Three Revolutions in Urban Transportation

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Why we select this research?

This study from ITDP and UC Davis quantifies how major changes in urban transportation could evolve and interact on a global and regional basis. The authors considers possible outcomes, as well as transitional pathways and policies needed to get to wishful outcomes.

Key findings

There can be an 80% cut in CO2 emissions if cities embrace 3 revolutions (3R) in vehicle technology: automation, electrification, and, most importantly, ride sharing. The analysis shows how 3R synergy provides 40% reduction in urban vehicle transportation costs globally by 2050.

By encouraging a large increase in trip sharing, transit use, and active transport through policies that support compact, mixed use development, cities worldwide could save an estimated $5 trillion annually by 2050 while improving livability and increasing the likelihood of meeting climate change targets.

Each revolution addresses different societal needs, but can also lead to societal costs:

- Vehicle electrification can cut vehicle energy user and CO2 emissions. However, for electrification to have maximum benefits, power generation must be strongly shifted away from fossil fuels and deeply decarbonized. In addition, these vehicles will likely remain expensive for at least one more decade.
- Automation can provide important safety benefits, reduce labor costs, and enable

cheaper travel and more productive use of time. However, by lowering the cost of travel in terms of time and money, automation would likely induce more travel and dramatically reduce the number of jobs in transportation.
- Shared mobility, whether through shared vehicle trips or public transport, can lead to more efficient use of urban space, reduce traffic congestion, enable more walking and cycling, cut energy use and emissions, and generally improve urban livability. However, this would require large increases in load factors (passengers per vehicle trip), and a range of strong policies to achieve.

Overall, the analysis suggests that a combination of electrification, automation, and multimodal shared vehicle trips would bring by far the greatest societal benefits for every country in this study. But achieving the full 3R scenario will require unprecedented levels of policy support; it will require creativity and vigilance to ensure that not one or two, but all three, revolutions move forward and to prepare cities around the world for a new era of travel.

Reference

Fulton L., Mason J. & Meroux D. (2017). Three Revolutions in Urban Transportation. Retrieved from: https://www.itdp.org/3rs-in-urban-transport/