Clearing the Air on the Benefits and Costs of Road Infrastructure (Balboni, Berman, Boehm, Marzano, and Waseem 2025)

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Summary

- More urban roads, more air pollution
  - Economic integration vs. local pollution exposure
  - Economic model + atmospheric model
- Setting: Lahore, Pakistan
  - One of the most polluted cities in the world
  - Average resident loses 5.3 years of life from particulate matter
- High-resolution measurement in both space and time
  - Commuting, goods trade, production, pollution

Leveraging scientific models

- Welfare analysis of road infrastructure
  - Benefits from economic model of transportation
  - Costs from atmospheric model of pollution
- More opportunities for urban environmental work
  - Extreme heat, flooding, wildfire
  - Often have spatial granularity and heterogeneity

Policy objectives

- What is the policymaker's objective function?
  - Residents, workers, earnings, employment
  - Utilitarian or weighted welfare
  - With or without air pollution
  - Over the short or long run

- This paper is primarily about roads
  - And how air pollution affects welfare evaluation
  - Alternatively, could primarily be about air pollution
  - And how vehicle emissions compare to other emissions

Distributional effects

- Key result: sign of welfare assessment flips for 77 of 287 locations
  - When accounting for changes in air pollution
- The result could be stronger or weaker for people
  - Depending on sorting patterns
  - Especially if people sort ignoring air pollution
  - Or if people sort exclusively on air pollution
- Minor points
  - Could connect explicitly to income
  - And decompose direct vs. relocation effects

Counterfactuals

- Focus on removing the "Lahore ring road"
  - Construction from 2006 to 2025 with more planned
  - Carries 400,000 to 500,000 vehicles daily
- Rich political implications
  - Comparing distributional effects with political frictions
  - Quantifying impacts at each phase of construction
  - Evaluating realized outcomes against stated goals
- Minor points
  - Isolated road shutdown abstracts from spatial interaction
  - Reducing full fleet emissions will obscure distributional effects

Future work

- Many urban environmental issues
  - Particularly in lower-income countries
  - Huge exposure to climate damages
  - But relatively few papers
- Adaptation will be crucial
  - What can people and governments do?
  - What are the distributional implications?
  - How will politics shape our next steps?