

Congestion Pricing: Overview

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Congestion as Distorted Prices

1. Drivers do not pay for the delay they impose on others
2. Drivers use infrastructure without paying for it by use
3. People do not pay for valuable urban land they occupy



Median home price: \$1.4 million
Average commercial rent: \$72/sq ft
Price to drive across: zero



Median home price: \$197,000
Average commercial rent: \$12/sq ft
Price to drive across: zero

Price Controls Have Four Consequences

- Shortages – You run out of the good
- High Search Costs – People expend extra energy to find the good
- Misallocation – The good is consumed both by people who value it a lot and people who don't
- Shadow Markets – the cost of the good ends up in the cost of other goods





Every day is black Friday on the roads: underpricing leads to a shortage

The Fundamental Law of Road Congestion

Suppose you capacity to a road:



If a New Lane or Train Pulls Some Cars off the Road

- Speed increases, *at first*
- But time is the biggest and most salient personal cost of driving
- So as speed rises price of driving falls
- Price falls → demand rises
- People start driving on the road from
 - --Other routes
 - --Other times
 - --Other modes
- Road returns to original congestion level
- Called *triple convergence*

You Can't Build or Buy Your Way out of Congestion



Can't reduce congestion by making driving at peak hours *cheaper*.

Congestion Pricing

- Only solution that addresses *cause* of congestion
- *Performance* pricing: *Not* a toll designed to raise revenue
- Government sets a performance standard (e.g., 55 mph), and the price floats to lowest level that achieves it
- Benefit comes from *charging the price*, not *spending the revenue*

Where It's Used, It Works



Can be cordons, corridors, or networks



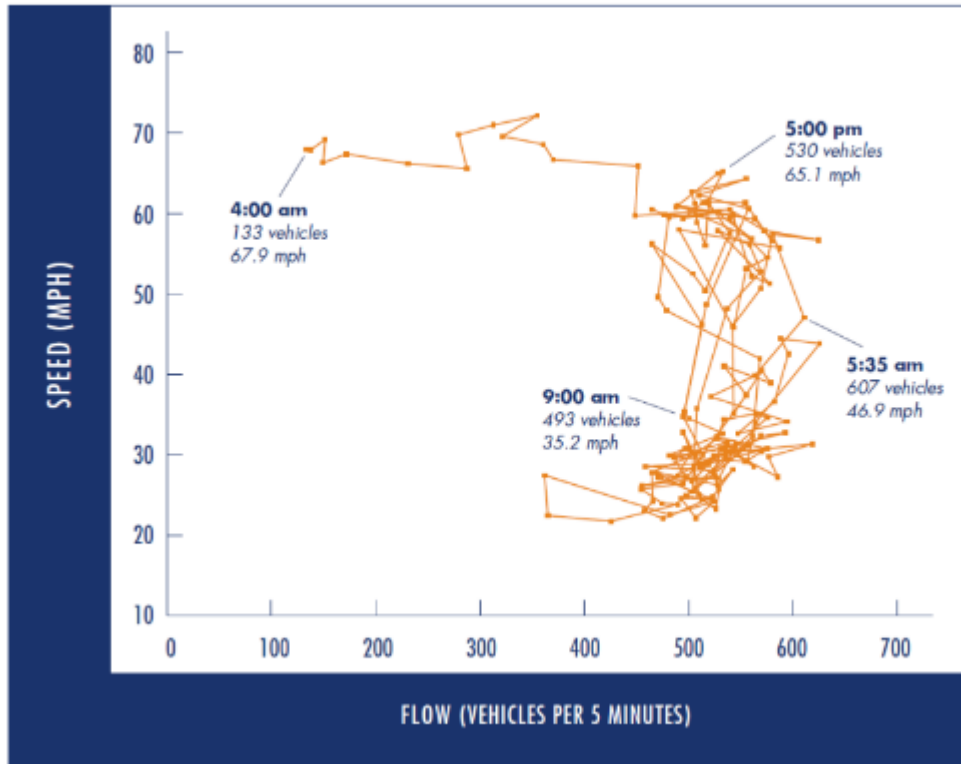
Pricing Creates Triple *Divergence*

- Some people who would travel on busy roads at busy times switch to
 - Other routes
 - Other times
 - Other modes

*Not many people
have to switch*



Congestion is Non-Linear



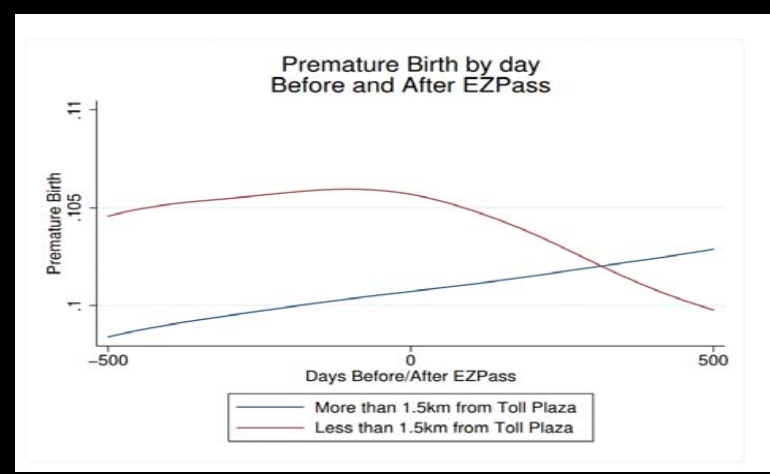
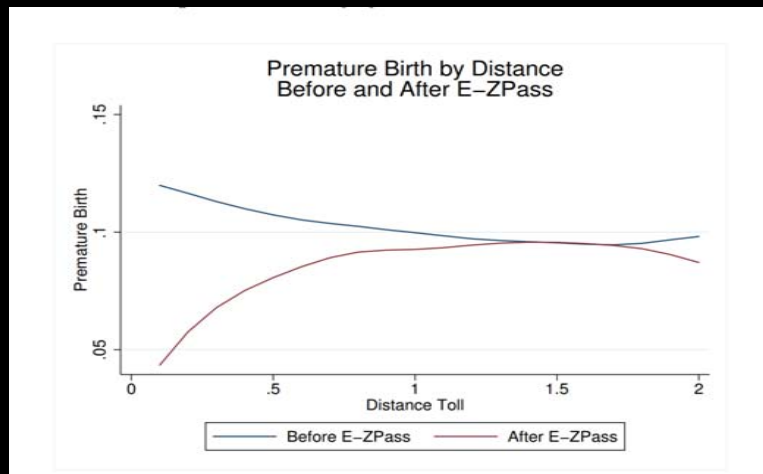
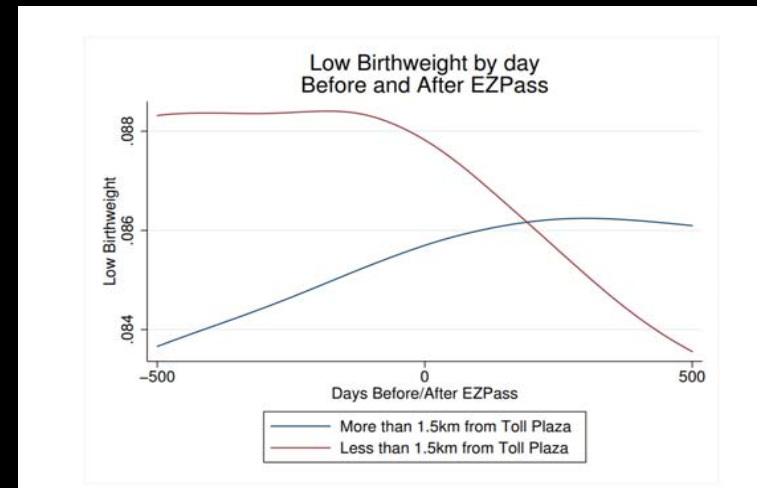
Speed vs. flow on I-10 westbound in 5 minute intervals from 4:00 am to 6:00 pm

Small share of vehicles can tip a road into gridlock. So slowing or preventing their entry removes bottlenecks, and moves more people.

Is this Fair?

- Congestion prices are regressive
- The entire transportation finance system is regressive (gas taxes, sales taxes, registration fees)
- Most of the infrastructure system is regressive (water meters, electric meters, etc)
- Priced roads disproportionately benefit the affluent
- *So do free roads*
- Priced roads, unlike free roads, produce revenue to help disadvantaged people
- Equity concern can be solved with the revenue

Congestion has Public Health Consequences



Thank you

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