

Childcare Facilities & High Traffic Areas: Any Problems?

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Introduction

This study investigates the location of day care centers in relationship to high traffic road ways. Specifically ,this study shows the number and percentage of day care centers that are located in Massachusetts in high traffic areas. The procedure I used was based on a similar study done in California by Douglas Houston called “Proximity of Licensed Child Care Facilities to Near-Roadway Vehicle Pollution” which was published in the American Journal of Public Health¹.

Generally more pollutants are emitted from high traffic roadways. Numerous studies have shown that young children ages 1-5 are permanently adversely impacted by traffic pollution. Children ages 1 through 5 are the most fragile because they do not have a complete immune system. For example, one study found girls age 4 months to 4 years exposed to nitrogen dioxide (NO₂) near their homes or day care centers may be associated with the development of wheezing bronchitis². Another study of infants revealed significant association between traffic-related air pollutants and cough without infection and dry cough at night in the first year of life³.

Data & Methods

I classified each day care center in Massachusetts into one of four categories—high traffic, medium traffic, low traffic, and very low traffic using the following methodology.

First I collected the locations of all the day care centers, from the www.mass.gov web site and geo-coded the locations. Using this procedure, 89% of the locations were mapped and included in this study. Then, from www.mass.gov, I used the census 2000 Tiger Roads layer to rank the roads into the following categories using :

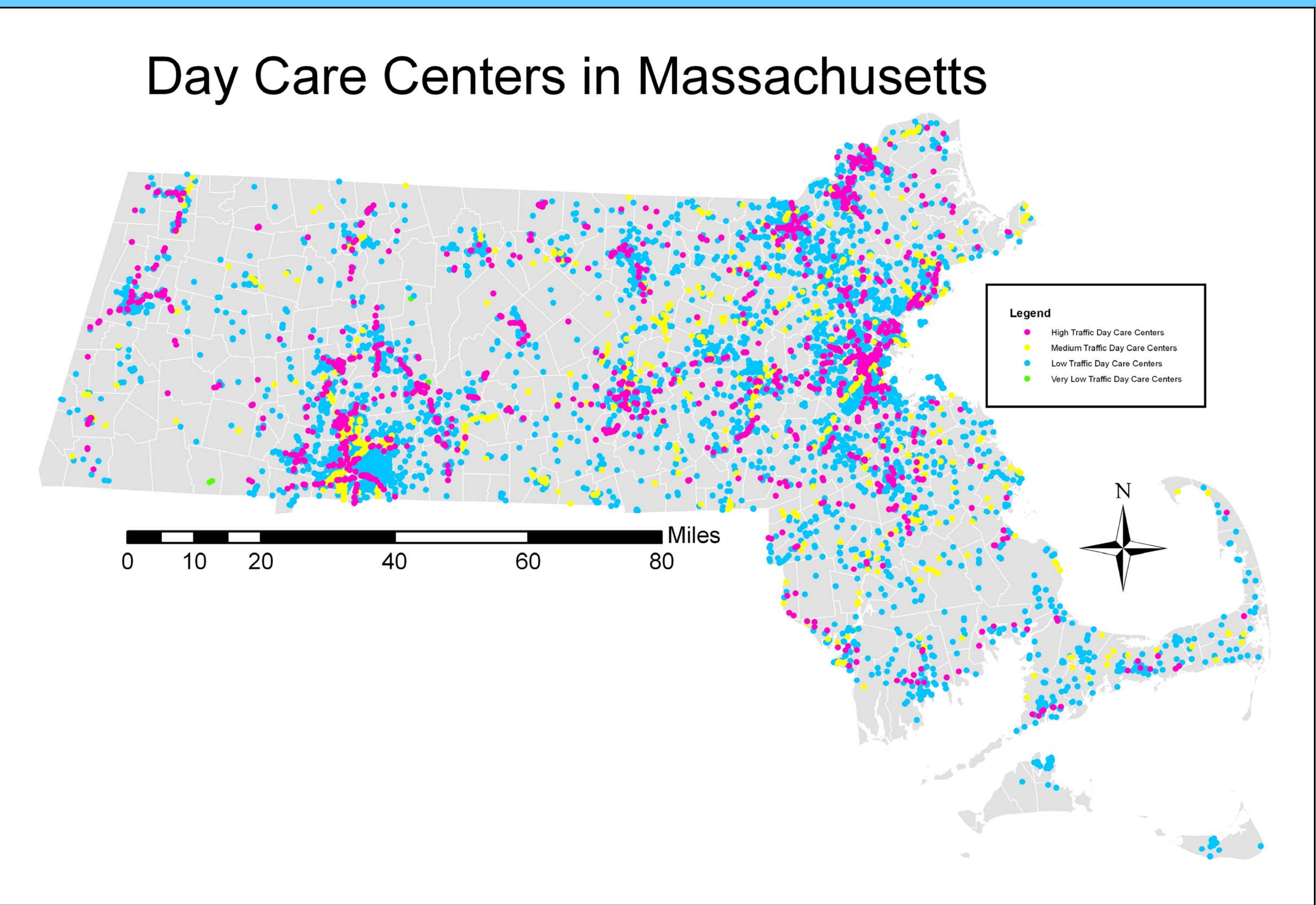
- Primary Roads (high traffic)
- Secondary Roads (medium traffic)
- Neighborhood Roads (low traffic)
- Road Trails (very low traffic)

Each day care center was sequentially located into only one of the above categories starting with high traffic and moving down to the very low traffic areas. For example, if a day care center was located within 200m of the high primary road ways it was considered a high traffic area and removed from this categorization process. This process was sequentially followed until all day care centers were classified into only one of the four categories.

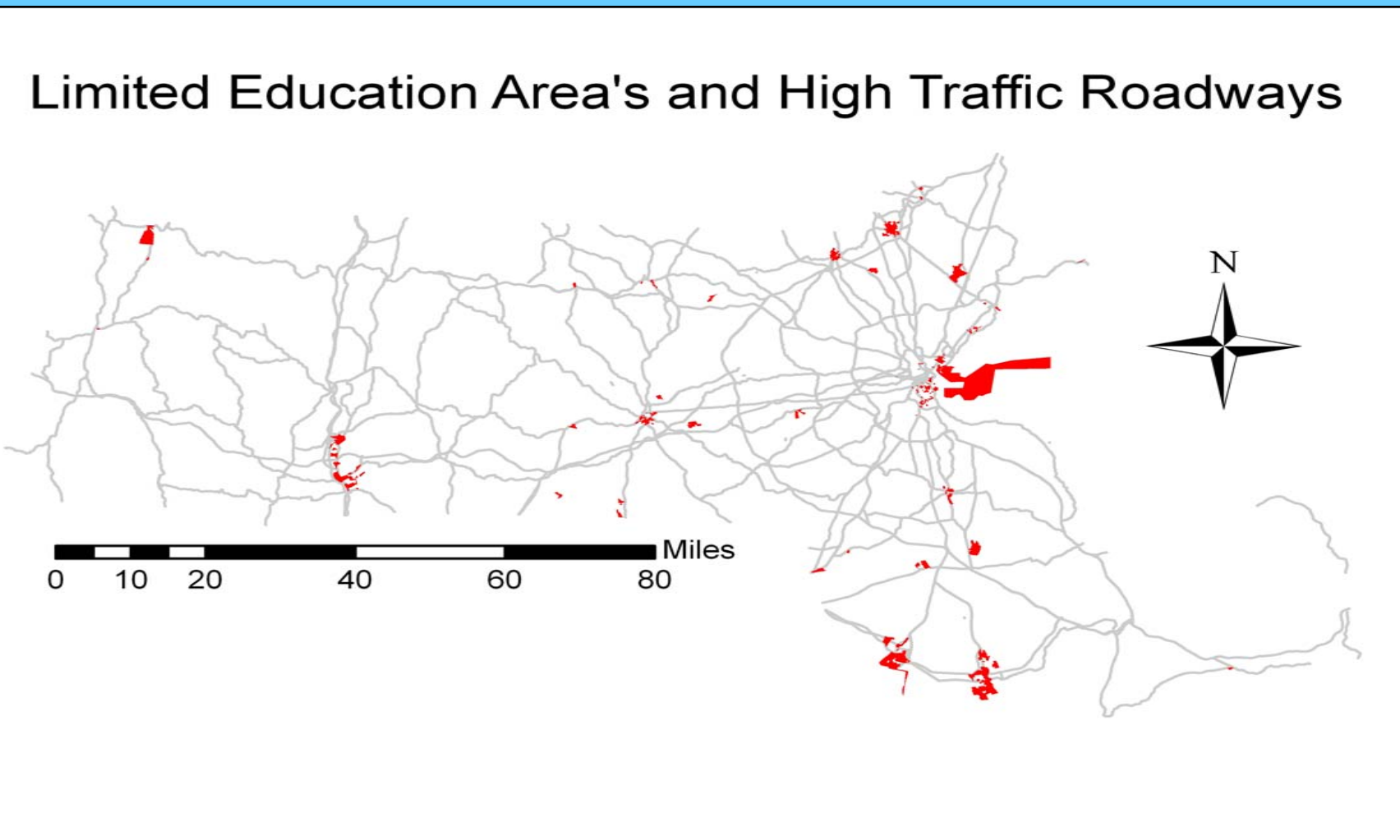
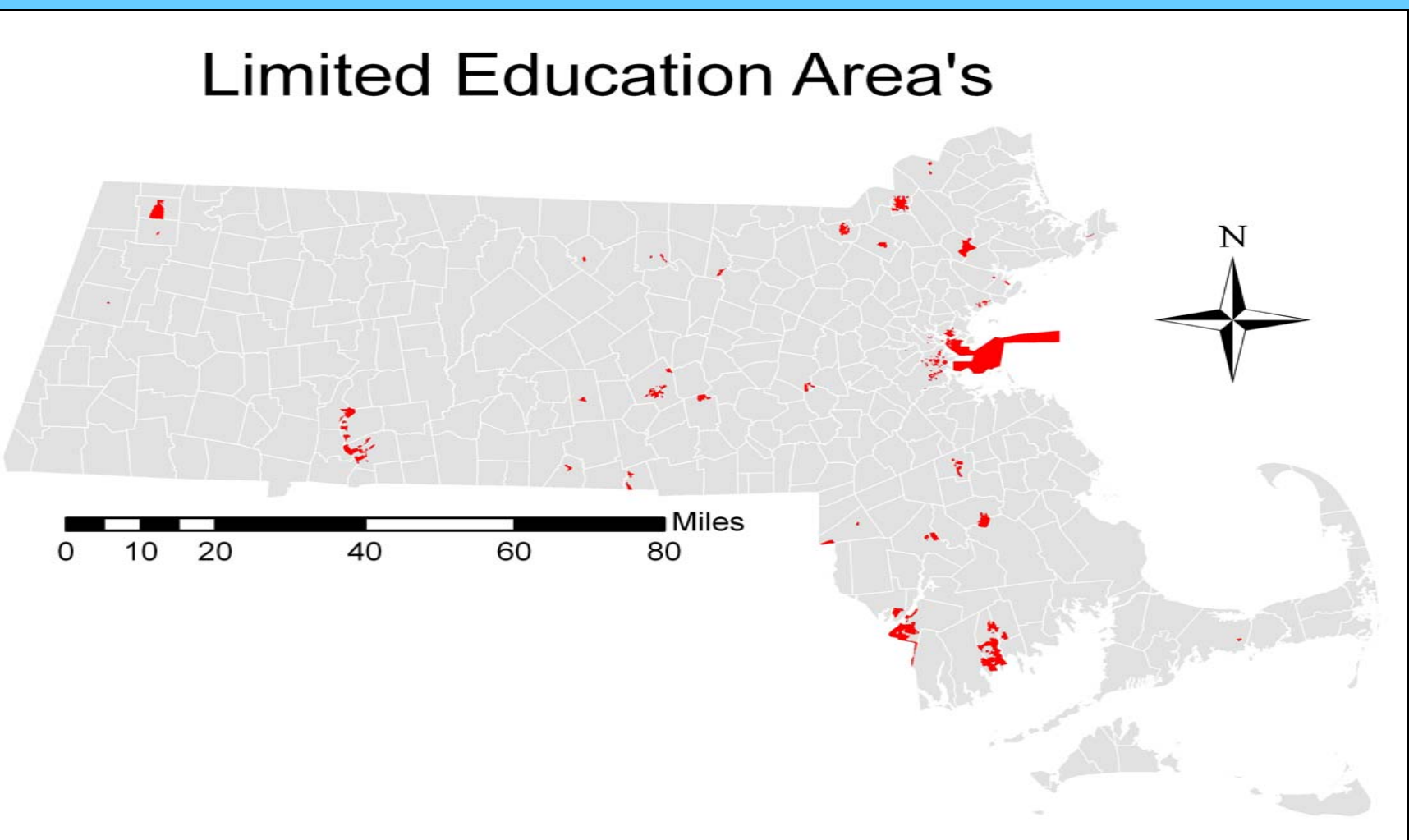
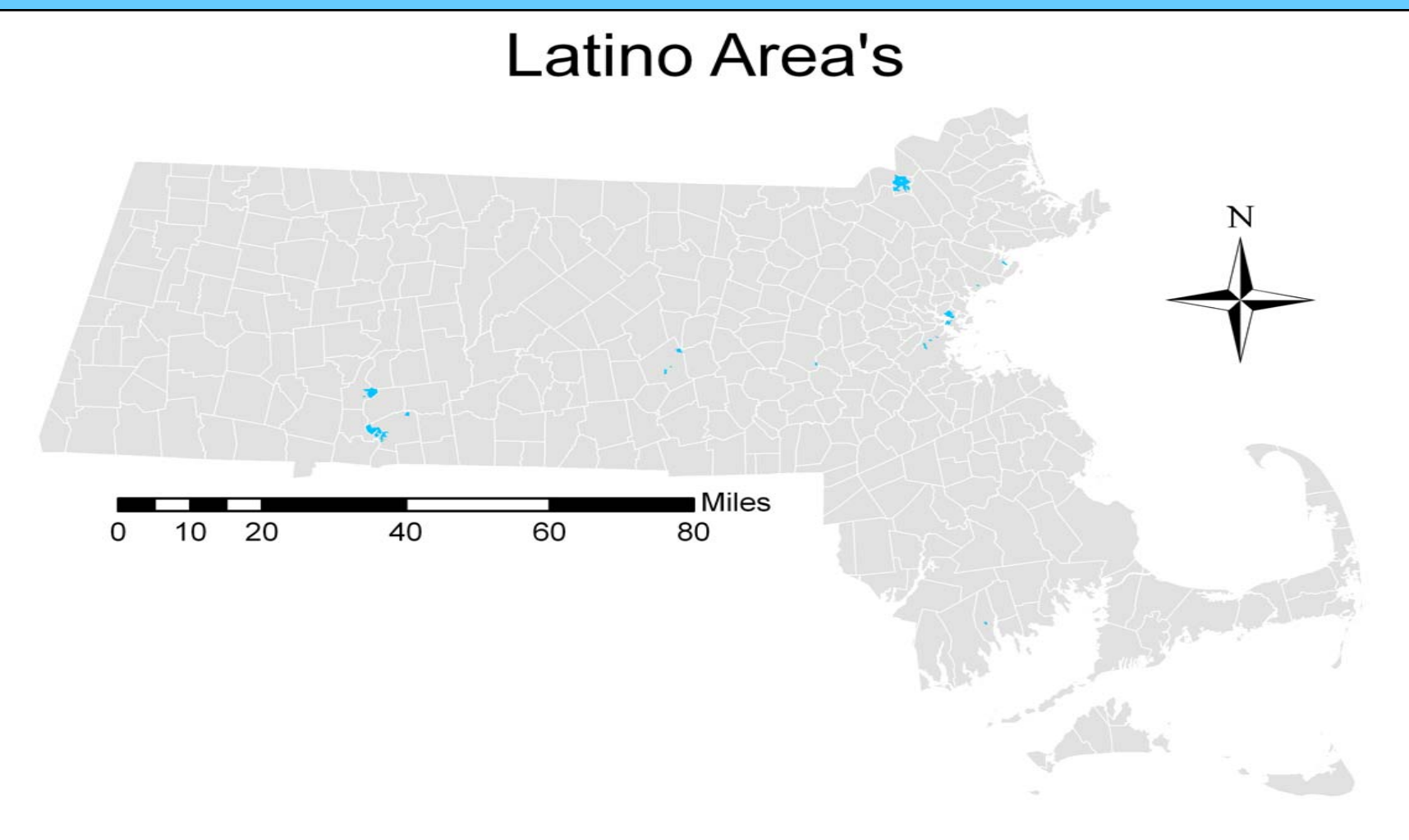
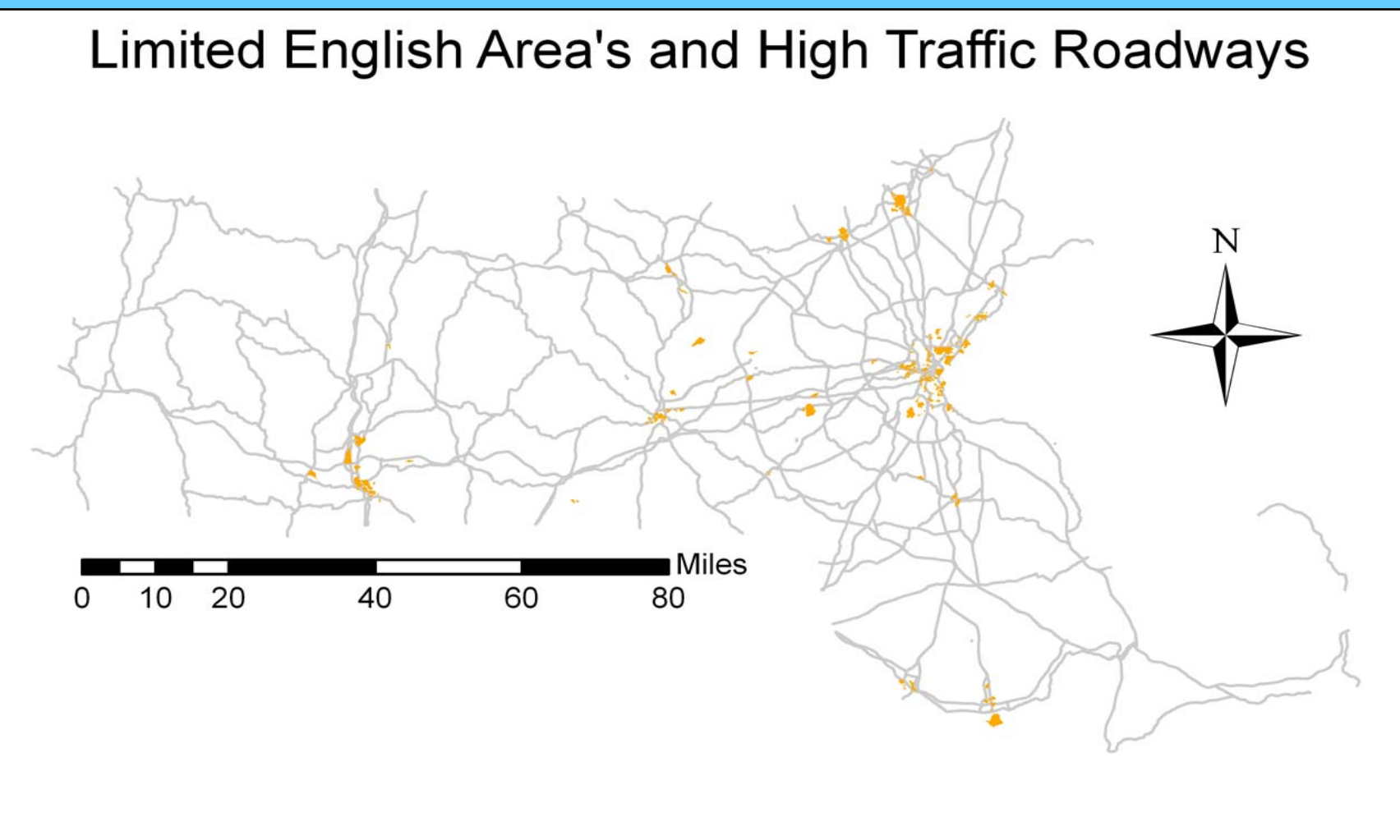
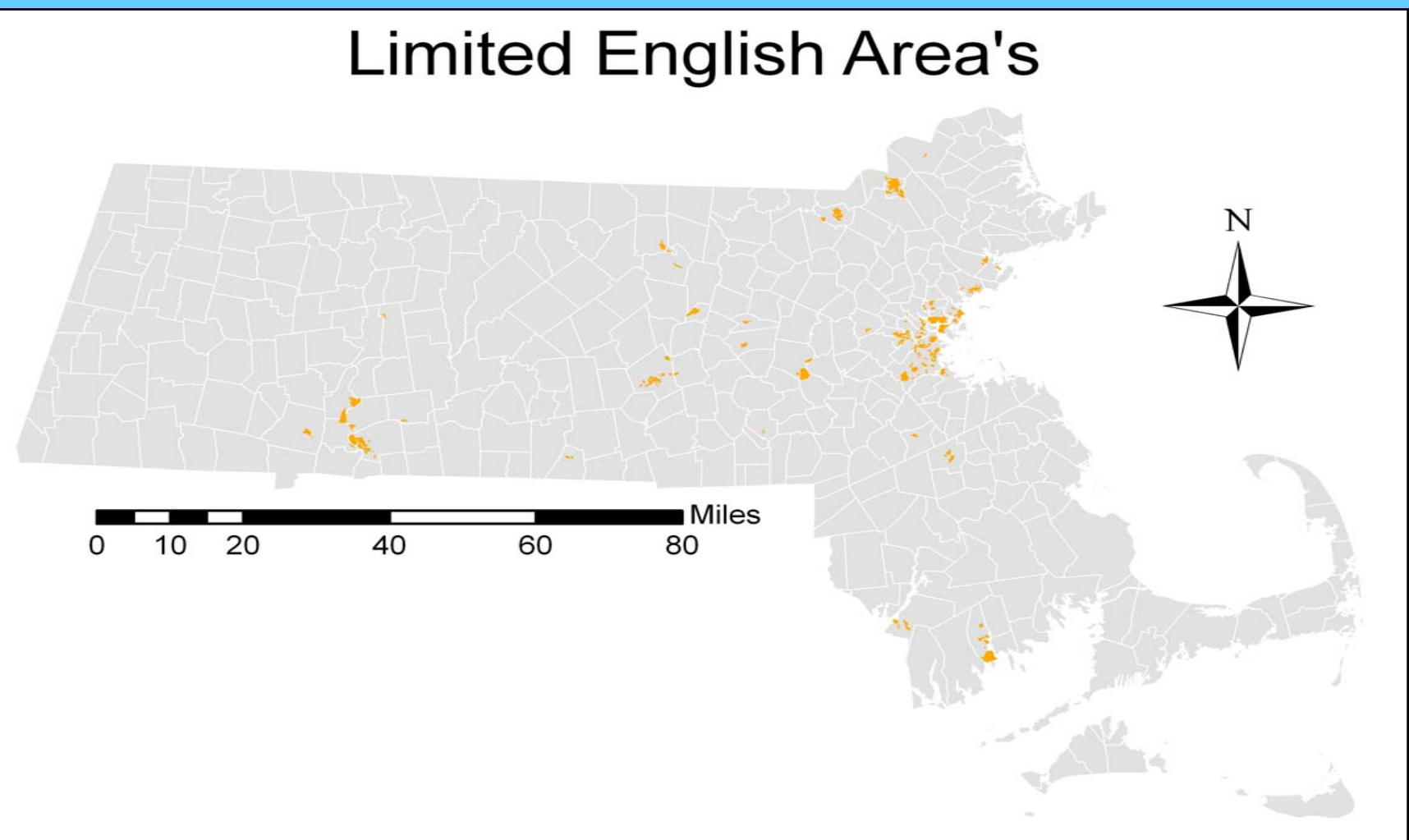
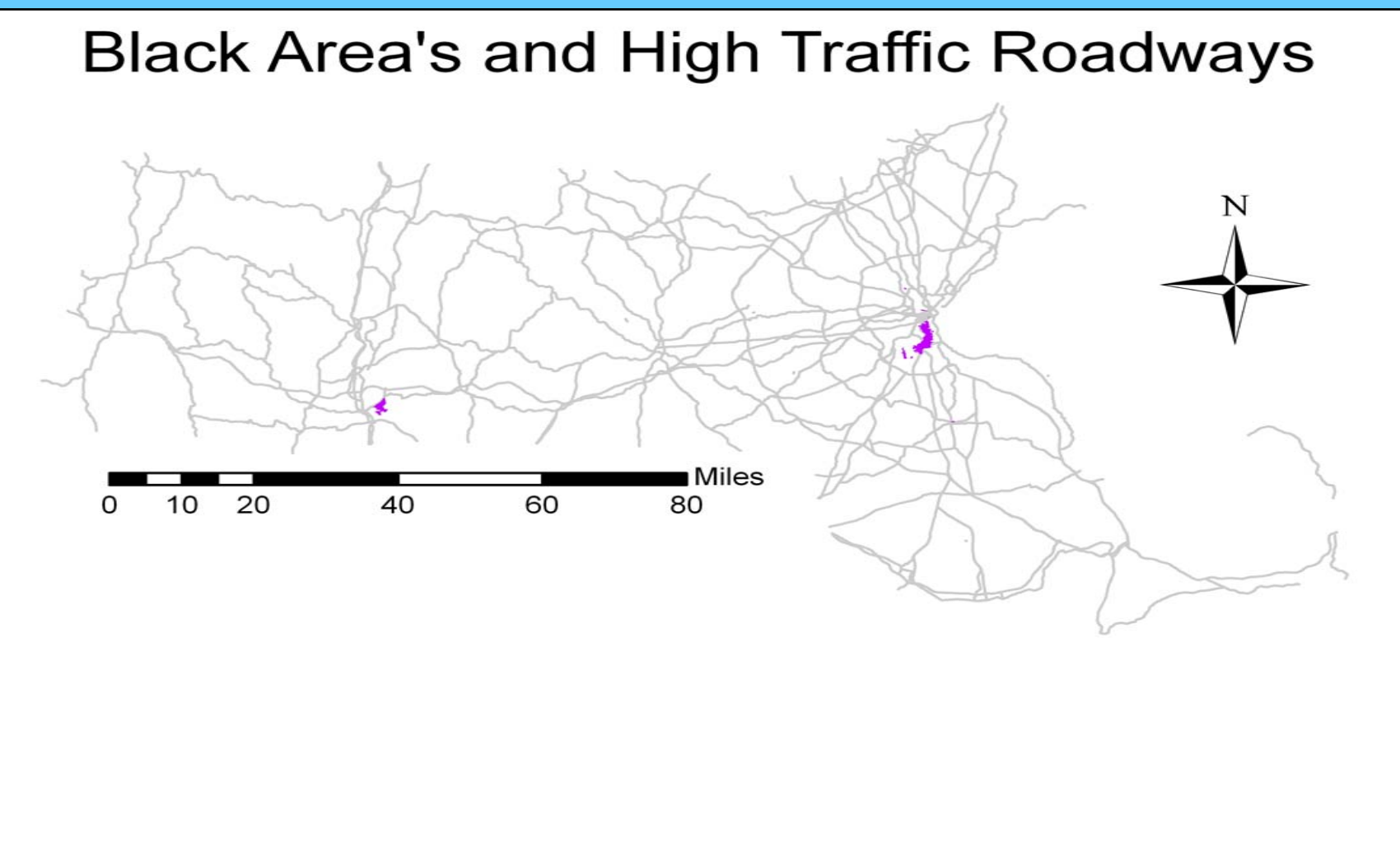
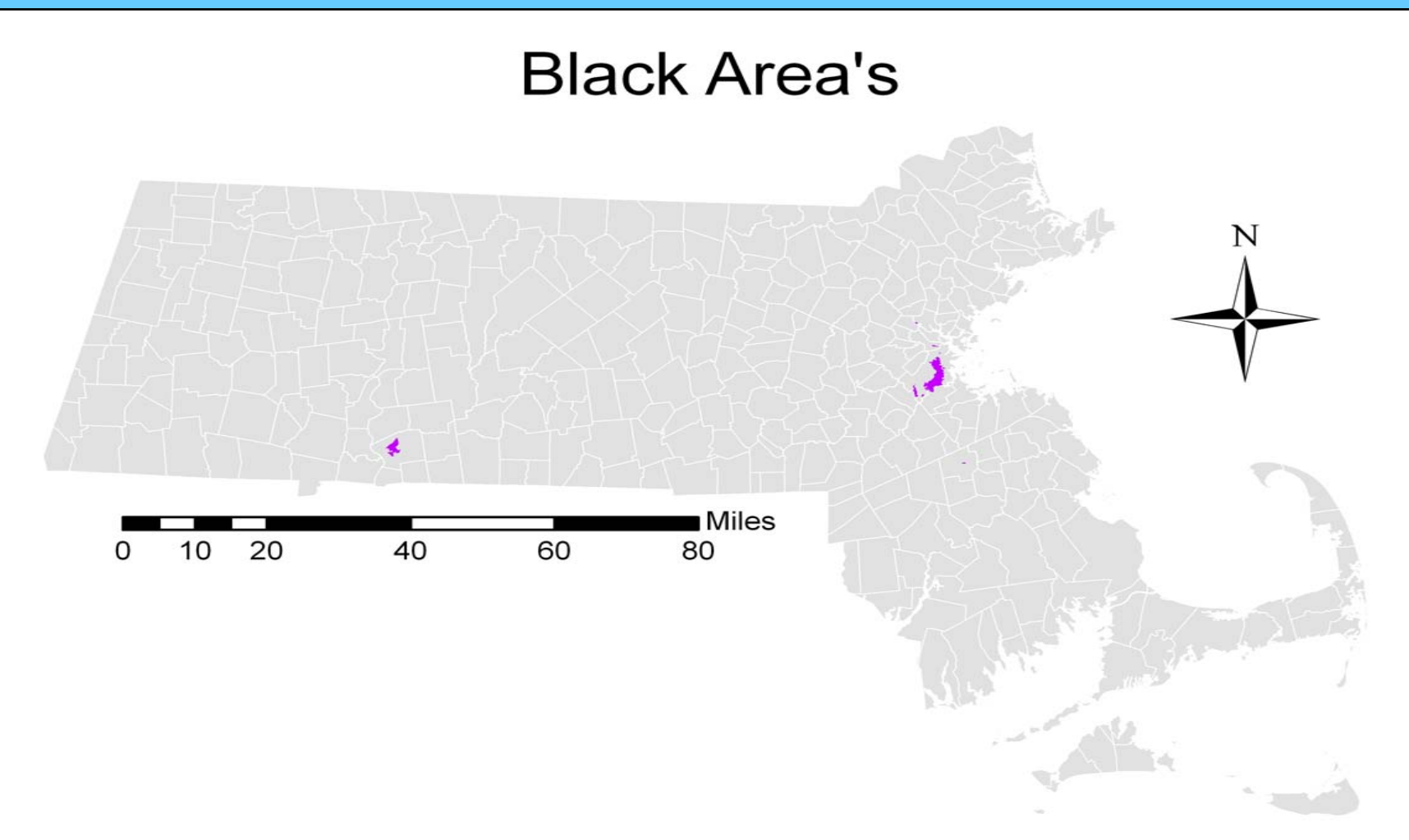
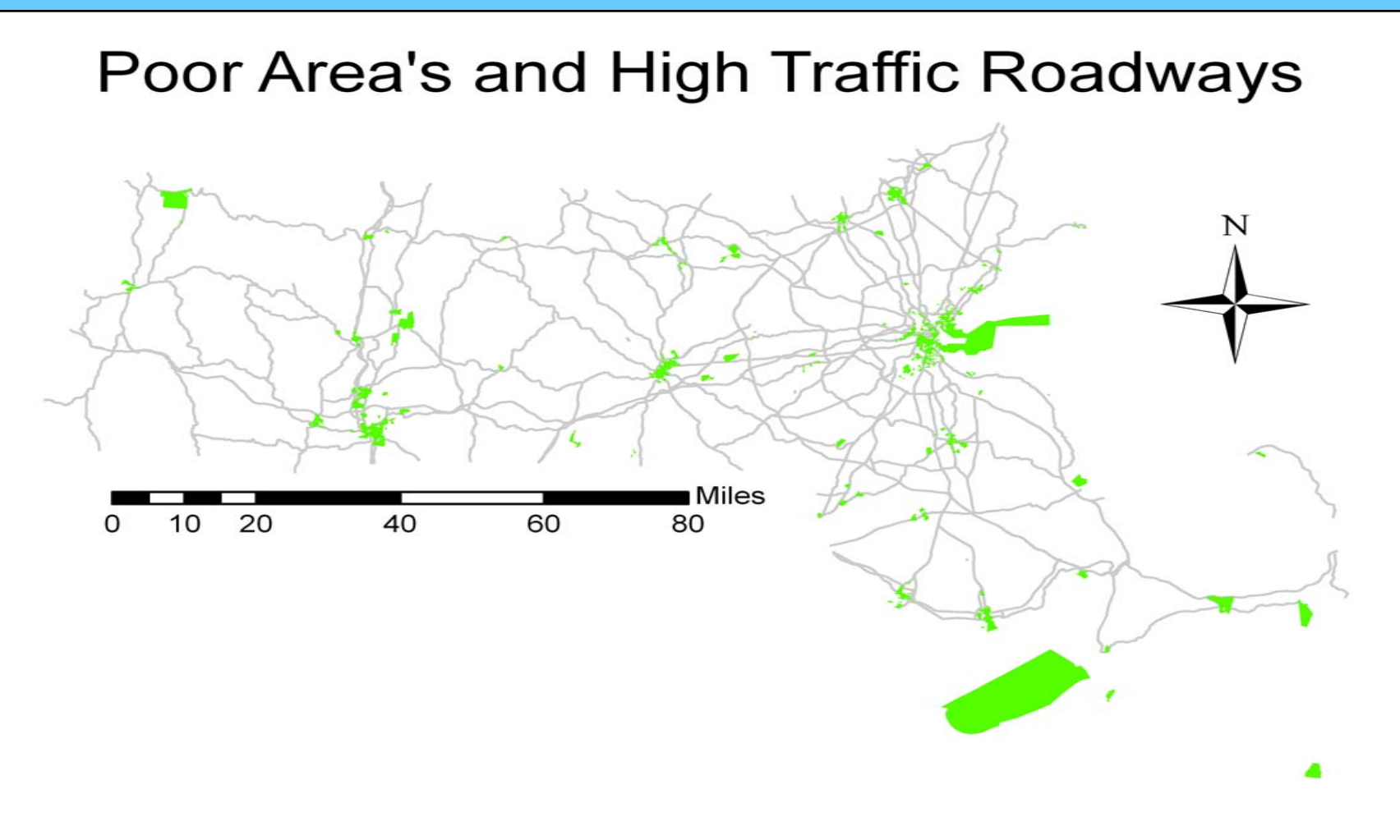
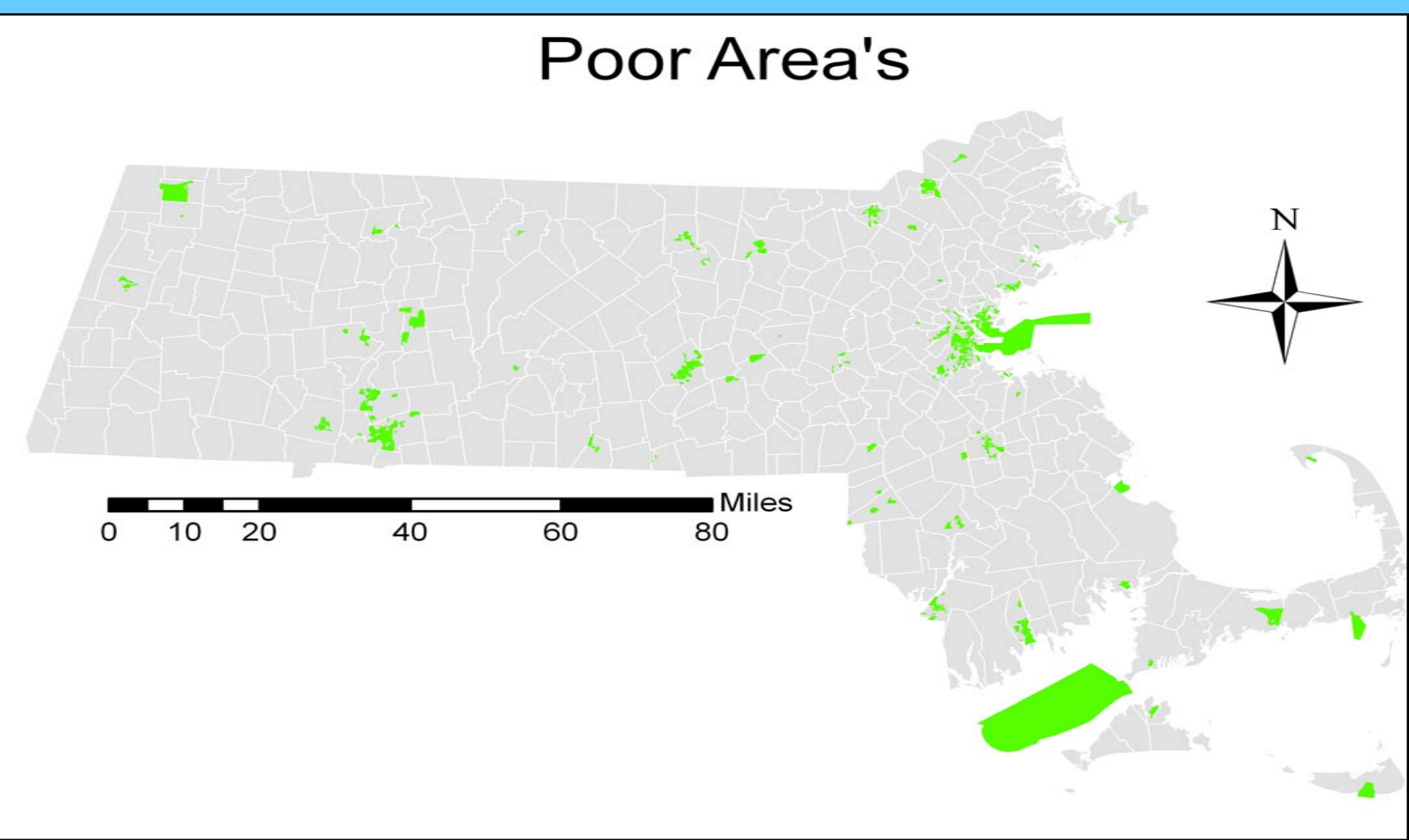
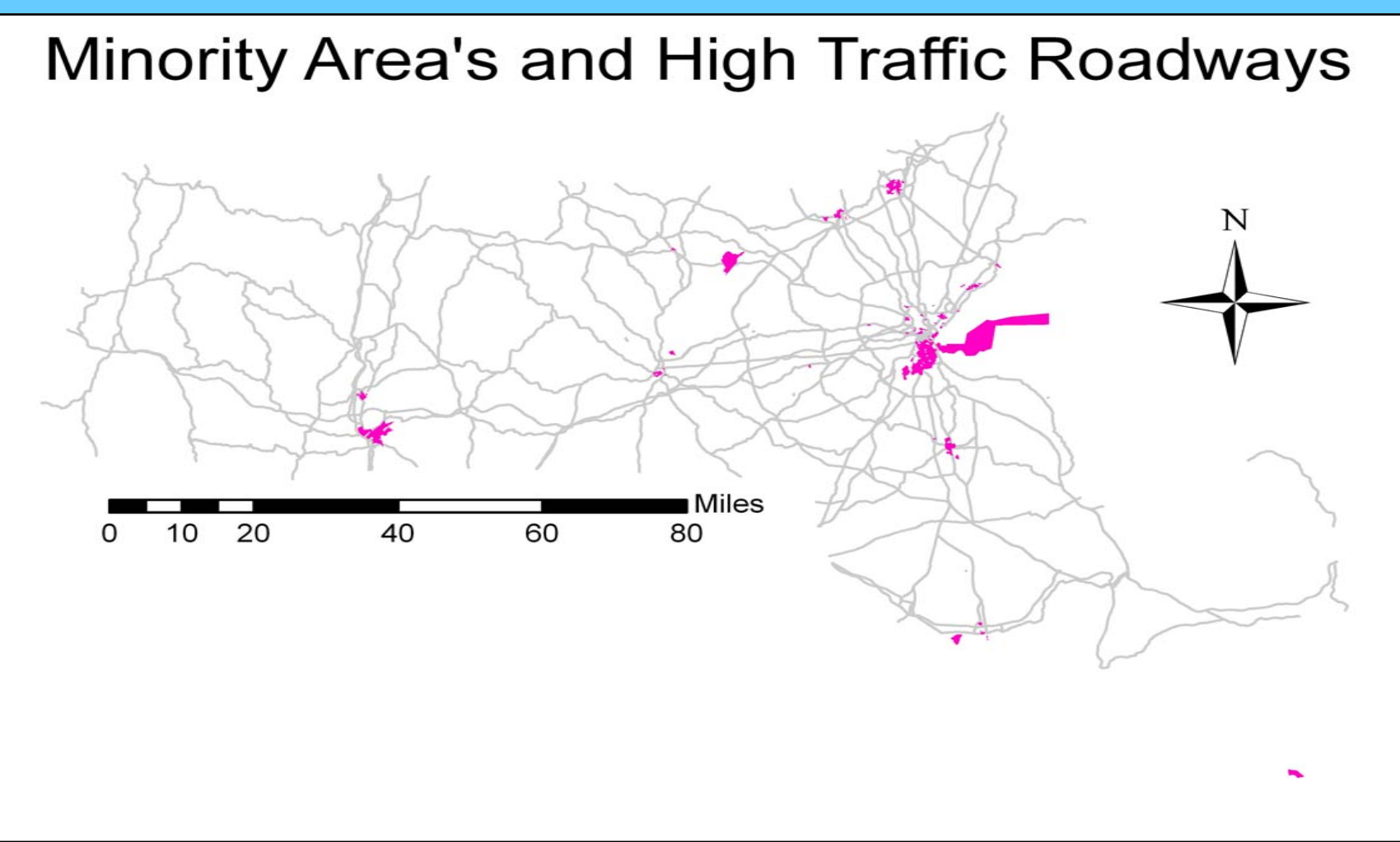
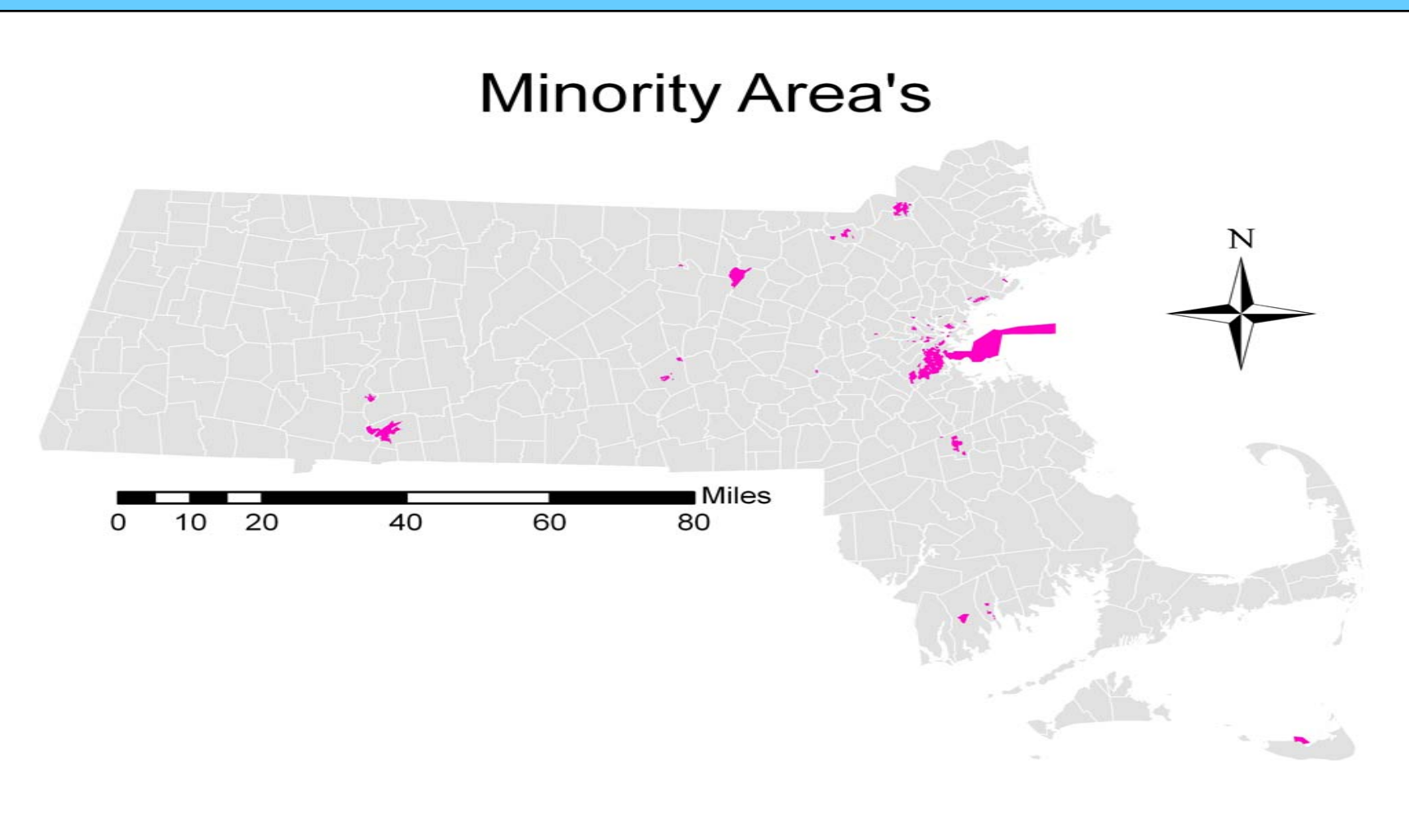
Second, I classified all the day care centers falling in 6 geographical block group areas using *census2000blockgroups* data into high, medium, low, and very low traffic areas.

The 6 geographic block group areas are:

- Black Area-more than 50% Black/ African American
- Latino Area-more than 50% Hispanic
- Limited English Area-more than 15% of residents with an English proficiency
- Limited Education Area-more than 35% with less than a high school education,
- Minority Area-more than 50% non-white residents
- Poor Area-more than 20% of residents living in poverty



	Very Low Traffic		Low Traffic		Medium Traffic		High Traffic		
	Amount	%	Amount	%	Amount	%	Amount	%	Total
Facilities	6	0.07%	5561	67.59%	963	11.71%	1697	20.63%	8227
Total Slots	87	0.06%	84872	59.56%	19976	14.02%	37563	26.36%	142498
Race/Ethnicity Classification									
Minority Area	0	0.00%	658	71.14%	72	7.78%	195	21.08%	925
Black Area	0	0.00%	279	79.26%	14	3.98%	59	16.76%	352
Latino Area	0	0.00%	212	61.99%	46	13.45%	84	24.56%	342
Socioeconomic Classification									
Poor Area	1	0.07%	874	60.86%	161	11.21%	400	27.86%	1436
Limited English	0	0.00%	442	59.57%	90	12.13%	210	28.30%	742
Limited Education	0	0.00%	391	60.62%	83	12.87%	171	26.51%	645
Facilities									
Family Child Care	4	0.06%	4548	71.15%	691	10.81%	1149	17.98%	6392
Group Child Care	2	0.11%	1001	55.33%	267	14.76%	539	29.80%	1809
School Aged Child Care	0	0.00%	12	46.15%	5	19.23%	9	34.62%	26
# of Slots									
1-7	2	0.05%	2848	71.04%	441	11.00%	718	17.91%	4009
8-12	2	0.08%	1722	71.19%	254	10.50%	441	18.23%	2419
13-20	0	0.00%	155	60.08%	33	12.79%	70	27.13%	258
21-50	2	0.26%	426	54.76%	118	15.17%	232	29.82%	778
51+	0	0.00%	410	53.74%	117	15.33%	236	30.93%	763



Results

In the high traffic area there are 1,697 centers which is 21.63%. In the medium traffic area there are 963 centers which is 11.71%. In the low traffic area there are 5,561 centers which is 67.59% of all the day care centers. In the very low traffic area there are 6 centers which is .07%. There was a total of 8,227 centers included in my study. In conclusion ,approximately 33%of the centers are located in high pollutant medium traffic and high traffic areas. The results for the 6 block groups show a similar and significant percentage among medium and high traffic centers.

Conclusion

A significant number of centers (about 30-40% of the centers in all block groups) are located in higher pollutant areas. In today's society, effects of road way pollutants on children in day care centers affects everyone across all socioeconomic and race groups— not just minorities and lower socioeconomic classes.

In future planning it may be prudent to locate new day care facilities in areas less susceptible to roadway pollutants. One might also include not only the proximity to high pollutant roadways but also the prevailing wind direction which might magnify the negative effects of the road way pollution on the center.

Bibliography

- ¹ Houston, D. (2006/September). Proximity of Licensed Child Care Facilities to Near-Roadway Vehicle Pollution. American Journal of Public Health. Volume 96 (6), 1611-1618
- ² Pershagen, G., Air pollution involving nitrogen dioxide exposure and wheezing bronchitis in children. *Int J Epidemiol.* 1995;24:1147-1153
- ³ Gehring U. Traffic related air pollution and respiratory health during the first two years of life. *Eur Respir J.* 2002;19:690-698

