# **UC Office of the President**

# **Policy Briefs**

#### **Title**

Policy Brief: Social Equity Impacts of Congestion Management Strategies

#### **Permalink**

https://escholarship.org/uc/item/7rm9w4pn

#### **Authors**

Shaheen, Susan, PhD Stocker, Adam Meza, Ruth

## **Publication Date**

2019-12-01

# **Social Equity Impacts of Congestion Management Strategies**

Susan Shaheen, Ph.D., Adam Stocker, and Ruth Meza – Transportation Sustainability Research Center, UC Berkeley, December 2019

For more information, contact Susan Shaheen at sshaheen@berkeley.edu.

UNIVERSITY OF CALIFORNIA

#### Issue

Congestion is worsening and vehicle miles traveled (VMT) are increasing in many cities across the United States (U.S.) and California. State, regional, and local governments have implemented or are considering a range of measures intended to curb congestion and its negative effects on the economy, the environment, and public health. However, social equity implications must be accounted for when crafting, piloting, and deploying congestion mitigation strategies. At present, many of the social equity implications of congestion management strategies are not well understood and lack empirical research.

## **Key Research Findings**

To better understand the equity implications of a variety of congestion management strategies, researchers at the Transportation Sustainability Research Center (TSRC) at University of California, Berkeley analyzed existing literature on congestion management strategies and findings from 12 expert interviews. The literature review applies the Spatial – Temporal – Economic – Physiological – Social (STEPS) Equity Framework<sup>1</sup> to identify impacts and classify whether social equity barriers are reduced, exacerbated, or both by a particular strategy. The congestion management strategies of interest were categorized into six broader categories: 1) pricing, 2) parking and curb policies, 3) operational strategies, 4) infrastructure changes, 5) transportation services and strategies, and 6) conventional taxation (see Figure 1).

The social equity impacts of congestion management strategies vary widely depending on the particular strategy, land-use and societal contexts, implementation details, and many other factors. Assessing the details of how congestion management strategies are implemented and who will ultimately benefit from installation are critically important for the success of a project in terms of achieving equitable outcomes.

While many different strategies exist that could reduce congestion, including parking policies, infrastructure changes, and shared mobility, pricing strategies were most often cited in the literature and among experts when discussing congestion mitigation measures. Most experts agreed that there is no "silver bullet" of congestion management strategies. Figure 2 shows some of the benefits and barriers of congestions management strategies that were identified during this research effort.

Figure 1. Inventory of Congestion Management Strategies

	•	D
Pricing <	•	M

- Cordon/Area pricing
- · Distance-based pricing
- Dynamic/congestion pricing
- · Means-based pricing
- · Flat-rate tolls
- Full-facility tolls
- · Managed lanes
- Dynamic parking pricing
  - · Off-street parking pricing/policy
  - · Parking navigation tools
  - Curb space management
  - · Parking cash out

## Operational Strategies

Infrastructure

Improvements

Transportation

Services and

Strategies

Parking and

Curb Policies

- Traffic signal priority (TSP)
- Ramp metering
- · Geofencing
- Public transit improvements
- · Park and ride facilities
- Transit oriented development (TOD)
- Car-free zones
- · Road diet
- Pedestrian and bicycle infrastructure
- Complete streets
- · Increased road capacity
- Shared mobility (automotive)
- Shared mobility (active)
- Courier network services (CNS)
- Pay as You Drive (PAYD) insurance
- Fleet pricing
- Telecommuting/flexible work hours

Conventional Taxation

Fuel taxes

<sup>1</sup>Shaheen, Susan, Corwin Bell, Adam Cohen, and Balaji Yelchuru (2017). "Travel Behavior: Shared Mobility and Transportation Equity." U.S. Department of Transportation. Report# PL-18-007.

## Key Research Findings (continued)

Benefits

Figure 2. Benefits and barriers of congestion management strategies

Equitable air quality: Congestion leads to poor local air quality, and households that live near freeways tend to be of lower incomes. As a result, congestion management strategies can increase equity by enhancing air quality near low-income communities, who also tend to drive less than higher income communities.

**Housing affordability:** The cost of driving is embedded in property development which artificially lowers the cost of driving while increasing the cost of housing. This, in turn, can be unfair for low-income residents who may not have access to a vehicle or drive at all. Reducing or eliminating minimum parking requirements can enhance equity by separating the cost of housing from the cost of driving, while allowing developers to provide more housing.

Safer streets: If congestion management strategies lead to increased use of active transportation (walking and biking), this can enhance roadway safety due to the "safety in numbers" effect.

Improved travel time/reliability: Several strategies can have a positive equity impact by improving travel time and reliability. For example, cordon pricing and managed lanes may improve the travel time and reliability of public transit service, and for others in high occupancy vehicles, without imposing additional costs.

Temporal + Economic barriers: If existing lanes are converted to tolled lanes (depending on how they are implemented), these may be prohibitively expensive for low-income populations and travel times for non-express lanes may increase.

Spatial + Economic barriers: Potential cordon tolling projects have equity implications for existing low-income residents living inside the proposed toll area. Existing residents often feel it is not fair to impose a new toll that did not exist previously.

Funding challenges: While means-based pricing can address some of the equity concerns of congestion pricing, attaining adequate funding may be a challenge for these programs to be successful.

**Barriers** 

# **Policy Considerations**

Although the policy implications of congestion management strategies are highly context dependent, key considerations have emerged from this research:

- Timely and regular outreach to the all members of the public and stakeholders involved is key and must begin early in the planning process.
- If thoughtfully implemented, means-based pricing schemes could help mitigate some of the unintended negative equity impacts of congestion management strategies.
- As a growing number of cities, regions, and states across the U.S. consider and begin implementing congestion management strategies, high quality and

periodic data collection will be critical to ensure the accurate measurement of social equity impacts.

## **Further Reading**

This policy brief is drawn from the research report titled: "Social Equity Impacts of Congestion Management Strategies," prepared by Susan Shaheen, Ph.D., Adam Stocker, and Ruth Meza of the Transportation Sustainability Research Center (TSRC) affiliated with the Institute of Transportation Studies at the University of California, Berkeley. The report and this policy brief can be found at: https://ww3.arb.ca.gov/research/single-project.php?row\_id=68591

Research presented in this policy brief was made possible through funding received by the Transportation Sustainability Research Center (TSRC) from the California Air Resources Board (CARB).

