

ALTERNATIVE MOBILITY



OVERVIEW OF A HIGH-IMPACT DRAWDOWN SOLUTION

Replacing emissions-intensive vehicle miles traveled (VMTs) with zero- or low-carbon alternatives such as bicycling, walking, or tele-working can reduce GHG emissions. This bundle includes the following Drawdown Georgia solutions: bike infrastructure, walkable cities, telepresence, and e-bikes, with a specific focus on replacing short-distance vehicle trips with these alternatives.

TECHNOLOGY AND MARKET READINESS

These technologies are mature and market ready. Telecommuting and alternative mobility solutions such as bicycles are already widely used around the world and have some presence in Georgia. Given the minimal current presence of biking and alternative mobility, there is significant potential to reduce CO₂ emissions by replacing CO₂-intensive car trips with low-carbon alternatives. Telecommuting has even greater potential. With advances in video-conferencing and teleworking solutions, there is significant potential to reduce VMT by implementing teleworking policies, and many businesses and organizations already employ teleworking as a strategy to improve employee satisfaction and reduce operation costs.

LOCAL EXPERIENCE AND DATA AVAILABILITY

The Federal Highway Administration's National Transportation Survey has detailed data for VMT at the state level, which can be used to estimate reduction in VMT resulting from more widespread use of alternative mobility measures. Several cities around the state are planning or have already started implementing improvements to bicycling and walking infrastructure, such as the Transportation Alternative Program (TAP), Georgia Commute Options (GCO), and the Atlanta Regional Commission (ARC). Challenges include a lack of data relating to existing biking and telecommuting data as well as historical trends of these data.

TECHNICALLY ACHIEVABLE GHG REDUCTION POTENTIAL

The GHG reduction potential is high, assuming that VMT for urban local trips can be substituted by biking, walking and/or telepresence. For example, preliminary analysis using data from the Federal Highway Administration's National Household Transportation Survey indicates that for bike infrastructure alone, a substitution of 1 out of 10 of urban local car trips (under 3 miles) by bikes could abate over 1 Mt CO₂ annually [1]. Additional substitution of vehicle trips by walking, telepresence, and/or e-bikes is expected to contribute to further abatement. In particular, telecommuting has high CO₂ reduction potential because telepresence has the ability to offset longer trips and thus more VMT. Average market penetration of telepresence one day per week could reduce VMT by nearly 20 percent. Combined with other market trends such as co-working and synergies with biking and walking, there is ample achievable CO₂ reduction potential.

COST COMPETITIVENESS

Review of literature and expert survey feedback indicates that this bundle is cost competitive, especially when considering the fact that new bike infrastructure will negate the need for new motorized vehicle infrastructure. Biking & bike infrastructure, telepresence, and walking are all cheaper solutions than building new automobile infrastructure. Alternative transportation and telepresence also reduce private expenditures on transportation and if managed properly, telepresence can reduce the need for physical office space. Further, reduced commuting can provide significant positive externalities related to congestion reduction and air quality.

BEYOND CARBON ATTRIBUTES

Co-benefits: Benefits include improved air quality from reduced emissions and improved water quality from reduced particulates and debris from cars that end up in stormwater runoff (Grabow et al., 2012). A drop in traditional commuting would also reduce wear & tear on local infrastructure, thereby lowering roadway construction and maintenance costs. Social co-benefits include improved public health due to increased physical activity and improved mental health, increased social interaction that could benefit local businesses, reduction in noise pollution caused by traffic, and overall reduction in local traffic & parking challenges (Grabow et al., 2012). Telecommuting would also reduce the productivity loss attributed to time lost in traffic jams, which was estimated to be \$87 billion in the United States in 2018 [2]. Moreover, a co-benefit of improved health of workers would lead to a decrease in workplace accidents due to fatigue and total sick days.

Co-costs: An equity related concern is that adoption rates for this solution would vary between urban versus rural communities, which may lead to possible gentrification impacts. On the other hand, insufficient dispersion of infrastructure for alternative mobility routes may discourage communities (i.e. gender, age) from adopting these options and cause social disparity in the degree of access (Bushell et al., 2013). An additional concern involves an increased number of bikes (or other mobility devices) and car accidents if the resources and infrastructure upgrades are not made available (Bacchieri et al., 2010).

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Endnotes:

1. <https://www.drawdown.org/solutions>
2. <https://www.weforum.org/agenda/2019/03/traffic-congestion-cost-the-us-economy-nearly-87-billion-in-2018/>

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