Traffic Density and Ethnic Composition in Massachusetts:

An Exploratory Study

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Outline

1. Introduction
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3. Methods
4. Results
5. Discussion
6. Future Work
Introduction

Impacts of high traffic density:

- Pollution
- Noise
- Traffic
- Displacement
- Segregation
- Neighbourhood nuisance
- Barrier to physical exercise
- Barrier to building social networks
Research Question

Are some ethnicities or racial groups more exposed to traffic burdens in Massachusetts?
Methods

Traffic density:

- Traffic data provided by the MA highway department
- Annual average traffic daily traffic (AADT) for 2003
- Average number of vehicles per day traveling in both direction on a road segment
- Buffer: 200m
- Vehicle miles of travel (VMT) = AADT*L
Methods

Traffic density :

- Traffic density = \( \sum \frac{VMT}{A_b} \) (SEE)
- Method used by Gunier et al. (put reference)
- High correlation between traffic density and data from monitoring stations for :
  - Carbon monoxide
  - Benzene
  - 1,3-butadiene
Methods

Race/ethnicity:

- Racial/ethnic composition of census tracts
- Data from the year 2000 census
- Minority CT: one standard deviation above the mean
- Hispanic CT: > 25% Hispanics (78)
- African American CT: > 21% African Americans (56)
- Asian CT: > 11% Asians (91)
Methods

Race/ethnicity:

- White CT: > 90% Whites (364)
- Excluded: 395 mixed ethnicities CT
Methods

Socioeconomic conditions:

- Describe the SES conditions of the different CT groups
- Data from the year 2000 census
- Percent population below poverty level
- Percent people above 25 years with no high school diploma
- Percent unemployed population
Results

Distribution of traffic density in Massachusetts:

- Percentage of census tracts
- Traffic density (thousands of VMT/mi²)
  - <100
  - 100-199
  - 200-300
  - >300
Results

Socioeconomic characteristics of CT by race/ethnicity:

- Hispanic
  - No high school diploma
  - Below poverty level
  - Unemployed
- African American
  - No high school diploma
  - Below poverty level
  - Unemployed
- Asian
  - No high school diploma
  - Below poverty level
  - Unemployed
- White
  - No high school diploma
  - Below poverty level
  - Unemployed
Results

Percent CT with high traffic density by race/ethnicity:

[Bar chart showing percentage of census tracts for Asian, Hispanic, African American, and White races/ethnicities. The Asian bar is the tallest, followed by the Hispanic bar, then African American, and finally White.]
## Results

Average traffic density in CT by race/ethnicity:

<table>
<thead>
<tr>
<th>CT racial/ethnic profile</th>
<th>Average traffic density</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asian</td>
<td>254,405</td>
</tr>
<tr>
<td>Hispanic</td>
<td>177,181</td>
</tr>
<tr>
<td>African American</td>
<td>123,773</td>
</tr>
<tr>
<td>White</td>
<td>99,034</td>
</tr>
</tbody>
</table>
Results

Average traffic density by race/ethnicity and poverty level:

![Traffic density graph showing different ethnicities and poverty levels]
Results

Average traffic density by race/ethnicity and population density:
Discussion

- People living in census tracts with high Asian population have higher probability of being exposed to high traffic density
- “Model Minority”
- Rare health studies
- Asians: 15 ethnic groups
  - = Bangladeshi, Cambodian, Chinese, Filipino, Hmong, Indian, Indonesian, Japanese, Korean, Laotian, Malaysian, Pakistani, Sri Lankan, Taiwanese, Thai, and Vietnamese
Discussion

• Diverse in socioeconomic conditions
  Median household Asian income: 72,000 USD
  Median household Indian income: 38,000 USD

• High percentage of foreign born: 71%

• High percentage non citizens: 40%

  -> Difficult to mobilize
Future Work

- Multivariate analysis
- Cost/Benefit of living in high traffic density areas
- Spatial mismatch
End