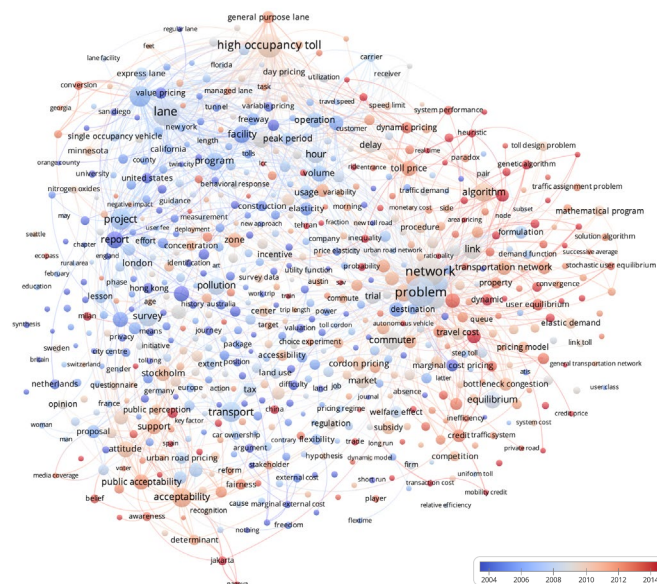


A Systems Approach to Pedestrian Safety, PHASE II: Using System Dynamics Tools to Examine Congestion Pricing Policies

This report features three parts: a bibliometric analysis of toll-based congestion pricing literature, a detailed review of studies examining the impact of congestion pricing policies on road user safety, and a system dynamics learning model exploring potential pedestrian safety impacts of congestion pricing policies under a range of scenarios.

A bibliometric analysis was conducted to broadly identify themes and patterns in the congestion pricing evidence base and identify potential research gaps. An analysis of 2,333 publications from 1956-2021 revealed research themes related to public perception and acceptability, policy implementation characteristics and specifics, and advanced modeling techniques to study policy impacts. Identified gaps included studies focused on safety, specific road user types (e.g., bicyclists, motorcyclists), and equity.

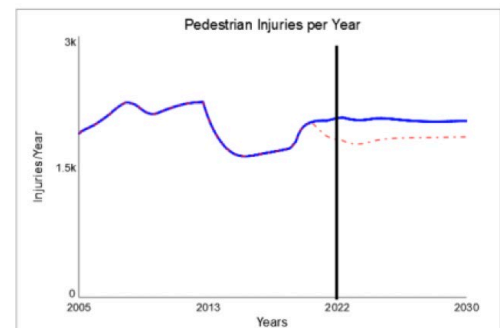


Study title and abstract terms with time overlay

The second part of the project honed in on specific findings from the few studies (n= 18) examining congestion pricing policy safety impacts. Research indicated potential safety

benefits for car occupants following congestion pricing policy implementation. However, some studies indicated short-term increases in injuries and crashes for vulnerable road users, like bicyclists and motorcyclists, which eventually decreased after a few years. Findings indicated that cities planning to implement these policies should consider potential mode shifts and safety supports for all road users (e.g., bicyclists, pedestrians).

The third part of this project involved building a system dynamics learning model to explore pedestrian safety impacts of congestion pricing policy implementation in New York City under a range of scenarios. One important policy take-away from this work was that a congestion pricing policy combined with other pedestrian efforts (e.g., infrastructure improvements) has substantial potential for positive gains in public health. To explore the model and outcomes of various scenarios, please visit: bit.ly/CPPinjury.



Example output from system dynamics learning model comparing pedestrian injury trends under different hypothetical implementation scenarios pre & post congestion pricing policy

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