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New Study: Global Shift from Cars to Mass Transit Can Save More than US\$100 Trillion and Eliminate 1,700 Megatons of CO₂ Pollution by 2050

Urban Transportation Systems an Emerging Priority Ahead of UN Climate and Sustainable Development Meetings

NEW YORK (17 September, 2014)—More than \$100 trillion in cumulative public and private spending, and 1,700 megatons of annual carbon dioxide (CO₂)—a 40 percent reduction of urban passenger transport emissions—could be eliminated by 2050 if the world expands public transportation, walking and cycling in cities, according to a new report released by the University of California, Davis, and the Institute for Transportation and Development Policy (ITDP).

Further, an estimated 1.4 million early deaths could be avoided annually by 2050 if governments require the strongest vehicle pollution controls and ultralow-sulfur fuels, according to a related analysis of these urban vehicle activity pathways by the International Council on Clean Transportation (ICCT) included in the report.

“Transportation, driven by rapid growth in car use, has been the fastest growing source of CO₂ in the world, said Michael Replogle, ITDP’s managing director for policy and co-author of the report. “An affordable but largely overlooked way to cut that pollution is to give people clean options to use public transportation, walking and cycling, expanding mobility options especially for the poor and curbing air pollution from traffic.”

“The analysis shows that getting away from car-centric development will cut urban CO₂ dramatically and also reduce costs, especially in rapidly expanding economies,” said report co-author Lew Fulton, co-director of NextSTEPS Program at the Institute of Transportation Studies at UC Davis. “It is also critical to reduce the energy use and carbon emissions of all vehicles.”

The report, *A Global High Shift Scenario*, is the first study to examine how major changes in transport investments worldwide would affect urban passenger transport emissions as well as the mobility of different income groups. The authors calculated CO₂ emissions in 2050 under two scenarios, a business-as-usual scenario and a “High Shift” scenario where governments significantly increased rail and clean bus transport, especially Bus Rapid Transit (BRT), and helped urban areas provide infrastructure to ensure safe walking, bicycling and other active forms of transportation. The projections also include moving investments away from road construction, parking garages and other ways that encourage car ownership.

Under this High Shift, not only would CO₂ emissions plummet, but the net financial impact of this shift would be an enormous savings over the next 35 years, covering construction, operating, vehicle and fuel-related costs.

The report was released at the United Nations Habitat III Preparatory Meeting in New York on September 17th, in advance of the September 23rd United Nations Secretary-General's Climate Summit, where many nations and corporations will announce voluntary commitments to reduce greenhouse gas emissions, including new efforts focused on sustainable transportation.

Better Mobility Leads to Social Mobility

The new report also describes sustainable transportation as a key factor in economic development. Under the High Shift scenario, mass transit access is projected to more than triple for the lowest income groups and more than double for the second lowest groups. Notably, the overall mobility evens out between income groups, providing those more impoverished with better access to employment and services that can improve their family livelihoods.

"Today and out to 2050, lower income groups will have limited access to cars in most countries under almost any scenario; improving access to modern, clean, high-capacity public transport is crucial," said Fulton.

"Unmanaged growth in motor vehicle use threatens to exacerbate growing income inequality and environmental ills, while more sustainable transport delivers access for all, reducing these ills. This report's findings should help support wider agreement on climate policy, where costs and equity of the cleanup burden between rich and poor are key issues," noted Replogle.

Emission Standards Save Lives

Air pollution is a leading cause of early death, [responsible for more than 3.2 million early deaths annually](#). Exposure to vehicle tailpipe emissions is associated with increased risk of early death from cardiopulmonary disease and lung cancer, as well as respiratory infections in children. Car and diesel exhaust also increases the risk of non-fatal health outcomes, including asthma and cardiovascular disease.

The International Council on Clean Transportation evaluated the impacts of urban travel by cars, motorcycles, trucks and buses on the number of early deaths from exposure to soot emitted directly from vehicle tailpipes. "Future growth in vehicle activity could produce a four-fold increase in associated early deaths by 2050, even with a global shift to mass transit," said ICCT's Joshua Miller, a contributor to the study. "We could avoid about 1.4 million early deaths annually if national leaders committed to a global policy roadmap that requires the strongest vehicle pollution controls and ultralow-sulfur fuels." Cleaner buses alone would account for 20 percent of these benefits.

Fuel Economy Standards Save Fuel and Cut CO₂ Emissions

While this study has not focused on further actions to boost motor vehicle fuel economy, it takes into account existing policies that, in the International Energy Agency's [Baseline scenario](#), improve average new car fuel economy by 32 percent in countries that belong to the Organisation for Economic Co-operation and Development (OECD), a group of 34 of the world's most developed, democratic, market economies, and 23 percent in non-OECD countries.

The High Shift scenario increases this to 36 percent and 27 percent respectively, due to improved in-use driving conditions and a slight shift to smaller vehicles. However, the Global Fuel Economy Initiative (GFEI) calls for much more: a 50 percent reduction in fuel use per kilometer for light-duty vehicles worldwide by 2030. Achieving the GFEI 2030 goal could reduce 700 megatons of CO₂ annually beyond the 1,700 reduction possible from a High Shift scenario. Taken together, achieving this fuel economy goal with better public transport, walking and cycling could cut annual urban passenger transport CO₂ emissions in 2050 by 55 percent from what they might otherwise be in 2050 and 10 percent below 2010 levels.

Cutting Emissions with Sustainable Transportation Across the World's Cities

Transportation in urban areas accounted for about 2,300 megatons of CO₂ in 2010, almost one quarter of carbon emissions from all parts of the transportation sector. Rapid urbanization—especially in fast developing countries like China and India—will cause these emissions to double by 2050 in the baseline scenario.

Among the countries examined in the study, three stand out:

- **United States:** Currently the world leader in urban passenger transportation CO₂ emissions, with nearly 670 megatons annually, the US is projected to lower these emissions to 560 megatons by 2050 because of slower population growth, higher fuel efficiencies, and a decline in driving per person that has already started as people move back to cities. But this pace can be sharply accelerated with more sustainable transportation options, dropping to about 280 megatons, under the High Shift scenario.
- **China:** CO₂ emissions from transportation are expected to mushroom from 190 megatons annually to more than 1,100 megatons, due in large part to the explosive growth of China's urban areas, the growing wealth of Chinese consumers, and their dependence on automobiles. But this increase can be slashed to 650 megatons under the High Shift scenario, in which cities develop extensive BRT and metro systems. The latest data show China is already sharply increasing investments in public transport.
- **India:** CO₂ emissions are projected to leap from about 70 megatons today to 540 megatons by 2050, also because of growing wealth and urban populations. But this increase can be moderated to only 350 megatons, under the High Shift scenario, by addressing crucial deficiencies in India's public transport.

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The Institute for Transportation and Development Policy (ITDP) is a global nonprofit that helps cities design and implement high-quality transit systems to make communities more livable, competitive and sustainable. ITDP works with cities worldwide to bring about transport solutions that cut greenhouse gas emissions, reduce poverty, and improve the quality of urban life. Please visit www.itdp.org for more information.

UC Davis is a global community of individuals united to better humanity and our natural world while seeking solutions to some of our most pressing challenges. Located near the California state capital, UC Davis has more than 34,000 students, and the full-time equivalent of 4,100 faculty and other academics and 17,400 staff. The campus has an annual research budget of over \$750 million, a comprehensive health system and about two dozen specialized research centers. The university offers interdisciplinary graduate study and 99 undergraduate majors in four colleges and six professional schools.

International Council on Clean Transportation (ICCT) is a non-profit research organization dedicated to improving the environmental performance and efficiency of transportation to protect public health, the environment, and quality of life. ICCT provides national and local policymakers with technical analysis of regulations, fiscal incentives, and other measures for clean vehicles and fuels. For more information, please visit www.theicct.org.