**Study Overview**

The use of Geographic Information Systems (GIS) as a tool to analyze individual exposure to traffic-related air pollution has started to increase in the field of epidemiology, with a primary focus on how to properly classify exposure groupings, and what is the best marker to characterize exposure. Other studies have investigated the affect geocoding can have on spatial accuracy with some attention being paid to analyzing the amount of positional error when using different geocoding address databases. To a lesser extent researchers have started to explain the need to establish a “gold standard” for locating addresses, such as using GPS, aerial orthophotography and in some cases parcel shapefiles. Most geocoding positional error studies that have used a gold standard to verify a geocoded location have used small cohorts and only reported on the amount of error, or missassigned exposure points. This study adds to a growing body of research on determining the amount of positional error when geocoding by conducting a proximity to major roadway exposure analysis, where Connecticut (CT) school locations are geocoded using two address databases (Census TIGERline & StreetMap USA) and comparing them against a True Ground Location (TGL) established using aerial orthophotography. This study will then expand upon this research by analyzing the affect positional error can have on results of a health study by comparing the ORs of the schools assigned to exposure groupings using TIGER to geocode their location versus the TGL.

The design of this study was to test the feasibility of using the CTDPH dataset in a spatial context, while examining spatial error within the geocoding process and the affect this can have on calculating health statistics. The results of each specific aim of this study indicate that geocoding is a flawed mechanism for controlling for spatial error. To restate the four specific aims that this research examined:
1. analyze the affect geocoding match score has on spatial error.

2. compare amount of spatial error that exists in two commonly used street networks.

3. examine the affect spatial error can have on assigning exposure groupings in a proximity to major roadways analysis.

4. determine if spatial error can bias the results of an exposure analysis by examining the asthma ORs of schools with varying exposure distances.

**Budget Report**

All expenses were used towards time working on the study and travel to the Connecticut Department of public Health.

- Travel via car to Connecticut Department of Public Health 6 trips at 210miles per trip.
- 2-3 months spent working on literature review.
- 7 months spent cleaning the asthma address data, geocoding using 2 different sources and then checking and correcting all 1142 schools fixed location.
- 1-2 months spent conducting statistical analysis.

Results of research have led to being invited to present this research at the 2008 Northeast Epidemiology Conference to take place October 16th 2008, as well as the URISA GIS in Public Health Conference June 5-8, 2009.  We are also in the process of submitting 2 different journal articles from this research.