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Brookings Institution Ranks Nation's 100 Largest Metro Areas for Carbon Footprint

Many Southern Metro Areas Have Largest Footprints; Western Ones Have Smallest

Development Patterns and Rail Transit Play Role

(Washington, DC) – A new report from the Brookings Institution quantifies, for the first time, the carbon footprint of the nation's 100 largest metropolitan areas and reveals—along with dramatic variation between metro areas—that regions with high density, compact development, and rail transit offer a more energy and carbon efficient lifestyle than sprawling, auto-centric areas.

In addition, the report confirms that although carbon emissions from urban centers continue to climb, the carbon footprint of someone living in a large metro area is 14 percent smaller than the average American's and, in recent years, has expanded by only half as much.

“Because two-thirds of us live in the nation's largest metro areas and nearly three-quarters of economic activity takes place there, large metro areas account for most of the greenhouse gas emissions in this country,” commented Bruce Katz, a Brookings vice president and director of the Metropolitan Policy Program there. “For that reason, metropolitan America will play a critical role in the nation's push to restrain its emissions. Fortunately, many metro areas offer major advantages for doing that.”

Entitled “Shrinking the Carbon Footprint of Metropolitan America,” the Brookings report quantifies the most significant sources of carbon emitted by the 100 largest U.S. metropolitan areas in 2000 and 2005. Data in the study reports on the fuels used by vehicles (personal and freight) and the energy used in residential buildings and so represent a partial carbon footprint because the results do not include emissions from commercial buildings, industry, or non-highway transportation. Still, these carbon footprints provide a basis for identifying the pricing, land use, and other policy changes that are needed to reduce the energy consumption and carbon emissions of metro America.

Per Capita Carbon Footprints from Transportation and Residential Energy Use Varied Widely by Metro Area in 2005

Largest Carbon Footprints (out of 100 Largest Metros)	Smallest Carbon Footprints (out of 100 Largest Metros)
1. Lexington-Fayette, KY	1. Honolulu, HI
2. Indianapolis, IN	2. Los Angeles-Long Beach- Santa Ana, CA
3. Cincinnati-Middletown, OH-KY-IN	3. Portland-Vancouver-Beaverton, OR-WA
4. Toledo, OH	4. New York-Northern New Jersey-Long Island, NY-NJ-PA
5. Louisville, KY-IN	5. Boise City-Nampa, ID
6. Nashville-Davidson-Murfreesboro, TN	6. Seattle-Tacoma-Bellevue, WA
7. St. Louis, MO-IL	7. San Jose-Sunnyvale-Santa Clara, CA
8. Oklahoma City, OK	8. San Francisco-Oakland-Fremont, CA
9. Harrisburg-Carlisle, PA	9. El Paso, TX
10. Knoxville, TN	10. San Diego-Carlsbad-San Marcos, CA
Visit www.blueprintprosperity.org for complete list of 100 metros' carbon footprints	

Topmost among the stories told by the new data is the large degree of variation reported between the carbon footprints of U.S. metropolitan areas. In 2005, per capita carbon emissions were highest in Lexington, KY and lowest in Honolulu, according to the report. The average resident in Lexington emitted two and a half times more carbon from transport and homes in 2005 than the average resident in Honolulu.

Variations in footprint size are due in large part to development patterns and rail transit. For example, many metro areas with small carbon footprints, such as New York, San Francisco, San Diego, and Los Angeles, have sizeable rail transit ridership and are densely built, while low-density metros like Nashville, TN and Oklahoma City are prominent in the ten largest per capita emitters. There are exceptions, however. Washington, Baltimore, and Atlanta all have high rail transit ridership but also have larger than average carbon footprints.

Carbon emissions show strong regional trends as well. The Mississippi River roughly divides the country into high and low emitters. In 2005, all but one of the 10 largest per capita emitters was located east of the Mississippi. Most of the metro areas with the smallest per capita footprints were located in the west. A north-south divide is also apparent with seven of the highest per capita emitters located south of Lake Erie, including two each from Tennessee, Ohio and Kentucky.

The west is the only region that decreased its carbon footprint over the five-year period. The midwest, northeast, and south all grew their carbon emissions. Trenton, NJ saw the most growth in its per capita footprint between 2000 and 2005. Conversely, Youngstown, OH and Grand Rapids, MI each saw their carbon footprints decline by 14 percent during the five-year period – the largest declines in the 100 metro areas.

In addition to the role of low-density land use and limited transit availability, one of the reasons that regions, such as the south, have a large carbon footprint is because of its heavy reliance on electricity for air conditioning and heating. Many of these same areas get their electricity from fuel sources with a high carbon content. For example, Washington, DC metro's residential electricity footprint was ten times larger than Seattle's footprint in 2005 partly because the area's mix of fuels includes high-carbon sources of electricity such as coal while Seattle draws its electricity largely from carbon-free hydropower.

Exacerbating a growing carbon footprint is electricity pricing. As natural gas and petroleum fuel use for home heating has declined over the past several years, electricity consumption has increased rapidly in the residential sector. Each of the 10 metros with the lowest per capita electricity footprints are in states -- including California, New York, and Michigan -- with higher than average prices. Many of the states with the highest electricity consumption and largest footprints have the lowest prices.

Another growing problem in metro areas across the country is freight. Twenty-four percent of all highway fuel consumed and carbon emitted within our 100 largest metro areas comes from trucks as opposed to cars. Growth in truck traffic is now outpacing growth in car traffic, and truck VMT (vehicle miles traveled) is expected to grow by more than 2 percent annually through 2020.

In recent years, state and local governments have taken steps to improve energy efficiency and curb carbon emissions. The federal government, however, has been slower-moving, the Brookings report contends. For example, fossil fuels are under-priced encouraging over consumption. Highway construction is favored over rapid transit. And finally, federal policy fails to promote energy efficiency in its housing policies.

"As the nation considers future actions to address climate change, metros and the built environment have been largely left out of the discourse when they are in fact where so much will be determined," said Dr. Marilyn A. Brown, professor, School of Public Policy, Georgia Institute of Technology. "Metropolitan America is the traditional locus of technological, entrepreneurial, and policy innovations and so is poised to play a leadership role in solving the nation's energy and climate challenges."

But so will national policy interventions be necessary.

"While many metro areas are taking the lead on climate action, they will be hard pressed to shrink their carbon footprints in the absence of supportive federal policies," added Mark Muro, policy director of the Metropolitan Policy Program and the co-author of a forthcoming Brookings policy agenda to be issued as part of the institution's *Blueprint for American Prosperity*, a multi-year initiative to promote metro-friendly federal policy stances.

"Metros can't 'go it alone' in solving as vast a problem as global climate change," Muro said.

In that vein, the Brookings report offers a portfolio of economy-wide and metro-targeted transportation and housing recommendations on how the federal government should step up its support of metropolitan efforts to shrink the nation's carbon footprint.

To improve the carbon efficiency of the wider economy, the report urges that Washington put a price on carbon; increase investment in energy R&D; establish a national renewable electricity

standard; help states reform their electricity regulations; and improve information collection on emissions and energy consumption.

To help metro areas reduce demand, for energy consumption, the paper recommends at greater length that the federal government empower states and metro areas to:

- Expand transit and compact development options
- Engage in regional freight planning to introduce more energy-efficient freight operations
- Stimulate energy efficient retrofitting
- Incentivize location efficient housing decisions
- Issue a metropolitan challenge to develop innovative solutions that integrate land use, transportation, energy, and other areas

The report concludes: “Altogether, a federal pro-metropolitan portfolio of carbon policies could place metropolitan America at the forefront of problem-solving on the nation’s energy and climate challenges.”

Much more information about the new research and the policy agenda are provided in a short policy brief and in the full-length report, available at www.blueprintprosperity.org

Author Bios

Marilyn A. Brown is a professor of energy policy in the School of Public Policy at the Georgia Institute of Technology and a visiting distinguished scientist at Oak Ridge National Laboratory. Her research has focused on the impacts of policies and programs aimed at accelerating the development and deployment of sustainable energy technologies. In 2007, she was designated a co-recipient of the Nobel Peace Prize for her work on the Intergovernmental Panel on Climate Change.

Frank Southworth is a member of the senior R&D staff at the Oak Ridge National Laboratory in Tennessee and a principal research scientist at the Georgia Institute of Technology in Atlanta. His interests center on the adoption of cost effective, energy efficient and environmentally sustainable forms of transportation, with a current emphasis on freight logistics and urban form.

Andrea Sarzynski is a senior research analyst in the Metropolitan Policy Program at the Brookings Institution. Her research focuses on measuring and understanding urban form and its transportation and environmental consequences.

About the Metropolitan Policy Program at Brookings

Created in 1996, the Metropolitan Policy Program (MPP) provides decision makers with cutting edge research and policy ideas for improving the health and prosperity of metropolitan areas including their component cities, suburbs, and rural areas. To learn more visit:

www.brookings.edu/metro.

About The Blueprint for American Prosperity

“Shrinking the Carbon Footprint of Metropolitan America” was prepared as part of MPP’s *Blueprint for American Prosperity*, a multi-year initiative to promote an economic agenda for the nation that builds on the assets and centrality of America’s metropolitan areas. Grounded in empirical research and analysis, the Blueprint offers an integrated policy agenda and specific federal reforms designed to give metropolitan areas the tools they need to generate economically productive growth, to build a strong and diverse middle class, and to grow in environmentally sustainable ways. Learn more at www.blueprintprosperity.org.

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