NEW ENGLAND
BOARD OF
HIGHER EDUCATION

Campus and Climate:

The Transportation Element of Climate Action Planning

David McIntyre

May 4, 2009".

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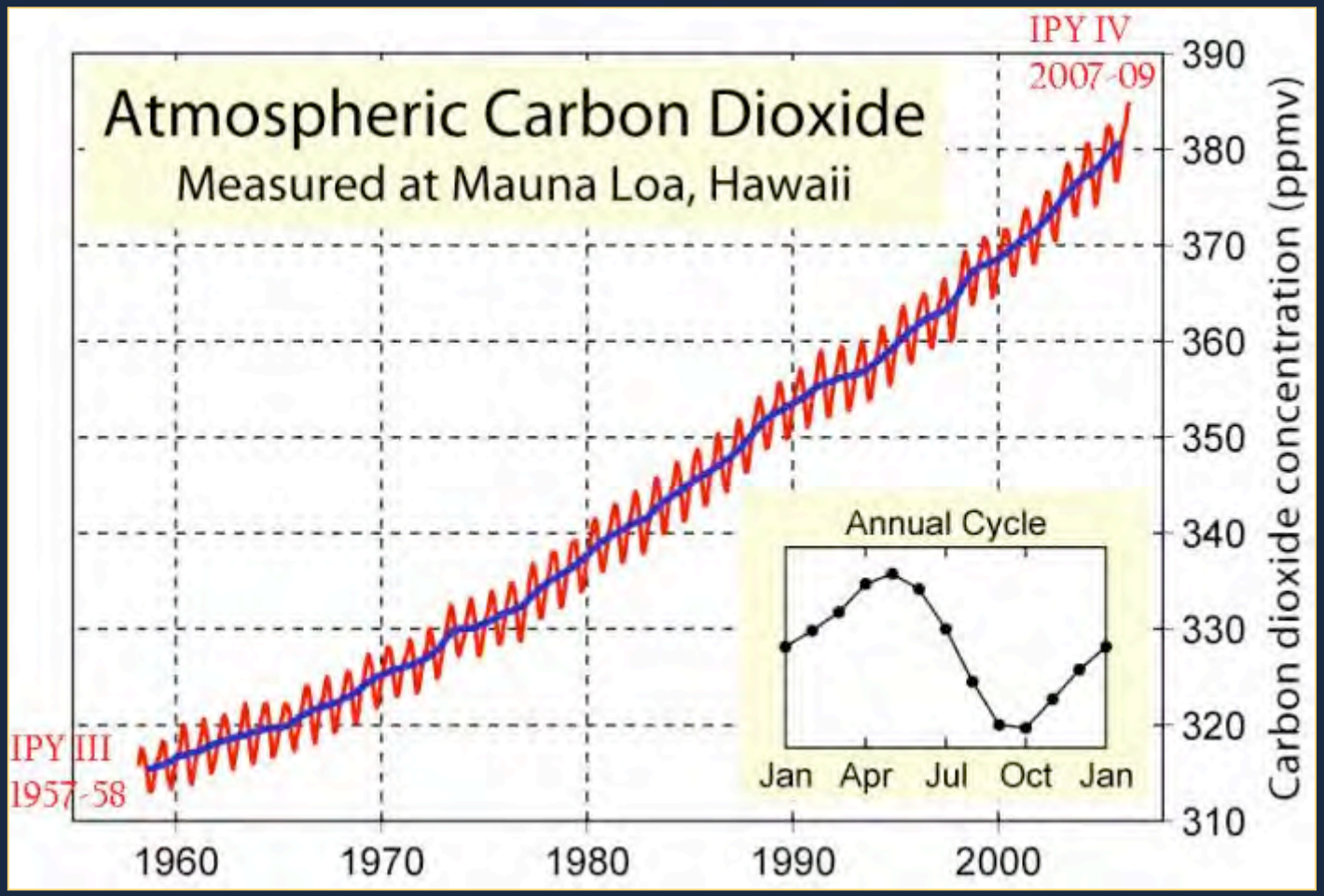
Atmospheric Carbon Dioxide
Measured at Mauna Loa, Hawaii
IPY IV
2007-09
IPY III
1957-58
Annual Cycle
Jan
Apr
Jul
Oct
Jan
1960
1970
1980
1990
2000
390
380
370
360
350
340
330
320
310
Carbon dioxide concentration (ppmv)

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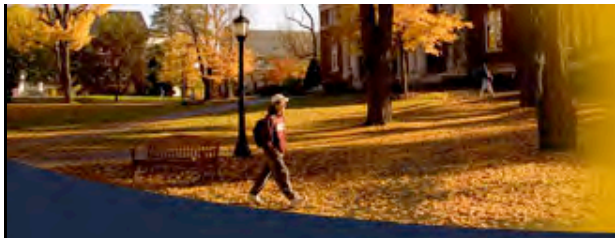
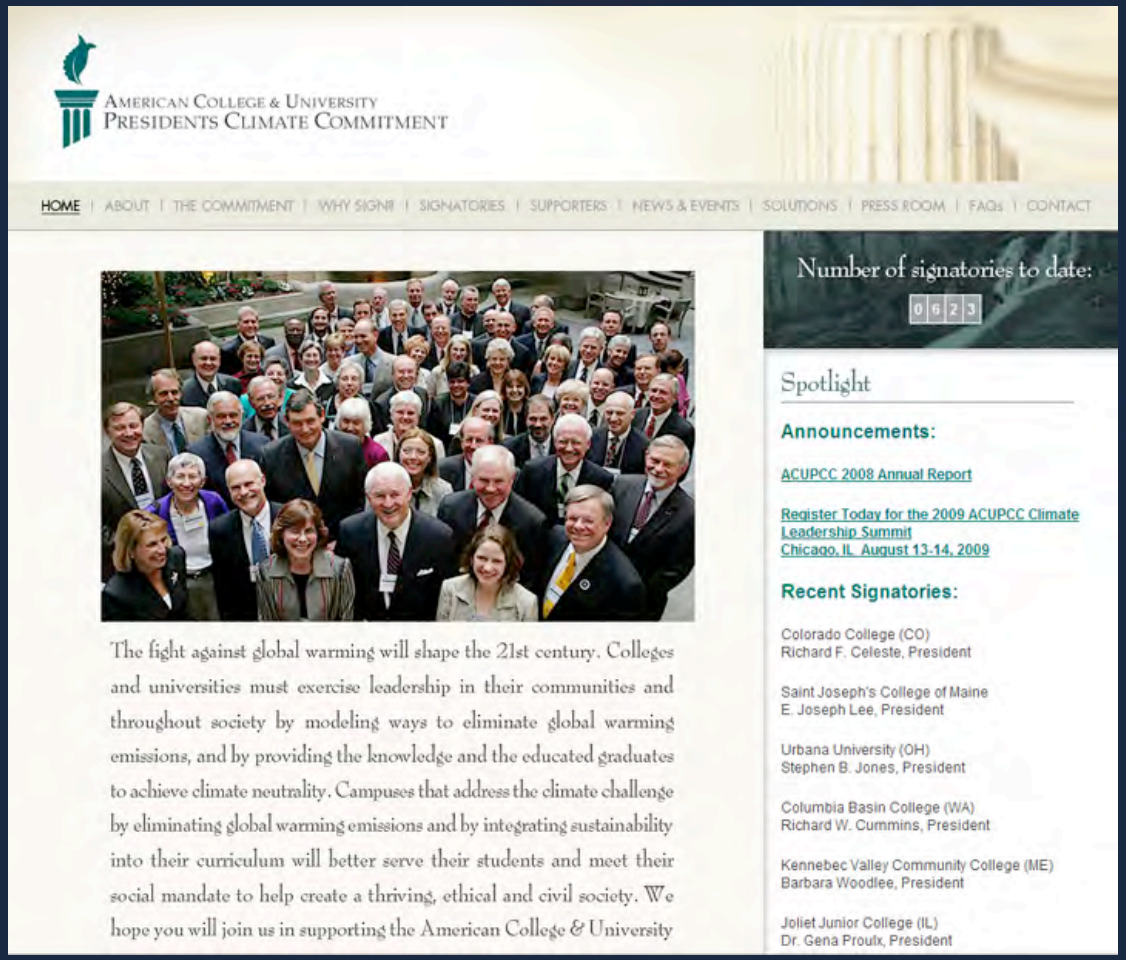




623 signatories

30% of all college students

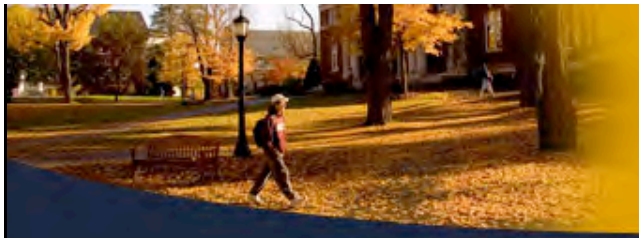
87 signatories in New England

4000 colleges and universities

17 million students

4 million resident on campus

Colleges and universities account for **3%** of GHG emissions



The Commitment

- **Develop plan to eliminate GHG emissions, integrate sustainability into student educational experience.**
- **Take tangible action to reduce emissions while comprehensive plan is being developed.**
- **Publicly report on plan and progress.**

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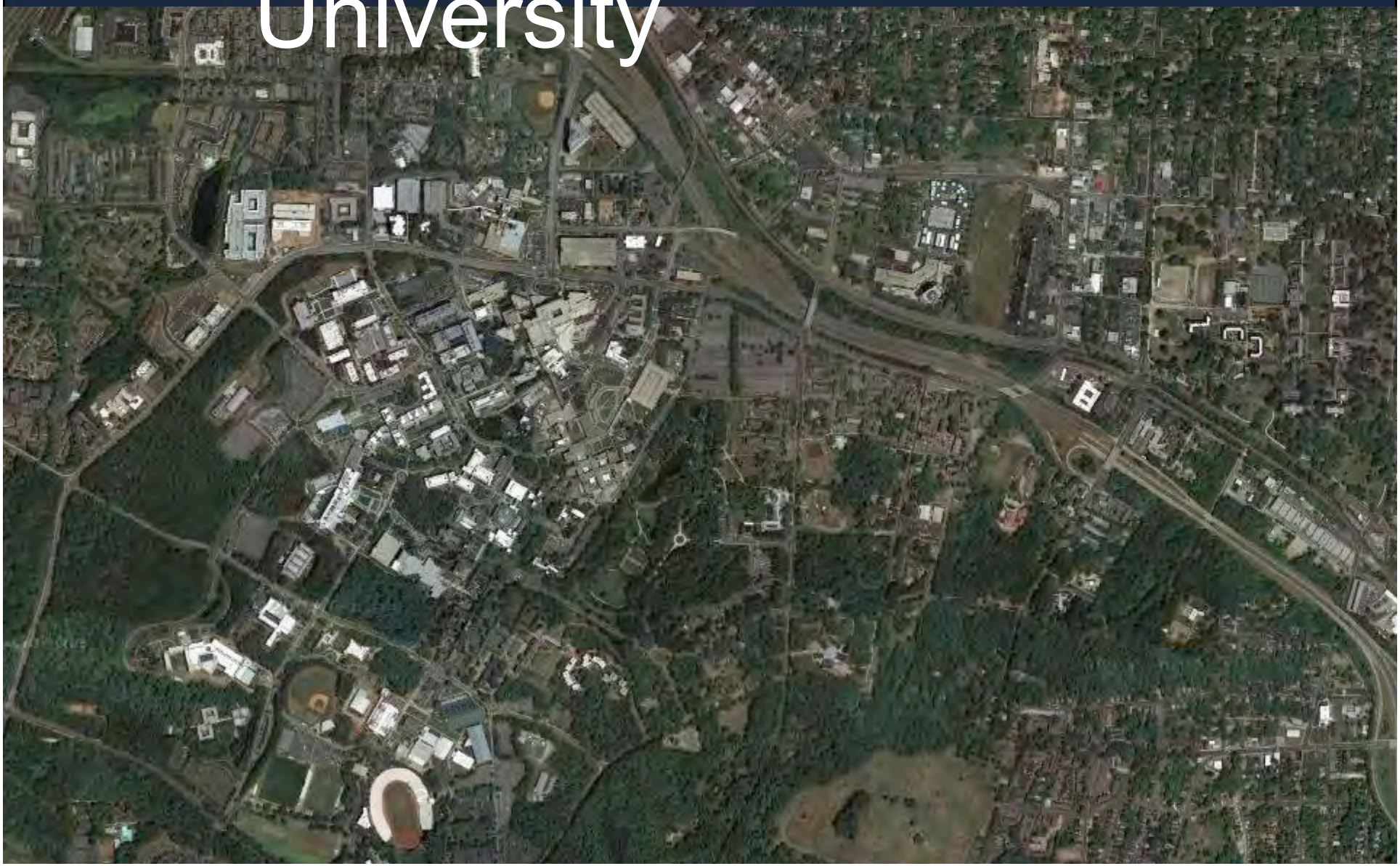
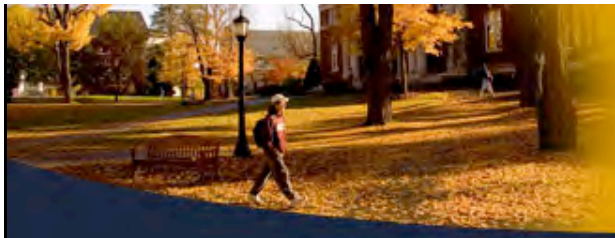
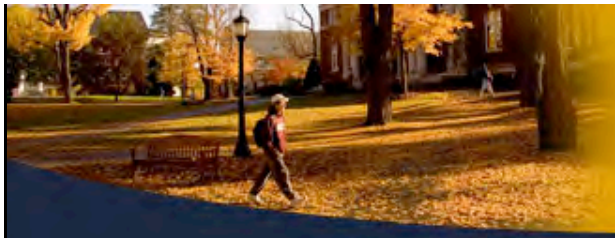
Duke University Transportation GHG



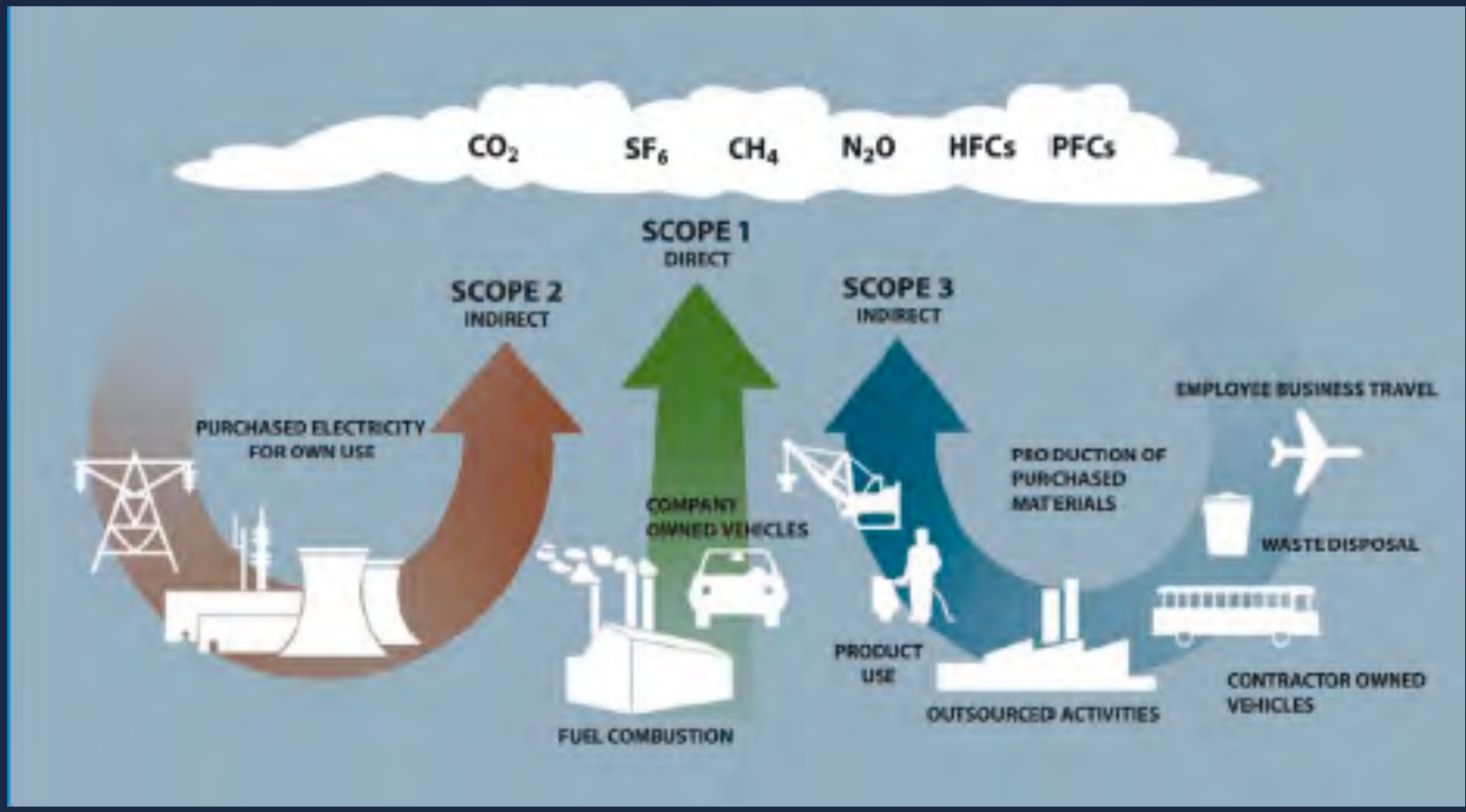


GHG Efforts at Duke

- Joined hundreds of school in national Presidents Climate Commitment
- Director of Sustainability in Executive Vice President's Office
- Campus Sustainability Committee
- 2008-2009 Timeline
  - Updated Duke GHG inventory – September 2008
  - CSC working towards final recommendations
  - April Board of Trustees – present draft Climate Action Plan to Facilities and Environment Committee

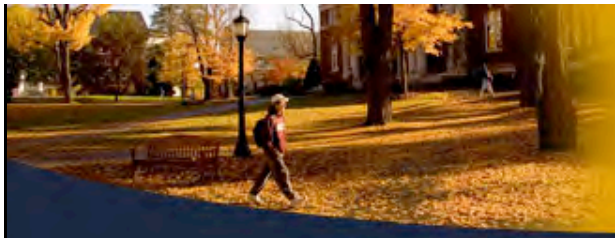


GHG emissions Sources



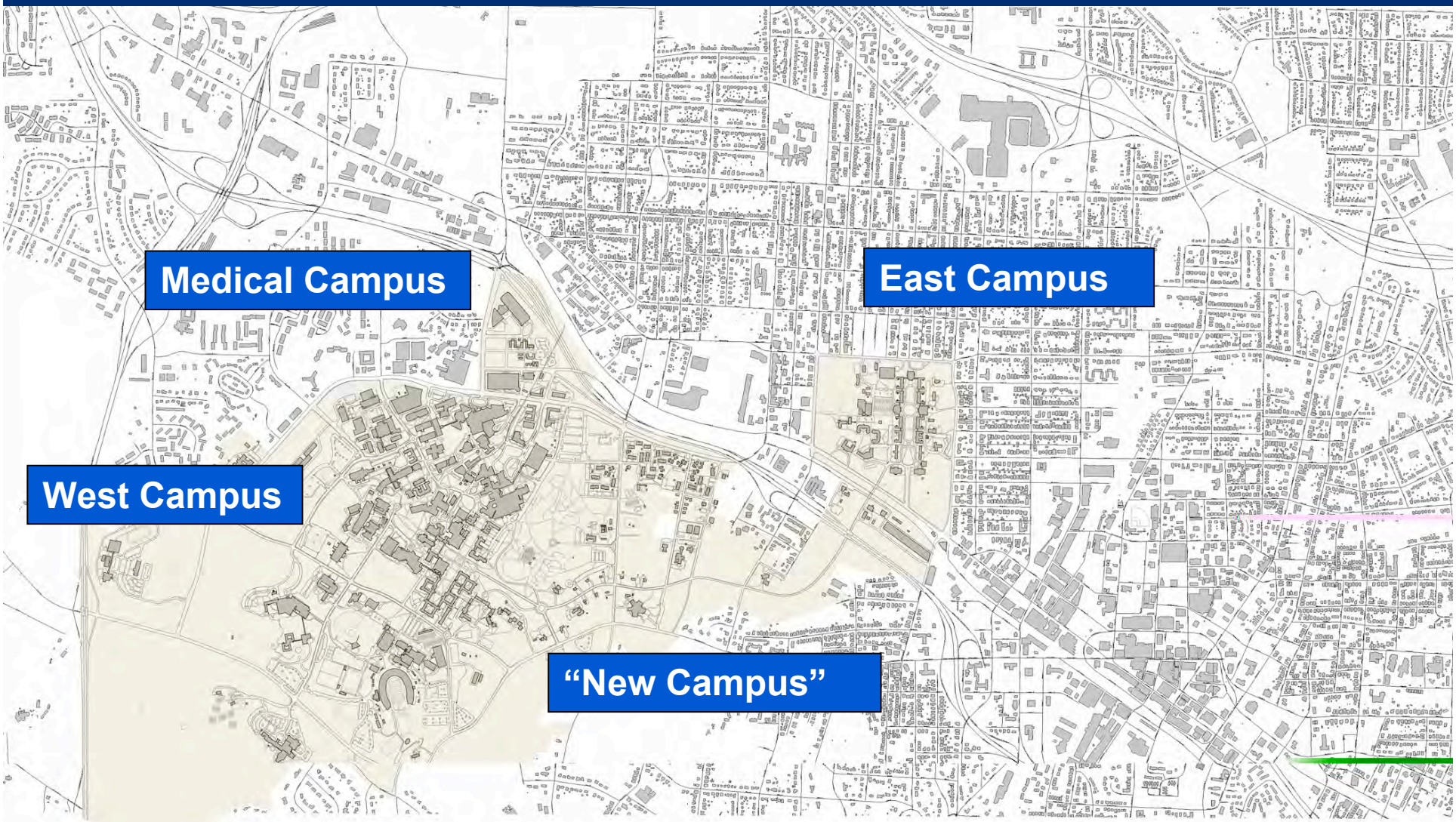
GHG Inventory Methodology

- Goals of the inventory -
  - Update Duke's 2004 GHG inventory
  - Characterize the major sources and examine trends in emissions over the last 18 years
  - Provide the baseline for Duke's overall Climate Commitment Action Plan
- Boundaries of the inventory -
  - "Duke proper" – University and Health System buildings on and adjacent to the Durham campus and the Marine Lab.
  - Did not include leased space or satellite health system buildings and hospitals
- Utilized Clean-Air Cool-Planet software



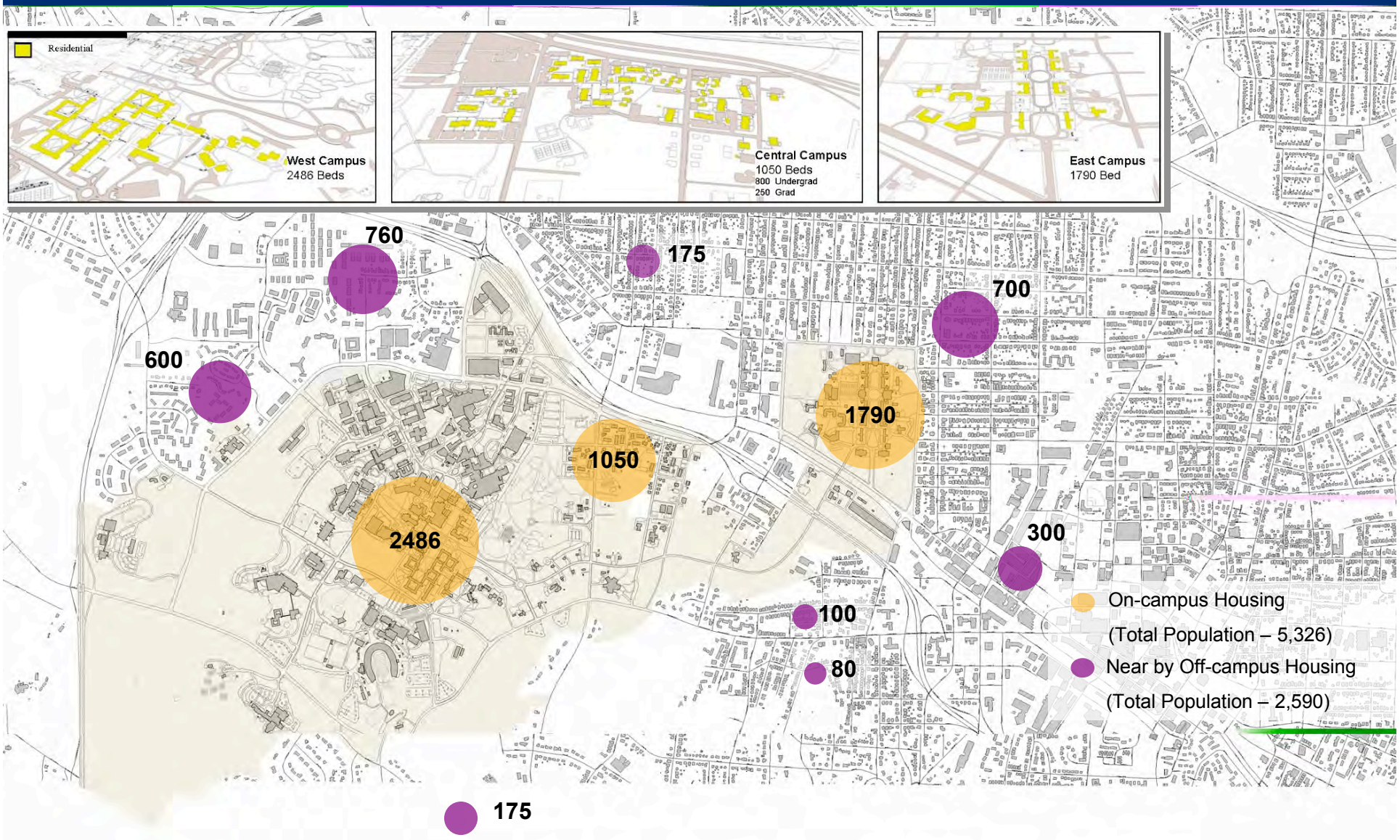
Sources of GHG Emissions Inventoried

- Transportation
  - Fleet fuel
  - Employee Air travel
  - Commuter miles
- Electricity
  - Duke Power consumption
- On-Campus Stationary
  - Steam Plant fuel
    - Coal
    - Natural Gas
    - #2 Fuel Oil
- Refrigerants
- Solid Waste
- Fertilizer
- Offsets
  - Duke Forest preservation
  - Composting
  - REC purchases

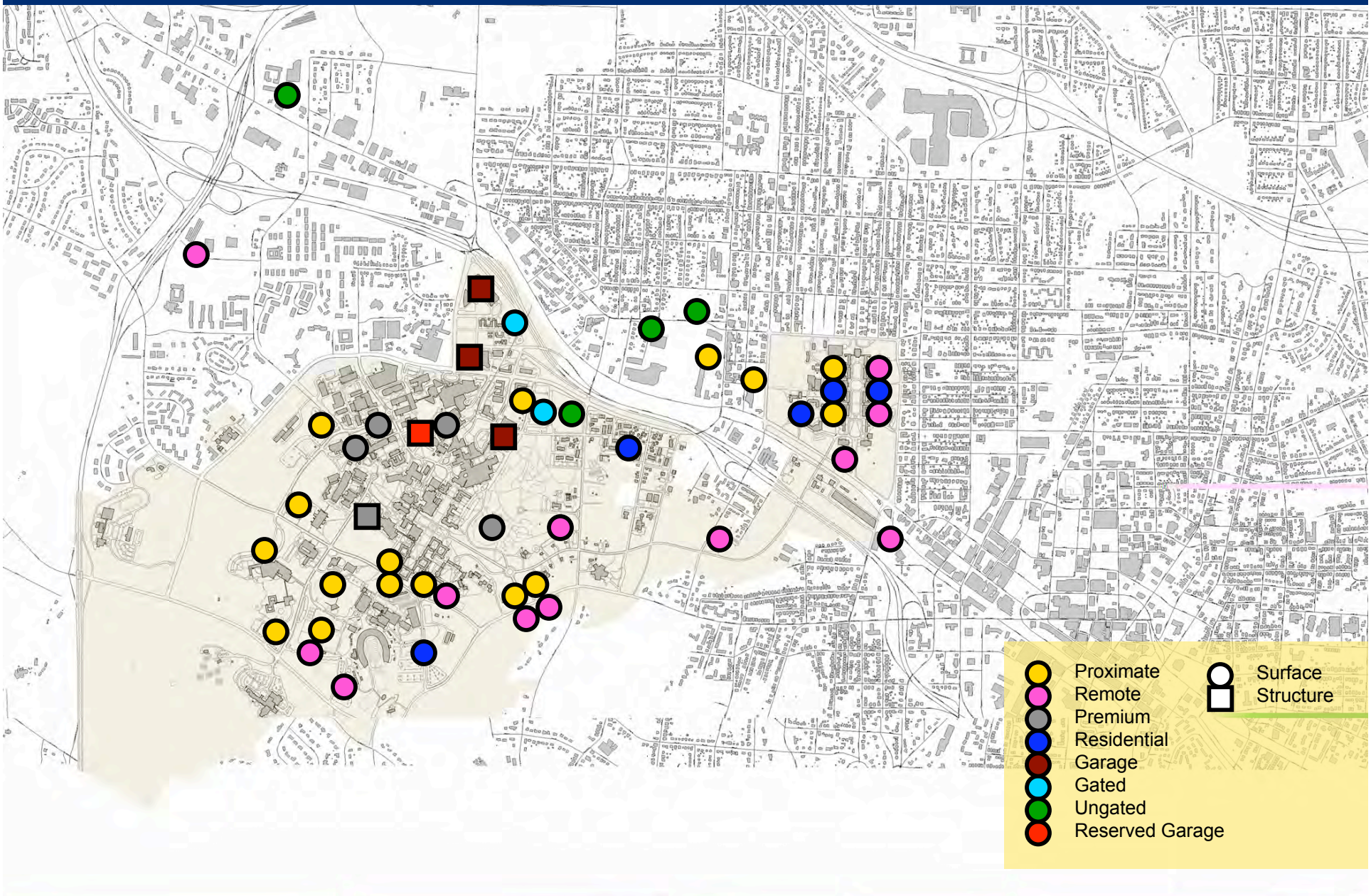


Duke University

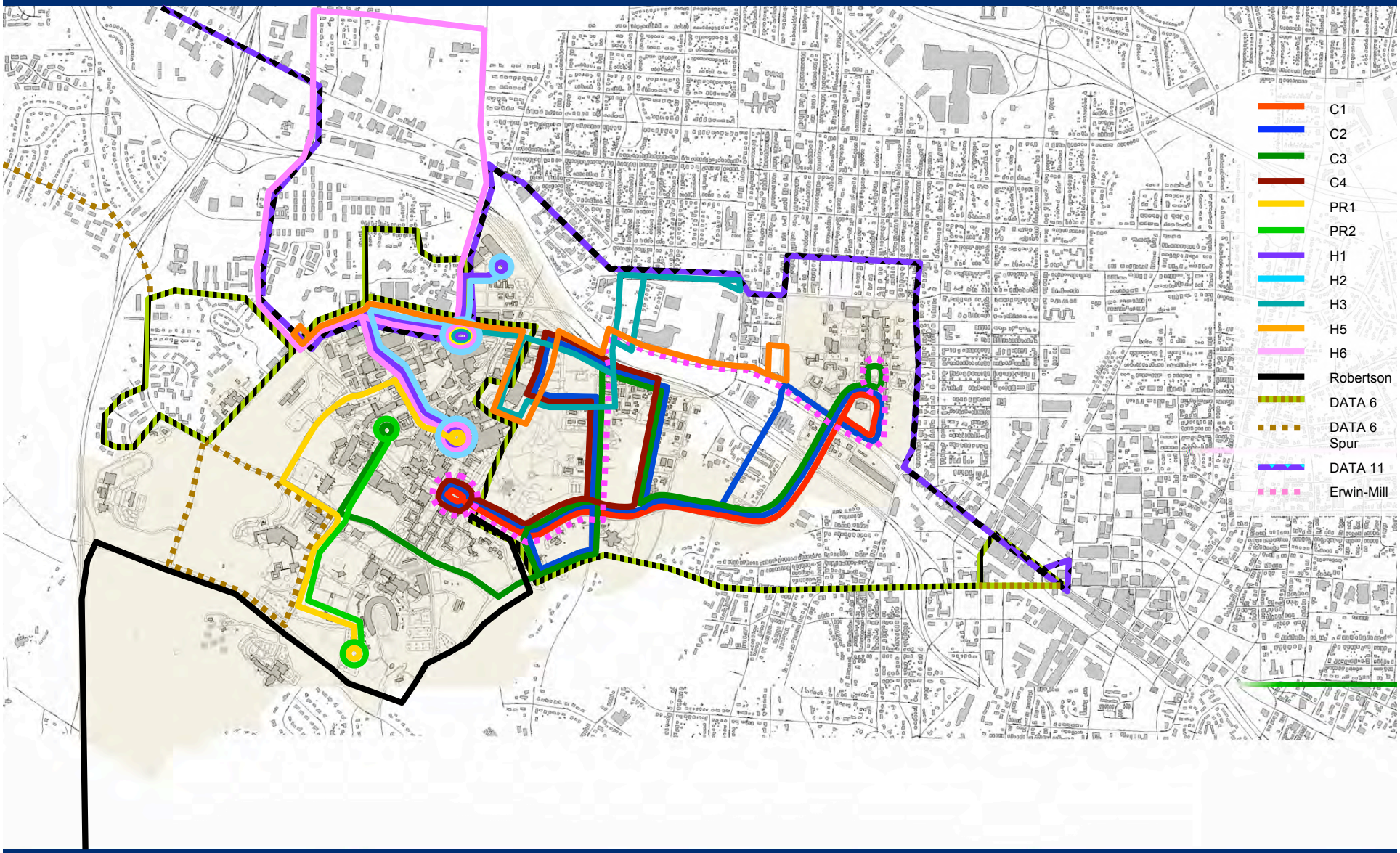
Academic Density by Precinct



Residential Density On or Near Campus

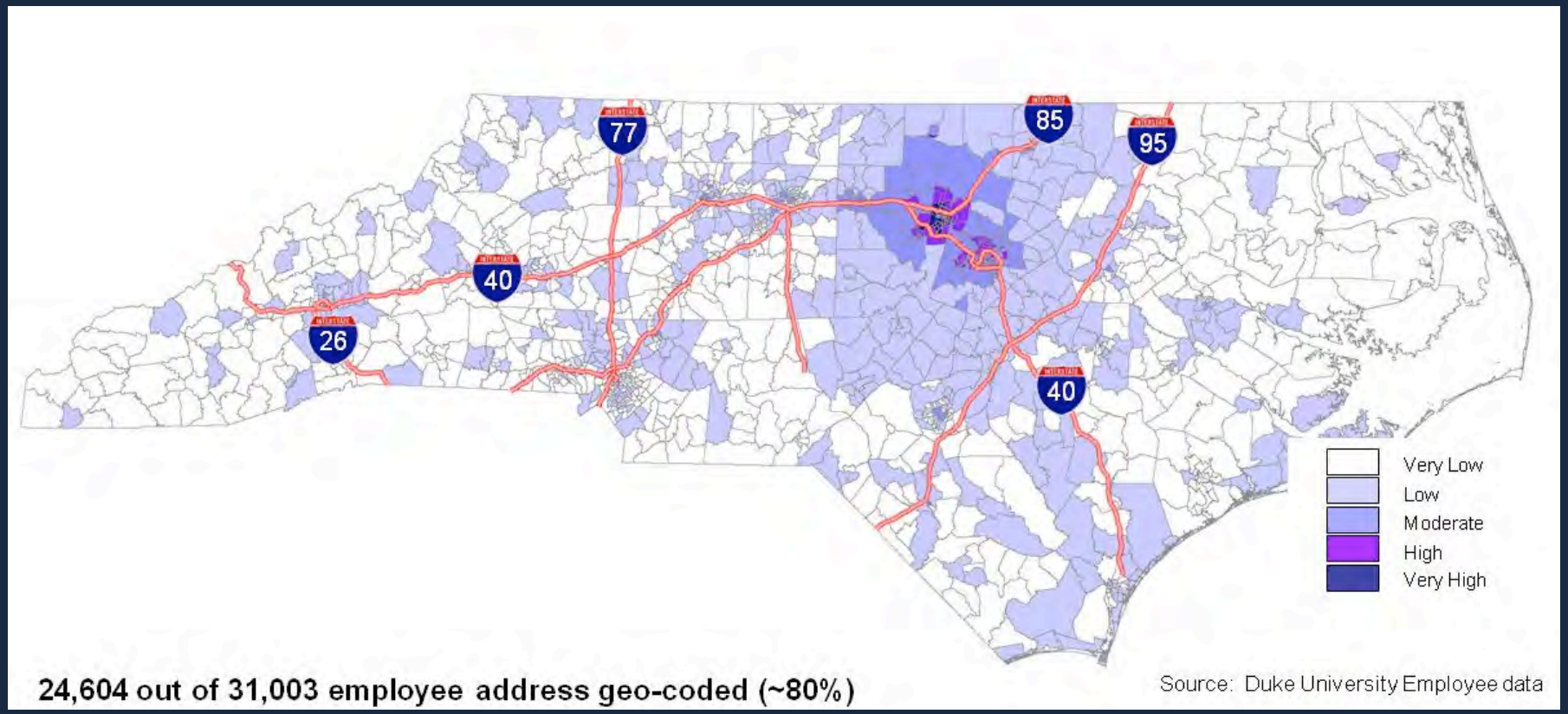


Duke University Parking

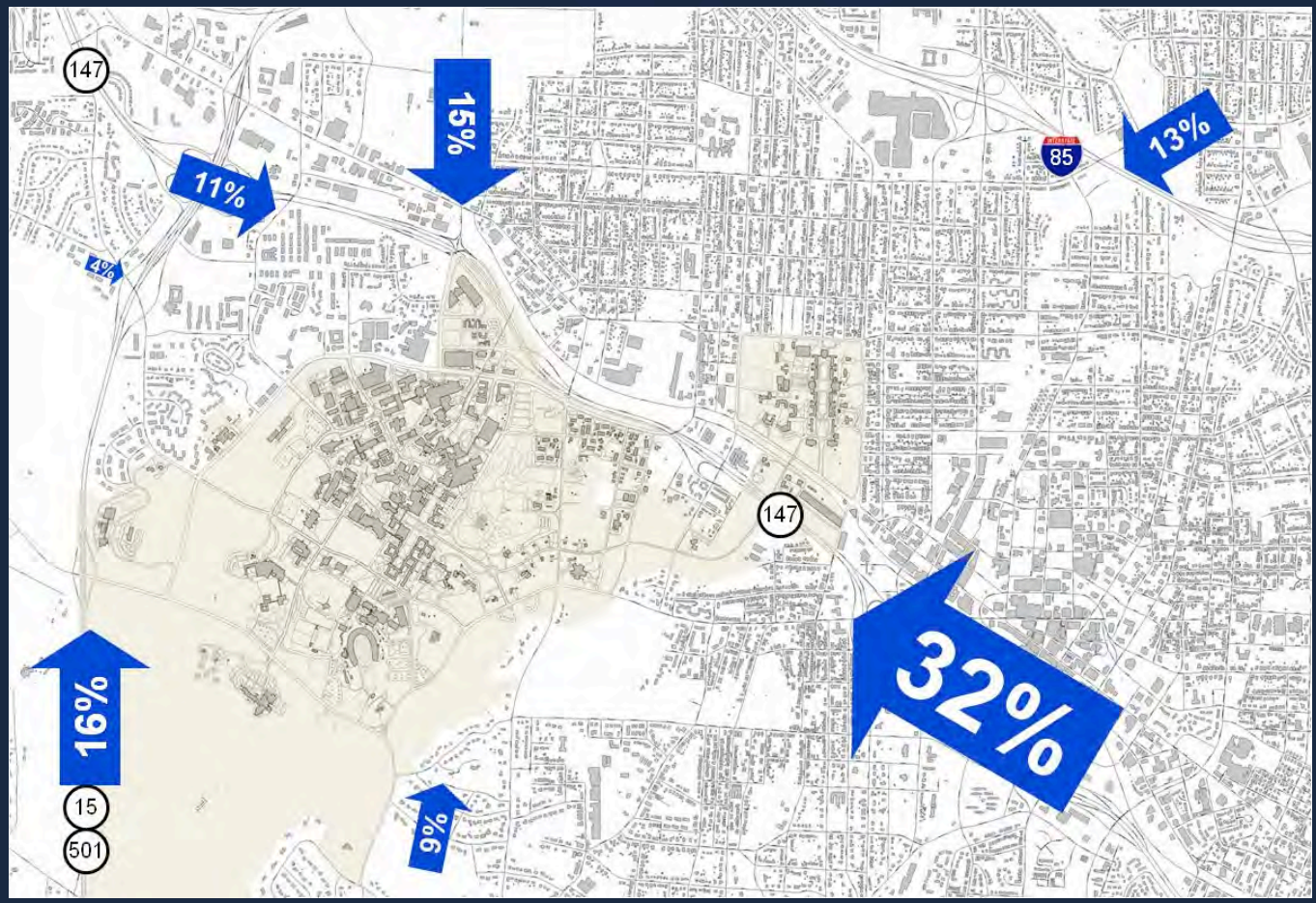


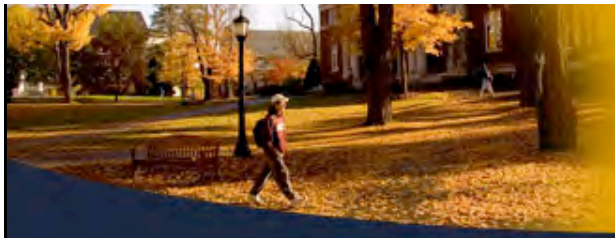
Overall Transit Network

Employee Commuting Trips: Duke Employee Distribution

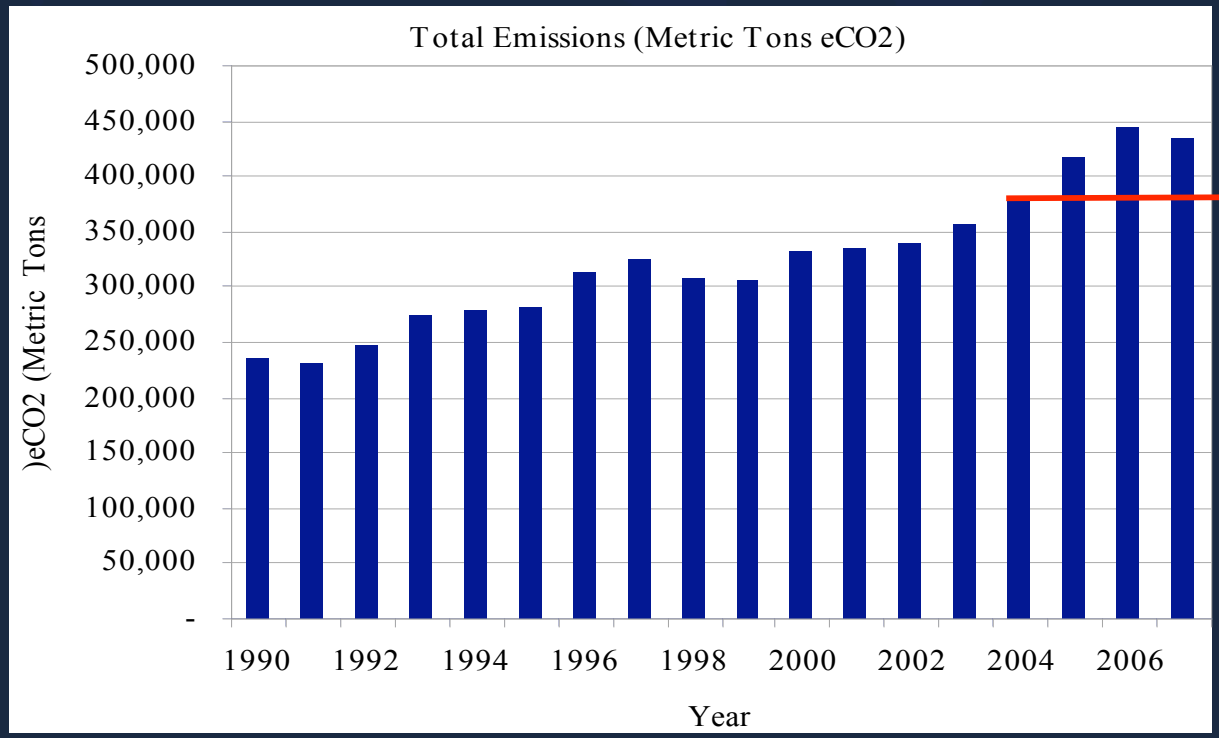


Duke Employee Commuting Patterns





Campus-wide Emissions



15% increase since 2004

2004 levels = 377,489 **+ 10.5%**

2005 levels = 416,951 **+ 6.5%**

2006 levels = 444,002 **- 2.3%**

2007 levels = 433,961

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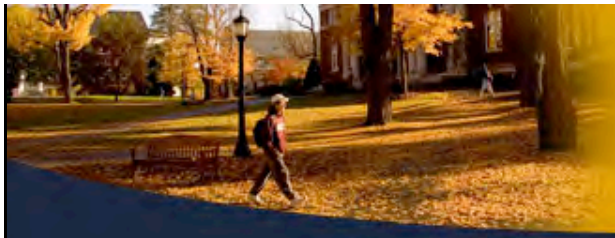
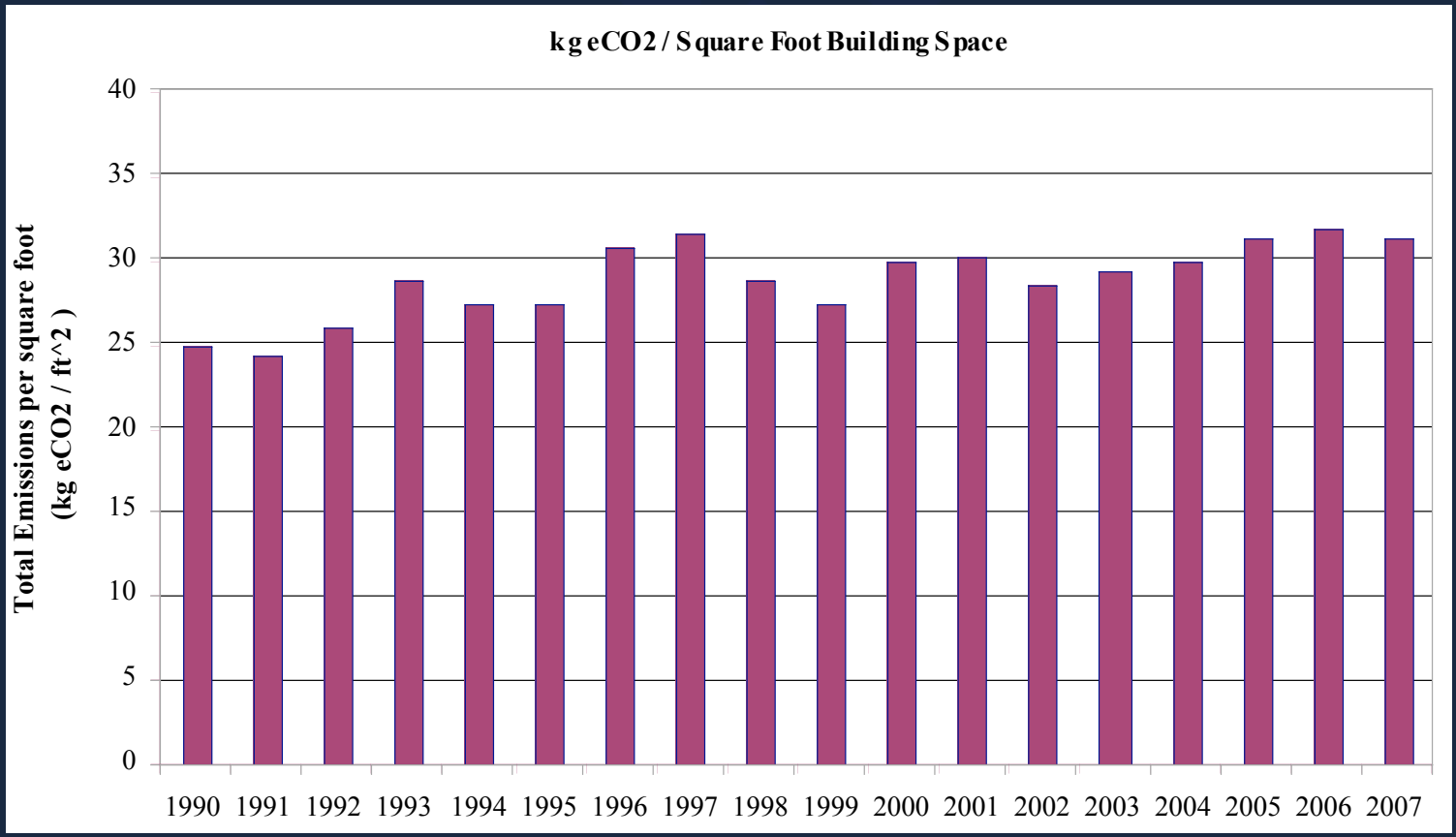
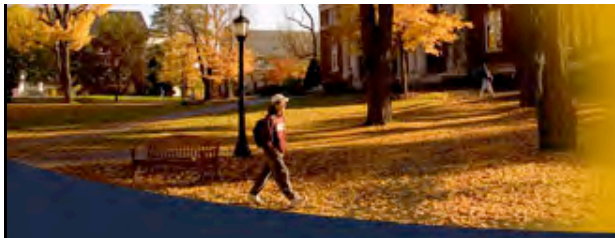


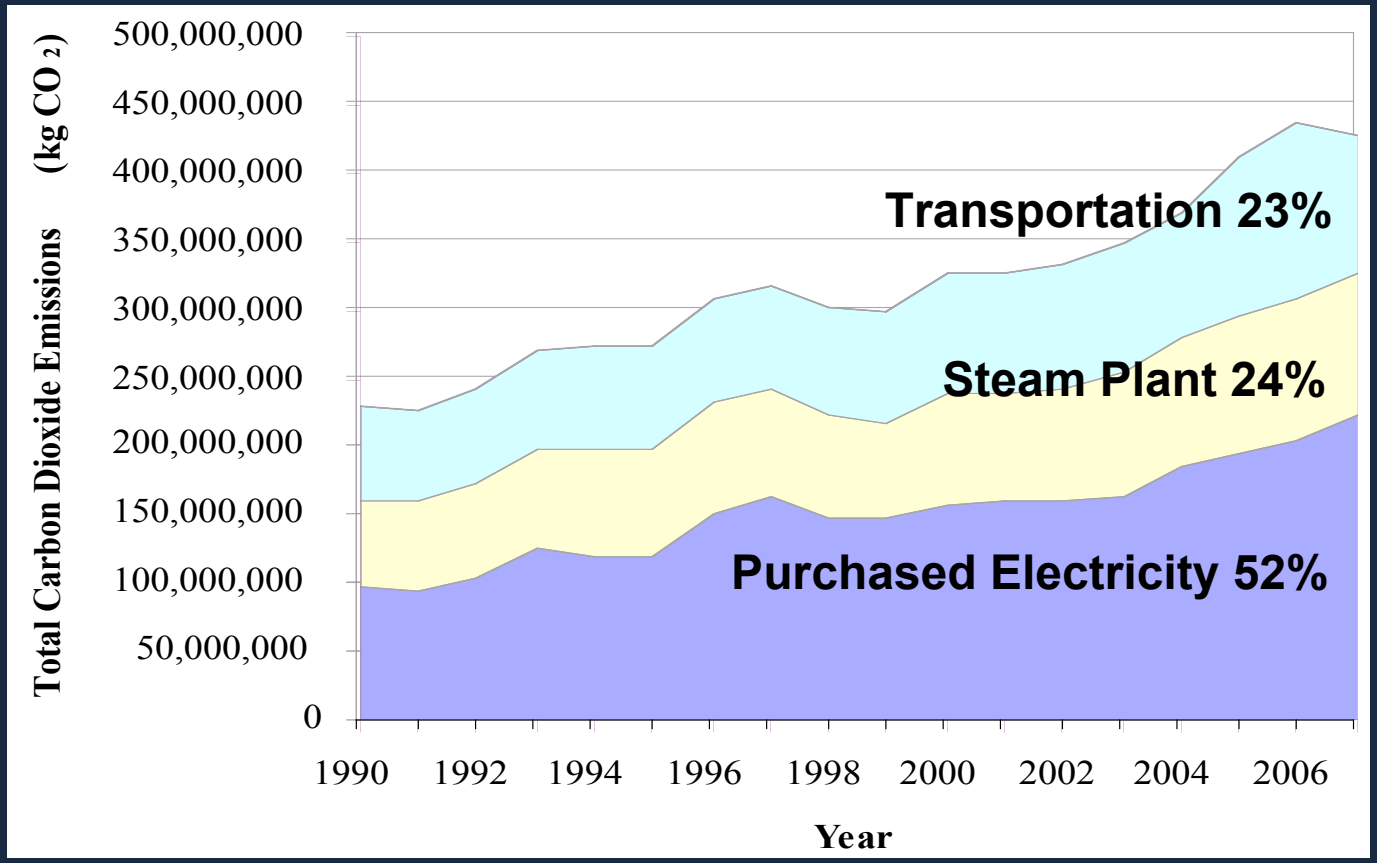
Emissions and Campus Growth



2004 = 30.0 **2005 = 31.3** **2006 = 32** **2007 = 31.2**



Emissions by Scope



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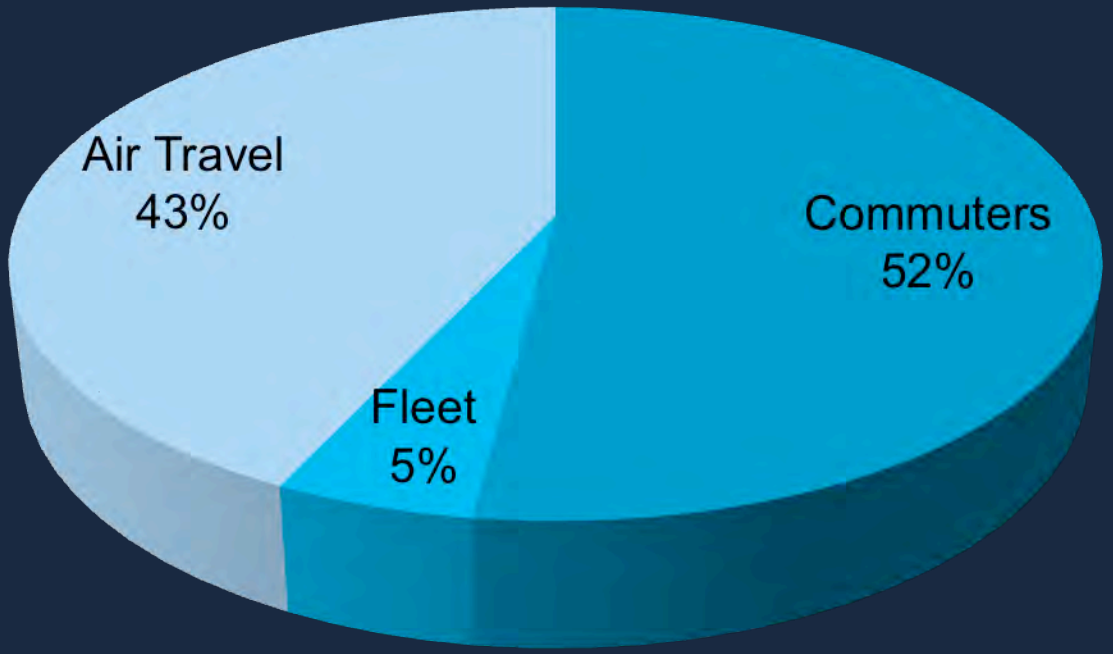
TDM Keys to Success

- **Provide comprehensive plan**
- **Support University vision and policies**
- **Tailor for different land uses and user groups**
- **Couple with parking management**
- **Encourage investment in and use of alternative modes**
- **Reinforced by physical design elements**
- **Periodically monitor and modify**

Eliminate the "Yeah, buts…"

Transportation-Related Emissions



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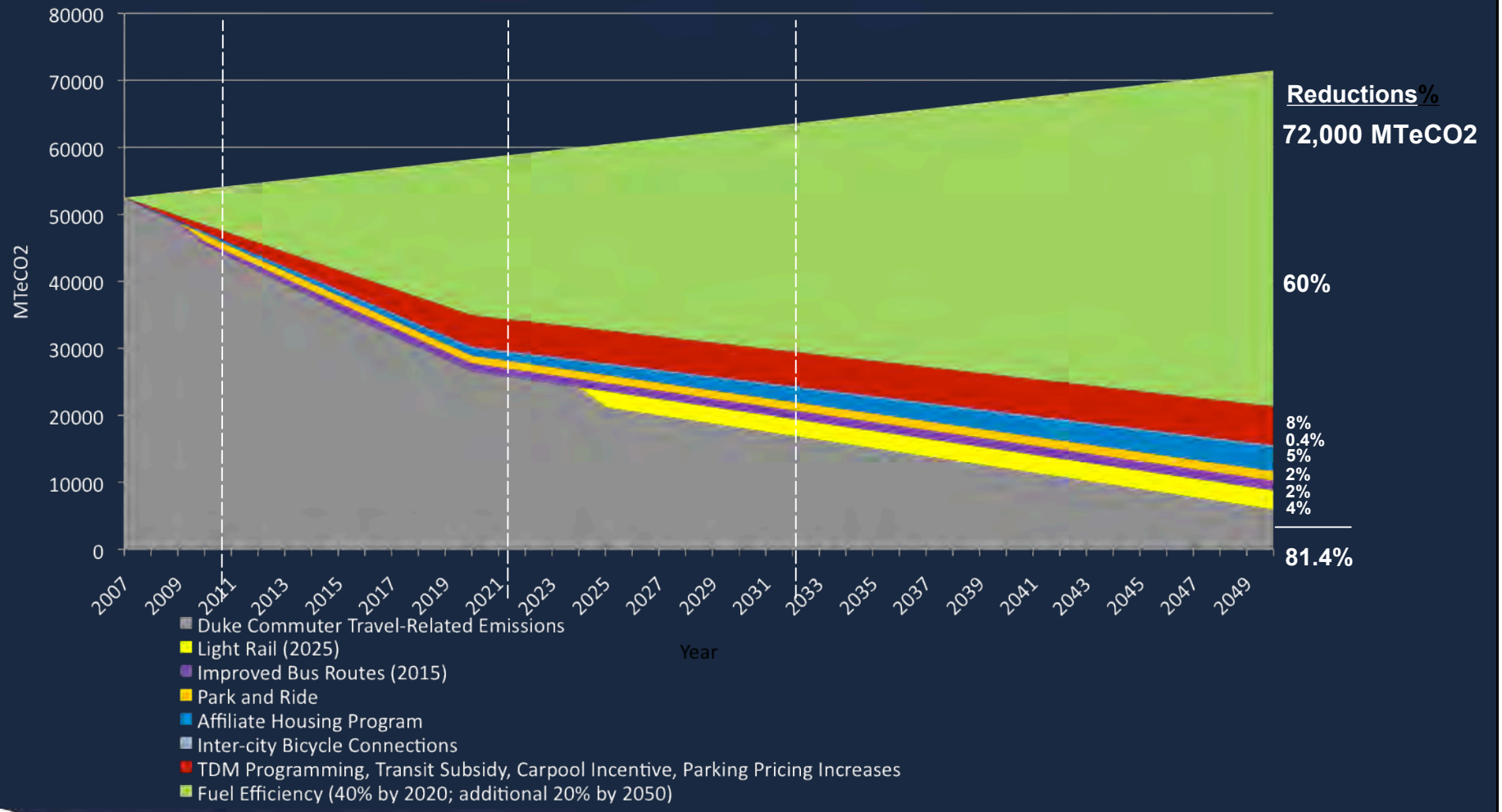

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		Duke Incremental Annual Cost $	GHG Reduction MTeCO2	$/MTeCO2	Reduction % Percent of Commuter %	Percent of All Transport %	Percent of Total Duke Emissions %
	Commuter Related						
Duke	TDM Programming	$120,000	2,012	$60	3.8%	2.0%	0.48%
	Transportation Coordinator	$62,500					
	Program Budget	$57,500					
	Additional Transit Subsidy	$(584,880)	293	$(1,996)	0.6%	0.3%	0.07%
	Carpool Incentive	$23,080	790	$29	1.5%	0.8%	0.19%
	Parking Pricing Increases	$(8,103,060)	1,157	$(7,004)	2.2%	1.1%	0.28%
	Park and Ride	$(2,145,140)	1,060	$(2,024)	2.0%	1.1%	0.25%
	Inter-city Bicycle Connections	$(219,530)	233	$(942)	0.4%	0.2%	0.06%
	Affiliated Housing (1,500 units)	$(2,628,000)	2,625	$(1,001)	5.0%	2.6%	0.63%
Regional Advocacy	Improved Transit Service	$(420,350)	1,060	$(397)	2.0%	1.1%	0.25%
	Light Rail/BRT	$ (1,261,040)	2,080	$(606)	4.0%	2.1%	0.50%
External	Commuter Vehicle Efficiency (Near-Term)	$ -	20,998	$ -	40.0%	20.9%	5.04%
	Commuter Vehicle Efficiency (Long-Term)	$ -	10,499	$ -	20.0%	10.4%	2.52%
			42,807		81.5%	42.5%	10.27%

15.5% Commuter Related Emissions

8.1% Transportation Related Emissions

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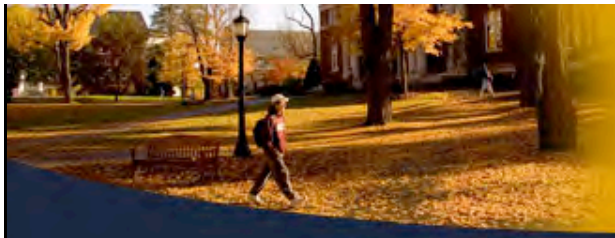


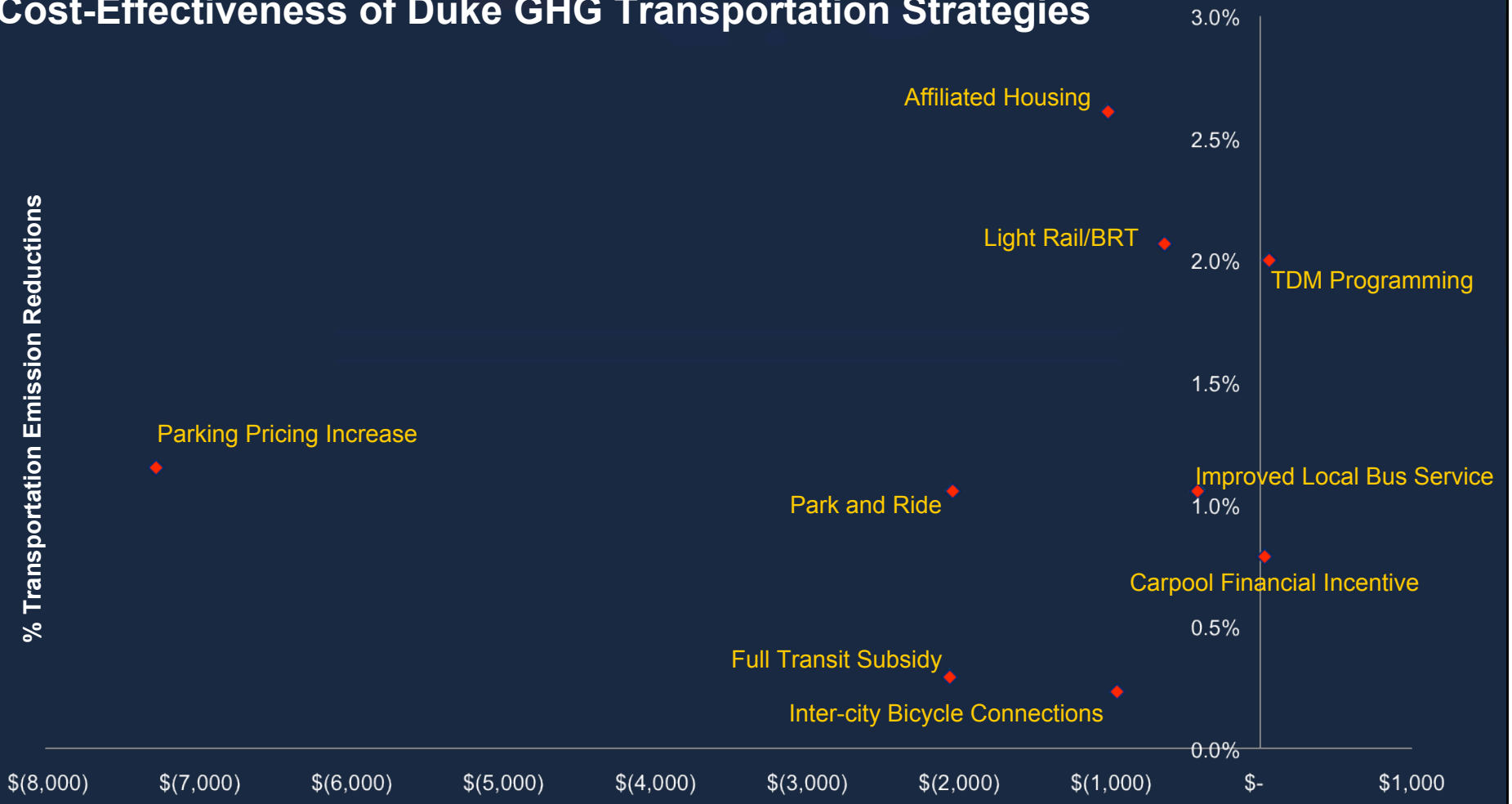
Commuter Wedge

- Estimated Mode Split Shift

2007		Full Program Implementation	
77%	Drive Alone	45%	Drive Alone
10%	Carpool/Rideshare	20%	Carpool/Rideshare
3%	Bicycle	7%	Bicycle
3%	Walk	5%	Walk
3%	Transit (Bus)	19%	Transit*
3%	Other	3%	Other
<1%	Vanpool	<1%	Vanpool

*Includes Park and Ride

Cost-Effectiveness of Duke GHG Transportation Strategies



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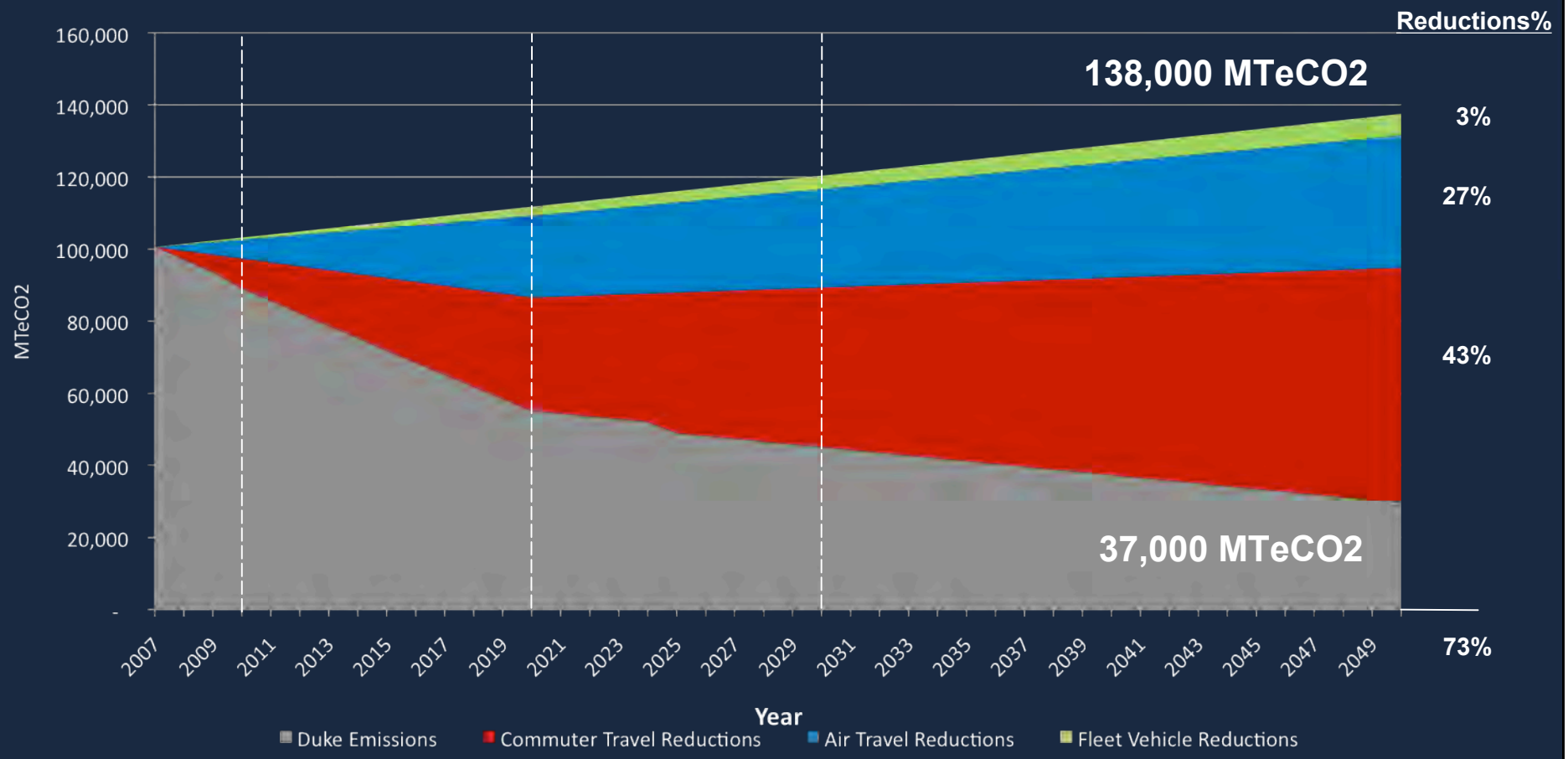
Total Duke Transportation-Related GHG Emission Reductions



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PCC web site:
http://www.presidentsclimatecommitment.org/index1.php

AASHE "how to guide" web site:
http://www.aashe.org/wiki/climate-planning-guide

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