City of Madison Climate Goals

ALERT TOP STORY

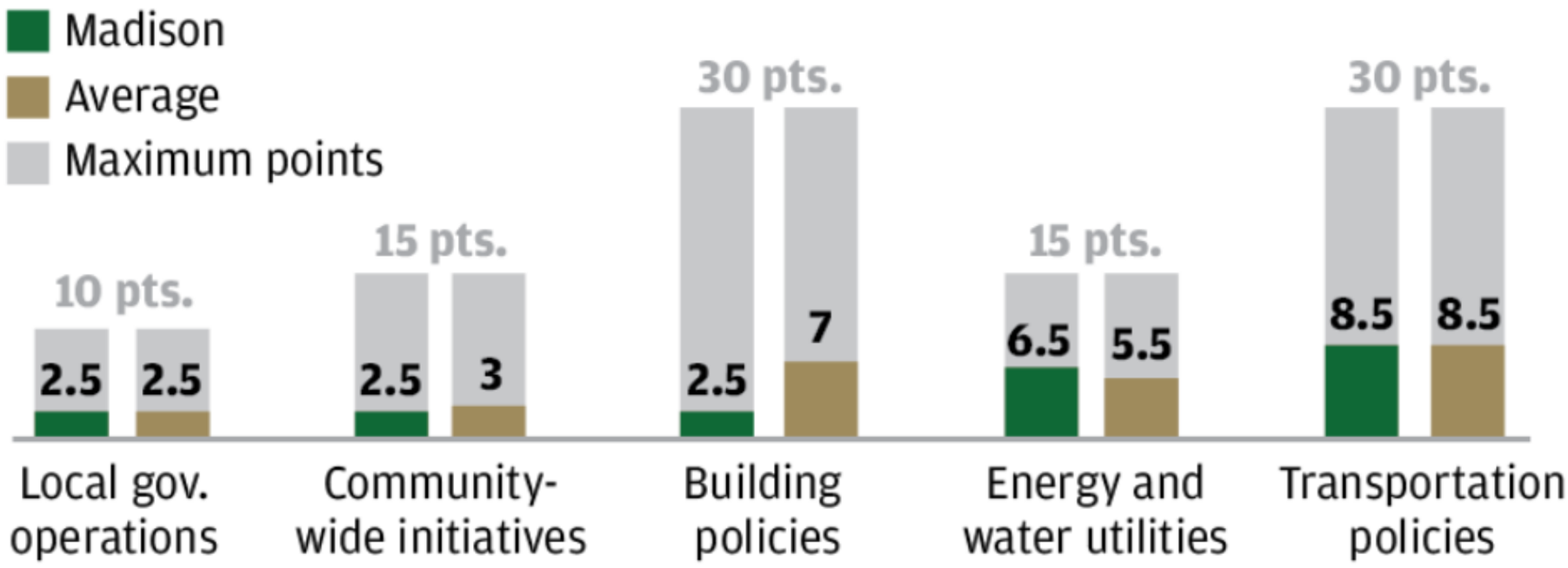
CLEAN ENERGY | NO. 64 OUT OF 100

Report: Madison not on track to meet climate goals; study blames lax building standards

Chris Hubbuch | Wisconsin State Journal Oct 10, 2020

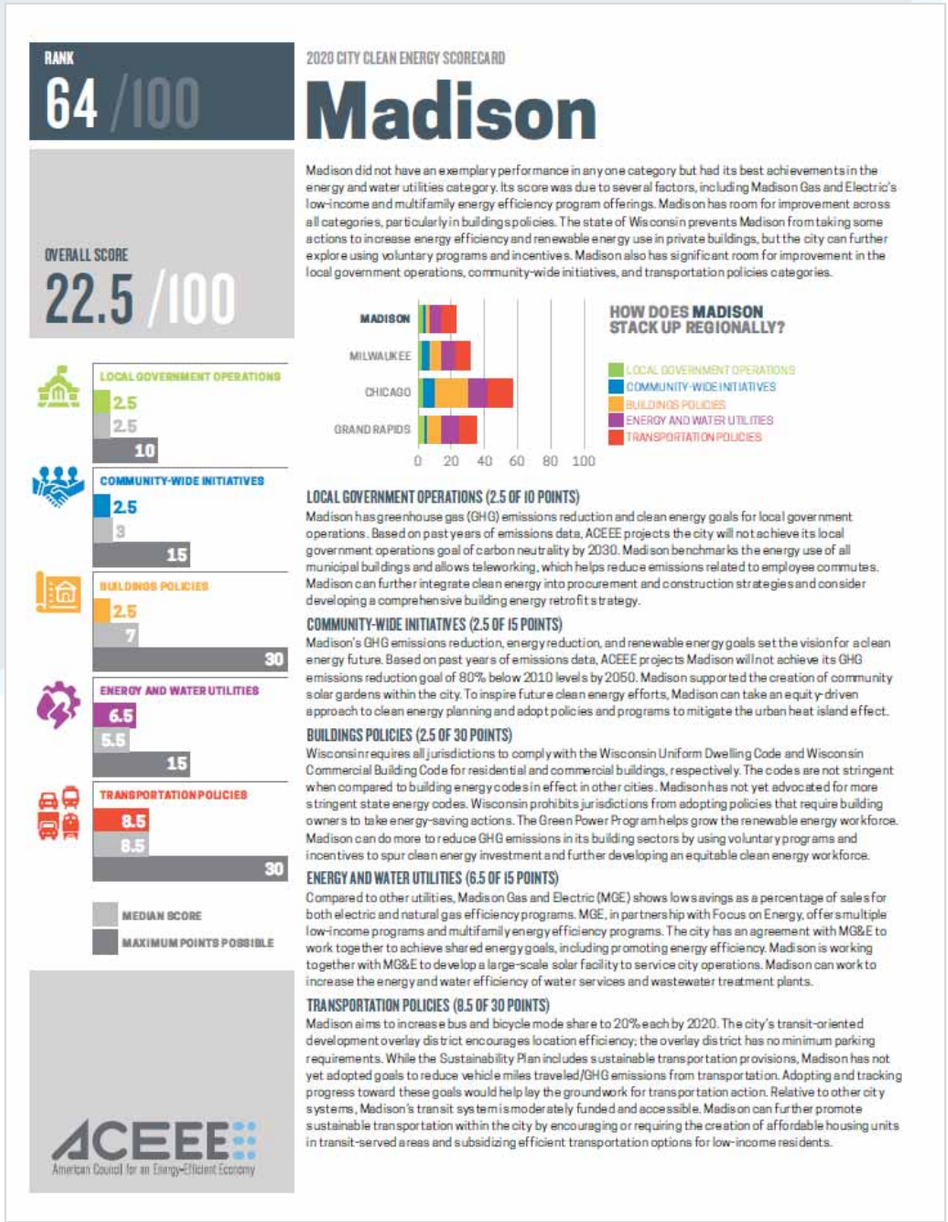
Madison's clean energy scorecard

Despite ambitious greenhouse gas reduction goals, Madison scored 22.5 out of 100 points in a study by the American Council for an Energy-Efficient Economy, ranking in the bottom half of large U.S. cities.



SOURCE: American Council for an Energy-Efficient Economy

State Journal



When they were collecting data (spring), our sustainability director wasn't able to provide all of the data requests (Covid19 and elections)

They used the 2011 Sustainability report as a base, instead of the 2018 100% Renewable report.

Even if able to provide information, some of the rating we can not control due to current Wisconsin Building codes (and the inability to enforce stricter codes)

Two Major Ways Transportation Affects Climate Goals

1. **Internal measures**
2. **External measures (decreasing VMT)**

1. Internal Measures

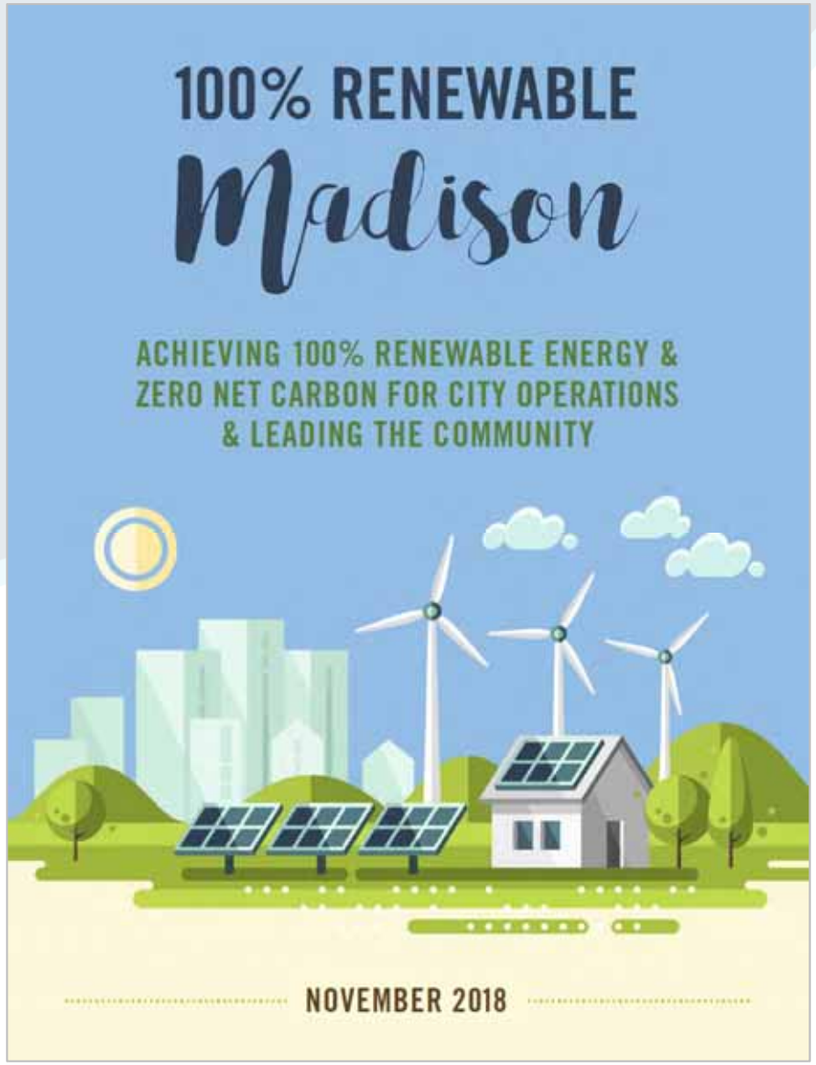


TABLE 2-4. SCENARIO 3: 100% RENEWABLE ENERGY AND ZERO NET CARBON BY 2030

MEASURE TYPE	ACTION
Efficiency (Demand)	Lighting Retrofits
	HVAC Retrofits
	HVAC Controls Retrofits
	HVAC RCx
	Plug Load Management Strategies
	Building Envelope Improvements
	Street Lighting Upgrades
	Water Distribution Optimization Strategies
Renewable Generation (Supply)	Behind-the-Meter Solar: Phase 1
	Behind-the-Meter Solar: Phase 2
	Utility Scale Solar (MGE RER or Alliant)
	Utility Fuel Mix (MGE and Alliant)
Transportation (Demand)	Green Fleet Measures
	100% Electric Buses
	Passenger Car EV Procurement
	Light Duty EV Procurement
	Landfill CNG Fueling
	Mid Duty EV Procurement
	Heavy Duty CNG Procurement
Investments	RECs
	Carbon Offsets

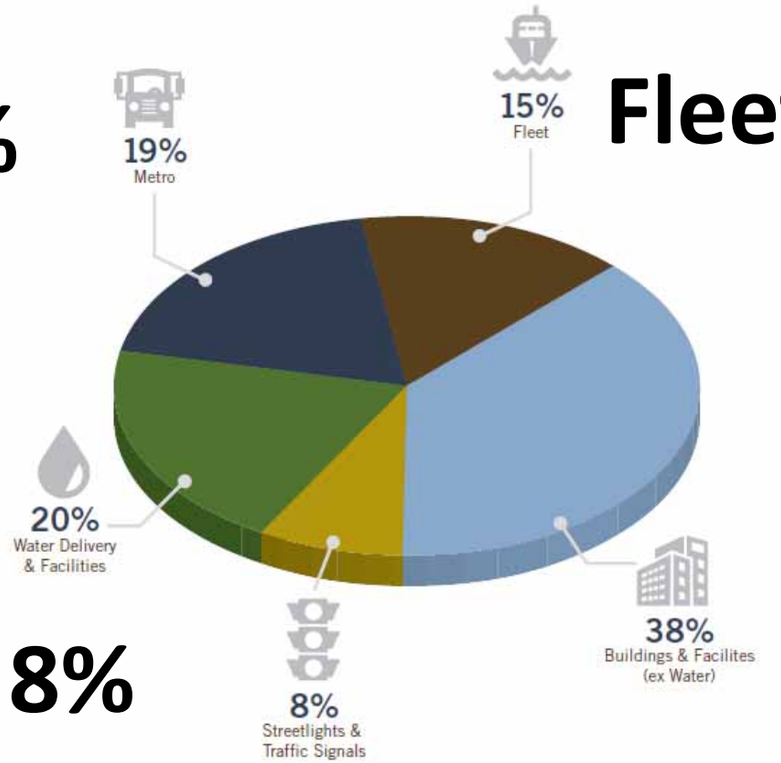
Source: HGA

Metro 19%

Fleet 15%

Signals and Lights 8%

FIGURE A-2. BASELINE CARBON EMISSIONS FOR CITY OPERATIONS BY CATEGORY*



***Excludes landfill, city employee commute, and City-owned housing emissions. Source: HGA based on ICLEI*

Figure A-3 illustrates baseline carbon emissions for municipal operations by fuel type in 2018, the baseline year for the report, including electricity (57%), diesel (29%), natural gas (9%) and gasoline (5%).

LED Streetlight replacement has been advanced in the 2021-2023 budget. All streetlights will have LED fixtures by 2023.

- Convert all 6,000 city maintained non-LED streetlight fixtures to LED
- $3.1 million project (2021: $850K, 2022: 750K, 20203: $1.5M)
- Estimated to save $390,000 in electricity cost alone annually
- Additional savings in maintenance cost

City Celebrates Major Solar Installation Milestone, Mayor Doubles GreenPower program

Led primarily by Facilities

Thursday, October 15, 2020 - 2:55pm

MADISON, WI – The City's GreenPower trainees will be busy for at least the next few years installing solar panels on City buildings at a 'rapid pace,' according City of Madison Mayor Satya Rhodes-Conway. At 9 a.m., Oct. 15, 2020, Mayor Satya Rhodes-Conway celebrated the City reaching its 1 Megawatt goal at Metro Transit, the latest and largest solar installation in City history. Rhodes-Conway spoke during a press conference about the project and what it means for the GreenPower Program expanding moving forward.

"Today we achieve our first goal, that we set for ourselves as a City related to solar energy," Rhodes-Conway said. "In 2014, we adopted a budget to achieve the Madison Megawatt, which aimed to install one megawatt of solar energy on city facilities by 2020, and today we reach that goal."

The solar panel installation on Metro Transit, located at 1101 East Washington Avenue in Madison, pushed the City past its one megawatt goal. The City now has 2.5 percent of its building electric use provided by solar power. The solar production offsets roughly 950 metric tons of carbon dioxide emissions per year, which is equivalent to the emissions of an average passenger vehicle driving 2.3 million miles. Twenty-six City buildings have solar installations, and there are more to come.

"We are going to dramatically ramp up the speed at which we install solar on our rooftops," Mayor Satya Rhodes-Conway said. "My proposed budget and capital improvement plan, will achieve our next one megawatt of solar in

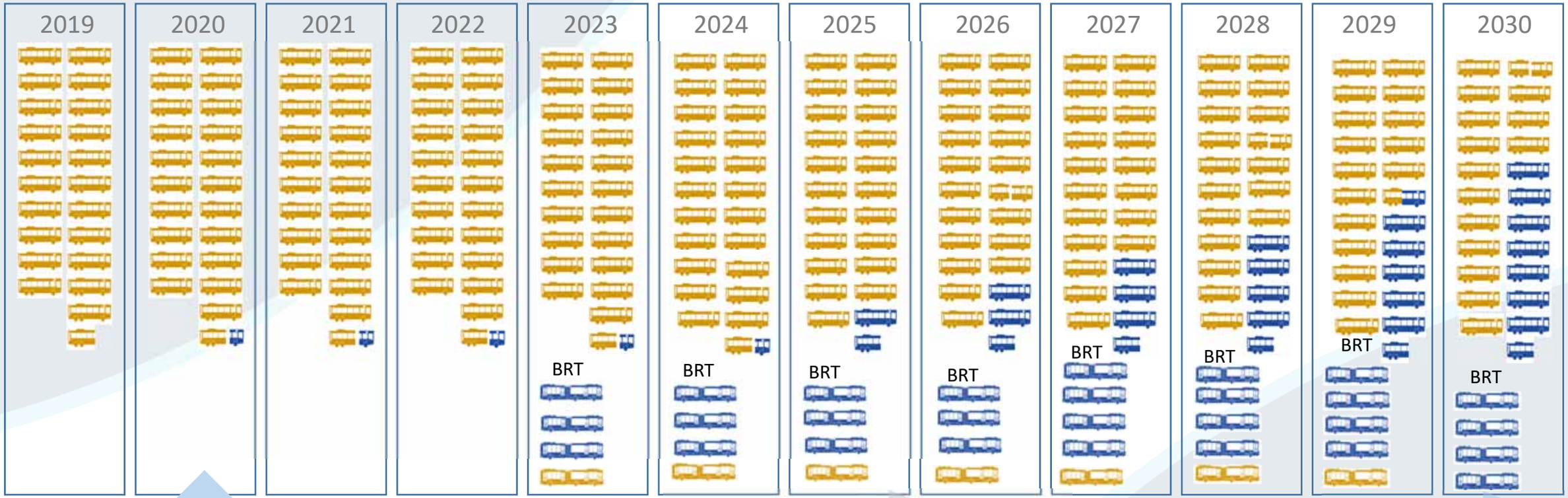
Links

Watch the press conference

Solar Power of Metro Project in Real Time

SCENARIO 3 **100% Renewable Energy and Zero Net Carbon by 2030**	**All Scenario 1 & 2 Measures** **Efficiency (Demand)** HVAC Retrofits Plug Load Management Strategies Building Envelope Improvements **Renewable Generation (Supply)** Behind-the-Meter Solar (Phase 2) **Transportation** 100% Electric Buses Mid-Duty EV Procurement Heavy Duty CNG Procurement **Policy** RECs and Carbon Offsets	•55% carbon reduction with 25% self-generated renewable energy •45% RECs and carbon offsets •$95M investment over 13 years; IRR 17% •Cost savings to city of $78M by 2030 •Reduce total carbon emissions by 426,000 tons by 2030 •Societal co-benefits range from $21M - $162M by 2030

Bus Replacement Schedule Dictates Fleet Conversion



EW retrofitted to allow electric buses in building, with capacity to charge 3 buses

+10 electric buses/year
Assumes charging capacity is provided

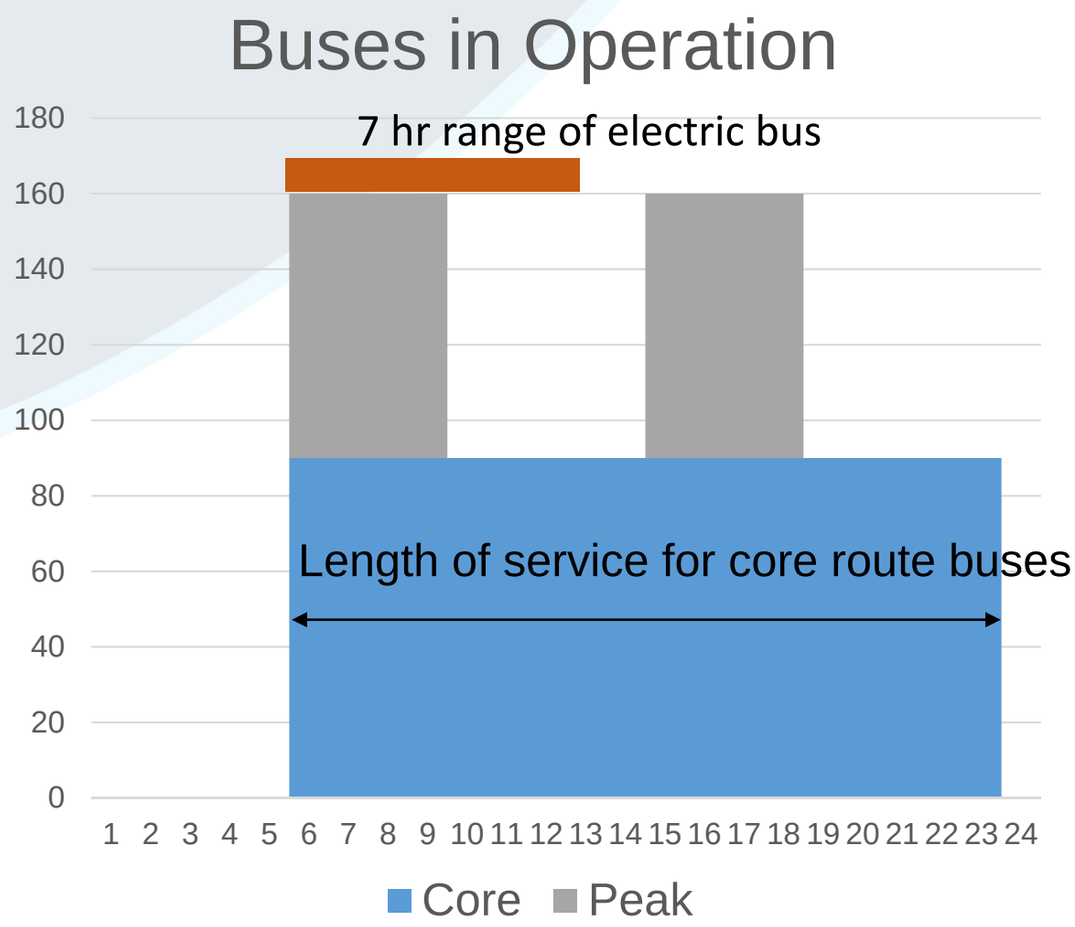
+15 electric buses/year

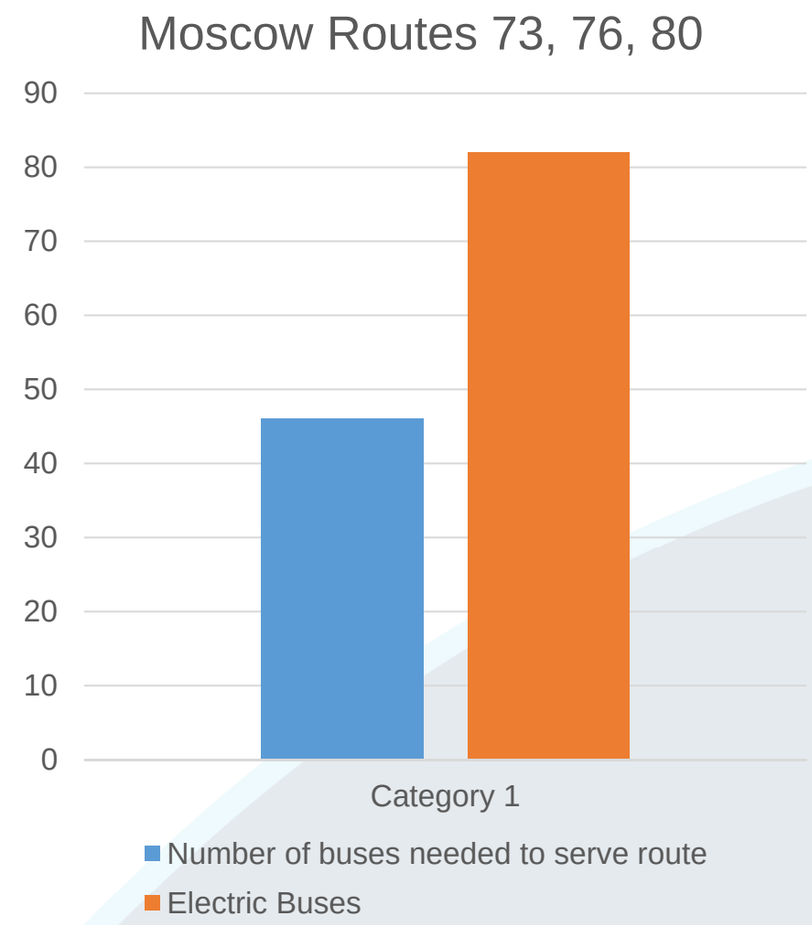
= 10 electric buses ~$0.7M/ea

= 10 diesel buses ~$0.5M/ea

= 10 electric articulated buses ~$1.2M/ea

Challenges





Moscow experience suggests that more electric buses may be needed to serve same routes

Other efforts

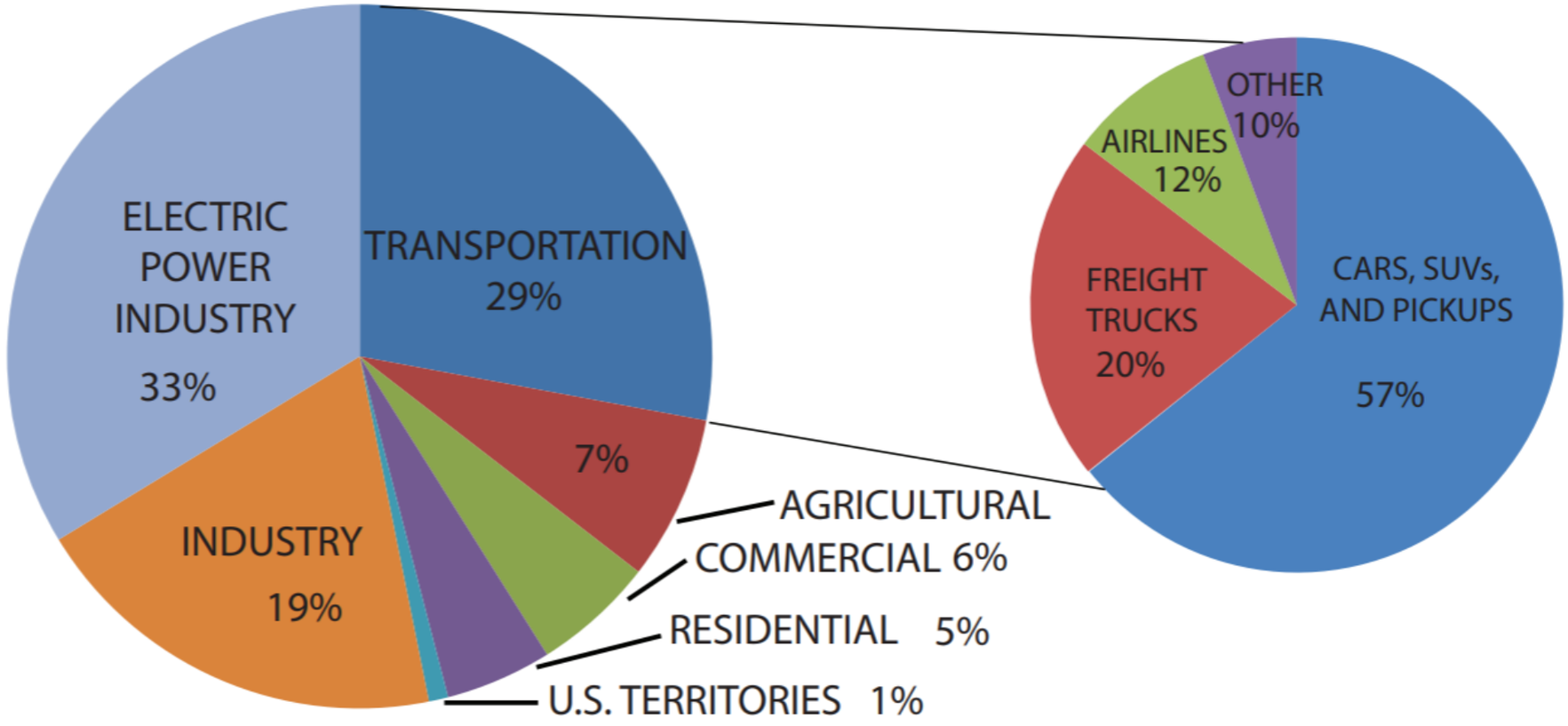
- Parking vehicle electric procurement
- Electric cargo bike pilot project (summer 2020)

Changing Travel Mode to Non-polluting

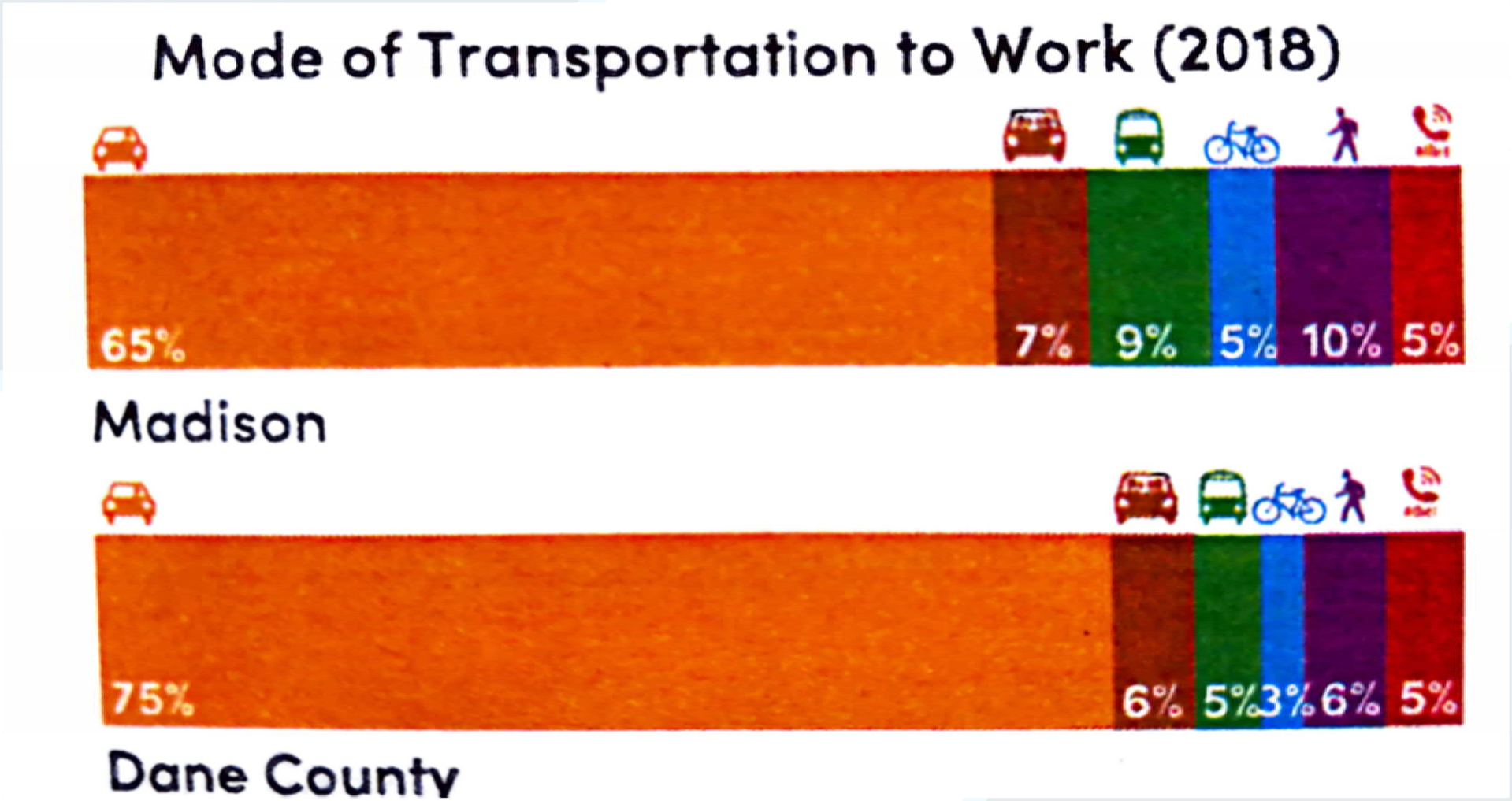
FIGURE 1

Transportation Accounts For 29% of U.S. Greenhouse Gas Emissions.

Source:
U.S. Environmental Protection Agency, *Inventory of Greenhouse Gas Emissions and Sinks: 1990-2007*, April 2009.



Complete Streets – Active Transportation



Madison Rankings

Transit

40th

1. New York City, New York – 56.5%
2. Jersey City, New Jersey – 47.6%
3. Washington, D.C. – 37.4%
4. Boston, Massachusetts – 33.7%
5. San Francisco, California – 33.1%
6. Cambridge, Massachusetts – 28.6%
7. Chicago, Illinois – 27.6%
8. Newark, New Jersey – 26.7%
9. Arlington, Virginia – 26.4%
10. Yonkers, New York – 26.4%
11. Philadelphia, Pennsylvania – 26.2%
12. Alexandria, Virginia – 21.7%
13. Berkeley, California – 21.6%
14. Oakland, California – 20.3%
15. Seattle, Washington – 20.1%
16. Daly City, California – 19.8%
17. Baltimore, Maryland – 18.6%
18. Pittsburgh, Pennsylvania – 17.0%
19. Hartford, Connecticut – 16.6%
20. Stamford, Connecticut – 14.1%
21. Richmond, California – 14.0%
22. Edison, New Jersey – 13.4%
23. New Haven, Connecticut – 13.3%
24. Minneapolis, Minnesota – 13.1%
25. Portland, Oregon – 12.1%
26. Paterson, New Jersey – 11.9%
27. Bellevue, Washington – 11.8%
28. Buffalo, New York – 11.7%
29. Miami, Florida – 11.4%
30. Elizabeth, New Jersey – 11.3%
31. Ann Arbor, Michigan – 11.2%
32. East Los Angeles, California – 10.9%
33. Bridgeport, Connecticut – 10.8%
34. Cleveland, Ohio – 10.5%
35. Los Angeles, California – 10.6%
36. Concord, California – 10.0%
37. Atlanta, Georgia – 9.8%
38. Naperville, Illinois – 9.7%
39. St. Louis, Missouri – 9.4%
40. Madison, Wisconsin – 9.3%

Bike

13th

1. Davis, California 23.2%
2. Berkeley, California 9.7%
3. Boulder, Colorado 8.9%
4. Somerville, Massachusetts 7.4%
5. Cambridge, Massachusetts 7.4%
6. Palo Alto, California 7.3%
7. Portland, Oregon 7.2%
8. Eugene, Oregon 6.8%
9. Fort Collins, Colorado 6.2%
10. Santa Barbara, California 6.1%
11. Missoula, Montana 6.1%
12. Bloomington, Indiana 5.5%
13. Madison, Wisconsin 5.3%
14. Flagstaff, Arizona 5.2%
15. Ann Arbor, Michigan 5.0%
16. Chico, California 4.7%
17. Minneapolis, Minnesota 4.6%
18. Iowa City, Iowa 4.6%
19. Gainesville, Florida 4.4%
20. San Francisco, California 4.4%
21. Bellingham, Washington 4.2%
22. Mountain View, California 4.1%
23. Washington, D.C. 3.9%
24. Seattle, Washington 3.7%
25. College Station, Texas 3.7%
26. Tempe, Arizona 3.7%
27. Oakland, California 3.7%

Walk

10th

1. Cambridge, Massachusetts 25.76%
2. Ann Arbor, Michigan 16.52%
3. Berkeley, California 15.99%
4. New Haven, Connecticut 14.0%
5. Columbia, South Carolina 13.78%
6. Provo, Utah 13.39%
7. Boston, Massachusetts 13.36%
8. Providence, Rhode Island 12.56%
9. Washington, D.C. 12.27%
10. Madison, Wisconsin 10.99%
11. New York City, New York 10.72%
12. Syracuse, New York 10.31%
13. Pittsburgh, Pennsylvania 10.02%
14. San Francisco, California 9.82%
15. Wichita Falls, Texas 9.29%
16. Philadelphia, Pennsylvania 9.22%
17. Jersey City, New Jersey 8.17%
18. Newark, New Jersey 8.03%
19. Seattle, Washington 7.72%
20. Allentown, Pennsylvania 7.55%
21. Baltimore, Maryland 7.28%
22. Worcester, Massachusetts 7.11%
23. Norfolk, Virginia 7.05%
24. Minneapolis, Minnesota 6.85%
25. Honolulu, Hawaii 6.8%
26. Erie, Pennsylvania 6.7%
27. Rochester, New York 6.65%
28. Eugene, Oregon 6.43%
29. Paterson, New Jersey 5.97%
30. Hartford, Connecticut 5.89%
31. Chicago, Illinois 5.8%
32. Arlington, Virginia 5.77%
33. Cincinnati, Ohio 5.61%

2015 acs

Key DOT efforts that shift mode and reduce VMT

- **Bus Rapid Transit**
- **Increased Transit Usage (network redesign)**
- **TDM Ordinance**
- **Complete Streets – Active Transportation**
- **Shared Streets – Active Transportation**
- **Transit Oriented Design Overlay (future)**

Bus Rapid Transit and Transit Network Design

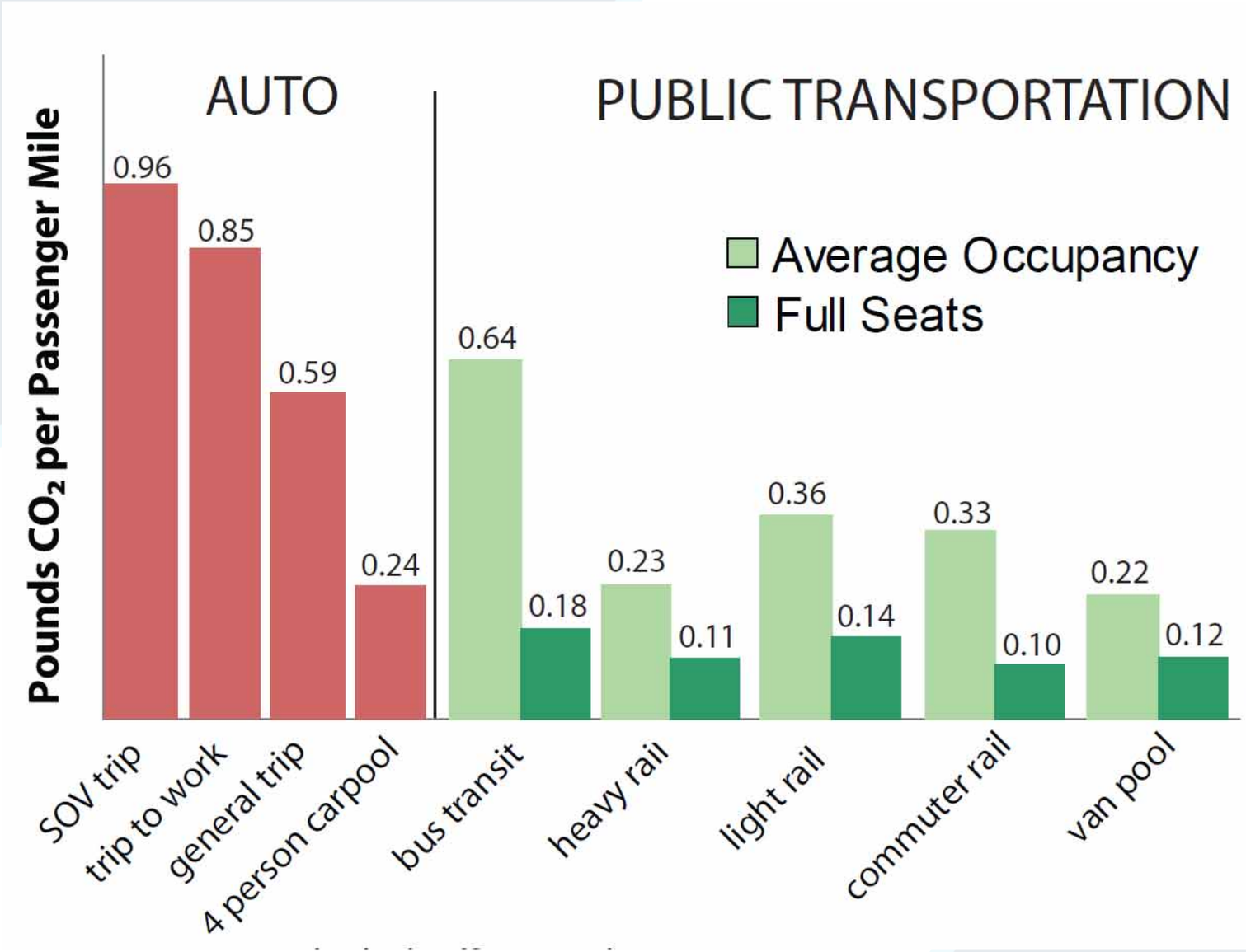


FIGURE 3
Estimated CO_2 Emissions per Passenger Mile for Average and Full Occupancy

Sources:
See Appendix II for data sources and methodology.

Notes: The average number of passengers for private auto trips is 1.14 for work trips and 1.63 for general trips.

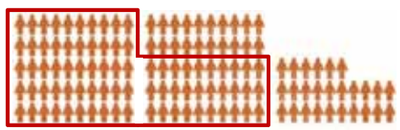
Sustainable Infrastructure

Moving people, not just cars

Source: Capital Metro/ Nelson\Nygaard

Less required in public infrastructure investment

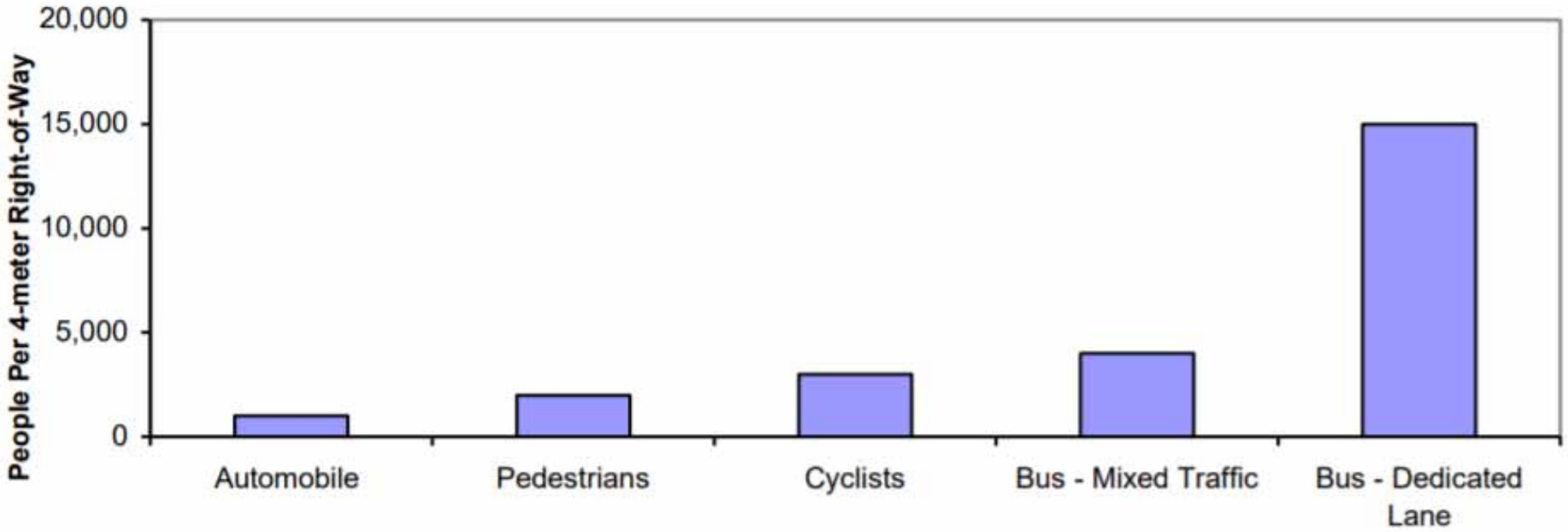
126 People move through this roadway during each light cycle. 80 in transit.



235 People on a road with transit-only lanes move through this roadway during each light cycle. 204 in transit.

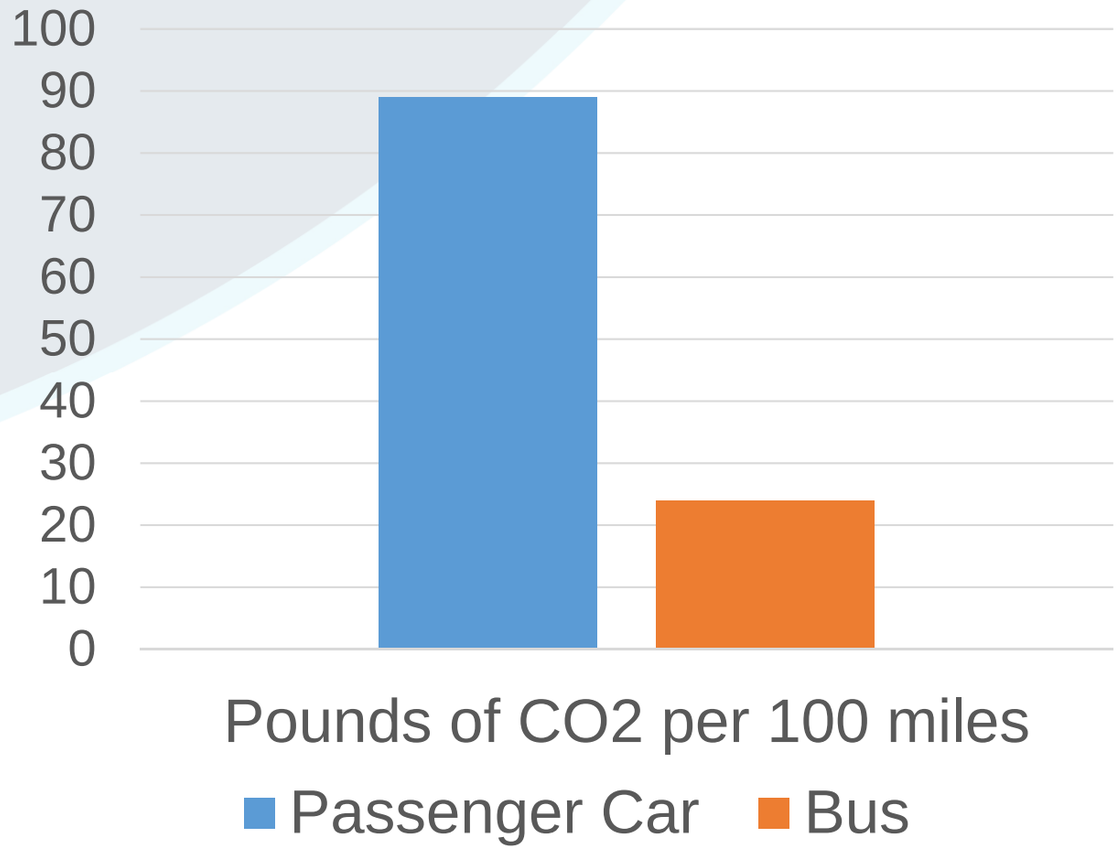
DEPARTMENT OF TRANSPORTATION

Figure 7 **Maximum Passengers Per Hour on Lane By Urban Mode**



The number of passengers carried by 4 meters of urban road right-of-way varies by mode, travel speed and load factor (passengers per vehicle). Automobiles are generally least space-efficient: an urban street lane can typically accommodate up to 800 vehicles with about 1,000 passengers per hour.

Metro reducing emissions from the private sector



Source: CGGC, based on mpg figures from (Barnitt, 2008) and CO_2 per gallon of fuel from (EPA, 2009).

10,000 new riders per workday reduces CO2 emissions by 6,000 tons/year

40 pass/bus, 3 mile average trip, weekdays only

This reduction would represent 1/3 of Metro's emissions

TDM effect on VMT

Arlington Co Virginia

The percentage of Arlington residents driving alone to work has dropped from 63% in 2001 to 53% in 2013.

The percentage of Arlington workers driving alone, including those coming in from other jurisdictions, has dropped from 59% in 2001 to 54% in 2013.

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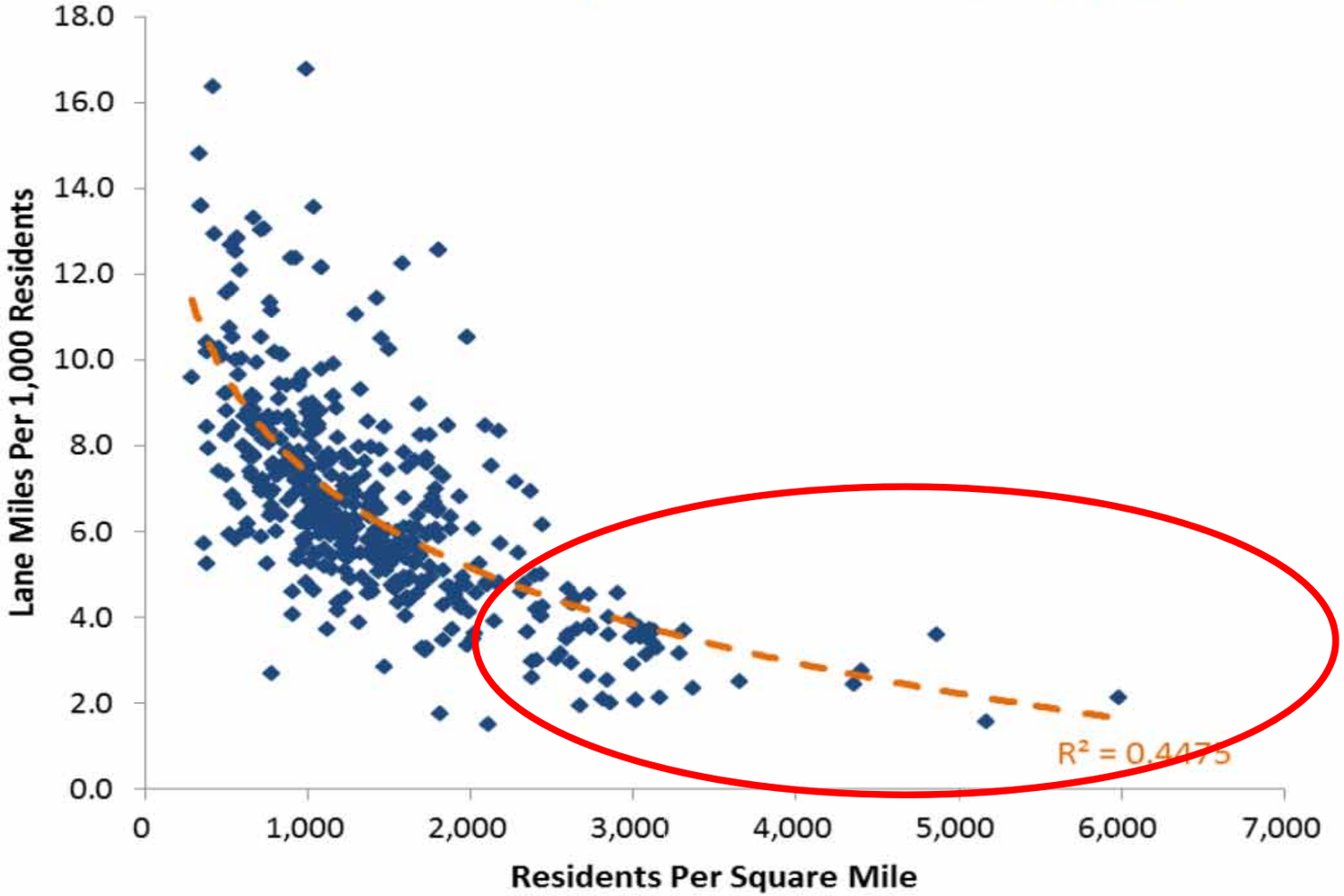
Sustainable Land Use

Figure 7 **Urban Density Versus Roadway Supply** (FHWA 2012, Table HM72)



Per capita roadway supply declines with density (Each dot represents a U.S. urban region.)

Transit helps:

- **Increase density which:**
- **Reduces land consumption**

Density and Trips

FIGURE 5
Vehicle Trips per Day of Transit Oriented Development (TOD) Housing Sites versus Typical Housing Sites
Source: *TCRP 128: Effects of TOD on Housing, Parking and Travel, 2008.*