Sumner M. Redstone Global Center for Prevention & Wellness

DRIVING CHANGE

ROAD PRICING AS A PUBLIC HEALTH STRATEGY

FOR THE DISTRICT OF COLUMBIA

Traffic: A Threat to Public Health

Traffic adversely affects public health through air pollution, noise pollution, traffic violence, harmful effects on community health and the environment, and through greenhouse gas emissions accelerating climate change, a public health crisis. A continual issue globally, traffic congestion in the United States has been on the rise over the past decade as Vehicle-Miles Traveled (VMT) continue to increase in urban areas in particular (Bureau of Transportation Statistics, 2023; Schrank et al., 2011). Car-centric planning and systems that prioritize movement of vehicles over human health have created transportation and health inequities which disproportionately burden marginalized communities in the District, the region, and the nation.

Traffic-related Air & Noise Pollution

Traffic-related air and noise pollution lead to adverse health effects. Traffic congestion increases tailpipe emissions of hazardous air pollutants that have the ability to penetrate deep into our lungs and enter our bloodstream, leading to systemic effects on cardiovascular and respiratory function, causing chronic disease (Levy et al., 2010; C40 Knowledge Hub, 2019). Air pollution from traffic-related congestion contributes to thousands of premature deaths a year (Levy et al., 2010). In the District of Columbia, on-road vehicle emissions are the largest contributor to air pollution-related health burdens, accounting for over 50% of NO2-attributable asthma cases and 23% of air pollution-attributable premature deaths (Nawaz, 2021). Children, the elderly, communities of color, and low-income populations are at an increased risk of exposure, susceptibility, and impact to air pollution-attributable health effects. A 2021 study found that when compared to least impacted areas (Castillo et al., 2021), like Wards 2 and 3, PM2.5-attributable morbidity and mortality were five times higher in the most impacted areas, like Wards 7 and 8 (Castillo et al., 2021).

Road traffic is also a leading source of noise pollution (National Academy of Engineering, 2010). One study estimated that in 2013 nearly 1 in 3 Americans experienced a hazardous annual noise, and that tens of millions of Americans experienced adverse health outcomes associated with noise exposure. Such effects include hearing loss, sleep disruption, high blood pressure and stress-related illnesses (United States Environmental Protection Agency, 2023). Chronic exposure to even low levels of noise pollution has been linked to chronic diseases (Hammer et al., 2013). Also similar to air pollution, socioeconomic and racial disparities in noise exposure pervade across the U.S., likely increasing risk of adverse educational and health outcomes associated with noise exposure for communities of color (Casey et al., 2017).

Traffic Violence & Community Health

Traffic fatalities have risen over the last decade, reaching a 15-year high in the District in 2023. Even non-fatal traffic injuries can reduce quality of life and create a significant economic burden for families, commonly leading to or entrenching poverty. Minoritized populations, children, and the elderly disproportionately experience the public-health threats of traffic violence. In 2021, there were 40 traffic fatalities in the District: half of the victims were in Wards 7 or 8 (Pascale, 2022). A census tract analysis (Calder, 2023) found that District tracts with higher proportions of Black residents have over two times the number of fatal/serious crashes than those with lower proportions of Black residents. Traffic violence also limits safe access to public spaces and infrastructure, driving additional health inequities (Hamann et al., 2020; Rigolon et al., 2017). When highways are built through neighborhoods, such as the I-295 in Southeast DC, increased vehicle traffic and hostile infrastructure limits pedestrian safety and related opportunities for physical activity, including walking, cycling, and the use of public transit. This leads to physical inactivity, which is linked to chronic disease risk.

Climate Change

Traffic is a major driver of climate change. Globally, the transportation sector is responsible for 37% percent of the overall CO2 emissions share, with passenger cars contributing the largest portion to the emissions profile (International Energy Agency, 2023). In the Washington metropolitan area specifically, the transportation sector was responsible for 38% of total greenhouse gas emissions in 2020 alone, comparable to the global proportion (Metropolitan Washington Council of Governments, 2022).

Road Pricing: A Public Health Solution

Road pricing, also known as congestion pricing, is the practice of charging drivers directly for their use of roads. Often increased during peak periods, road pricing is a proven policy tool for reducing the concentration of vehicles entering and driving within a defined urban area, thereby relieving congestion. Aside from revenue generation, benefits of road pricing implementation include improved air quality from reduced traffic, increased traffic safety, and environmental and climatic improvements – as well as more efficient and reliable trips for people who still choose to drive. Road pricing has been successfully implemented in cities including Singapore, London, Stockholm, and Milan, with impressive results for both environmental and human health.

Road Pricing Improves Air Quality

A recent study (Provonsha & Sifuentes, n.d.) estimates congestion pricing in London has saved 1,888 extra years of life among roughly eight million residents who are now breathing cleaner air. One study found that after Stockholm expanded congestion pricing in their densely populated inner city, PM10 and NO2 levels decreased by up to 15% and 20% respectively (Simeonova et al., 2018). This was followed by a significant reduction in visits for acute asthma attacks among children (aged 0-5) as well as an overall decline in asthma rates by 15.2% among children (Simeonova et al., 2018).

Road Pricing Reduces Traffic Violence

When Singapore pioneered the congestion pricing scheme in 1975, vehicle crashes were reduced by 25% (Environmental Defense, n.d.). In the year following Milan's implementation of road pricing, they saw a 24% reduction of all road casualties (C40 Cities, 2015). In London, one study estimates that road traffic crashes decreased by an estimated 35% per month in the zone-based

charge area following congestion pricing implementation (Singichetti, 2021). These cities have prioritized investment of road pricing revenue in street safety improvements like more comprehensive mobility networks of bike lanes and pedestrian zones, thereby building safer environments for active transport and physical activity (Area C Milano, n.d.; Provonsha & Sifuentes, n.d.).

Road Pricing Supports Public Transportation

Cities have also centered transportation equity by investing road pricing revenue in expanding public transit infrastructure. For example, Stockholm is tapping revenue to raise funds for new metro lines that will service affordable housing developments for its rapidly growing population (C40 Cities, 2015). Singapore increased bus and rail ridership by 15% by expanding these systems and constructing new intermodal transit hubs (Provonsha & Sifuentes, n.d.). – effectively reducing vehicle traffic despite also experiencing significant population growth (Environmental Defense, n.d.; Provonsha & Sifuentes, n.d.). London's investments in enhanced bus, bike and pedestrian infrastructure have contributed to a 30% decrease in bus wait times and a 60% decrease in traffic delay due to central city congestion (Transport for London, 2004). Moreover, private car trips decreased while public transport, walking, and cycling all increased (C40 Knowledge Hub, 2022).

Road Pricing Reduces Carbon Emissions

Globally, road pricing mechanisms have contributed to the decline in overall greenhouse gas (GHG) emissions - including a 10-15% reduction in CO2 emissions in Singapore's inner city, a 16% decline in London's CO2 emissions, and a 14% reduction in CO2 in Stockholm (Provonsha & Sifuentes, n.d.). It is anticipated that Stockholm's expansion of road pricing will confer an additional savings of 15-20,000 metric tons of CO2 annually (C40 Cities, 2015).

Conclusion: Road Pricing for A Healthier DC

Cities that implement road pricing consistently achieve climate and health gains, from both decreased vehicle traffic and by investing revenue in multi-modal transportation infrastructure. Through cleaner (and quieter) air, safer streets, and enhanced mobility and connectivity, road pricing would help the District reduce chronic disease inequities and leap toward our carbon neutrality goals.

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