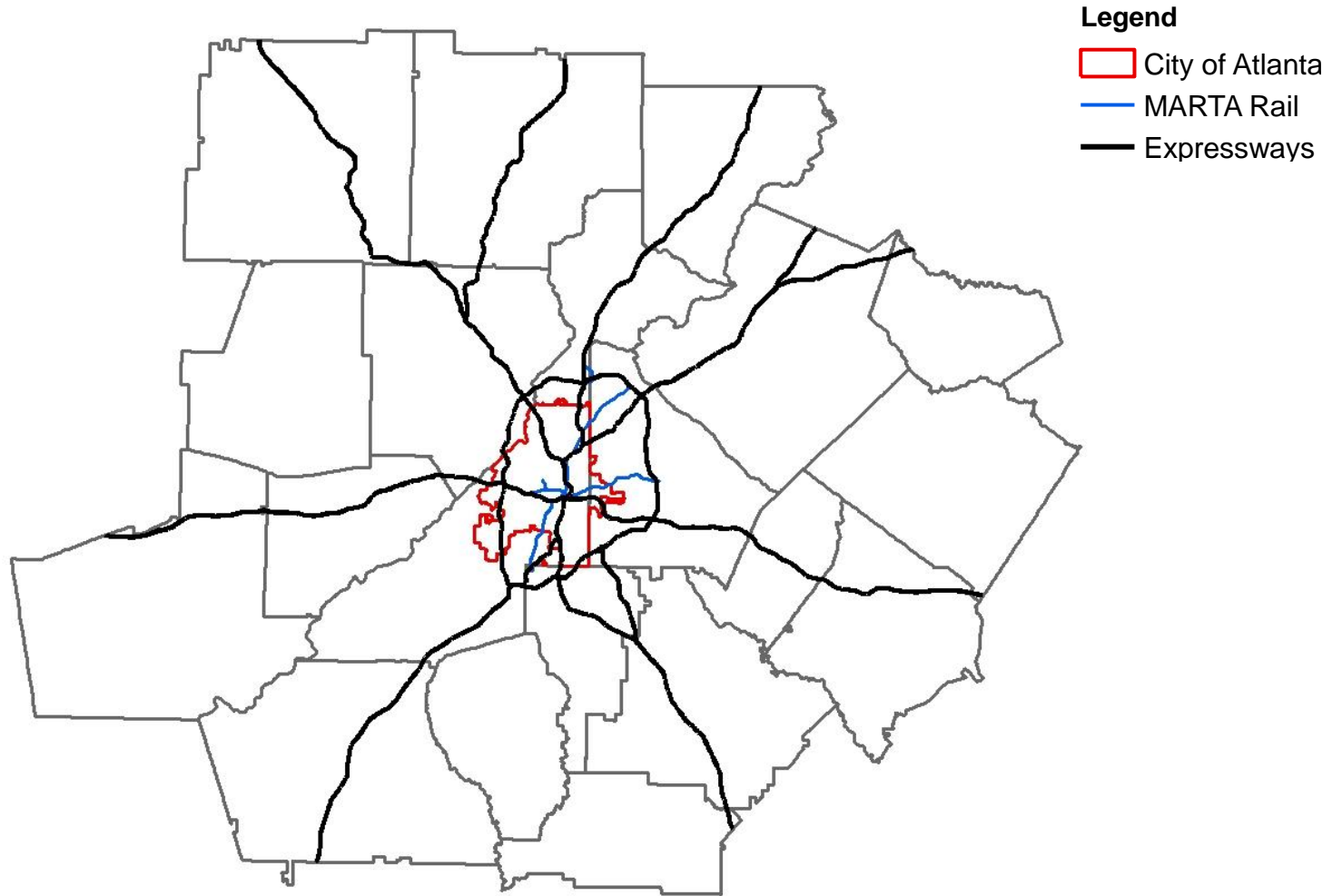
# The Atlanta Region

## Legend

-  City of Atlanta
-  MARTA Rail



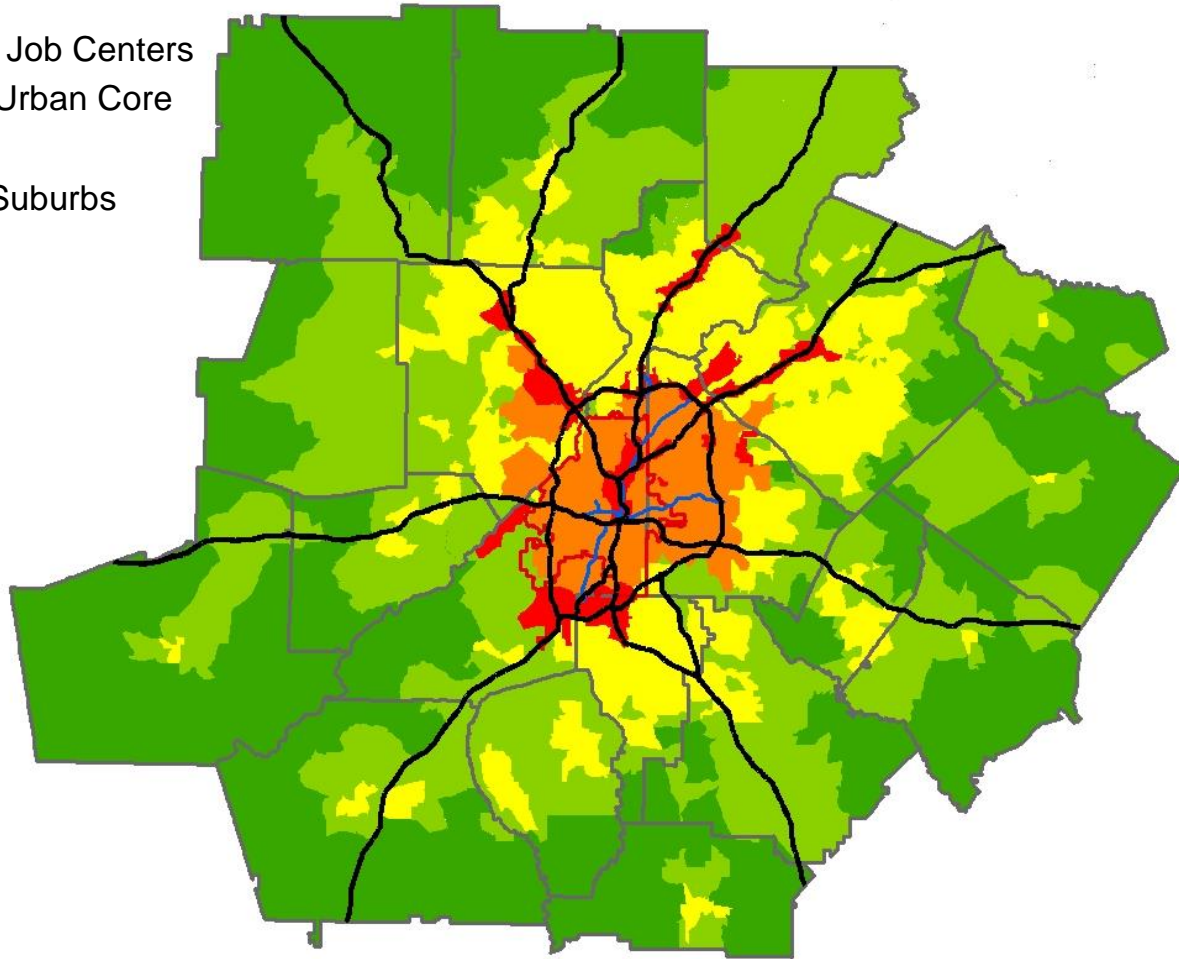
# The Atlanta Region



# The Atlanta Region

## Legend

- City Center / Job Centers
- Established Urban Core
- Suburban
- Developing Suburbs
- Rural Areas



## Legend

- City of Atlanta
- MARTA Rail
- Expressways

# Past Climate Change Work at ARC

Emission Inventory

Scenario Planning

Project Evaluation

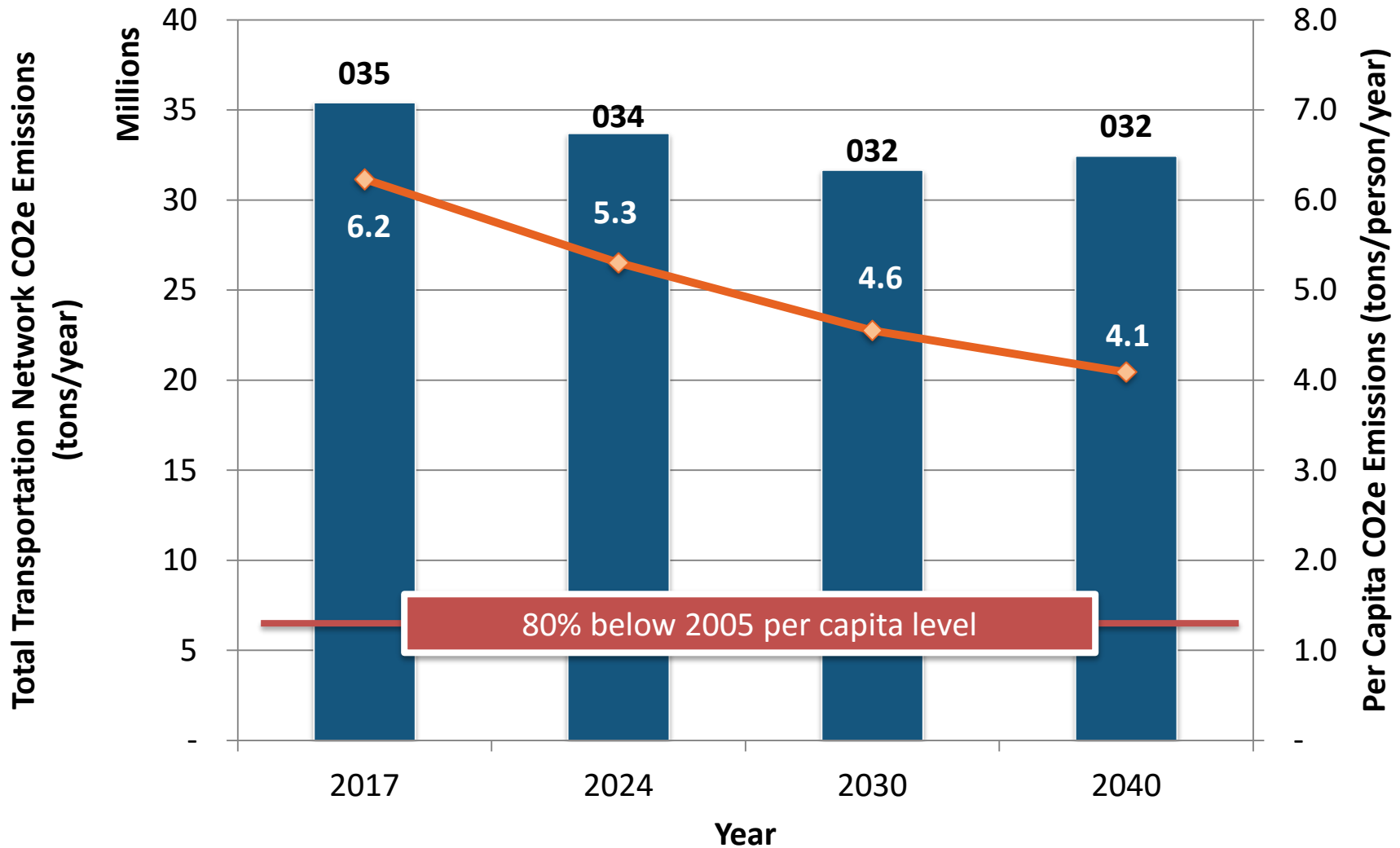
Community Design

local relevance

+

regional impact

# Past Climate Change Work at ARC

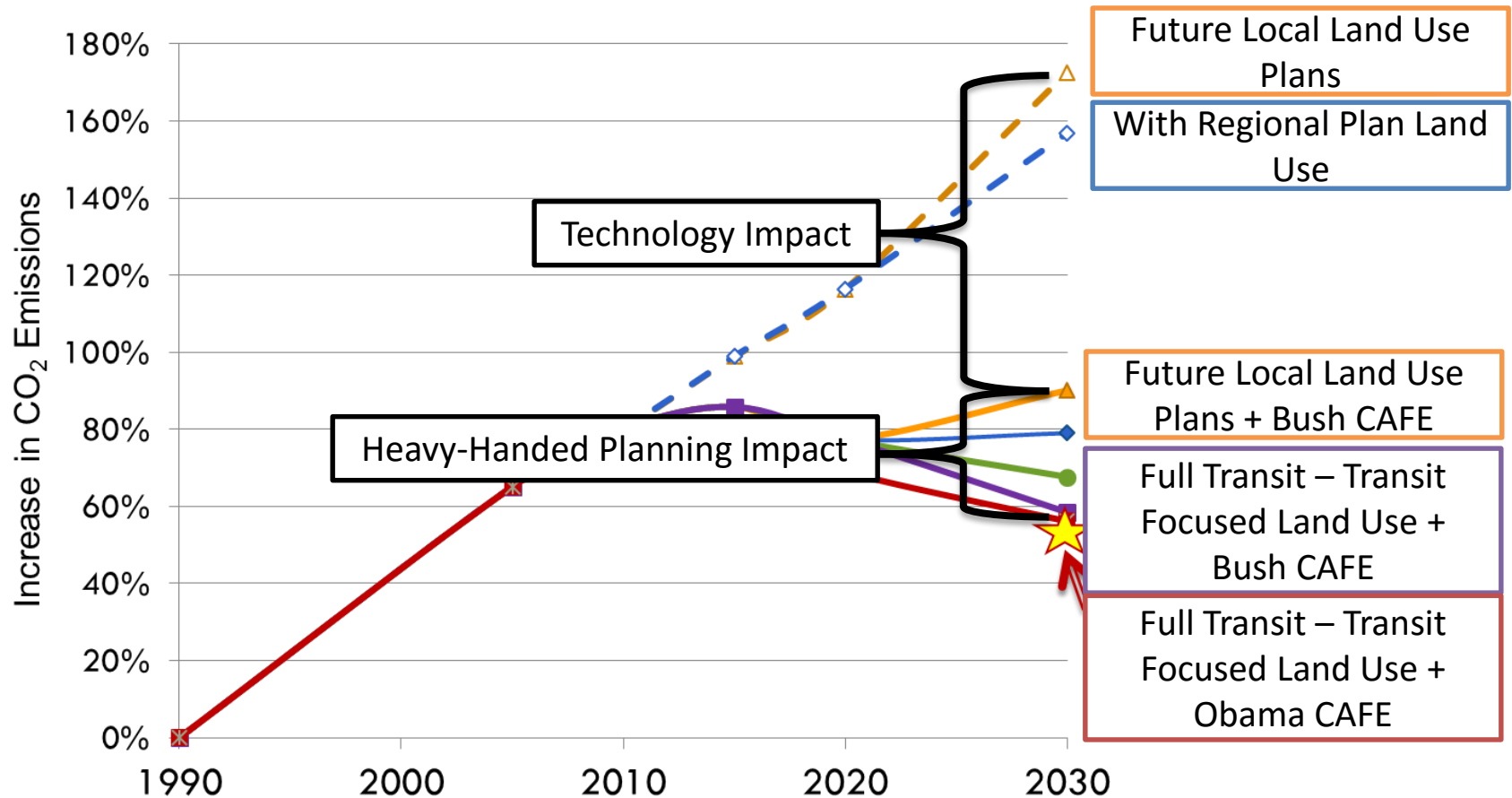


■ Total Network CO2e Emissions

◆ Per Capita CO2e Emissions



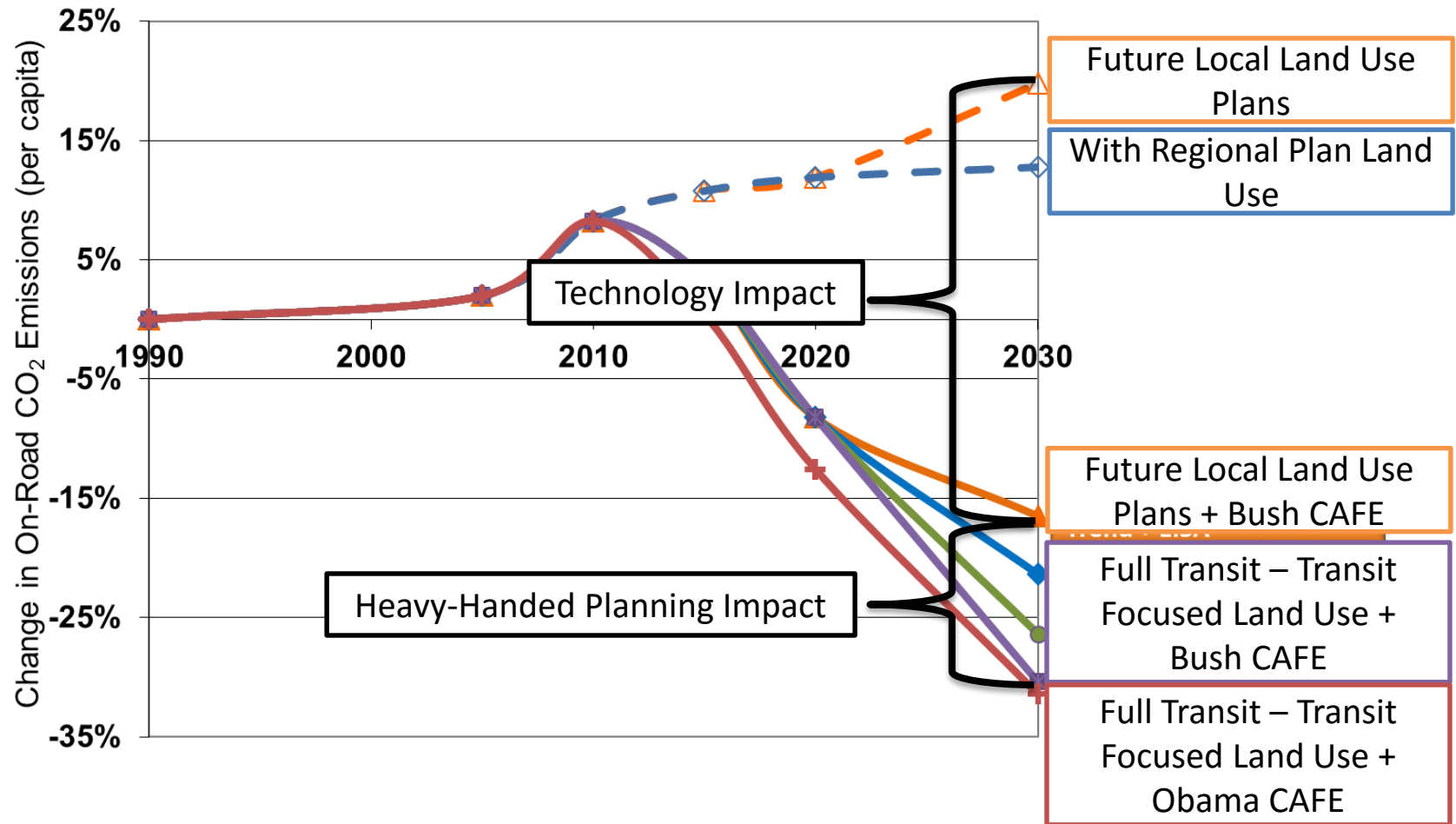
# Past Climate Change Work at ARC



2009 Taking the Temperature White Paper

<http://www.atlantaregional.com/climatechange>

# Past Climate Change Work at ARC



2009 Taking the Temperature White Paper  
<http://www.atlantaregional.com/climatechange>

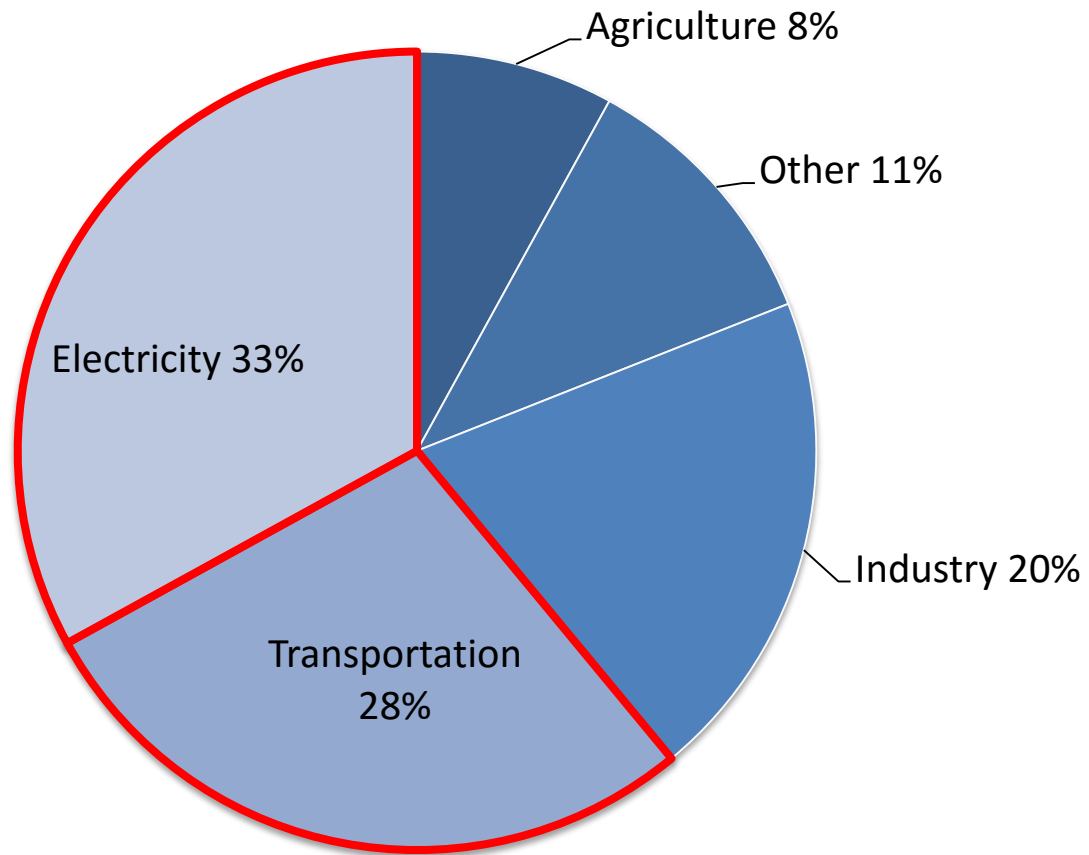
# Past Climate Change Work at ARC

Price Carbon and  
Incorporate into Project  
B/C

Produce CO<sub>2</sub> Emissions  
as Part of CMAQ Project  
Selection

Pursue  
Programs/Policies to  
Reduce Vehicle Trips &  
Encourage Sustainable  
Development

# Transportation & Household Electricity Account for 61% of US GHG Emissions



Source: US EPA

# Recent Research...

## Understanding Neighborhood Level Emissions

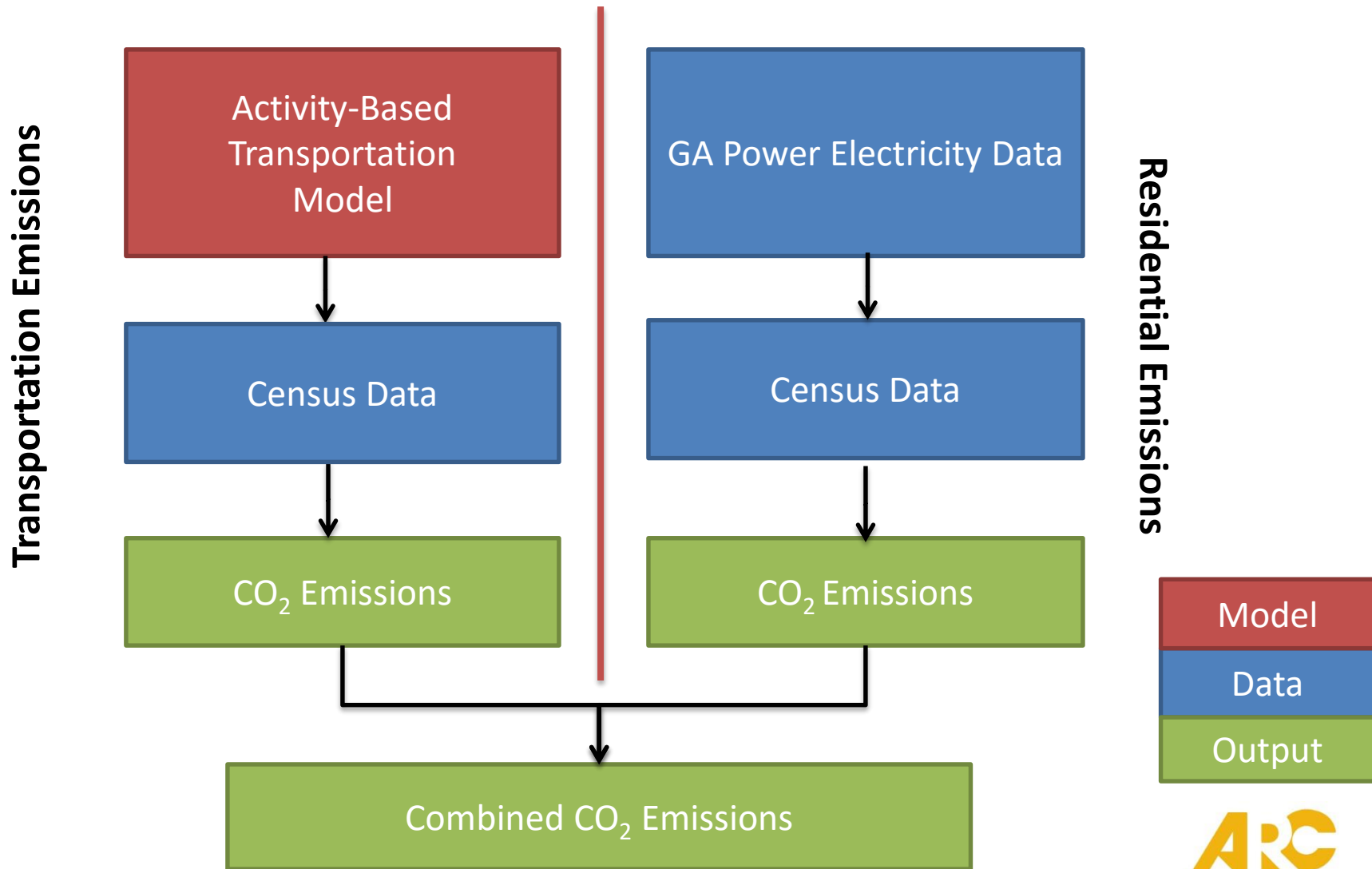
### Goals:

- Continue previous ARC work in transportation and emissions modeling to establish a neighborhood level inventory of CO<sub>2</sub> emissions
- Understand potential policies and programs that impact CO<sub>2</sub> emissions



005

# Understanding Neighborhood Level Emissions



# What's the Ultimate Source of Greenhouse Gas Emissions?

**Transportation Emissions**

How many miles are driven

**Residential Emissions**

How much electricity is used at home

# Impact of Community Design on Greenhouse Gas Emissions

- Multimodal accessibility
- Transit share
- Distance to regional activity centers
- Population density
- Neighborhood walkability

## Transportation Indicators

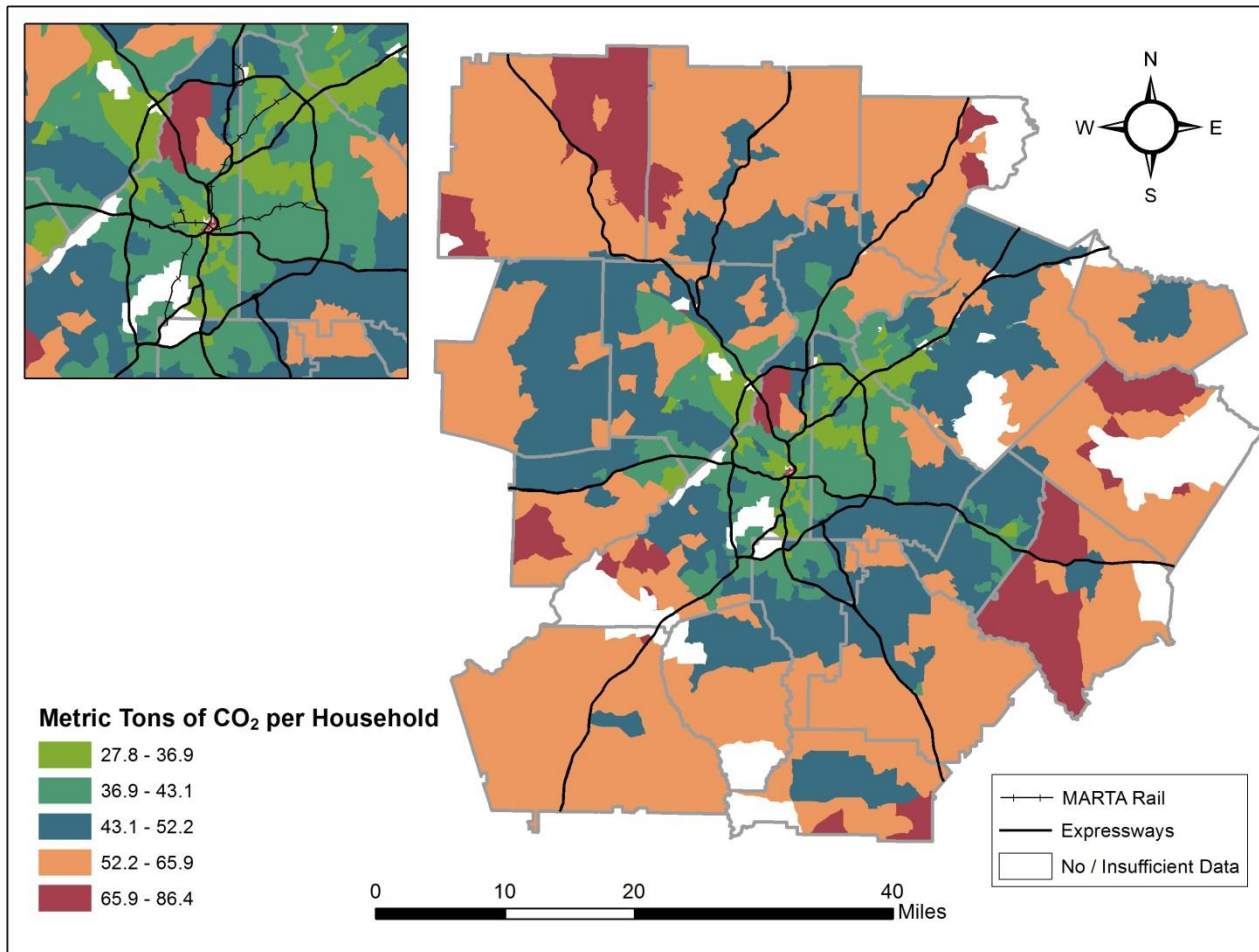
## Residential Indicators

- Presence of multifamily housing
- Size of the residences
- Density of housing
- Number of people per household



# Impact of Community Design on Greenhouse Gas Emissions

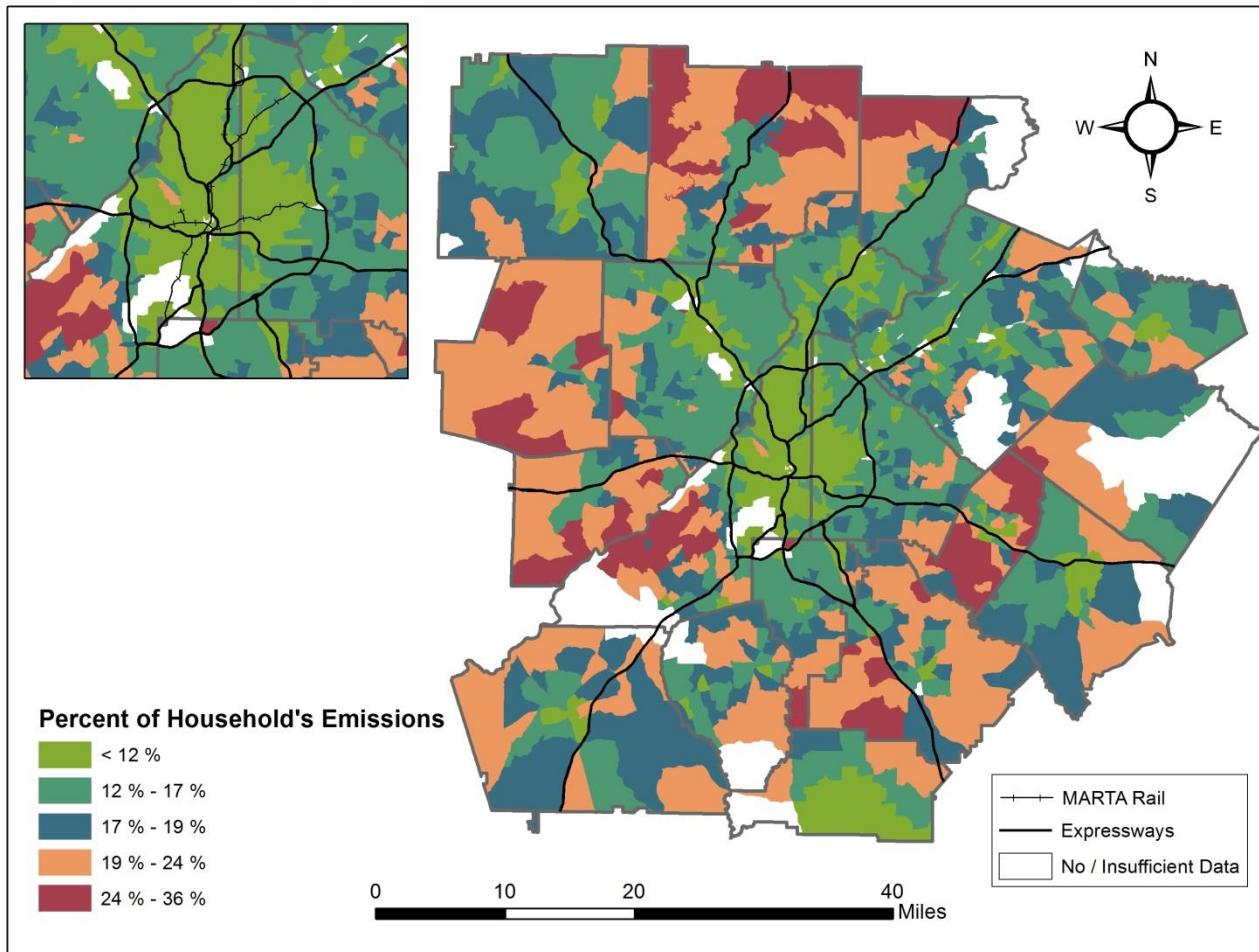
regional impact + local relevance



**Total CO<sub>2</sub> Emissions per Household**

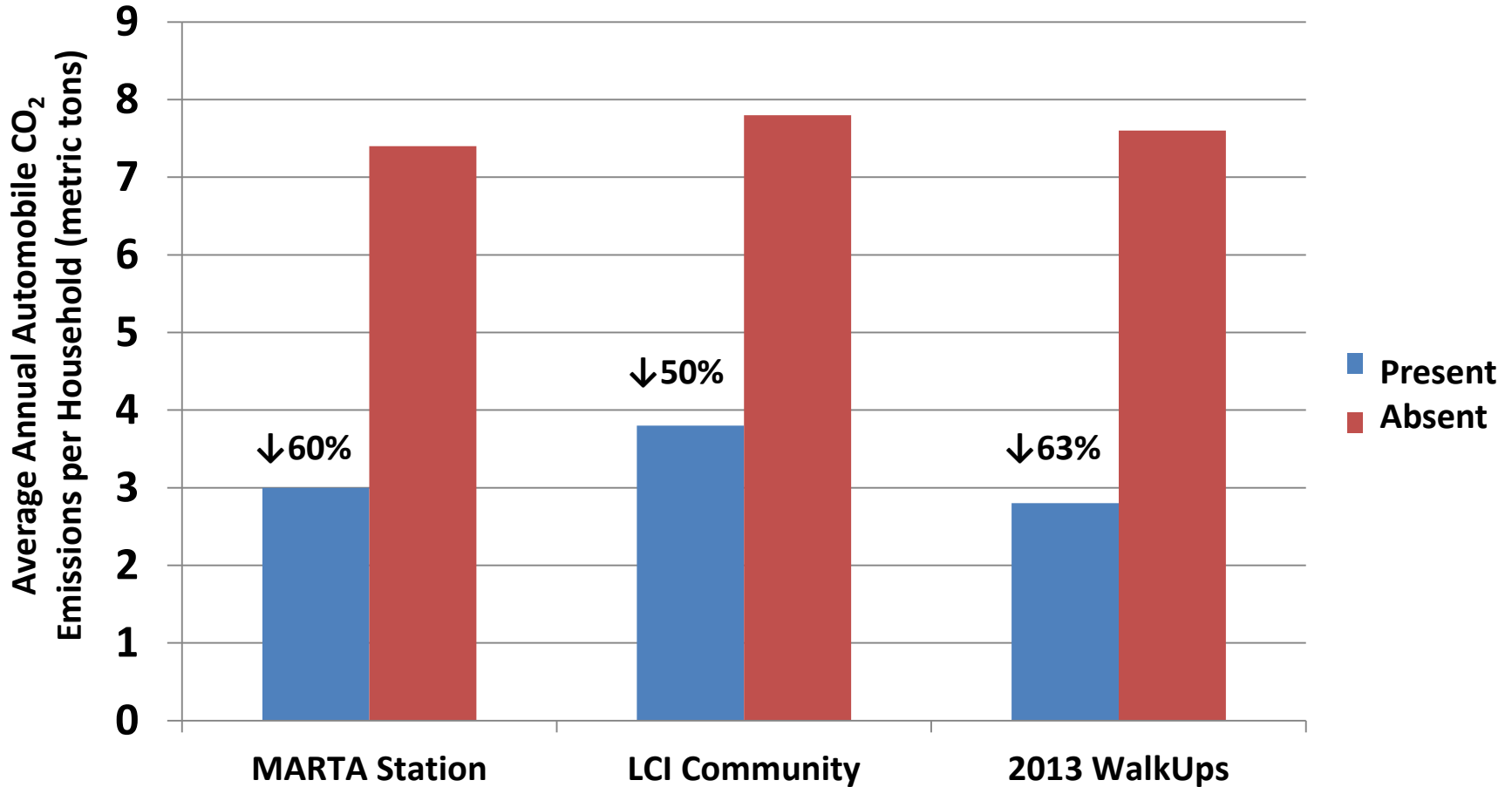
# Impact of Community Design on Greenhouse Gas Emissions

regional impact + local relevance



**Percent of CO<sub>2</sub> Emissions from Transportation**

# Walkable & Transit Accessible Communities Have Lower Transportation Emissions



# Impact of Community Design on Greenhouse Gas Emissions



Improved Safety

Healthy Living



Better Air Quality

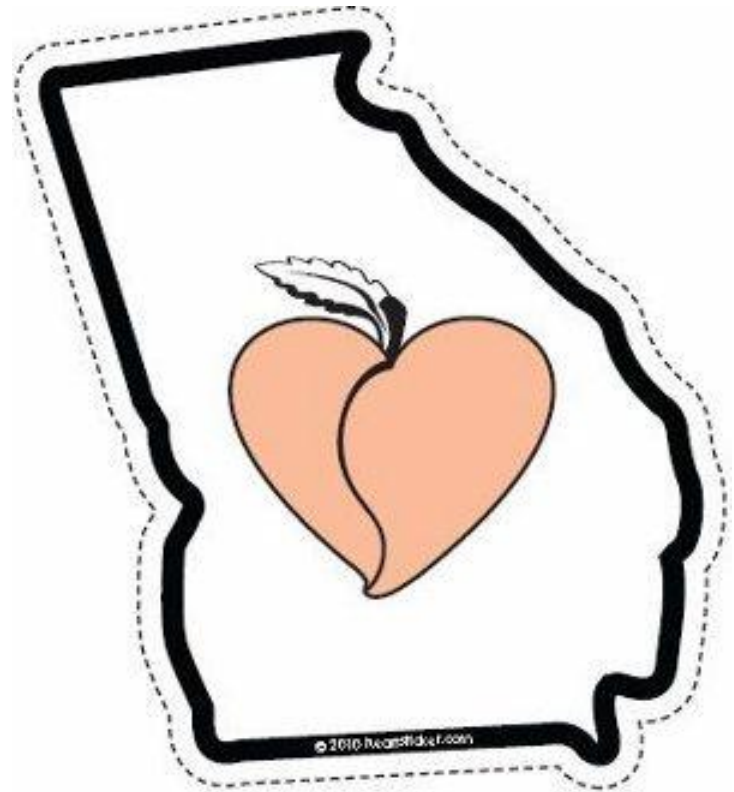
Improved Economy



Co-Benefits of Climate Change Mitigation Strategies

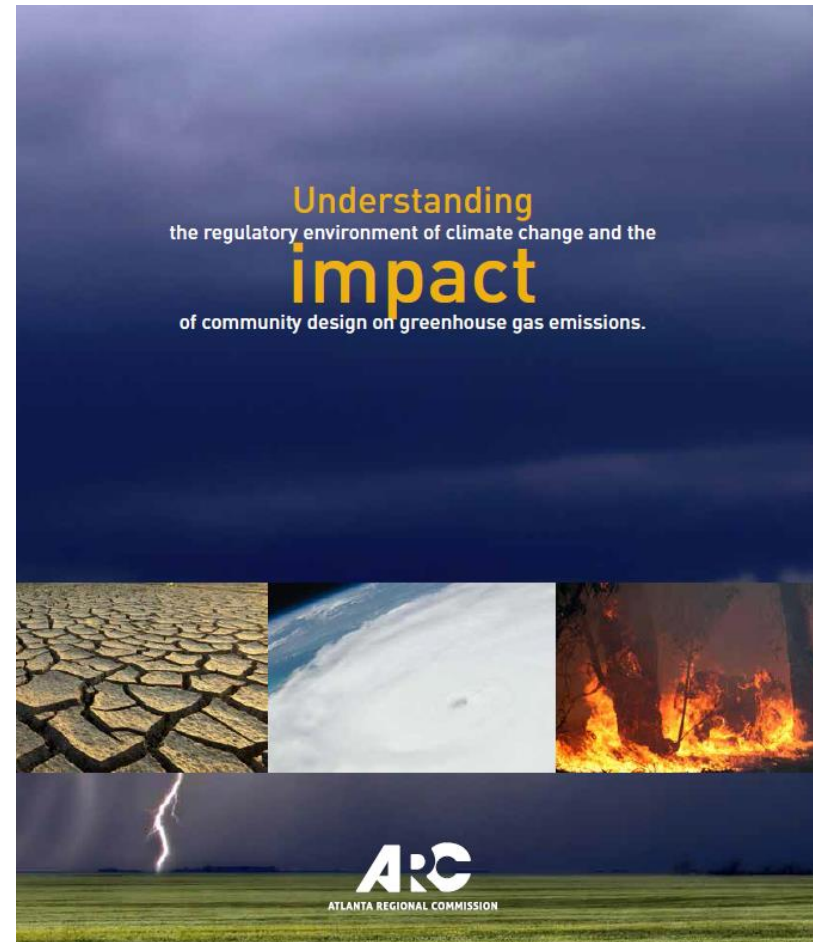
# What We've Learned in Atlanta

- Technology drives emissions
- Planning has a small – but important role to play
- Good community design can reduce emissions without asking people to change behavior
- In conservative states, the federal government has to drive change



# Impact of Community Design on Greenhouse Gas Emissions

- Final report available on our website:
  - [www.atlantaregional.com/climatechange](http://www.atlantaregional.com/climatechange)
- Interactive emissions mapping:
  - <http://atlregional.github.io/climatechange>



**David D'Onofrio**

**ddonofrio@atlantaregional.com**

**(404) 463-3268**

