GREENHOUSE GASES, TRANSPORTATION AND URBAN DEVELOPMENT

Linkages between climate justice and social justice in the locality of Philadelphia, PA

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Justification for a place-based approach

- National-scale solutions are politically burdensome
- Gasoline taxes are regressive and would require complete restructuring of the tax code
- Price controls and command-and-control approaches improve efficiency, but vehicle miles traveled (VMT) continue to increase (over the long term)
- Transportation emissions are the result of local decisions made in response to local circumstances
- The regional transportation networks and land-use patterns vary greatly across the nation and the world

Justification from an Environmental Justice Perspective

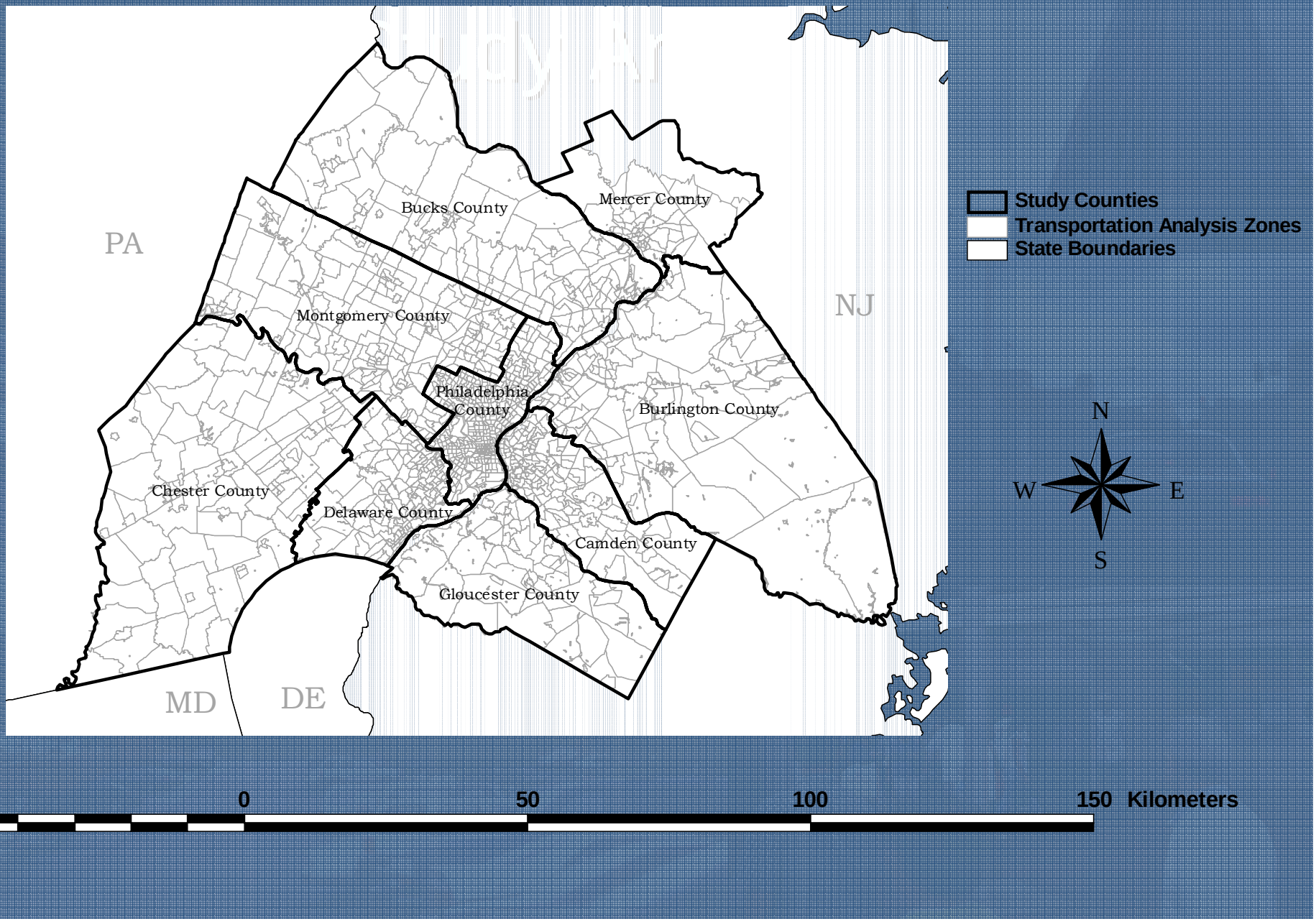
- Gasoline taxes are regressive and would require complete restructuring of the tax code
- Justice is a highly contested concept, and must be understood within local and regional contexts
- Urban processes as a microcosm of North-South struggles
- Local-scale studies are required to understand mitigation efforts outside of purely economic criteria

Outline

- Research Approach
- Study Area/Transportation Modeling Results
- Implications for GHG Mitigation and Social Equity in Philadelphia

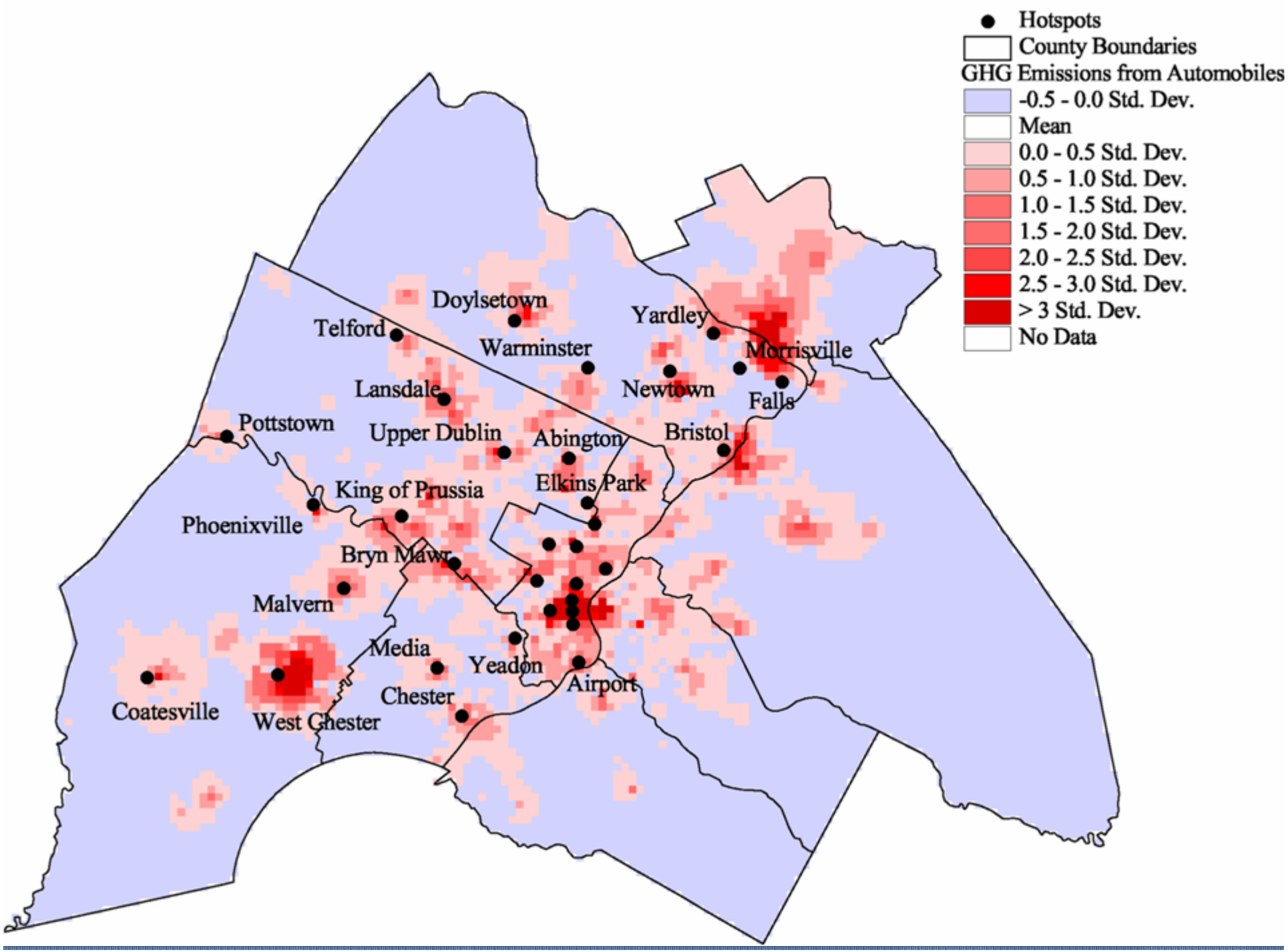
Research Approach

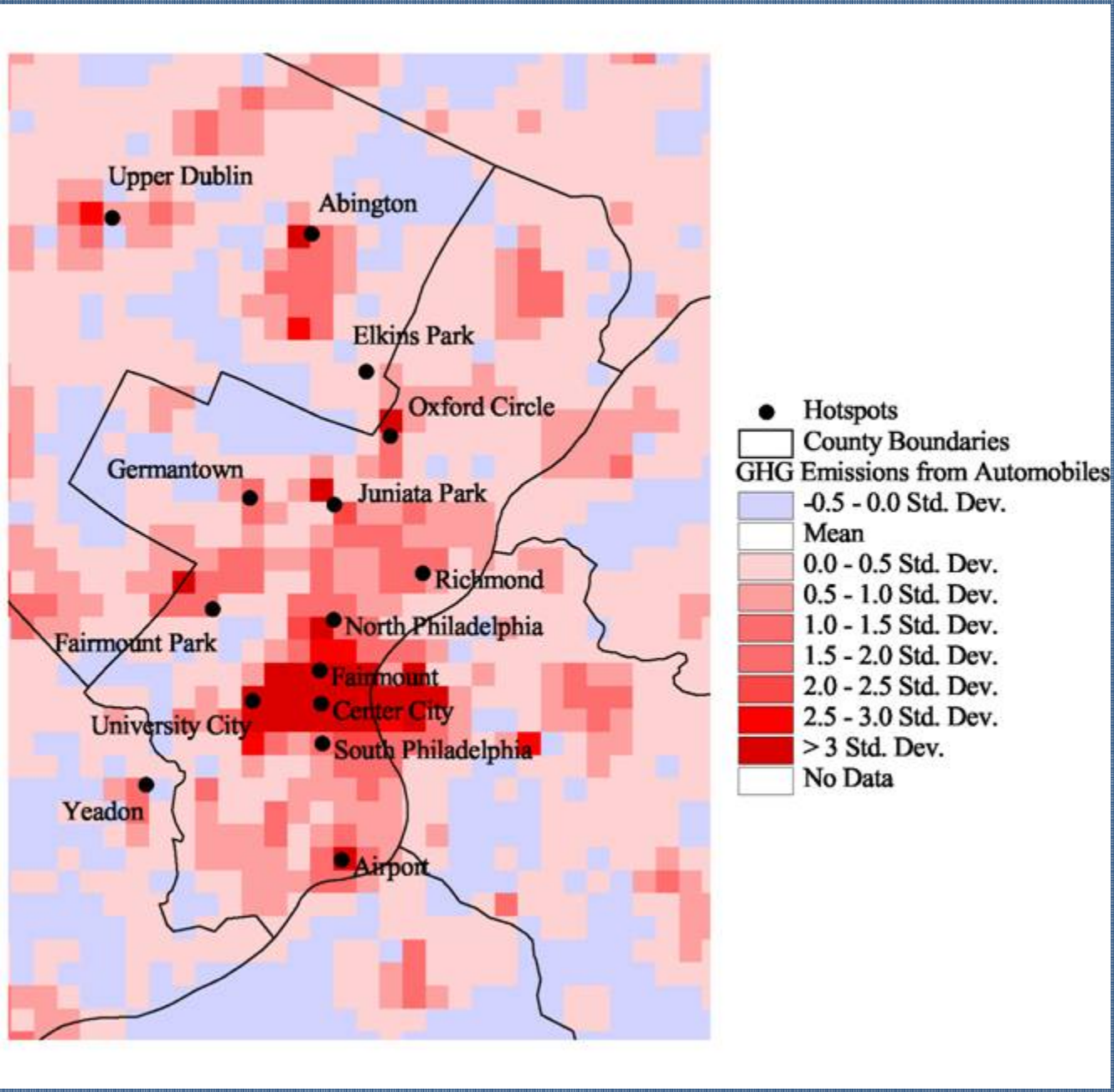
- Mixed Methods Approach
  - Traffic Modeling
  - Demographic analysis
  - Archival research
  - Field work
- The goal: To not only describe the pattern of emissions, but to understand the impact of past decisions on that pattern, and to inform speculation about potential mitigation options


Bucks County
Mercer County
Montgomery County
Philadelphia County
Burlington County
Chester County
Delaware County
Camden County
Gloucester County
PA
NJ
MD
DE
Study Counties
Transportation Analysis Zones
State Boundaries
N
W
E
S
50
0
50
100
150
Kilometers

Results

- Identification of “hotspots” (i.e. Destinations associated with higher than average emissions)
- Emissions for each destination are mapped, showing the emission-shed of each hotspot


Hotspots
County Boundaries
GHG Emissions from Automobiles
-0.5 - 0.0 Std. Dev.
Mean
0.0 - 0.5 Std. Dev.
0.5 - 1.0 Std. Dev.
1.0 - 1.5 Std. Dev.
1.5 - 2.0 Std. Dev.
2.0 - 2.5 Std. Dev.
2.5 - 3.0 Std. Dev.
> 3 Std. Dev.
No Data
Doylsetown
Telford
Warminster
Yardley
Morrisville
Lansdale
Newtown
Falls
Pottstown
Upper Dublin
Abington
Bristol
King of Prussia
Elkins Park
Phoenixville
Bryn Mawr
Malvern
Media
Yeadon
Airport
Chester
Coatesville
West Chester


Upper Dublin
Abington
Elkins Park
Oxford Circle
Germantown
Juniata Park
Richmond
North Philadelphia
Fairmount Park
Fairmount
Center City
University City
South Philadelphia
Yeadon
Airport
Hotspots
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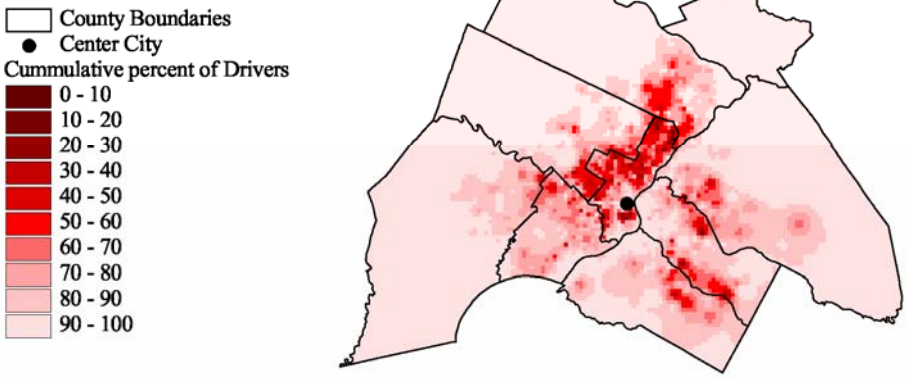
1.5 - 2.0 Std. Dev.
2.0 - 2.5 Std. Dev.
2.5 - 3.0 Std. Dev.
> 3 Std. Dev.
No Data

Summary of Top Hotspots

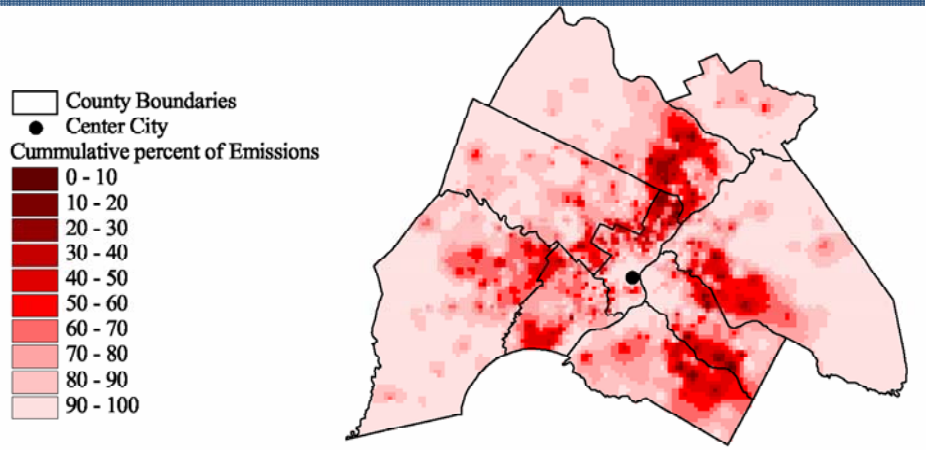
Workplace	Total Distance Driven (1000's Km Per Day)	MTCE	% Total
Center City	13,410	95.39	68.08
North Philadelphia	891	6.34	4.52
University City	690	4.91	3.50
Fairmount	610	4.34	3.09
West Chester	450	3.20	2.29
South Philadelphia	436	3.10	2.21
King of Prussia	336	2.39	1.70
Bryn Mawr	295	2.10	1.50
Lansdale	239	1.70	1.21
Juniata Park	235	1.67	1.19
Germantown	174	1.24	0.88
Fairmount Park	172	1.23	0.88
Newtown	157	1.12	0.80
Richmond	154	1.09	0.78
Abington	152	1.08	0.77

Center City

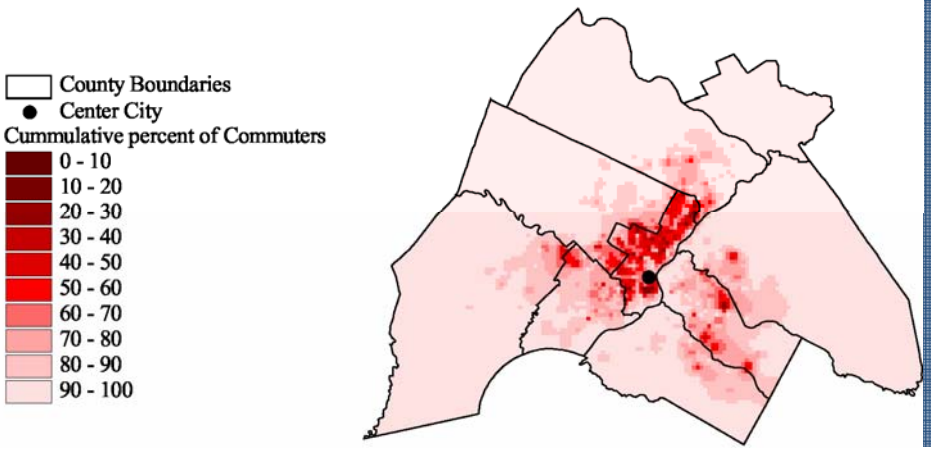
Drivers



Emissions

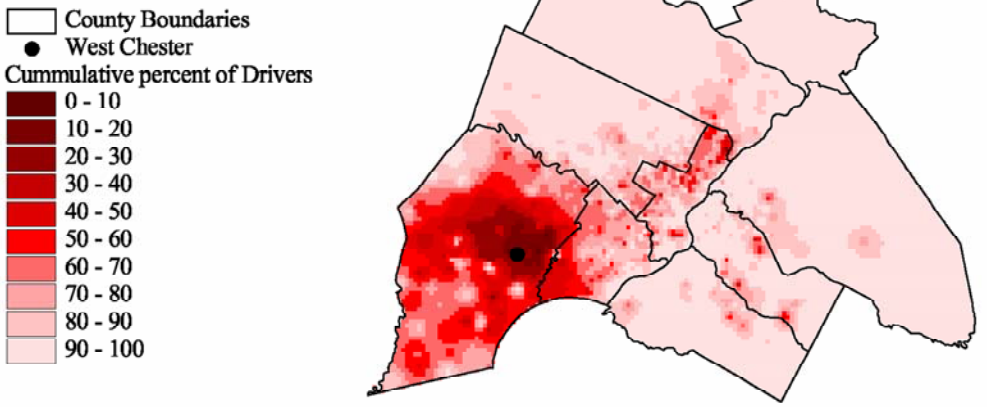


Commuters

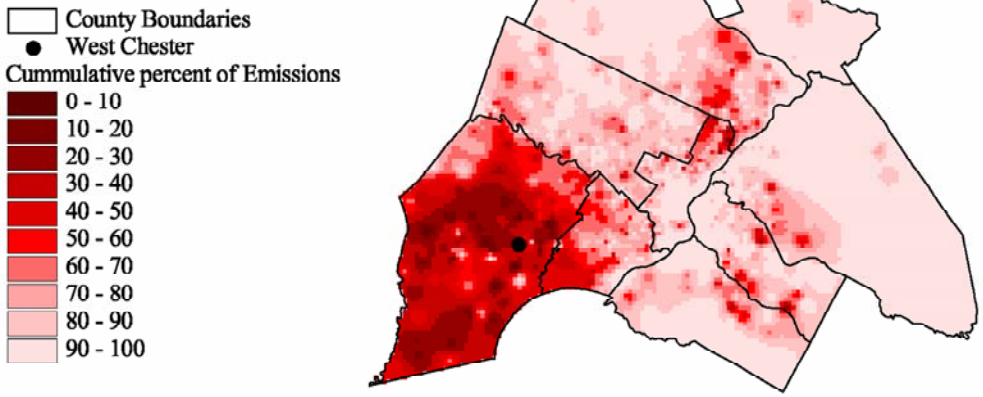


West Chester

Drivers



Emissions



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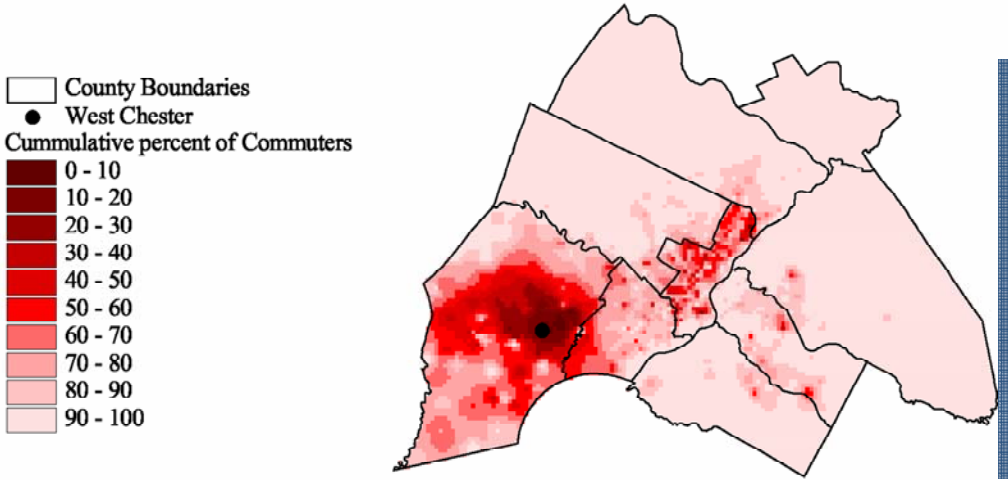
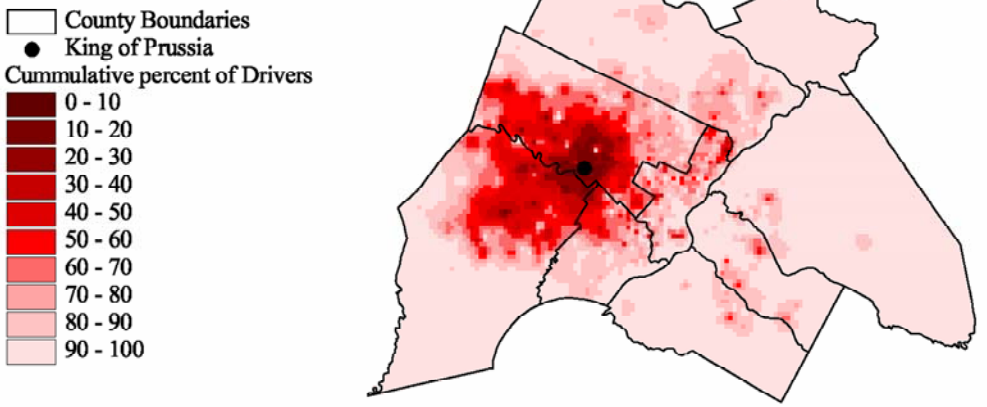
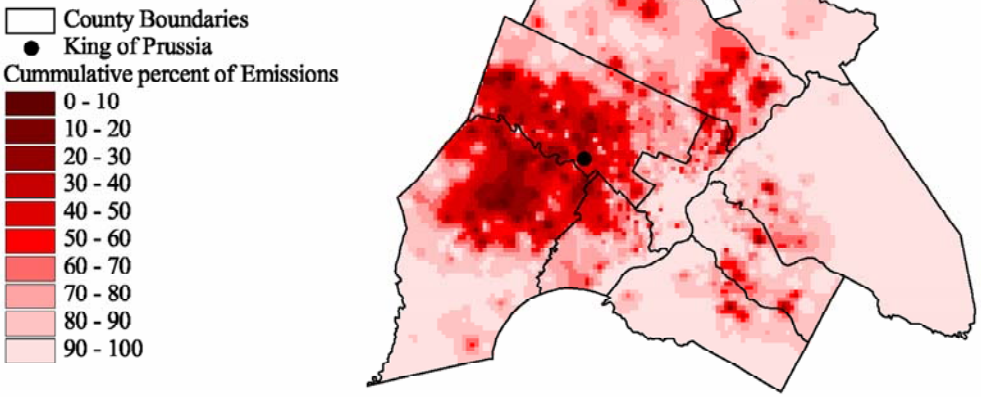


King of Prussia

Drivers



Emissions



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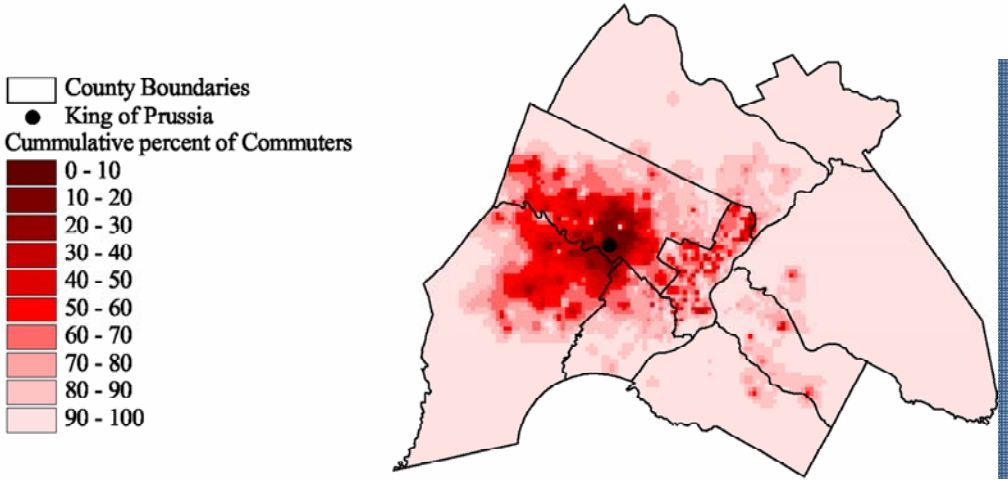
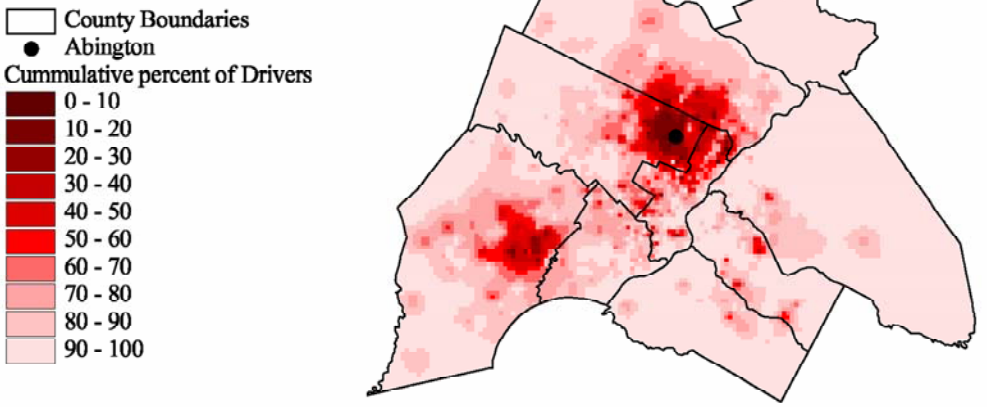
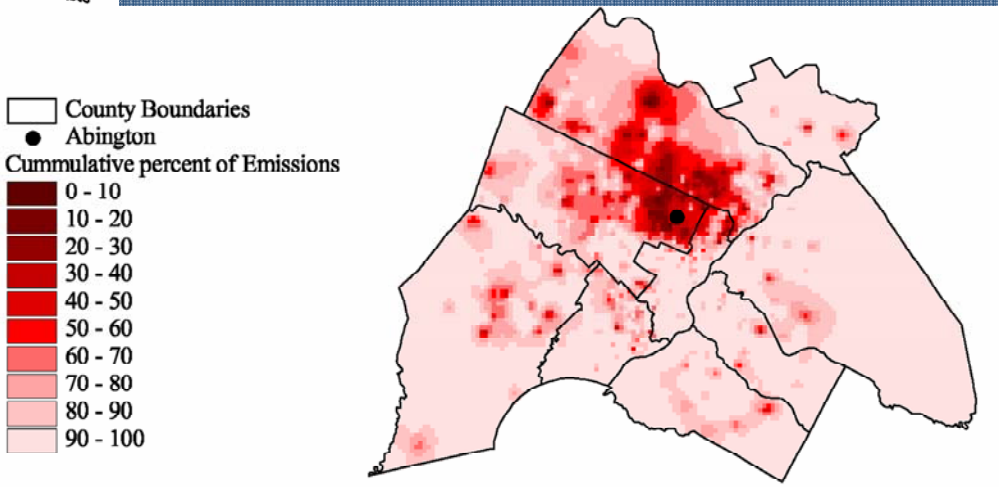


Abington

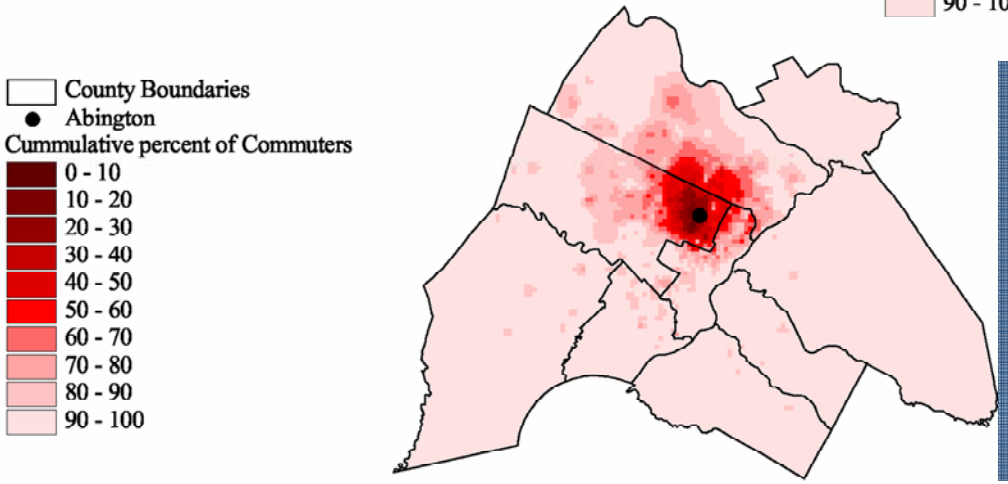
Drivers



Emissions



Commuters



Summary

- Emissions come disproportionately from suburb-to-city commuting, despite typical commuting patterns
- Public transit riders are either close to their workplace or poor
- Significant enhancements to public transportation are difficult due to sprawl and edge city conditions
- Public transit is unlikely to be used by the most significant emitters
- Public transit improvements aimed at the most significant emitters would be terribly unfair
- A more credible solution would be to alter the development patterns of the city.

Justification from an Environmental Justice Perspective

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- Local-scale studies are required to understand mitigation efforts outside of purely economic criteria