



SOUTH BRONX ENVIRONMENTAL HEALTH AND POLICY STUDY

Public Health and Environmental Policy Analysis

Funded with a Congressional Appropriation sponsored by Congressman José E. Serrano
and administered through the U.S. Environmental Protection Agency

Outreach, Dissemination and Education Activities

Final Report for Phase V

April 2008

Institute for Civil Infrastructure Systems (ICIS)

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New York University

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Edited by Carlos Restrepo and Rae Zimmerman

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I. Introduction

The application of Geographic Information Systems (GIS) to land use and environmental justice issues has proven to be a very promising approach for the evaluation of potential policies, to visualize and present information, and to produce outreach, dissemination and education materials related to the project.

In Phase V of the Project the ICIS research team built on the GIS work produced in previous phases of the project and presented in the Phase II & III report and the Phase IV report. The GIS analyses presented in this report continue the research work on the proximity of public schools to major highways and truck routes by including social variables, including demographic, race and ethnicity variables, in the analyses, for the purpose of examining the spatial relationship between a sensitive population (school-aged children with high asthma rates) and environmental health risk factors.

In this Phase V report the team has also assembled all the outreach, dissemination and education work from the entire project. This report includes work that the Wagner-ICIS research team participated in, including a variety of activities such as academic conference presentations, the development of a project web page, and collaborative efforts with the other project team members in various forums, press events and community educational activities.

The next and final phase of the South Bronx Environmental Health and Policy Study, Phase VI will synthesize the research, outreach, dissemination and education activities and present a set of public policy recommendations based on work carried out throughout the project.

ICIS research team

A number of people from the NYU Wagner/ICIS team contributed to the various outreach and education activities included in this report. They are listed below:

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Carlos Restrepo, Ph.D., Research Scientist, ICIS, NYU
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Wendy Remington, Assistant Research Scientist, ICIS, NYU
Alison Kling, Graduate Research Assistant, ICIS, NYU
Renuka Vijayanathan, Graduate Research Assistant, ICIS, NYU
Becca Nagorsky, Graduate Research Assistant, ICIS, NYU
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Sara Clark, Graduate Research Assistant, ICIS, NYU
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Nicole Dooskin, Graduate Research Assistant
Roy Guzman, Web Design
David Klebenov, Graduate Research Assistant
Jennifer Lara, Graduate Research Assistant

II. GIS Analyses: Environmental Justice and Land Use in the South Bronx

Zvia Segal Naphtali, Carlos E. Restrepo and Rae Zimmerman

During Phase V of the project the Wagner/ICIS research team continued to use Geographic Information Systems (GIS) to analyze the location of public schools in relation to the location of major highways and truck routes. The rationale for conducting these analyses was presented in the Phase IV report. Major highways and truck routes in the South Bronx are characterized by very high vehicle traffic. Transportation and air quality models presented in the Phase II & III report suggest that there are air pollution hotspots along these transportation infrastructures. Moreover, an extensive literature on the subject shows that air pollution concentrations within about 150 meters (about two city blocks) of a major highway tend to be significantly higher than background pollution concentrations. In addition, as described in the Phase I report, the South Bronx includes a sensitive population of asthmatic children. This area has one of the highest asthma hospitalization rates in the United States. These factors led the ICIS research team to carefully examine the location of public schools, where children spend a significant part of their time, in relation to these environmental health risk factors (highways and truck routes). GIS provides an important analytical tool for this purpose.

The GIS analyses presented in the Phase IV report address the proximity of public schools to major highways and roads in Bronx County and compare the results to other urban areas such as New York City, Los Angeles County, Chicago and Houston. The new analyses carried out during Phase V go beyond the previous analyses in that they include some of the socio-economic characteristics of the neighborhoods around the schools identified as being in close proximity to major highways. These characteristics include percentage of Black, Hispanic and White residents, as well as population density, using Census data at the Census-tract level.

Figure 1 shows an example of this type of analysis for Bronx County. It uses GIS to look at the percentage of Hispanics at the Census-tract level in the project Study area and also shows schools that are located within two city blocks of a major highway. As the figure shows, these schools tend to be in areas with very high percentages of Hispanic residents, which is a reflection of the population characteristics of the study area. These analyses have been done for five geographical areas: The South Bronx, New York City, Chicago, Los Angeles County and Houston. The maps are presented in this section of the report.

Figures 5, 9, 13 and 17 show the percentage of Hispanics at the Census-tract level in the other urban areas considered. In the South Bronx and other parts of New York City the schools in proximity to major highways tend to be in areas with high percentages of Hispanics. This is not true in Chicago but is also true in Los Angeles County and in Houston.

As Figure 10 shows, Chicago stands out as the urban area where the schools that are located in close proximity to major highways are in areas with very high percentages of black people. In the other urban areas, the schools located in close proximity to major

highways are located in areas with relatively low populations of black people (Figures 2, 6, 10, 14 and 18). But there are some exceptions within these urban areas. In New York City (Figure 6) there are some schools in close proximity to major highways in Harlem and northern Manhattan. These are areas with relatively high percentages of black population. Similarly, there are some schools located in close proximity to major highways in Los Angeles County and Houston that are in areas with high percentages of black people.

In general, schools that are located in close proximity to major highways tend to be located in areas with high-percentages of minority populations. Figures 7, 11, 15 and 19 are maps produced for New York City, Chicago, Los Angeles County and Houston that show that most of the schools in those urban areas that are located in close proximity to major highways are in areas with very low percentages of White residents.

In terms of population density the maps do not show very clear patterns. In the case of New York City and Houston (Figures 8 and 20) there are many schools located in close proximity to major highways that are in areas with high population densities relative to other areas in those cities. In the case of the South Bronx, Los Angeles County and Chicago (Figures 4, 12 and 16) it is difficult to discern a clear pattern.

In conclusion, the GIS maps presented in this section suggest that schools located in close proximity to major highways in the urban areas considered tend to be in areas with low percentages of white people. In general, they tend to be located in areas with high percentages of Hispanics. In the case of Chicago they are located in areas with high percentages of black people.

Bronx County

Figure 1

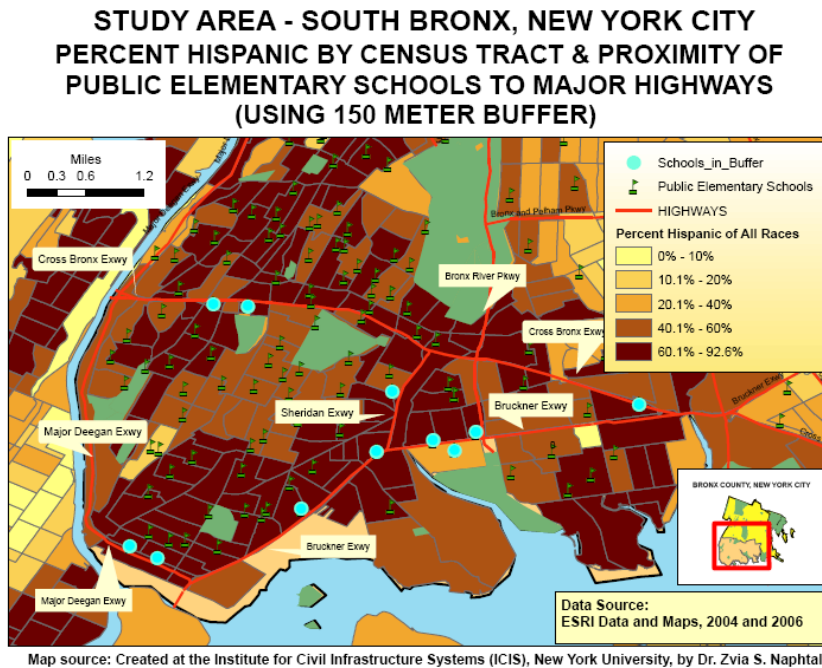


Figure 2

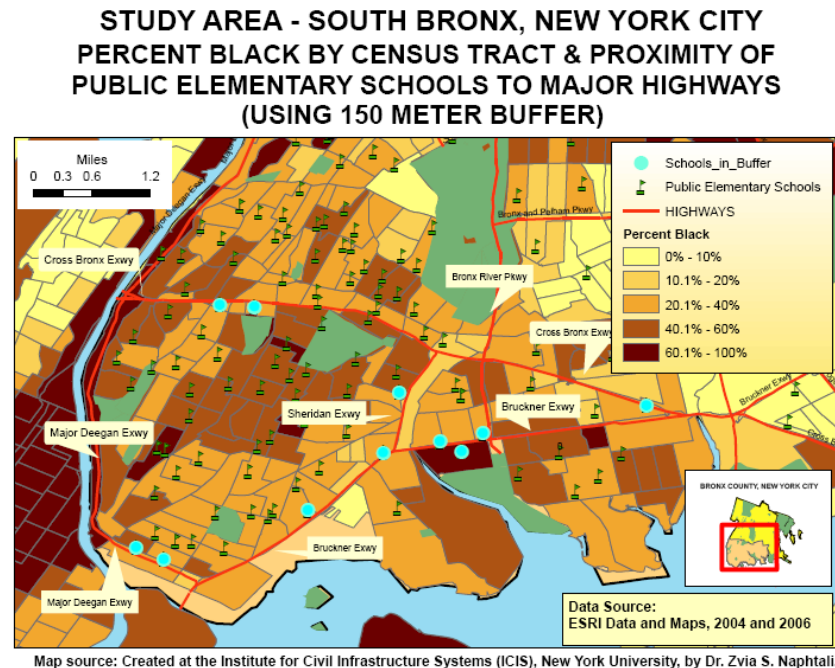


Figure 3

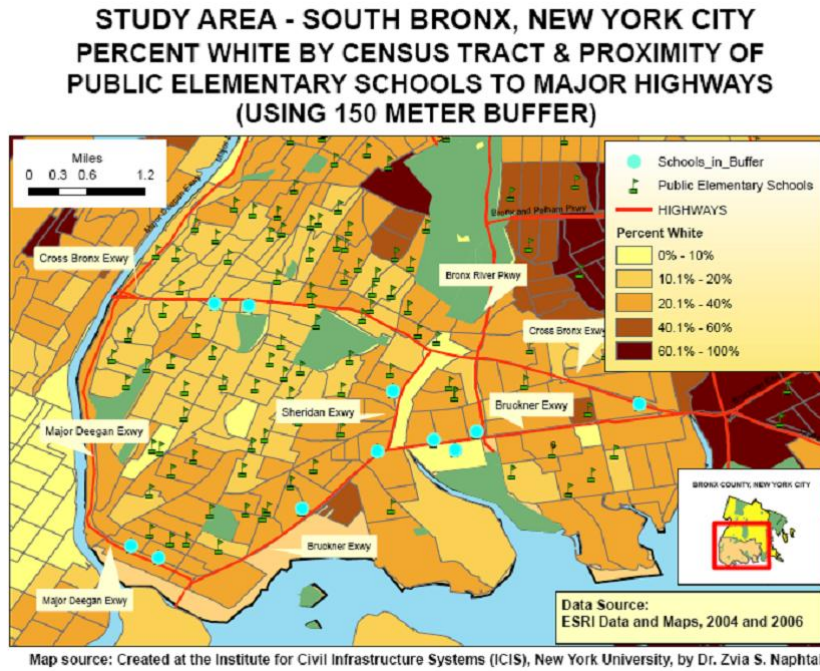
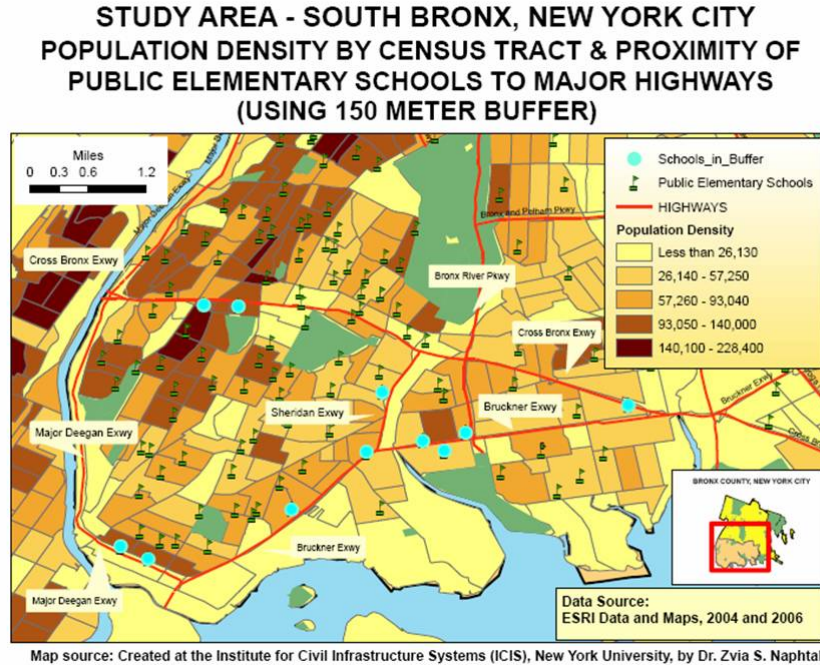


Figure 4



New York City

Figure 5

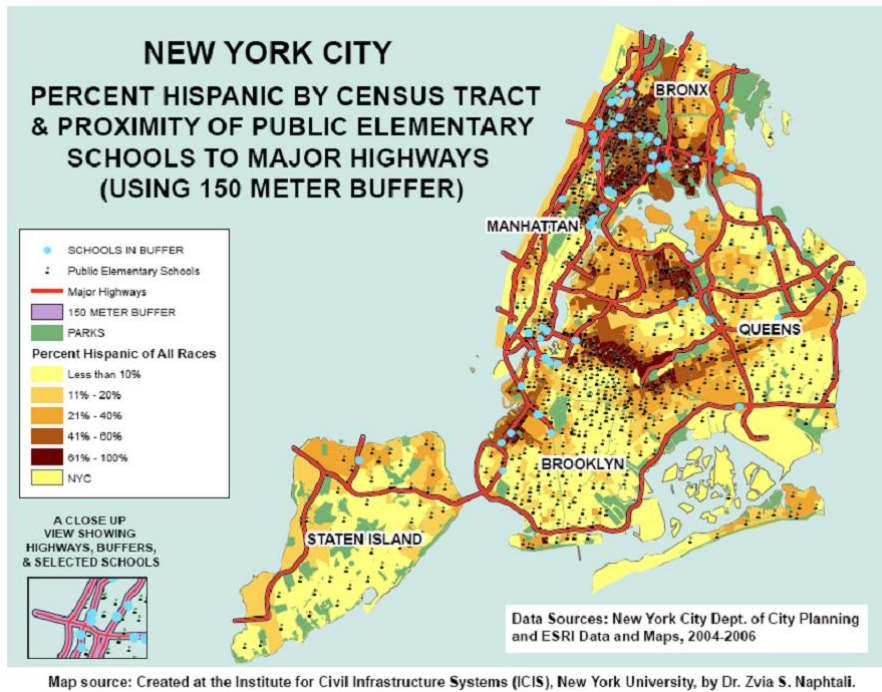


Figure 6

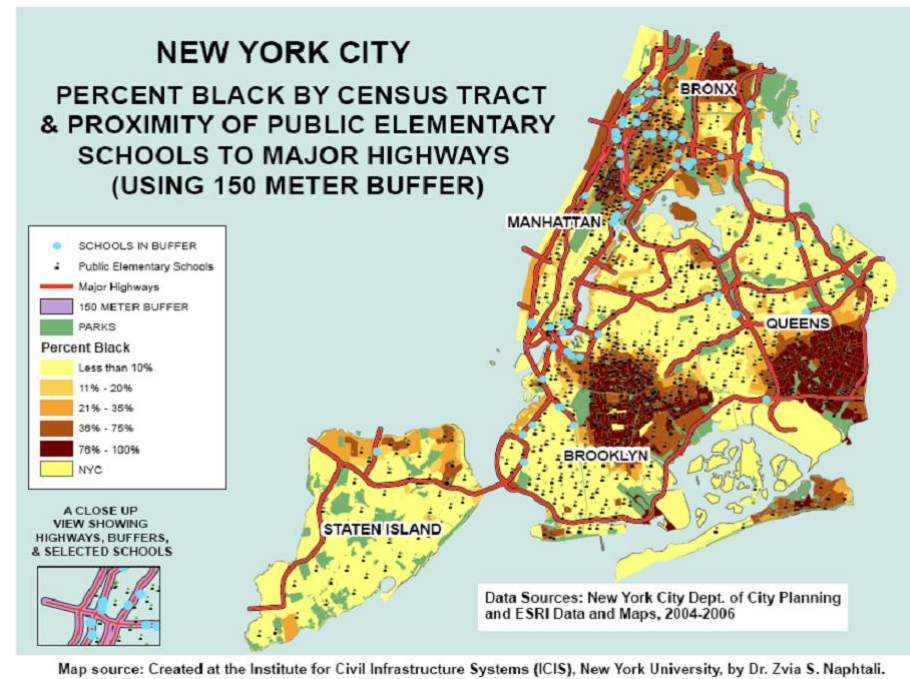


Figure 7

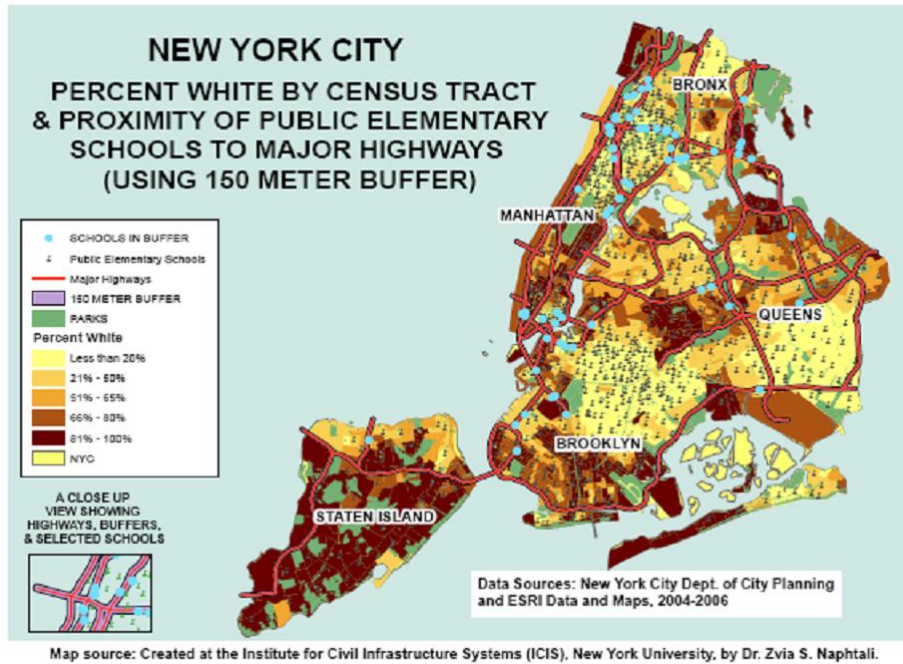
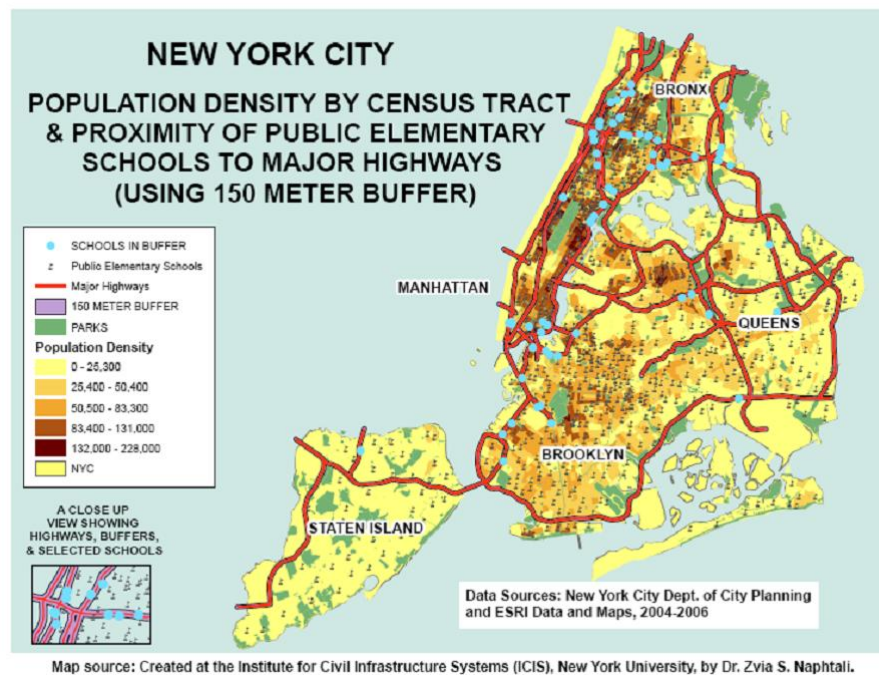


Figure 8



Chicago

Figure 9

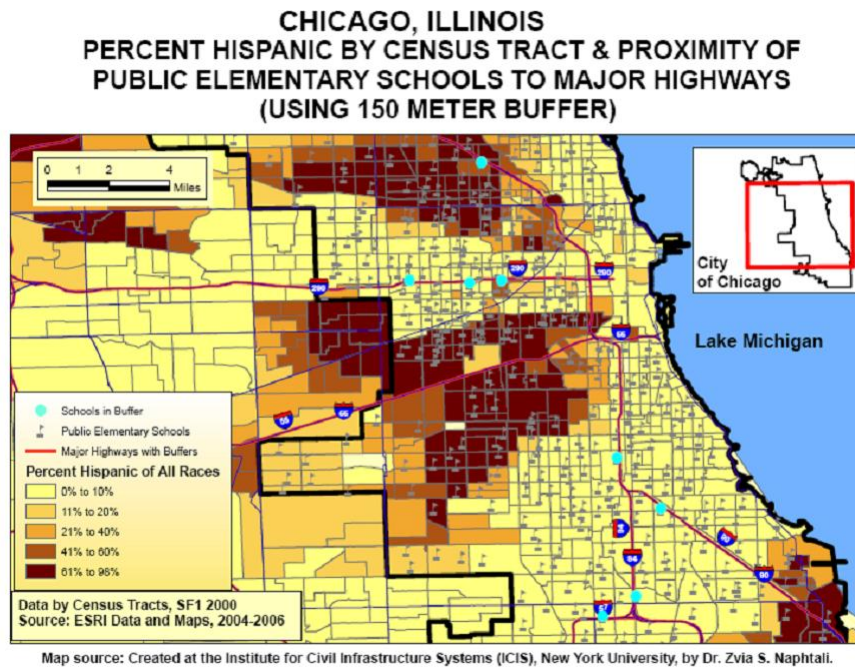


Figure 10

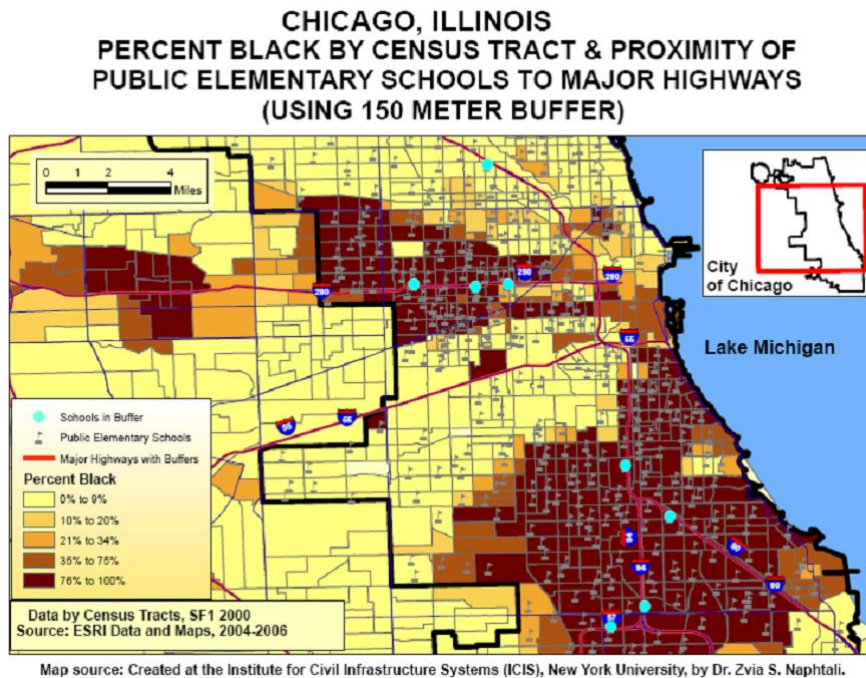


Figure 11

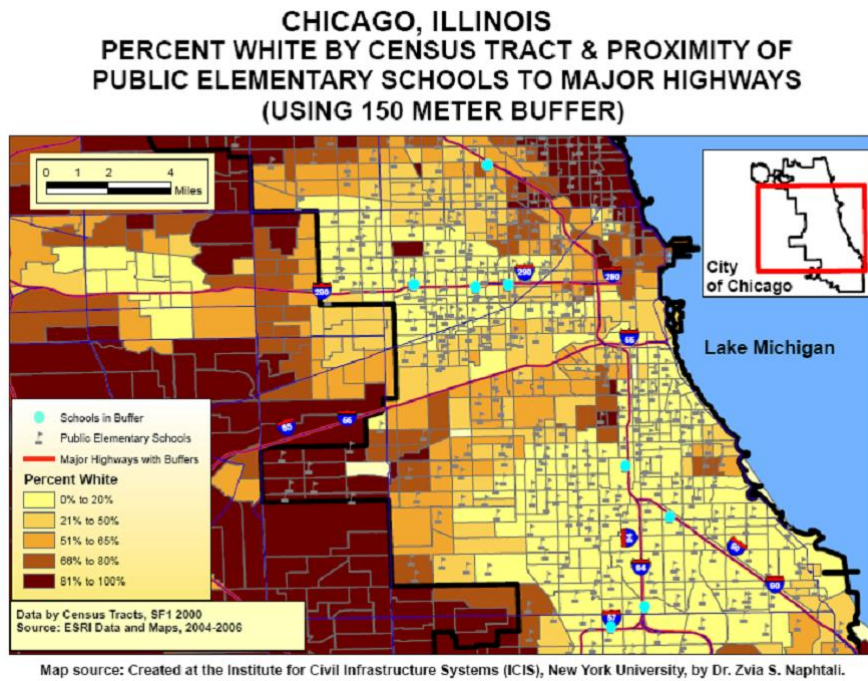
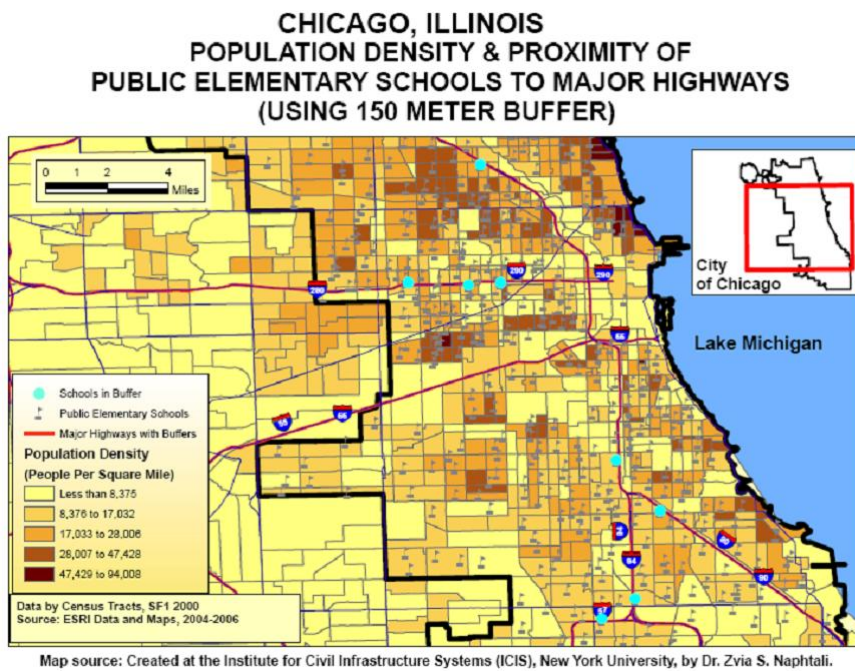


Figure 12



Los Angeles County

Figure 13

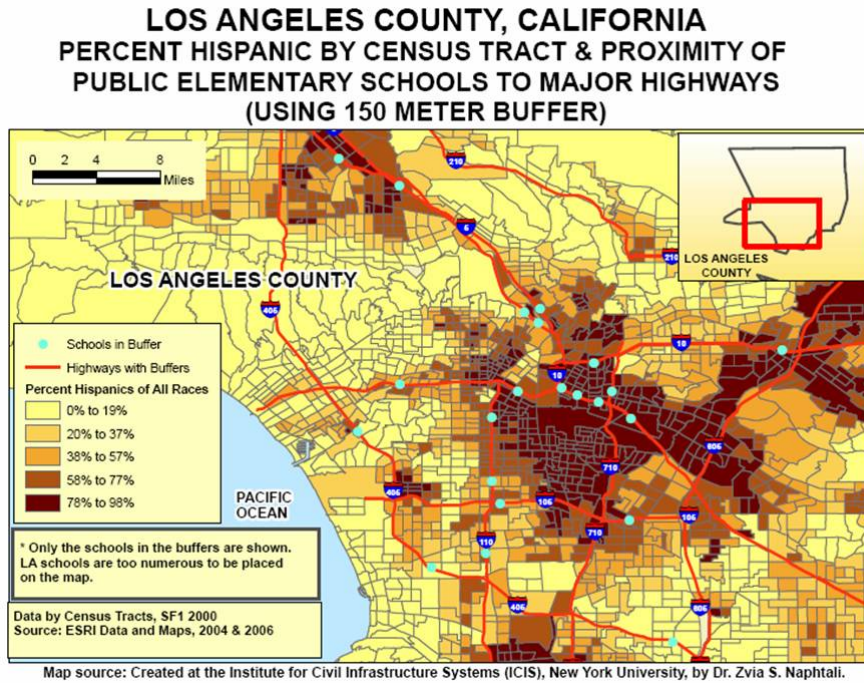


Figure 14

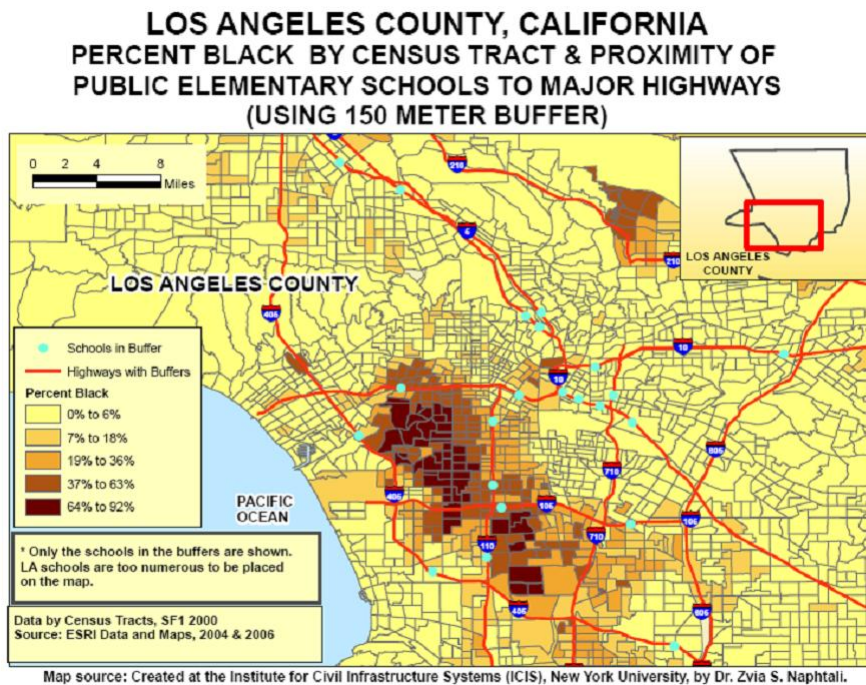


Figure 15

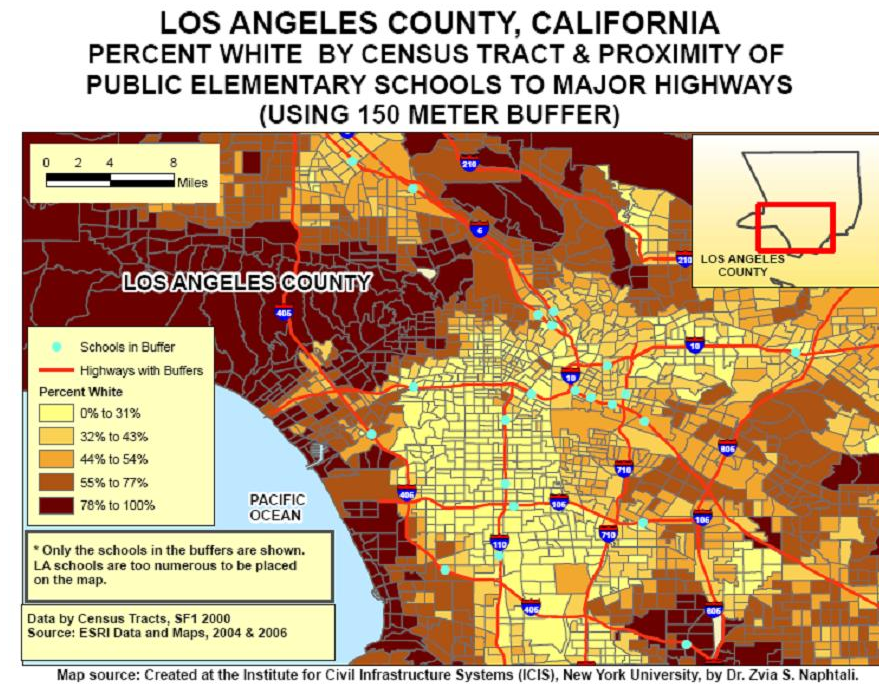
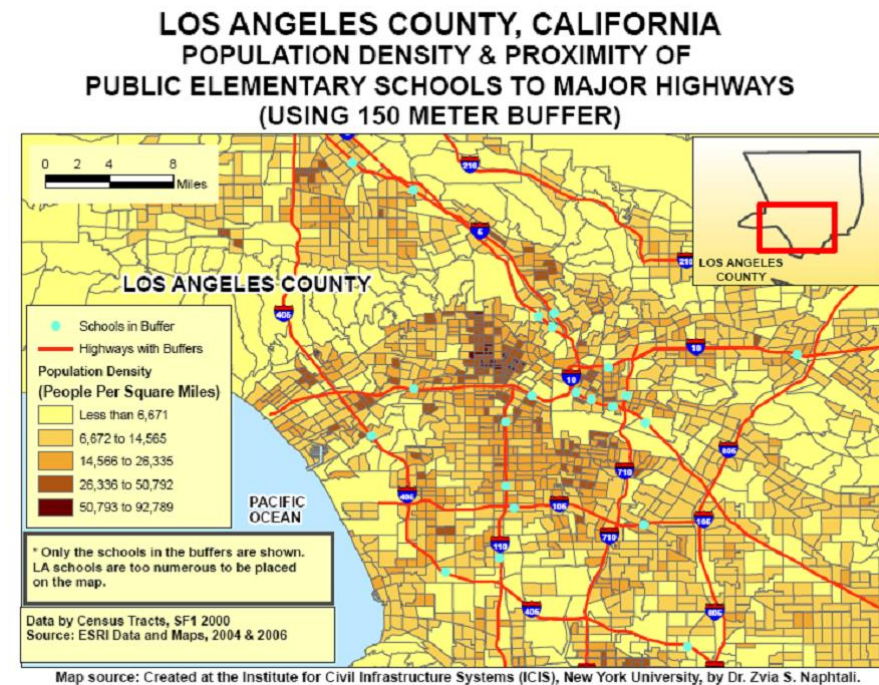


Figure 16



Houston

Figure 17

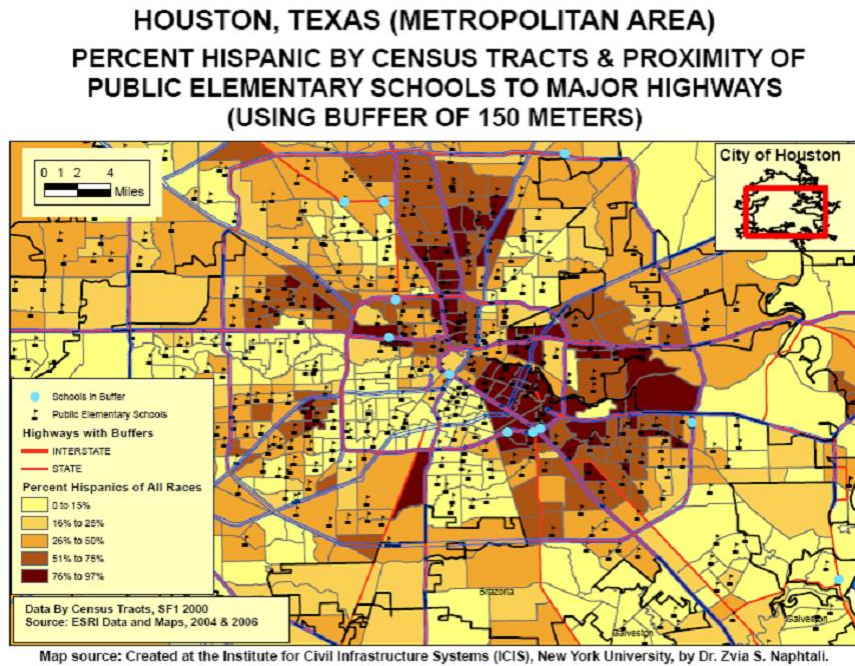


Figure 18

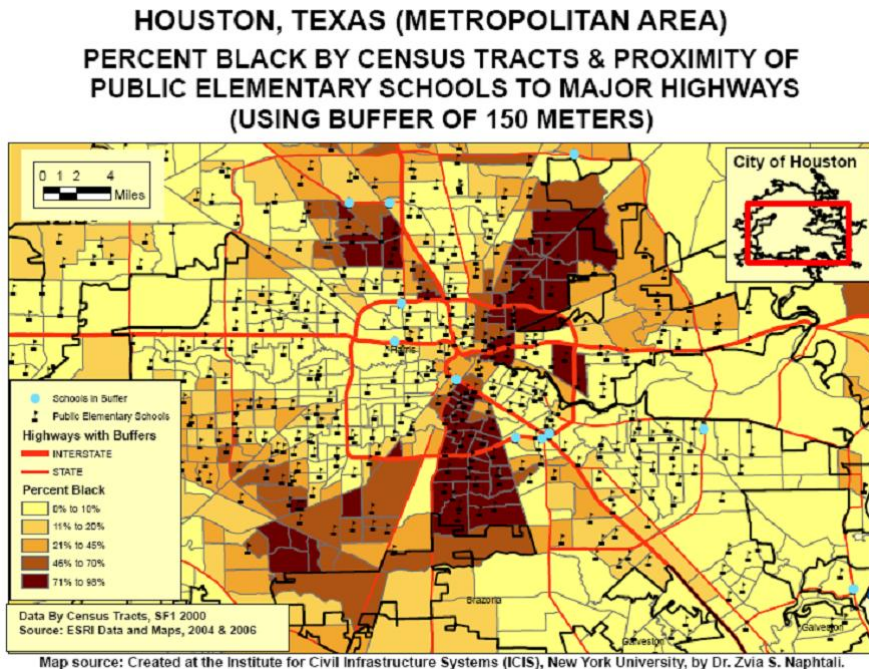


Figure 19

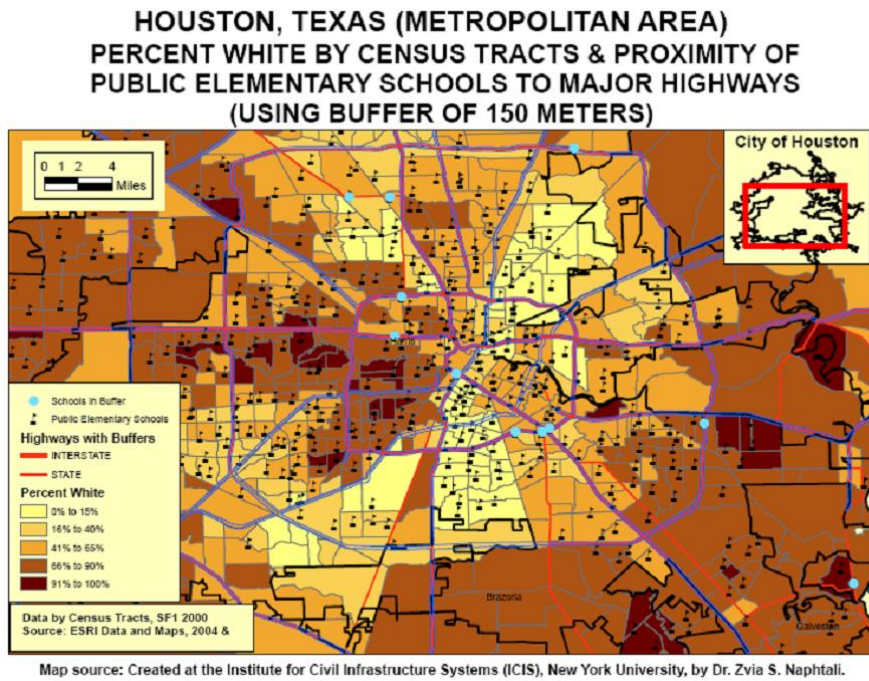
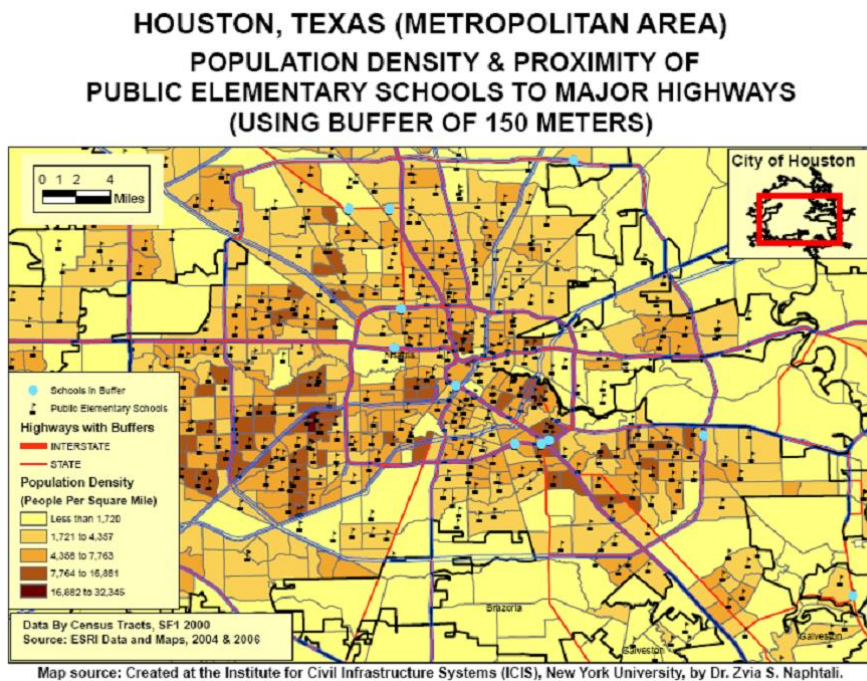


Figure 20



III. Analysis of EPA's Proposed Modification of the PM_{2.5} Standard Analysis

One of the topics of discussion among project researchers and the participating community groups during 2006 was the proposed EPA revisions to the fine particulate matter (PM_{2.5}) standards. In order to facilitate discussion among the project members and to get a better understanding of the potential impact of the changes on air quality in the project study area the team conducted a brief analysis on this topic which is included in this section of the report. The research members provided information to the community groups that are part of the study. They traveled to Philadelphia on March 8, 2006 to attend an EPA public hearing on the subject and presented their opinion. The rest of this section is the document that was prepared in January 2006 to discuss the issue among team members and with the community groups.

Proposed Revisions to the PM_{2.5} Standards and Potential Impact on Air Quality in the South Bronx

In December 2005 the U.S. Environmental Protection Agency (EPA) announced a series of proposed revisions to particulate matter air quality standards¹. Particulate matter refers to any suspended solid or liquid particles. PM_{2.5} refers to particles with a diameter of 2.5 micrometers or less. The current standards for this pollutant are 65 µg/m³ for a 24 hour average and 15 µg/m³ for an annual standard. According to the current standards compliance is determined as follows²:

- Twenty-four hour average PM_{2.5} not to exceed 65 µg/m³ for a three-year average of annual 98th percentiles at any community-representative site in a monitoring area.
- Three-year annual average PM_{2.5} not to exceed 15 µg/m³ concentrations from a single community-representative site or the spatial average of eligible community-representative sites in a monitoring area.

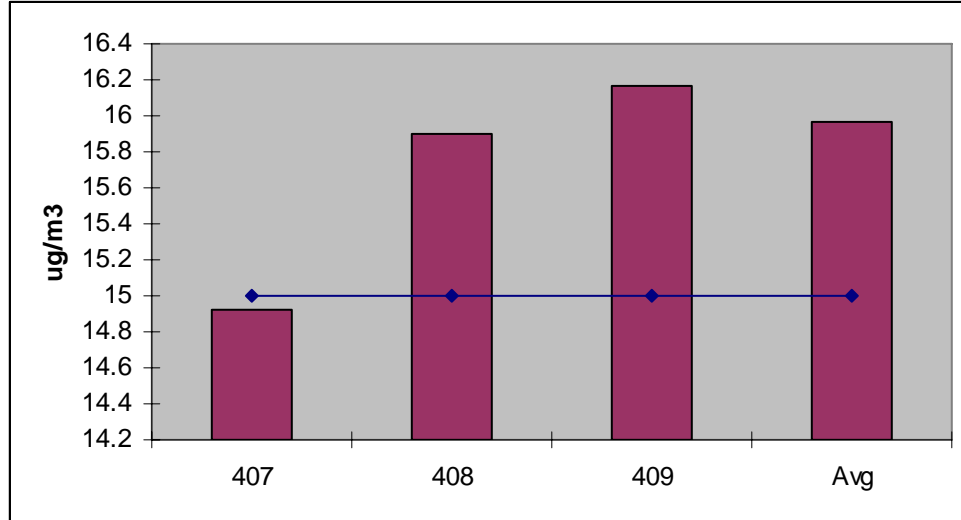
The proposed revisions would reduce the 24-hour average standard from 65 µg/m³ to 35 µg/m³ and would leave the annual average standard unchanged at 15 µg/m³.

Currently the South Bronx monitoring stations suggest that the current annual average standard is exceeded. Figure 1 shows data for the three monitoring stations available in the South Bronx during 2001. The monitoring stations are maintained by the New York State Department of Environmental Conservation (DEC). Station No. 407 is located at IS 52; Station No. 408 is located at PS 74; and station No. 409 is located at PS 154. In the figure, Avg refers to the average of the three annual values for the stations.

¹ See US EPA, "Fact Sheet: Proposal to Revise the National Ambient Air Quality Standards for Particulate Matter," available online: <http://www.epa.gov/particles/fs20051220pm.html>

² See US EPA NAAQS, 1997.

Figure 1. Annual Average Ambient Concentrations of PM_{2.5} – South Bronx

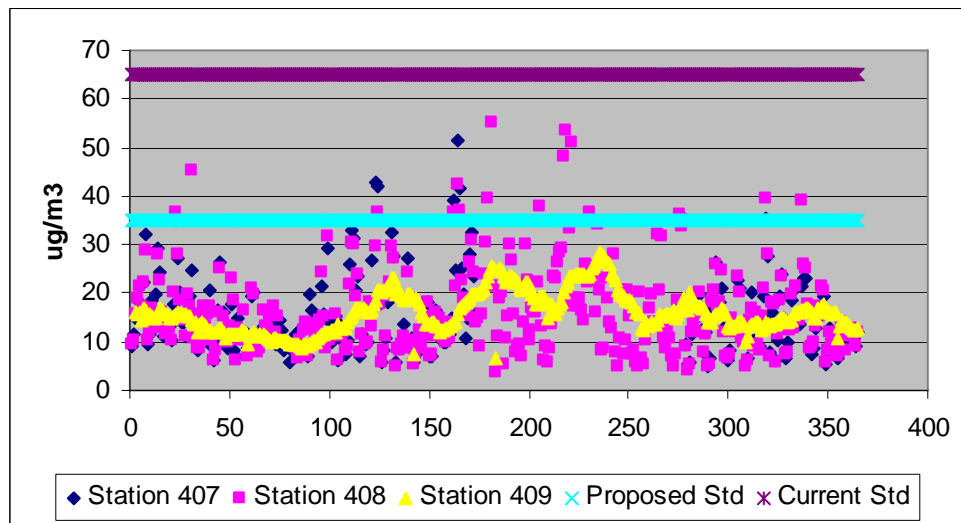


Source: Graphed using data from DEC, 2001.

If these concentrations are maintained for a period of three years an area is considered to be in noncompliance. Since the annual standard for PM_{2.5} is not being changed, we can't expect things to improve although even with the current standard New York State has to reduce current levels of pollution.

A comparison of the daily levels of PM_{2.5} ambient concentrations (24-hour averages) are presented in Figure 2, which shows the values for the three stations relative to the current standard (65 $\mu\text{g}/\text{m}^3$) and the proposed standard (35 $\mu\text{g}/\text{m}^3$).

Figure 2. Daily Concentrations of PM_{2.5} (24-hour averages) in 2001



Source: Graphed using data from DEC, 2001.

As the graph shows, during 2001 no daily values exceeded the current 24-hour standard of $65 \mu\text{g}/\text{m}^3$. Had the standard been $35 \mu\text{g}/\text{m}^3$ as proposed in the current revisions, a few daily values would have exceeded the standard. Given the available data, for station 407 the value would have been exceeded on 9 days. For station 408 the value would have been exceeded 17 times. However, none of the values from station 409 would have exceeded the standard. If the daily values from the three stations are averaged, the value would have been exceeded 4 times. These numbers by themselves are not enough to determine noncompliance, since EPA would look at 98th percentile values. These values are shown in the table below. The average refers to the 98th percentile value of the daily averages of the three stations for 2001.

Station	98th percentile value	Above proposed standard?
407	35.46	Yes
408	39.46	Yes
409	25.91	No
Average of three stations	31.41	No

Three years of data such as those shown in the table above would be necessary to determine noncompliance.

From the data it seems that reducing the standard from $65 \mu\text{g}/\text{m}^3$ to $35 \mu\text{g}/\text{m}^3$ would not guarantee any improvements in air quality. If spatial averaging of the data from all monitoring stations in the area is used for a three year period the 98th percentile values would likely not exceed the new proposed standard. Reducing the standard to 25 or $30 \mu\text{g}/\text{m}^3$ would be more likely to ensure that policies to improve air quality would be implemented. On the other hand, if spatial averaging is not used and the highest values from one of the monitoring stations in the area are used then the proposed standard could have an impact in the area.

The 24-hour standard is designed to protect people from short-term acute health effects. These health outcomes include asthma, pneumonia, bronchitis and other respiratory diseases. The South Bronx is afflicted with some of the highest rates of asthma hospitalizations and school absenteeism due to asthma in the country. In 2000 Bronx County had an asthma hospitalization rate of 56 per 10,000 people. This value is much higher than the average for New York City which was 32 hospitalizations per 10,000 people. Protecting this vulnerable population from the health effects of $\text{PM}_{2.5}$ would be better served by a 24-hour standard of $30 \mu\text{g}/\text{m}^3$ than the proposed $35 \mu\text{g}/\text{m}^3$.

IV. Project Brochure

The South Bronx Environmental Health and Policy brochure has been used extensively to introduce the project to community residents and to a wider audience, as well as to disseminate some of the early findings of the project. The brochure was a collaborative process that involved all the members of the project, including the Wagner-ICIS team, the NYU School of Medicine team, the NYU Office of Federal Policy, and the four participating community groups (The Point CDC, Nos Quedamos/ We Stay, Youth Ministries for Peace and Justice Inc., and The Sports Foundation Inc.). The Wagner-ICIS team provided written sections of the brochure, a map and an image, and translated the brochure to Spanish. The final brochure included the written parts in both English and Spanish to make it accessible to the large Spanish-speaking population of the South Bronx. Several thousand copies of the brochure were made and distributed widely at South Bronx events and professional conferences.

The brochure is divided into the following sections:

- What Is the South Bronx Environmental Health and Policy Study?
- Why Is This Study Important?
- Who Are The Partners in the Study?
- What Has the Study Found So Far?
- Where Do We Go From Here?
- Contact Information

The brochure is included in Appendix A.

V. Project Presentations (Conferences and Miscellaneous Venues)

The Wagner-ICIS team has presented the results of their research in a number of venues, including various academic conferences. This section of the report lists these presentations. Presentations were made at TRB, APA, AAAR, AAG, SRA, ISEE, ICUH, MWA, ACSP and ESRI. The research has also been used routinely in several New York University graduate level courses on sustainability, environmental health, infrastructure management and environmental impact assessment.

Academic Conference Presentations

January 15, 2002. The findings of Phase I of the project were presented in a poster titled, “Environmental Equity and Trucking: Case of the South Bronx Waste Transfer Facility,” in Session #596 Environmental Justice at the *Transportation Research Board (TRB) Annual Meeting*. The session consisted of several presentations from municipalities and communities around the country on their experiences with environmental justice and transportation issues. The graphics prepared for the TRB session were used subsequently in the project for distribution to the community and the U.S. EPA, and were also part of the Phase I report. [The Phase I report is available on-line at: <http://www.icisnyu.org/admin/files/PhaseIWagner930.pdf>].

April 14, 2002. Rae Zimmerman incorporated portions of the South Bronx work into a presentation titled, “A Framework for the Evaluation of Social Equity in Public Infrastructure Facilities,” for a Panel on “Equality in Public Infrastructure Services,” at the *2002 National American Planning Association Conference*, held in Chicago, IL.

March 31-April 4, 2003. Carlos E. Restrepo presented a poster titled “South Bronx Environmental Studies Project: Comparison of Ground-Level Air Quality Data with New York State Department of Environmental Conservation Monitoring Stations Data” at the *American Association for Aerosol Research’s Particulate Matter: Atmospheric Sciences, Exposure and the Fourth Colloquium on PM and Human Health*, held in Pittsburgh, PA. The poster summarized the comparison between the project van’s ground-level measurements of ambient pollutant concentrations (taken by the NYU School of Medicine team) with concentrations measured by NYSDEC’s monitoring stations. The results presented in the poster were later published in the journal *Atmospheric Environment* (see Publications).

December 10, 2003. Carlos E. Restrepo presented a poster titled “Air Quality and Risk in New York City: An Analysis of New York State Department of Environmental Conservation’s Ambient Air Quality Data” at the *Annual Meeting of the Society for Risk Analysis* in Baltimore, Maryland.

August 1-4, 2004. Rae Zimmerman presented a paper titled “The Epidemiology of Extreme Events: Health and Safety Impacts of Cascading Infrastructure Failures” at the

16th Conference of the International Society for Environmental Epidemiology: Addressing Urban Environmental Problems. The conference was held at New York University and the presentation incorporated some of the findings from the South Bronx Environmental Health and Policy Study.

September 16-18, 2004. Carlos E. Restrepo presented a poster by Zvia Segal Naphtali, Carlos E. Restrepo and Rae Zimmerman at the Association of American Geographers' (AAG) *Conference on Race/Ethnicity and Place*, held at Howard University, Washington, D.C. The poster was titled, "Demographics and Waste Transfer Stations in South Bronx, New York."

October 20 – 22, 2004. Carlos E. Restrepo presented a poster titled, "Asthma Hospitalization Rates, Poverty, Demographics and Industrial Land Use in Bronx County, New York" at the *Third International Conference on Urban Health*, which was held at Northeastern University in Boston, Massachusetts,. The poster summarized some research work on asthma hospitalization rates and it was co-authored by Carlos E. Restrepo, Zvia Segal Naphtali and Rae Zimmerman. The poster was awarded an honorable mention.

March 7-11 2006. Carlos E. Restrepo presented a paper titled, "Land Use, Demographics and Industrial Facilities: Using GIS to Support Improved Land Use Initiatives and Policies in South Bronx, New York City" at the *2006 Meeting of the Association of American Geographers (AAG)*, held in Chicago, Illinois. The presentation was co-authored by Carlos E. Restrepo, Zvia Segal Naphtali and Rae Zimmerman.

May 23, 2006. Rae Zimmerman and Alison Kling presented a poster titled, "Zoning Compatibility with Open Space Planning along the Bronx River, Bronx River, New York" at the (MWA) *Waterfront Conference 2006: Economy + Environment = Community*. This is an annual conference held by the Metropolitan Water Alliance (MWA). The conference was held on at the National Museum of the American Indian in New York City. The material for the poster was based on a document written by Alison Kling that describes the different zoning designations along the Bronx River. The theme of the poster was that increasing clean and safe public space along the waterfront in an area dominated by manufacturing would raise the environmental quality of life for South Bronx residents. In addition, parkland that would be part of the greenway along the Bronx River could add to the economic vitality of the South Bronx. This material was included in chapter 3 of the Final Report for Phase IV.

June 21 - 24, 2006. Carlos E. Restrepo attended the *Second American Congress of Epidemiology* held, in Seattle, Washington. He presented a poster titled, "A Spatial Analysis of Asthma Hospitalization Rates and Socioeconomic and Land Use Variables in New York City." Part of the poster included material from the South Bronx Environmental Health and Policy Study, related to the work on proximity of air pollution risk factors to sensitive receptors. The overall material in the poster focused on the association between asthma hospital admission rates and poverty, race, ethnicity, education, percentage of renters, percentage of people living in households with more

than one person per room, industrial facilities per square mile and presence of bus depots and waste transfer stations using linear and spatial regression models for New York City and for Bronx, Kings, New York and Queens Counties.

November 9-12, 2006. Rae Zimmerman presented a paper titled, “Connectivity and Consistency of Environmental Decision Tools for Community Planning” at the Association of Collegiate Schools of Planning (ACSP) *Borders and Cores: What is Planning in the Global Era* 17th Annual Conference, held in Fort Worth, Texas. The presentation incorporated some material on environmental decision tools from Phase IV of the project.

December 3-6, 2006. Carlos E. Restrepo presented a paper titled, “Traffic hotspots, highways and proximity to sensitive receptors as inputs to environmental health risk management in the South Bronx, New York” at the *Society for Risk Analysis (SRA) Annual Meeting*, held in Baltimore, Maryland. The presentation was co-authored by Carlos E. Restrepo, Zvia S. Naphtali and Rae Zimmerman.

April 17-21, 2007. Carlos E. Restrepo presented a paper titled, “Using GIS to Examine the Proximity of Major Highways to Public Schools in Urban Areas” at the *2007 Annual Meeting of the Association of American Geographers (AAG)*, held in San Francisco, California. The presentation was co-authored by Carlos E. Restrepo, Zvia Segal Naphtali and Rae Zimmerman.

October 7-10, 2007. Zvia Segal Naphtali presented a paper titled, “Using GIS to examine the proximity of Waste Transfer Stations, Industry, and Major Highways to Public Elementary Schools in Urban Areas” at the *2007 ESRI Health GIS Conference*, held in Scottsdale, Arizona. The presentation was co-authored by Zvia Segal Naphtali, Carlos E. Restrepo and Rae Zimmerman.

Presentations to Government and Professional Organizations

October 30, 2003. Members of the South Bronx Environmental Health & Policy Study made a presentation to EPA Region 2 at their offices. The goal of the presentation was to present the findings of the project to date and to discuss the future direction of the project. All ICIS Group members participated in the EPA Briefing. Rae Zimmerman introduced the ICIS presentation by explaining the project objectives and goals and describing the various phases of the project. Cary Hirschstein discussed waste transfer activities in the project area, as well as water quality. Carlos E. Restrepo provided an overview of the air quality in the South Bronx and compared air quality data taken from New York State Department of Environmental Conservation’s monitoring network to data taken by the NYU School of Medicine’s project’s van. José Holguín-Veras presented the transportation modeling work and Bruce Egan explained the details of his air quality modeling work. This material was later included in Phase I report. [The Phase

I report is available on-line at:

<http://www.icisnyu.org/admin/files/PhaseIWagner930.pdf>].

April 5, 2007. Rae Zimmerman, Zvia Segal Naphtali and Carlos E. Restrepo presented some of the findings of the South Bronx Environmental Health and Policy Study to the *Environmental Law Committee of The Association of the Bar of the City of New York*. Before the presentation they recorded an interview where they discussed environmental quality issues in the South Bronx and their research. The interview is available as a podcast at: <http://www.nycbar.org/Committees/index.htm>

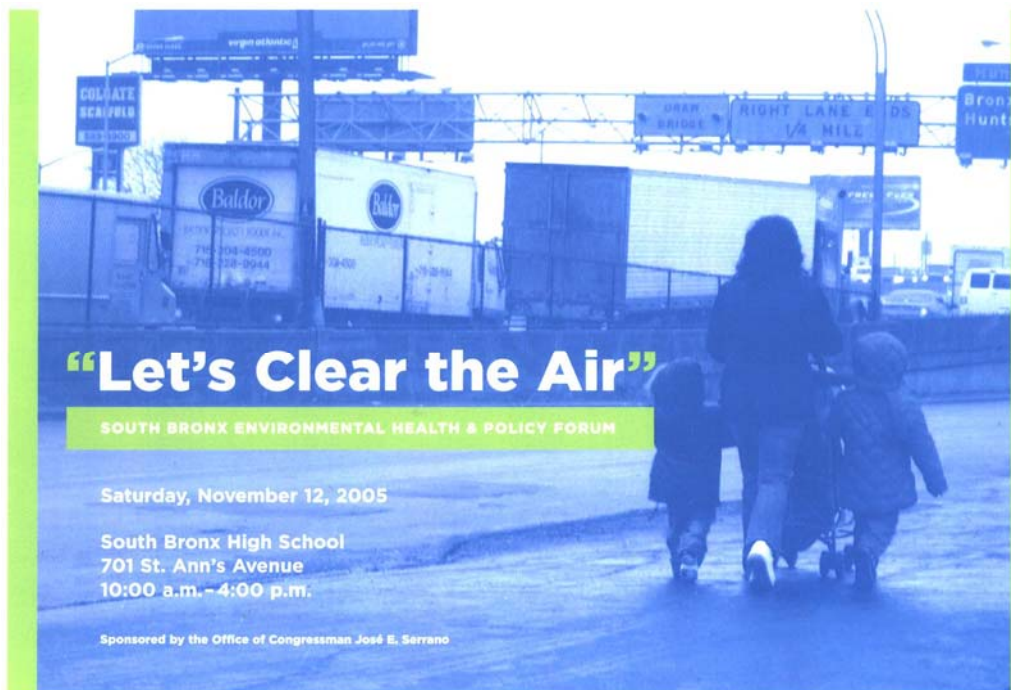
April 24, 2008. Rae Zimmerman, Carlos E. Restrepo and Zvia Segal Naphtali attended a meeting at EPA along with the rest of the NYU researchers to present the main results of the South Bronx Environmental Health and Policy Study. Rae Zimmerman and Carlos E. Restrepo summarized the early findings and focused on the more recent analyses summarized in the Phase II & III and Phase IV reports.

February 18, 2008. Carlos E. Restrepo gave a talk titled, “Infrastructure and Environmental Health Risks in the South Bronx: A Review of the South Bronx Environmental Health and Policy Study” at *Solar One* in New York City. The presentation included general information about the study, and focused on some of the recent Geographic Information Systems (GIS) work related to proximity of public schools to major highways in urban areas carried out by Carlos E. Restrepo, Zvia Segal Naphtali and Rae Zimmerman.

VI. Forums and Press Events

November 12, 2005 - South Bronx Environmental Health & Policy Forum “Let’s Clear the Air”

The Wagner/ICIS team participated actively in the November 12, 2005 - South Bronx Environmental Health & Policy Forum “Let’s Clear the Air”. The goal of the forum was to reach to the communities of the South Bronx and other interested parties and present the South Bronx Environmental Health and Policy Study’s research, as well as to gather a number of medical practitioners, scientists, policy makers, and environmental advocates to discuss practical solutions on how to make the South Bronx a better place to live and improve environmental health issues. There was free food, entertainment and prizes for the attendees. The figure below shows the invite that was produced to advertise the event.



Three presentations were made by team members at the forum and all team members were in attendance. The following presentations were made:

1. Carlos Restrepo’s presentation was titled “Land Use, Transportation, Waste Transfer and Air Quality.” It summarized a lot of the work done by Rae Zimmerman, José Holguín-Veras, Bruce A. Egan, Carlos Restrepo, and Cary Hirschstein during Phases I, II and III of the project. The presentation was part of the first panel at the Forum which introduced the different research components of the NYU researchers.

2. Rae Zimmerman participated in the fifth panel of the Forum with a presentation titled “The Environmental Justice Context for Policy.” The presentation provided an introduction to the research methods used in environmental justice analyses and their application to public policy.

3. Zvia Segal Naphtali also participated in the fifth panel of the Forum. Her presentation was titled “Geographic Information Systems (GIS) and Environmental Justice Analysis”. The presentation included a description of the GIS tools used in the project for both research, outreach and education.

The agenda for the forum is included in Appendix B.

October 16, 2006 Press Event

On October 16, 2006 Congressman José E. Serrano's office held a Press Event to provide an update to the community on the findings of the study. The findings presented by the ICIS/Wagner-NYU portion of the study centered on an analysis of proximity of public schools to environmental health hazards such as highways, truck routes and industrial land use areas. A summary of findings titled *Land Use, Transportation and Industrial Facilities: GIS to Support Improved Land Use Initiatives and Policies, the South Bronx, NYC* was distributed at the event. This document is available for download in the project web page at:

http://www.icisnyu.org/south_bronx/admin/files/HandoutWagnerOct162006.pdf. The document is also included in Appendix C of this report. The NYU Press Release for the event is included in Appendix D.

A sample of the media coverage that the event received is provided below:

- The New York Times:
<http://www.nytimes.com/2006/10/29/nyregion/29asthma.html>
- WNBC: <http://www.wnbc.com/news/10090863/detail.html#>
- Greenwire: <http://www.eenews.net/gw/>
- United Press International:
<http://www.upi.com/ConsumerHealthDaily/view.php?StoryID=20061017-014133-9441r>
- Environment News Service (ENS): [Http://www.ens-newswire.com/ens/oct2006/2006-10-17-01.asp](http://www.ens-newswire.com/ens/oct2006/2006-10-17-01.asp)
- Best Syndication: http://www.bestsyndication.com/?q=101606_higher-risk-for-asthma-children-exposed-to-diesel-truck-pollution.htm

- eMaxHealth: <http://www.emaxhealth.com/108/7920.html>
- New York Post:
http://www.nypost.com/seven/10172006/news/regionalnews/trucks_soot_has_so
- __bx__kids_gasping_regionalnews_carl_campanile.htm
- New York Daily News: http://www.nydailynews.com/10-17-2006/city_life/story/462404p-389033c.html
- Washington Square News:
<http://www.nyunews.com/vnews/display.v/ART/2006/10/27/45417edbe2469>
- NY1: <http://www.ny1.com/ny1/content/index.jsp?stid=1&aid=63856>

VII. Research Reports and Publications

The Wagner-ICIS team's research has been included in a number of research reports available in the project's web page, as well as in published articles and papers. These research reports and publications are described and listed in this section.

Research Reports

I. Wagner/ICIS South Bronx Environmental Health and Policy Study Phase I Report

The Wagner/ICIS South Bronx Environmental Health and Policy Study Phase I Report was completed in September, 2002. The report includes a description of data gathered and analyzed on the demographic characteristics of the study area, transportation, waste transfer activities, ambient air quality, and water quality. In addition, the report includes a review of the literature on the association between asthma and air pollution. The report includes chapters on:

- Demographic characteristics of the study area
- Waste transfer stations in the South Bronx
- Transportation and traffic in the study area
- Air quality in the South Bronx
- Asthma and air pollution - literature review
- Water quality in the South Bronx watershed

The full Phase I report is available on-line at:
<http://www.icisnyu.org/admin/files/PhaseIWagner930.pdf>.

II. Wagner/ICIS South Bronx Environmental Health and Policy Study Phase II and III Report

The Wagner/ICIS South Bronx Environmental Health and Policy Study Phase II and III Report was completed in December, 2004. The report includes more detailed analyses of transportation and air quality in the study area. In addition, Geographic Information Systems (GIS) are introduced as a tool to analyze demographic data and to carry out an environmental justice analysis. The report ends with a general discussion of some preliminary policy recommendations based on this work. The Phase IV report includes a more detailed discussion of policy recommendations and the Phase VI report will include further policy recommendations based on the entire project research activities. The Phase II and III Report is divided into the following sections:

- Introduction

- Air quality in the South Bronx: Comparing ground-level measurements of air pollutants with data from the New York State Department of Environmental Conservation monitoring network
- Transportation and air quality modeling
- Waste transfer scenario analyses using transportation and air quality modeling
- Environmental justice analyses
- Policy recommendations and conclusions

The full Phase II and III report is available on-line at:
<http://www.icisnyu.org/admin/files/ICISPhaseIIandIIIreport.pdf> .

III. Wagner/ICIS South Bronx Environmental Health and Policy Study Phase IV Report

The overarching goal of Phase IV of the project was to assemble the data that was collected during prior stages of the project and to identify, develop, and adapt a set of decision tools to allow the community to leverage this data for policy making. The Phase IV report is divided into the following sections:

- Introduction
- Environmental Planning Frameworks and Decision Tools
- Zoning along the Bronx River
- Air Quality Monitoring, Spatial Location and Demographic Profiles
- Morbidity Rates in the South Bronx
- Proximity Analysis to Sensitive Receptors using Geographic Information Systems (GIS)

The full Phase IV report is available on-line at:
<http://www.icisnyu.org/admin/files/ICISPhaseIVreport.pdf> .

Publications

The following papers describing the research of the Wagner-ICIS research team have been published to date:

Carlos Restrepo, Rae Zimmerman, George Thurston, Jessica Clemente, John Gorczynski, Mianhua Zhong, Martin Blaustein, and Lung Chi Chen. 2004. "A comparison of ground-level air quality data with New York State Department of Environmental Conservation monitoring stations data in South Bronx, New York." *Atmospheric Environment* Vol. 38, pages 5295-5304.

Zvia Segal Naphtali, Carlos E. Restrepo and Rae Zimmerman. 2007. "Using GIS to Examine Environmental Injustice in the South Bronx: The Case of Waste Transfer Stations." *Connect* magazine. Spring/Summer 2007 Issue. The article is available online at: <http://www.nyu.edu/its/pubs/connect/spring07/>

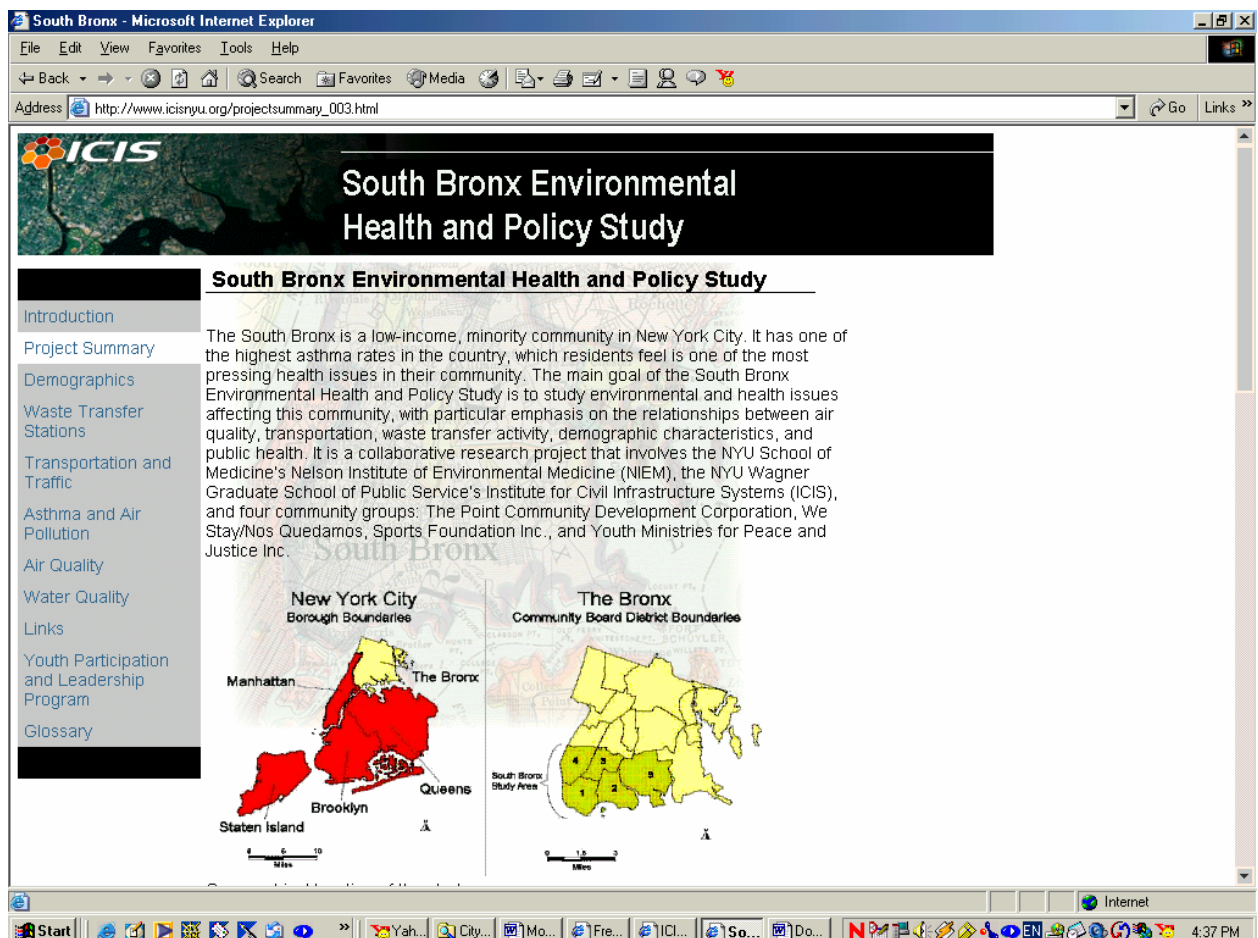
Zvia Segal Naphtali, Carlos E. Restrepo and Rae Zimmerman. 2008. "Maps Expand Asthma Hazards Awareness: GIS Helps Policy Makers See Where Childhood Asthma, Schools, and Pollution Sources Collide." Health GIS, ESRI, Winter 2008 Issue, pages 4-5. Available online at: <http://www.esri.com/library/newsletters/healthygis/healthygis-winter2008.pdf>

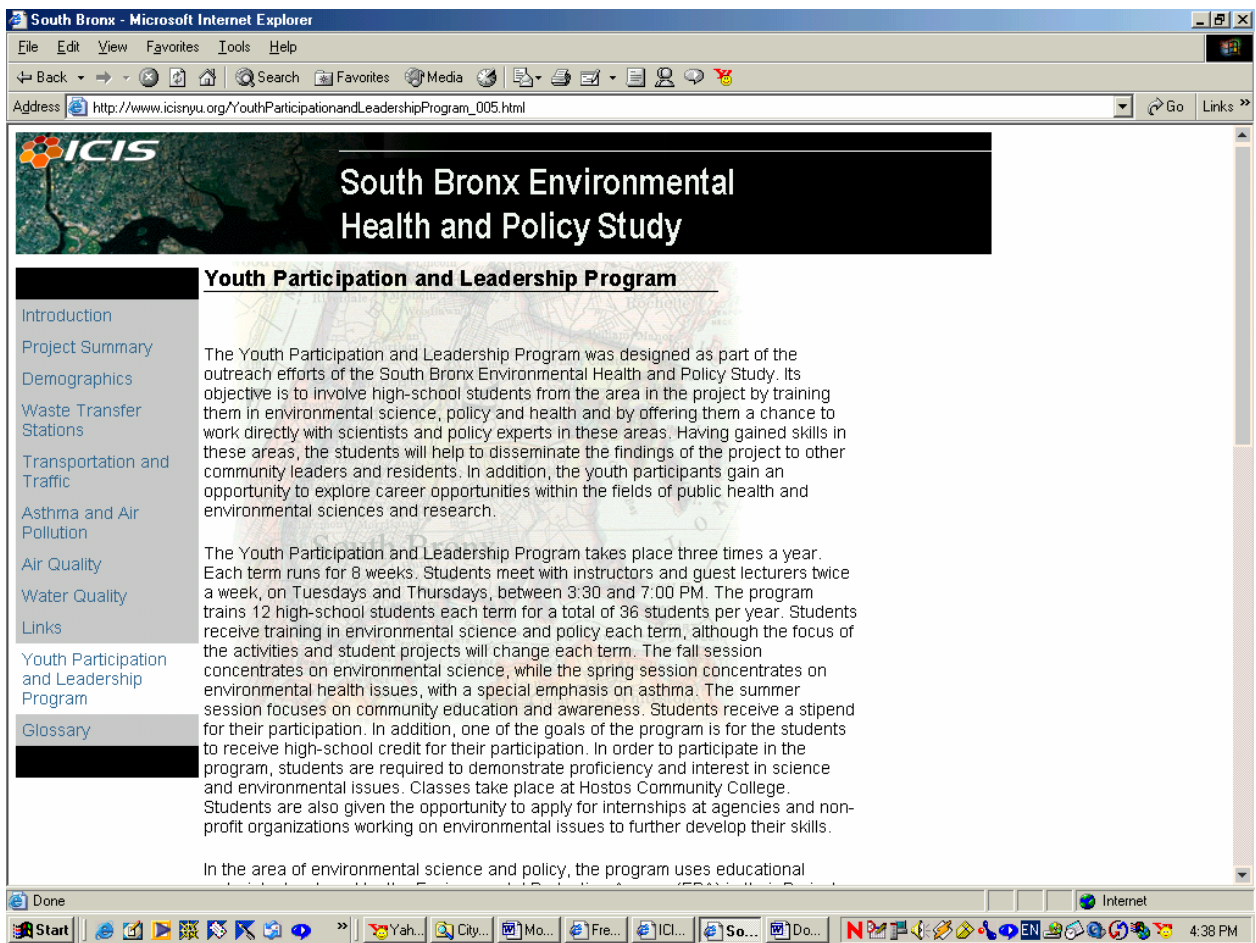
VIII. ICIS Web Page

As part of the outreach and education component of the South Bronx Environmental Health and Policy study, the ICIS team developed a web page to summarize and disseminate the findings of the ICIS component of project. The web page was initiated by Roy Guzman, Cary Hirschstein and Carlos E. Restrepo and is updated on a regular basis. The web page includes a description of the study and information about the following topics: Demographics in the study area, waste transfer stations, transportation and traffic, asthma and air pollution, air quality, and water quality. There is also a section with links to various web pages, including other NYU and community group partners in the study, sponsoring agencies, and related research and information resources in the areas of asthma, air quality and environmental justice. The page also has a section describing the Youth Participation and Leadership Program. In addition, a glossary of useful terms is provided.

The ICIS web page address is: http://www.icisnyu.org/south_bronx/index_001.html

The screen captures below show what the page looks like.





IX. Youth Participation and Leadership Program

The Youth Participation and Leadership Program was designed as part of the outreach efforts of the South Bronx Environmental Health and Policy Study. Its objective was to involve high-school students from the area in the project by training them in environmental science, policy and health and by offering them a chance to work directly with scientists and policy experts in these areas. Having gained skills in these areas, the participating students could then help to disseminate the findings of the project to other community leaders and residents. In addition, the youth participants gain an opportunity to explore career opportunities within the fields of public health and environmental sciences and research.

The Youth Participation and Leadership Program was offered twice. Each time the program ran for 8 weeks. Students met with instructors and guest lecturers twice a week, on Tuesdays and Thursdays, between 3:30 and 7:00 PM. The program trained 10-20 students each session. Students received training in environmental science and policy each term, although the focus of the activities and student projects varied each term. The Youth Participation and Leadership Program was facilitated and coordinated by Jessica Clemente, Anthony Winn and Carlos Restrepo. A number of speakers from EPA, the New York Environmental Justice Alliance, The Point, Youth Ministries for Peace and Justice, Inc. (YMPJ), NYU's Nelson Institute of Environmental Medicine (NIEM), and others supported the efforts of the facilitators to present these students with the information.

In order to participate in the program, students were required to demonstrate proficiency and interest in science and environmental issues. The participating students were recommended by the community groups that participate in the South Bronx Environmental Health and Policy Study. Classes took place at Hostos Community College.

In the area of environmental science and policy, the program used educational materials developed by the Environmental Protection Agency (EPA) in their Project A.I.R.E.³ and "Air Pollution: What's the Solution?" programs.⁴ Students also worked on developing skills in library and internet research, data analysis and interpretation, and communications. In addition, the program provided instruction in environmental health issues such as asthma. This part of the program relied on educational materials developed by the American Lung Association⁵ and other institutions working in this area. In the area of community education and awareness, the program relied on the experiences of the participating community groups and area activists for educational material development.

³ See: www.epa.gov/region01/students/teacher/aire.html

⁴ This is a collaborative program between EPA, NESCAUM and CIESE. See: <http://k12science.ati.stevens-tech.edu/curriculum/airproj/>

⁵ See: www.lungusa.org/school/

The first six-week pilot Youth Participation and Leadership Program was held from October 6 to November 13, 2003. Eight students from the South Bronx (7 high-school and one college students) participated in this pilot program. As part of the program the students attended a career panel where guests from the U.S. EPA, NYU's Nelson Institute of Environmental Medicine (NIEM) and Youth Ministries for Peace and Justice, Inc. (YMPJ) talked about their educational and professional experiences. The culminating event for the students was a mock Senate hearing. The topic discussed at the hearing was whether it is necessary to reduce the 24-hour average particulate matter (PM_{2.5}) standard. Four students were asked to play the role of experts in one of the following fields: atmospheric science, epidemiology, environmental engineering and environmental economics. Their presentations to the Senate committee focused on PM_{2.5} trends, health effects of PM_{2.5}, technologies to reduce PM_{2.5} emissions, and the costs and benefits of reducing PM_{2.5} emissions. The students were asked to make their presentations using PowerPoint. The other four students in the program were asked to play the roles of aides to specific senators. The senators were played by other project participants from the NYU Office of Federal Policy, The Sports Foundation and YMPJ. Feedback from the students indicated that they really enjoyed and valued this experience.

The Youth Participation and Leadership Program was offered a second time in the Spring of 2004, between February 24 and April 22. Fourteen high-school students from the South Bronx participated in this program. The time and location of the classes were the same as in the Fall of 2003. The educational materials were also similar. For their final assignment students were required to make a presentation as part of a mock hearing to the New York City Council. Students were assigned to one of the following topics:

Group 1: Proposal to Have NYC Buses Convert From Using Diesel Gas To Cleaner Fuels
Group 2: Proposal to Site Waste Transfer Station in South Bronx
Group 3: Proposal for Asthma-Free School Zone in Williamsburg, Brooklyn

A CD with all the files related to program description, class schedule, lesson plans, student presentations, photographs from the events, and program evaluations was compiled distributed to all the South Bronx Environmental Health & Policy project participants. The contents of the CD are described below:

Youth Participation and Leadership Program CD

Table of Contents

This section describes the contents of each of the folders included in the CD.

1. South Bronx Environmental Health and Policy Study – This folder includes a document that describes the overall South Bronx Environmental Health and Policy Study. The Youth Participation and Leadership Program is a part of the communications and outreach component of this study.

2. Youth Participation and Leadership Program – This folder includes two documents. One is a Word document that summarizes and describes the Youth Participation and Leadership Program. The other is a PowerPoint presentation that also describes the program.

3. Program Schedule – This folder includes two documents. The first is the schedule of classes and events for the Fall 2003 Youth Participation and Leadership Program. The second is the schedule of classes and events for the Spring 2004 program.

4. Lesson Materials – This folder includes the materials used as part of the lectures. They are divided in three folders according. The first is Basic Skills. These materials are used to provide the students with a set of analytical and research skills that allow them to better understand the substantive material presented in the program and helps them carry out their research in preparation for the culminating event of the program. This folder also includes a glossary with definitions of terms relevant to the program. The other two folders refer to class materials in the areas of air quality and health, and air pollution regulation and policy. These materials were put together by the program facilitators. They are based on materials from EPA's A.I.R.E. program and from various web pages. The materials are included in three folders as following:

Basic Skills:

- Read my data
- Graph my data
- Library and internet research
- Oral presentation guidelines
- Project planning
- Resume writing and interviewing skills

Air Quality and Health:

- Air Pollution: what's the solution?
- Finding sources of air pollution
- Introduction to asthma
- Air quality van measurements in the South Bronx

Air Pollution Regulation and Policy

- Seeing the big picture
- The business of clean air/Air pollution tradable permits
- Scales, rules, policy, science and standards
- Costs and benefits of reducing pollution

5. Career Panel – This folder includes a short description of the career panel held in the Fall of 2003.

6. Culminating Event – This folder is divided into two separate sections. One refers to the Fall 2003 culminating event, which was a mock-Senate hearing. It includes a description

of the event and the preparation materials given to the students. It also includes the presentations made by the students that role-played scientists. In addition, a number of pictures taken at the event are included. The other section refers to the Spring 2004 culminating event, which was a mock-City-Council hearing. It includes a description of the event and the materials given to students in order to prepare for the event. The folder also includes the presentations made by the students, as well as some pictures from the event.

7. Evaluations – This folder includes the documents used to evaluate the students and the program. It includes a quiz given to the students in the Fall and Spring semesters, a presentation with a review of the Spring 2004 quiz, and an end of program evaluation designed to obtain feedback from the students about the program.

8. NYCDOE Credit Proposal – One of the goals of the Youth Participation and Leadership Program is to give the participating students the opportunity to receive one credit for their high school course of study. The folder contains a document that will be presented to the New York City Department of Education (NYCDOE) as a proposal to achieve this goal. The facilitators have determined that the program meets the Department of Education's standards.

9. Awards Ceremony – The Fall 2003 program ended with an awards ceremony. Students and their relatives were invited to a formal dinner where they received a diploma of participation. This folder includes photographs from the event.

10. Youth Program Press – This folder includes copies of articles about the Youth Participation and Leadership Program that appeared in Bronx Times, NYU Today and Washington Square News.

11. Participant Bios – This folder includes documents with short bios of the people who participated as facilitators and guest speakers, as well as people who participated in the career panels and end of program events in the Fall 2003 and Spring 2004 programs.

X. GIS Workshops for Community Groups

Zvia Segal Naphtali conducted four workshops on Geographic Information Systems (GIS) for members of the community groups that participate in the South Bronx Environmental Health and Policy Study. This work was part of the outreach and dissemination component of the project. The goal of the GIS workshops is to provide training for the community groups in an important analytical tool so that they can continue to work in the field of environmental health and policy in their communities beyond the project completion date. The first four GIS workshops were held on June 19-22, 2006. They were held in a computer lab at New York University from 10:00 AM to 2:00 PM. Ten students from the South Bronx attended the workshops and each participating community group was provided with an ESRI ArcGIS software package so that they can continue to use their skills at their organization. Zvia Naphtali also prepared extensive teaching materials that were given to the students. The material included the basics the GIS as well as more advanced topics. The students were also given links to data sources so they could work on a GIS project of their choice. The material included the following lessons:

- Lesson 1.1: Mapping Layers – Bronx data
- Lesson 1.2: Making a Map from A to Z: Symbolizing Population Data
- Lesson 2.1: Mapping in Layers and Symbolizing – Bronx Data
- Lesson 2.2: Making a Map from A to Z: Symbolizing Poverty in the Bronx
- Lesson 3.1: Mapping Pediatric Asthma and Poverty in the Bronx
- Lesson 3.2: Geoprocessing – Clipping Bronx Subway Maps
- Lesson 3.3: Mapping Traffic Congestion in the Bronx
- Lesson 4.1: Geocoding
- Lesson 4.2: Buffering Waste Transfer Stations – Bronx

A second set of workshops was held in a computer lab at New York University from 1:00 PM to 4:00 PM on July 12 and 13. Ten students from the South Bronx attended the workshops. Zvia Segal Naphtali prepared the teaching materials and data that were given to the students. The second set of workshops concentrated on mapping Bronx specific data with a special emphasis on health and other data of interest to the community groups, and on geocoding data. The material included the following lessons:

- Lesson 5. Working with Census Data: Downloading, Clipping & Symbolizing – July 12, 2006
- Lesson 6. Geocoding Revisited – July 13, 2006

Two samples of the GIS lesson materials developed by Zvia Segal Naphtali are included in Appendix E.

Appendix A:

South Bronx Environmental Health and Policy Study Brochure

South Bronx

Environmental Health
and Policy Study



a collaboration between the
South Bronx community and
New York University



“Children and families have suffered enough. Our communities must be treated fairly and with the same respect as other communities in the city and state.”

CONGRESSMAN JOSÉ E. SERRANO



New York University
A private university in the public service

WHAT IS THE SOUTH BRONX ENVIRONMENTAL HEALTH AND POLICY STUDY?

In the South Bronx, 17 percent of school-aged children have asthma, a rate that is twice the New York City average (as reported by New York City Department of Mental Health & Hygiene, *Asthma Facts*, 2003). The South Bronx environment has a host of problems that have caused the disease to develop in the first place. Heavy diesel truck traffic on highways, such as Bruckner Boulevard, the Cross Bronx Expressway, and the Major Deegan Expressway, exposes residents to outdoor air pollution, a likely risk factor for asthma.

In 1999, Congressman José E. Serrano enlisted NYU's School of Medicine, Robert F. Wagner Graduate School of Public Service, and four community groups (The Point Community Development Corporation, Sports Foundation, Inc., We Stay/Nos Quedamos, Inc., and Youth Ministries for Peace and Justice, Inc.) for help in understanding this important public health issue. The *South Bronx Environmental Health and Policy Study* has been working to determine how local air quality is related to factors such as the number of waste transfer stations and the level of car and truck traffic in the area.

Today, scientific findings from the *South Bronx Environmental Health and Policy Study* are beginning to inform the community. The study will also provide a set of tools on how to better understand the problem of poor air quality and to engage in environmental policy-making efforts.



WHY IS THIS STUDY IMPORTANT?

Through the *South Bronx Environmental Health and Policy Study*, New York University has been finding out **how** poor the air quality in the South Bronx is, **why** it is that bad, and **what** is in it to make it that way. The more we know about the air quality in the South Bronx, the easier it is to work within the community, with the city, and with the state to make the air safer to breathe.

WHO ARE THE PARTNERS IN THE STUDY?

NYU School of Medicine—Nelson Institute of Environmental Medicine operates an air pollution mobile van laboratory (“NYU mobile van”), which gathers air samples and identifies pollution sources at different locations in the South Bronx. They are also conducting a study on the impact of air pollution on children with asthma (“Backpack Study”) in several local schools.

NYU Robert F. Wagner Graduate School of Public Service—Institute for Civil Infrastructure Systems studies the effects of traffic, air quality, and the number of waste transfer stations on the living conditions in the South Bronx. They have also compared ground-level air samples taken by the NYU mobile van with rooftop air samples taken by New York State Department of Environmental Conservation (DEC).

The Point Community Development Corporation, Sports Foundation, Inc., We Stay/Nos Quedamos, Inc., and Youth Ministries for Peace and Justice, Inc., helped NYU scientists develop the study and continue to provide guidance on future research strategies. Each group also participates in outreach efforts to raise awareness about air pollution, environmental justice, and asthma. In October 2003, community groups helped develop the Youth Participation and Leadership Program, which engaged local high-school students in research related to the study and exposed them to careers in environmental health and policy.

WHAT HAS THE STUDY FOUND SO FAR?

Since 2001, the NYU mobile van lab has been collecting samples at eight sites in the South Bronx to determine ground-level pollution concentrations. Because current NY State DEC measurements are drawn from roof-top stations, community residents have expressed particular interest in studying air pollution closer to where people live and breathe—at ground level. The study has confirmed that because of the number of highways and industrial facilities, heavy car and truck traffic exposes residents of the South Bronx to more air pollutants than other New Yorkers.

- Concentrations of elemental carbon—a component of diesel exhaust from trucks—were higher at all South Bronx sites than at sites in Manhattan.
- Car exhaust and burning fuels are producing higher ground-level concentrations of pollutants, like CO (carbon monoxide), NO₂ (nitrogen dioxide), and SO₂ (sulfur dioxide), in the South Bronx compared to rooftop station samples.
- Local and regional air pollution from cars, power plants, construction activity, and other chemical processes are producing high concentrations of O₃ (ozone) and PM_{2.5} (particulate matter) in the South Bronx—at levels that exceed U.S. EPA standards.
- While urban environments generally contain a presence of NO₂ (nitrogen dioxide) in the air, samples from the NYU mobile van in the South Bronx were higher than scientists expected. In order to compare to the yearly U.S. EPA standard, the study recommends that New York State Department of Environmental Conservation perform more ground-level monitoring of NO₂ in the South Bronx.
- Peak outdoor elemental carbon concentrations at South Bronx schools participating in the “Backpack Study” were related to rush-hour traffic, especially in the mornings.
- Elemental carbon can influence asthma symptoms more than PM_{2.5}, while lung health can be affected by both PM_{2.5} and elemental carbon.
- Higher asthma hospitalization rates are more likely to occur in lower-income areas of the South Bronx and in areas where there is a large presence of Latino/Hispanic residents.
- There is a strong link between Bronx zip codes with high asthma rates and those with a large concentration of industrial facilities.

KIDS ASSIST IN BRONX ASTHMA STUDY

by Amy Odell

Originally published in the *Washington Square News*,
November 15, 2004*

Every day for three weeks, Jessica Clemente listened for the sound of rolling plastic wheels echoing through the hallway to signal that her crack team of 10 researchers was returning to report its results.

Clemente was stationed at an elementary school in the South Bronx, and these researchers weren't draped in white lab coats and didn't hold Ph.D.s. They were fifth graders with asthma.

Clemente, who works for the NYU School of Medicine, recently finished up the second leg of a study exploring the link between pollution and asthma in the South Bronx, which has one of the highest asthma rates in the country.

This is the first time the study is taking this approach—using fifth graders with backpacks to measure the air pollution they encounter in their everyday lives. The researchers asked 10 students from three South Bronx elementary schools to spend three weeks wheeling around devices that measure air quality. Two schools have finished the study, and a third will complete it this spring.

The students take the rolling backpacks nearly everywhere they go.

"It feels like someone's following me," fifth grader Alex Perez said.

Clemente meets with each student twice a day to go over diaries the students keep about their health, activities, and medication. Meanwhile, a van, equipped with air pollution readers and computer and weather stations, is parked outside the school and monitors local air quality conditions.

The devices in the backpacks, Clemente noted, measure levels of particulate matter in the air, which comes from diesel fuel combustion and emissions from cars and trucks.

"When you see a truck give off a big cloud of black smoke, in that soot is particulate matter," Clemente said.

The children volunteered for the study with parental consent, though Clemente said parents were eager to have their children participate.

"To know that there's someone out there looking into these questions for their health is powerful to [the parents]," she said.

*Minor alterations have been made to this article since its first publication.

WHERE DO WE GO FROM HERE?

The NYU research team is working to create tools that will help the community respond to city, regional, and national decisions that influence public health and environment.

Additional findings from the NYU mobile van, Backpack Study, and transportation modeling will continue to inform the research over the next year—all of which will assist the community groups raise awareness on the harmful impacts of air pollution.

- Air pollution can be a major cause of asthma. South Bronx residents also live with a disproportionate share of industrial facilities, a higher concentration of poverty, and inadequate access to health care—factors that can also make the disease worse.
- Living conditions could be significantly improved if pollution from diesel trucks, a major contributor of PM_{2.5}, were reduced by redirecting traffic flow or enacting other environmental policy initiatives.
- In areas where school-based asthma rates are as high as 20 to 25%, children would particularly benefit from air conditioners or filters in the classrooms to reduce the effect of diesel fumes from nearby highways.





Even though there is still much work to be done to investigate air pollution and its effects on the South Bronx, information from the *South Bronx Environmental Health and Policy Study* can help find ways to make the air safer to breathe.

- **RECOMMEND** that New York State Department of Environmental Conservation monitor NO₂ closer to ground level for at least one full year. This would help determine whether this pollutant is within EPA standards.
- **PREVENT** future schools from being built near highways and other high-traffic areas through rezoning.
- **CREATE** more green space buffers near highways and industrial facilities.
- **PROMOTE** alternatives to diesel fuel, such as compressed natural gas and technologies that reduce the impact of truck idling.
- **IMPROVE** access to health care to decrease asthma hospitalization rates.

Contact a South Bronx community partner in your area to see how you can get involved in making the South Bronx a better place to live—and breathe!

FOR MORE INFORMATION

NYU School of Medicine—
Nelson Institute of Environmental Medicine
www.med.nyu.edu/environmental/labs/NYU_bronx/

NYU Robert F. Wagner Graduate School of Public Service—Institute for Civil Infrastructure Systems
www.icisnyu.org/index_001.html

NYU—Office of Federal Policy
www.nyu.edu/ofp

GOVERNMENT PARTNERS

Office of Congressman José E. Serrano
788 Southern Boulevard
Bronx, New York 10455
Telephone: 718.620.0084
www.house.gov/serrano/

U.S. EPA—Region 2 Office
www.epa.gov

COMMUNITY PARTNERS

The Point Community Development Corporation
940 Garrison Avenue
Bronx, New York 10474
Telephone: 718.542.4139
www.thepoint.org

Sports Foundation, Inc.
384 East 149th Street, Suite 401
Bronx, New York 10455
Telephone: 718.665.9585

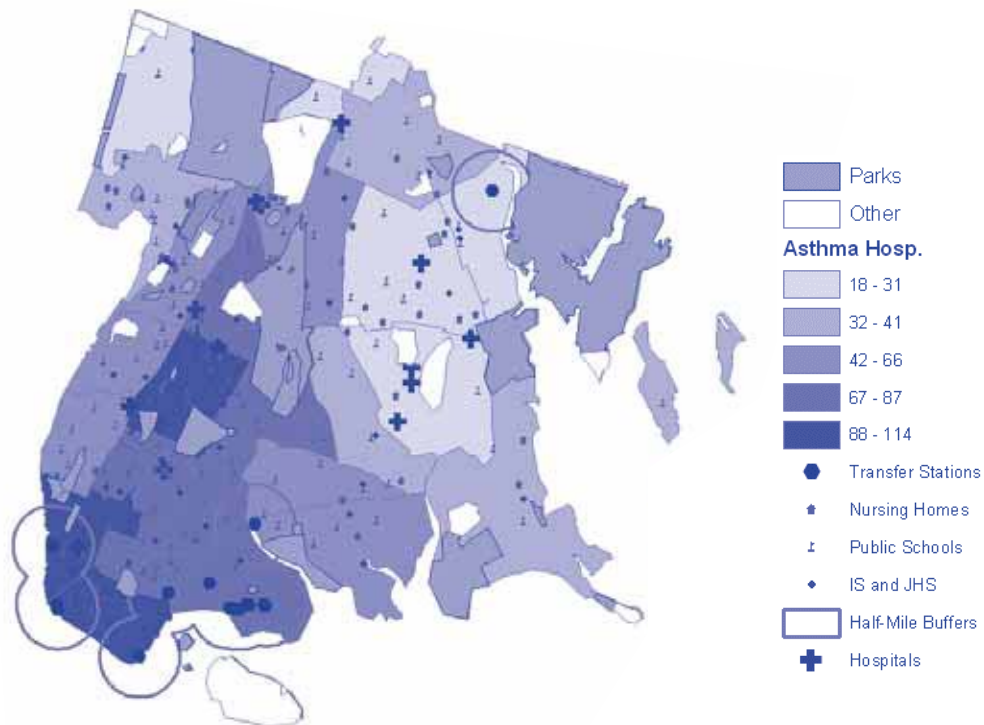
We Stay/Nos Quedamos, Inc.
811 Courtlandt Avenue, Suite 1
Bronx, NY 10451
Telephone: 718.585.2323

Youth Ministries for Peace and Justice, Inc.
1384 Stratford Avenue
Bronx, New York 10472
Telephone: 718.328.5622
www.geocities.com/ymjpj_ny/

In memory of
Yolanda Garcia (1951-2005)
Founder and Executive Director
We Stay/Nos Quedamos, Inc.

Bronx County Asthma Hospitalization Rates

in Relationship to Waste Transfer Stations, Schools, Hospitals, and Nursing Homes



Sources: InfoShare.org, Census 2000;
SPARCS; DCP.

- Asthma hospitalization rates are highest in the central and southern parts of Bronx County, especially in zip codes 10457, 10451, 10454, and 10456.
- There is a strong association between asthma hospitalization rates, poverty, the percentage of Hispanic residents, and the number of industrial facilities in the Bronx.
- Zip Code 10474—Hunts Point—has by far the highest number and density of industrial facilities in Bronx County.

Appendix B:

November 12, 2005 - South Bronx Environmental Health & Policy Forum “Let’s Clear the Air” Agenda

"Let's Clear the Air..."

SOUTH BRONX ENVIRONMENTAL HEALTH & POLICY FORUM

Tracking Air Quality in the South Bronx
11:40 AM

10:50 –

Moderator: Ajamu Kitwana, Youth Ministries for Peace and Justice

Panelists: Alicia Hurley, NYU Office of Federal Policy
Lung Chi Chen and Jessica Clemente, NYU School of Medicine
Carlos Restrepo, NYU Wagner – ICIS

Main Questions:

- What is the current air quality of the South Bronx?
- How is what NYU found different from what we already know?
* Comparing ground-level samples taken by the NYU mobile van to roof-top samples taken by NY DEC
- What are current air quality standards? How do findings in South Bronx compare?

Introductions:

10:50 –

11:00 AM

- AJAMU: Make introductions and read bios / background of panelists
- ALICIA: Describe history of study - how NYU and partners came together

Focus on Findings:

11:00 – 11:25

AM

- LUNG CHI / JESSICA: Presentation of School of Medicine's findings
- CARLOS: Presentation of Wagner – ICIS' findings

Directing Dialogue: AJAMU

11:25 – 11:30

AM

- What does this all mean? Place research in context of outreach plans / structure for forum
- Steer conversation on course – make sure main questions get answered
- Clarify and summarize most important points

Questions/Answer: AJAMU

11:30 – 11:40

AM

- Field questions from the audience

II. Air Pollution & Health Effects

11:40 AM –

12:30 PM

Moderator: Kellie Terry-Sepulveda, The Point CDC

Panelists: Dr. George Thurston, NYU School of Medicine
 Dr. Rachel Miller, Columbia Center for Children's Environmental Health (CCCEH)
 Corrie Freedman, Director of Advocacy, American Lung Association – NYC

Main Focus:

Backpack Study - health effects of pollution on children with asthma in South Bronx

- How did the study work? What were the main findings? What do they mean?

Mothers & Newborn Study (CCCEH)– long-term health effects of air pollution on NYC cohort of women and children (i.e. Washington Heights, West Harlem and South Bronx)

- How did the study work? What were the main findings? What do they mean?

Air Pollution as a Major Public Health Concern

- How has public been made aware of research in this area? (advocacy)
- How can we protect ourselves? (overview of major legislation introduced / passed)

Introductions:

11:40 AM –

11:45 AM

KELLIE: Make introductions and read bios / background of panelists

Focus on Findings:

11:45 AM–

12:10 PM

GEORGE: Presentation of Backpack Study's findings (12-15 minutes)

RACHEL: Complementary presentation of Columbia's findings to Backpack Study (10 minutes)

Research as Advocacy Tool:

12:10 –

12:15 PM

CORRIE: How ALA has made public aware of links between air pollution & asthma (5-7 minutes)

- How can we use research (from Backpack Study and Mothers & Newborn Study) to bring awareness to the health impacts of air pollution?

Directing Dialogue: KELLIE

12:15 –

12:30 PM

- Steer conversation on course – make sure main questions get answered

- Clarify and summarize most important points
- Field questions from audience

III. Asthma and Asthma Management

1:20–

2:10 PM

Moderator: Yolanda Gonzalez, We Stay / Nos Quedamos

Main Questions:

- How is asthma triggered? What does it feel like? What are long-term effects?
- Who is most susceptible to asthma? Why does the South Bronx have high rates?
- What are the costs of high asthma hospitalization rates? (i.e. absenteeism, hospital bills, etc.)
- What kind of ways can we inform the community about risks?

Panelists: Dr. Paloma Hernandez/ Matilda Cruz, Urban Health Plan
Rebecca Kalin, Asthma Free School Zone
Norma Galloway, American Lung Association
Lorna Davis, NYC Asthma Partnership, Department of Mental Health &

Hygiene

YOLANDA: Make introductions and read bios / background of panelists

1:20 –

1:25 PM

The Pathology of Asthma and Its Impact on the Bronx:

- **MATILDA/PALOMA:** - Stats on doctor visits for asthma-related illnesses in South Bronx
- Asthma Management Plans

Asthma Awareness in New York

- **LORNA-** Describe NYCAP and its job in coordinating asthma prevention / management

Create clean air zones around schools

- **REBECCA-**Describe your organization's activities with special emphasis on the link between air quality and asthma

Role of sports in improving asthma health

- **NORMA-**Describe growing up with asthma, how it has affected your life and how sports can help manage your asthma

Directing Dialogue: YOLANDA

1:55–

2:10 PM

- Steer conversation on course – make sure main questions get answered

- Clarify and summarize most important points
- Field questions from audience

IV. Community Responses and Solutions **2:10– 3:00**
PM

Moderator: Vaughn Thomas, The Sports Foundation, Inc.

VAUGHN: Make introductions and read bios / backgrounds of panelists **2:10 – 2:15**
PM

Questions for Panelists: **2:15 – 2:45**
PM

How can we manage asthma triggers more effectively?

Alexie Torres Fleming, YMPJ – shut down Sheridan Expressway

What can we do to create more healthy living conditions in the South Bronx?

Kellie Terry-Sepulveda, The Point CDC – education and awareness projects

Yolanda Gonzalez, Nos Quedamos – green building technology

Jim Quigley, Bronx CC - Center for Sustainable Energy –alternative fuels (tentative)

How do we spread the word about what is going on in the South Bronx?

What is the role of community organizing / lobbying / litigation?

ShaKing Alston, Executive Director, NYC Environmental Justice Alliance

How can the community be equipped with tools to evaluate living conditions?

Geoffrey Canada, Harlem Children's Zone (discuss w/ Vaughn and Gerry)

Mathy Stanislaus, Esq., Allegiance Resources Corp/New Partners for Community Revitalization

Directing Dialogue: VAUGHN **2:45 – 3:00**
PM

- Steer conversation on course – make sure main questions get answered
- Clarify and summarize most important points
- Field questions from audience

V. Translating What We Know About Air Pollution into Effective Policy 3:00 - 3:50 PM

Moderator: Siddhartha Sanchez, Congressman Serrano's Office

SIDD: Make introductions and read bios / backgrounds of panelists **3:00 – 3:05 PM**

Panelists: Paul Lipson, Chief of Staff, Congressman Serrano's Office
Stephen Boese, Healthy Schools Network
John Robert, Bronx Community Boards #2
TBD, Bronx Borough President's Office

Main Focus: **3:05 – 3:25 PM**

PAUL: How can environmental justice efforts create better living conditions for South Bronx?

What are the impacts of waste transfer stations on South Bronx community?

TBD: What are some alternative transportation and waste management policies that could benefit community?

How will NYC's proposed plans help improve air quality in the South Bronx?

MICHAEL: What are other legislative proposals that could impact the health of the South Bronx?

Directing Dialogue: SIDD **3:30 – 3:40 PM**

- Steer conversation on course – make sure main questions get answered
- Clarify and summarize most important points
- Field questions from audience
- Develop a “road map” for participants - suggesting how they can get involved (need help from another partner?)

Re-cap What We Have Learned Today: **3:40 – 3:50 PM**

- SIDD: Review important highlights at each panel
- JESSICA: Discuss plans for *South Bronx Environmental Health & Policy Study* over next year

Appendix C:

October 16, 2006 Press Event

Land Use, Transportation and Industrial Facilities:
GIS to Support Improved Land Use Initiatives and Policies, the South Bronx, NYC

South Bronx Environmental Health and Policy Study

**Land Use, Transportation and Industrial Facilities:
GIS to Support Improved Land Use Initiatives and Policies, the South Bronx, NYC**

**Wagner Graduate School of Public Service/ Institute for Civil Infrastructure
Systems (ICIS)
New York University
October 16, 2006**

The main goal of the South Bronx Environmental Health and Policy Study is to investigate environmental and health issues affecting the South Bronx community, with particular emphasis on the relationships between air quality, transportation, waste transfer activity, demographic characteristics, and public health. It is a collaborative research project of the NYU School of Medicine's Nelson Institute of Environmental Medicine (NIEM), the NYU Wagner Graduate School of Public Service's Institute for Civil Infrastructure Systems (ICIS), and four community groups: The Point Community Development Corporation, We Stay/Nos Quedamos, Sports Foundation Inc., and Youth Ministries for Peace and Justice Inc.

This summary highlights some of the findings of the Wagner School portion of the study.

THE SOUTH BRONX (THE PROJECT'S STUDY AREA), MAJOR HIGHWAYS, WASTE TRANSFER STATIONS AND TOXIC RELEASE INVENTORY (TRI) SITES



Background Information

The South Bronx has large volumes of heavy vehicle traffic passing through it along major highways, creating pollution affecting local residents.

- Industry concentration: Hunts Point Market, private waste transfer stations, etc.

- Highway concentration: Interstates 87, 95, 278, and 895

The South Bronx is afflicted with very high asthma rates.

- In New York City, 17% of children 17 years and younger—300,000 children—have had asthma at some time in their lives. In the South Bronx the figure is 20-30% (NYC Vital Signs, April 2003 Volume 2, No. 4, New York City Department of Health and Mental Hygiene).

Transportation and Air Quality Modeling

The Bronx is currently a “non-attainment area” for particulate matter (PM_{2.5}), which means that the U.S. Environmental Protection Agency’s current annual standard for this pollutant is exceeded.

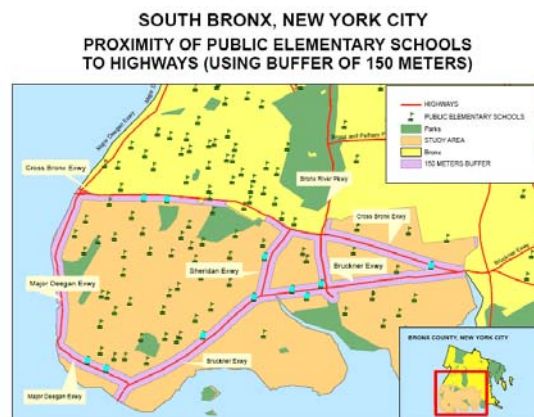
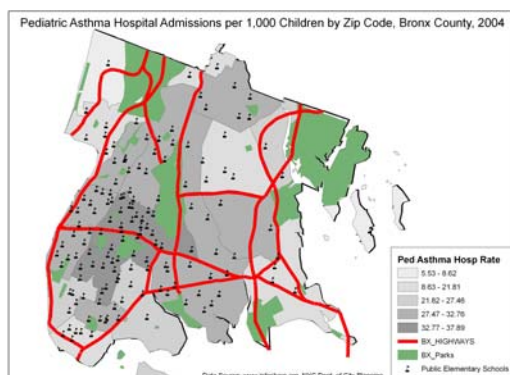
Past land use planning decisions in the South Bronx have placed this sensitive population in close proximity to highways, truck routes, industrial land use areas and other environmental hazards. Studies have shown that traffic associated with these facilities exacerbates asthma symptoms.

Modeled concentrations of traffic-related particulate matter and nitrogen oxides are two to five times higher around South Bronx highways than in other parts of the South Bronx.

Highways, Truck Routes and Proximity to Schools

About a fifth of all pre Kindergarten to 8th grade students in the South Bronx attend schools within 150 meters (500 feet or less than two city blocks) of major highways, where air pollution concentrations exceed background levels.

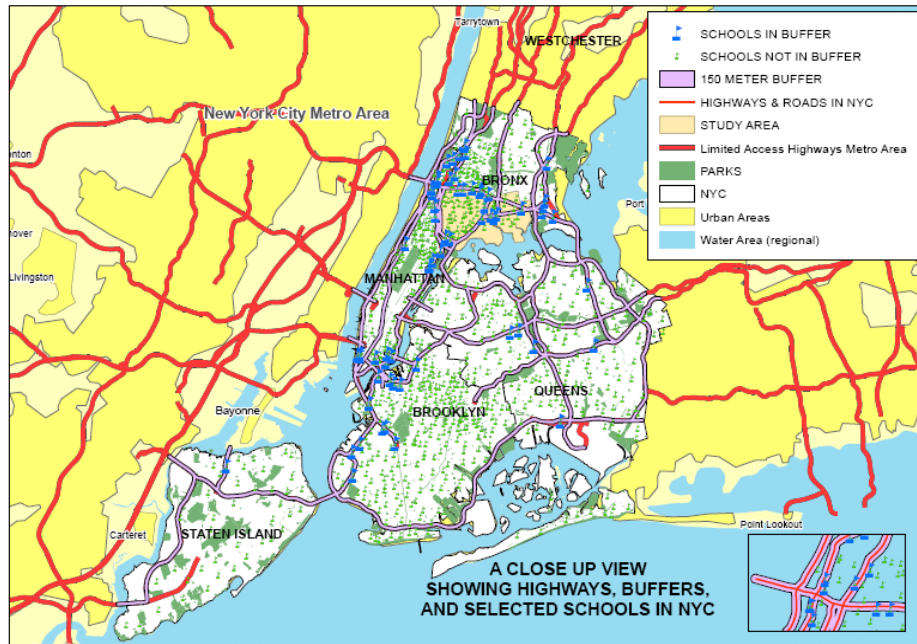
DISTRIBUTION OF PEDIATRIC ASTHMA HOSPITALIZATIONS PER 1000 CHILDREN BY ZIP CODE



According to the literature on traffic and health effects, people within 150 meters of major highways or high traffic density roads are exposed to air pollution concentrations that are higher than the ambient background concentrations (Hitchins 2000). About a fifth

of pre Kindergarten to 8th grade students attend schools within 150 meters (500 feet or less than two city blocks) of a highway in the South Bronx compared to far less (ten percent) in New York City as a whole. If you live in the South Bronx your child is twice as likely to attend a school near a highway as other children in the City.

**NEW YORK METRO AREA HIGHWAYS, MAJOR ROADS,
AND PUBLIC ELEMENTARY SCHOOLS WITHIN 150 METER BUFFERS**



About half of the pre Kindergarten to 8th grade students in the South Bronx attend schools located within 150 meters (500 feet or less than two city blocks) of a highway or truck route.

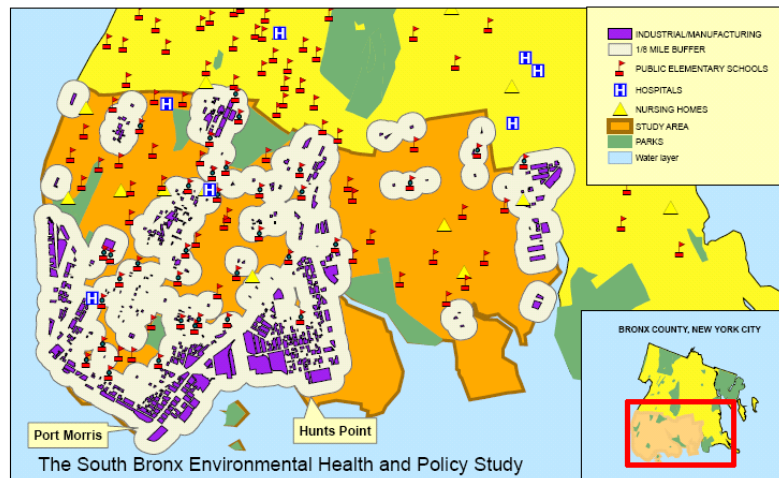
**STUDY AREA - SOUTH BRONX, NEW YORK CITY
PROXIMITY OF PUBLIC ELEMENTARY SCHOOLS
TO TRUCK ROUTES (USING A BUFFER OF 150 METERS)**



Industrial Land Use Areas and Proximity to Schools

About half of all pre Kindergarten to 8th grade public elementary school students in the South Bronx attend schools close to industrially-zoned land (within 1/8 of a mile or two and a half city blocks) containing waste transfer stations and other facilities associated with high diesel truck traffic and pollution emissions.

THE SOUTH BRONX, PROXIMITY OF SCHOOLS, NURSING HOMES AND HOSPITALS TO AREAS ZONED FOR MANUFACTURING LAND USES – USING A 1/8 MILE BUFFER



References cited and project reports

Note: Maps showing buffer zones and proximity of schools to various areas and statistical findings in connection with proximity were prepared by Zvia S. Naphtali, Ph.D., Adjunct faculty member and Research Scientist at the Wagner School.

Hitchins, J., L. Morawska, R. Wolff, and D. Gilbert. 2000. "Concentrations of Submicrometer Particles from Vehicle Emissions Near a Major Road." *Atmospheric Environment* 34:51-59.

Restrepo, C. and R. Zimmerman (eds). 2004. *South Bronx Environmental Health and Policy Study: Transportation and Traffic Modeling, Air Quality, Waste Transfer Stations, and Environmental Justice Analyses in the South Bronx. Final Report for Phase II & III.* <
<http://www.icisnyu.org/admin/files/ICISPhaseIIandIIIreport.pdf>>

Zimmerman, R., C. Restrepo, C. Hirschstein, J. Holguín-Veras, J. Lara, D. Klebenov. 2002. *South Bronx Environmental Studies: Public Health and Environmental Policy Analysis: Final Report for Phase I.* <
<http://www.icisnyu.org/admin/files/PhaseIWagner930.pdf>>

Special Thanks To

Participating Community Groups

- The Point Community Development Corporation
- Sports Foundation, Inc.
- We Stay/Nos Quedamos
- Youth Ministries for Peace and Justice, Inc.

Sponsors

- Congressman José E. Serrano
- U.S. Environmental Protection Agency

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Appendix D:

October 16, 2006 Press Event

NYU Press Release

Asthma Symptoms Linked to Soot Particles From Diesel Trucks in South Bronx

Available online at: <http://www.nyu.edu/public-affairs/releases/detail/1263>

Asthma Symptoms Linked to Soot Particles From Diesel Trucks in South Bronx

Monday, Oct 16, 2006N-106, 2006-07

NEW YORK, October 16, 2006 - Soot particles spewing from the exhaust of diesel trucks constitute a major contributor to the alarmingly high rates of asthma symptoms among school-aged children in the South Bronx, according to the results of a five-year study by researchers at New York University's School of Medicine and Robert F. Wagner Graduate School of Public Service.

Over the course of the study, asthma symptoms, particularly wheezing, doubled among elementary school children on high traffic days, as large numbers attend schools in close proximity to busy truck routes because of past land-use decisions.

The South Bronx has among the highest incidences of asthma hospital admissions in New York City, and a recent city survey of asthma in the South Bronx's Hunts Point district found an asthma prevalence rate in elementary school of 21 percent to 23 percent. The South Bronx is surrounded by several major highways, including Interstates 95, 87, 278 and 895. At Hunts Point Market alone, some 12,000 trucks roll in and out daily.

The study is a collaboration of NYU School of Medicine, the Robert F. Wagner Graduate School of Public Service, and four community groups - The Point Community Development Corporation, Sports Foundation, Inc., We Stay/Nos Quedamos, Inc., and Youth Ministries for Peace & Justice Inc. Endorsed by Congressman Jose E. Serrano, the aim of the study was to examine the impact of industrial emissions on air quality and to direct policy initiatives. Serrano sponsored the press conference today where the findings were discussed.

As part of the investigation, the NYU team dispatched a mobile van lab to assess ground-level pollution levels, and they conducted a "Backpack Study" to monitor carbon concentrations taken from air samples collected by commuting students. The findings have shown that high concentrations of air pollution worsen asthma problems among elementary school children in the South Bronx.

The schools in the study were: PS 154, MS 302, CS 152 and MS 201. Ten elementary school children with asthma from each of the four schools were followed for a month. Data on respiratory symptoms, lung function, activity patterns, as well as personal air pollution exposures were collected at the same time.

According to the study, among all of the children the daily average exposure to tiny particulate matter smaller than 2.5 microns (PM2.5) ranged from 20 to 50 micrograms per cubic meter. In addition, the Environmental Protection Agency's proposed daily limit of 35 micrograms per cubic meter was exceeded on about one-third of the study

days. Only about 10 percent of the total mass of tiny particles was diesel soot, but it was this portion that was most closely related to children's adverse health effects.

Particles smaller than 2.5 microns (a human hair is 100 microns thick) have been mostly closely linked to lung and heart disease. The EPA has regulated PM_{2.5} since 1997, limiting each person's average exposure per year to no more than 15 micrograms per cubic meter.

Other studies have shown that people who live near highways have a higher incidence of asthma. But researchers had not measured levels of traffic air pollutants that individuals were being exposed to. "We went in and actually measured personal exposures to traffic pollution, which had not been done before. Our results confirm that diesel soot particles in air pollution are causing exacerbations of asthma in children," says George Thurston, Sc.D., Associate Professor of Environmental Medicine at NYU School of Medicine, one of the study's principal researchers.

The major type of air pollutant that was associated with symptoms of asthma was elemental carbon. This type of carbon, called black soot, is found in diesel exhaust and is a component of particulate matter in pollution that is smaller than 2.5 microns. This type of carbon has been cited as a causal agent in asthma in a number of other controlled-exposure studies in the laboratory.

Past land use decisions have placed school children in close proximity to highways, truck routes, industrial land-use areas and other environmental hazards. Modeled concentrations of traffic-related particulate matter and nitrogen oxides are two to five times higher in close proximity South Bronx highways than in other parts of the South Bronx. About one-fifth of all pre-K to 8th-grade students in the South Bronx attend schools within less than two blocks of major highways.

"If you live in the South Bronx, your child is twice as likely to attend a school near a highway as other children in the city," according to Rae Zimmerman, professor of planning and public administration at the Robert F. Wagner Graduate School of Public Service, a principal researcher for the study.

Appendix E:

Two Samples of GIS Workshop Materials

Prepared by Zvia Segal Naphtali

New York University
Robert F. Wagner Graduate School
of Public Service

GIS WORKSHOP

LESSON 1.1:

MAPPING IN LAYERS

June 19, 2006
10:00am-2:00pm

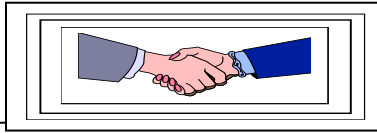
Zvia Segal Naphtali, Ph.D.

e-mail: <zvia.naphtali@nyu.edu>

Telephone: 212-877-1475 (Home office)

Welcome and Introductions

DISCUSSION OF PLANS & PROJECTS



Zvia Segal Naphtali, Ph.D. (Sociology, NYU 1981) is an Adjunct Clinical Assistant Professor at the Robert F. Wagner Graduate School of Public Service, New York University, where she has been teaching GIS, data management, surveys and interviews, and statistics courses over the last thirteen years.

Most recently (1999-2003), Dr. Naphtali served as the Data Manager of The New York City Nonprofits Project of Community Studies of New York, Inc./Infoshare (CSNY). In this project, she was involved in a groundbreaking study documenting how the nonprofit sector affects the economy and employment, and how it provides cultural, health, education, and social services to New York City and its residents. The project extended a 1990 study on the nonprofit sector.

The findings of the study have been published as a report on the World Wide Web and as a Service Atlas at [The New York City Nonprofits Project](http://www.nycnonprofits.org) (see www.nycnonprofits.org) with maps highlighting the spatial distribution of nonprofit services throughout New York City's neighborhoods.

Dr. Naphtali is also the founder and president of Resource Mobilization Inc., a consulting firm established in 1982 that specializes in statistical and demographic data analysis and GIS mapping applications.

In recent years, Prof. Naphtali has been making presentations on GIS at ESRI conferences, universities in Israel and local GIS meetings in New York City (most recently at GITA).

Dr. Naphtali is a founding member and active participant of GISMO, a local GIS users group, GITA, AAPOR, ASA, and the Data Council of New York city.

Dr. Naphtali is the author of the ESRI web course on "Mapping for Health Care Professionals". This is the only course on this subject and has been offered successfully on the ESRI Website since 2001. See <http://www.esri.com/industries/health/>. Please look under "Events and Training." Each summer since 1997, Prof. Naphtali has been teaching a similar course at Wagner.

What is GIS? Definitions and illustrations

Examining the US Dept. of Interior publication on GIS

"In the strictest sense, a GIS is a computer system capable of assembling, storing, manipulating, and displaying geographically referenced information, i.e. data identified according to their locations. Practitioners also regard the total GIS as including operating personnel and the data that go into the system." [USGS](#)

MORE DEFINITIONS

"A geographic information system (GIS) is a computer-based tool for mapping and analyzing things that exist and events that happen on earth. GIS technology integrates common database operations such as query and statistical analysis with the unique visualization and geographic analysis benefits offered by maps." [ESRI](#)

"GIS is an integrated system of computer hardware, software, and trained personnel linking topographic, demographic, utility, facility, image and other resource data that is geographically referenced." [NASA](#)

GIS has already affected most of us in some way without us even realizing it. If you've ever using an Internet mapping program to find directions, congratulations, you've personally used GIS. The new supermarket chain or drugstore on the corner was probably located using GIS to determine the most effective place to meet customer demand



ABC of GIS; On Spatial Data Organization

Basic terminology and Introduction to the basics of computer mapping

INTRODUCTION TO GIS

CONCEPTS AND HISTORY

"Learning GIS is much like learning to sail. About half of the task involves learning the constructs and vocabulary of its practitioners. Most of the remaining learning requires that one come aboard and try it."

Adapted from Prof. Jacob Cohen's comment on statistics



LESSON 1.1: OVERVIEW

Introduction to the GIS software

Learning About the ArcGIS Environment (the software)

ArcMap , ArcCatalog  and ArcToolbox .

A Brief Guide to the software, GIS Concepts, Examples & Exercises


The concepts, examples and exercises you will be working with today will introduce you to basics of Geographic Information Systems (GIS). You will also begin to learn how to conduct spatial analysis using the leading software package – ArcGIS.

The best way to learn how to use ArcMap is to try it yourself. The first lesson will take you through some basic ArcMap skills and teach you to create and print maps about the Bronx.

STEP 1: CREATING A FOLDER FOR THE DATA



Create a folder on the “C: drive” of your computer and name it “C:\GIS.” Copy the LESSON 1 files from your CD ROM to the hard drive of your computer into the “C:\GIS” folder. You should now have a folder called “c:\GIS\LESSON1.”

STEP 2: LAUNCH ArcMap

Start ArcMap™. If you have a shortcut icon for ArcMap  on your desktop, double-click it to start ArcMap. You can also start ArcMap by clicking the Start menu, then choosing Programs and next ArcGIS, and then ArcMap. (The location of ArcMap may be different on your computer and depends on where the software was installed.)

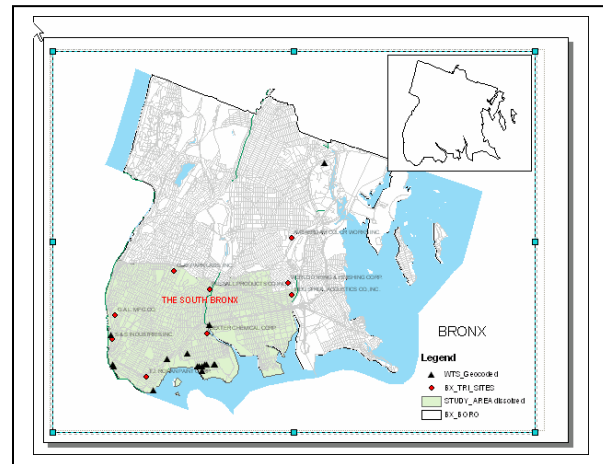
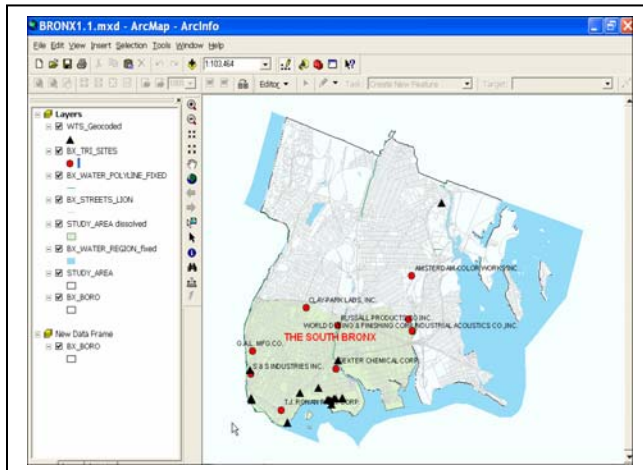
You can open ArcCatalog  from within ArcMap.

We begin our brief tour of both

ArcMap  and ArcCatalog  with a map that I prepared for this purpose. In the course of the tour, you will learn about the ArcMap & ArcCatalog interface as you inspect the map shown on the right.

STEP 2: OPEN AN EXISTING MAP DOCUMENT

Go to **File > Open** (on the main menu of ArcMap), navigate to "...LESSON 1\BRONX MAPS" and bring in a map document called "Bronx1.1.mxd."



The "BRONX1.1.mdx" map document (sometimes called "project") will open in ArcMap.

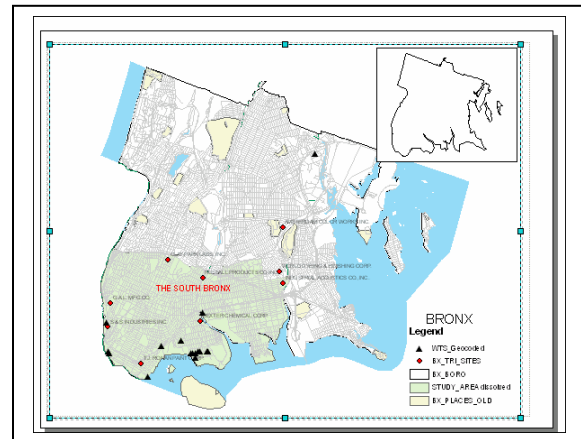
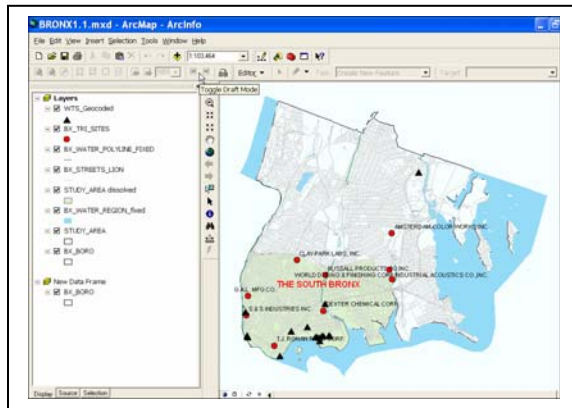
The map shows the outlines of the borough of the Bronx, the Bronx streets, the South Bronx Study Area, Waste Transfer Stations and TRI Sites, and the water around the borough.

ArcMAP stores this map as a "map document" (.mxd) that you can redisplay, modify, and share it with others. This map document does not store the data but references the data stored on your disk in various folders, along with information about how the map should be displayed.

In **ArcMap** you make maps from layers of spatial data. As you will learn in the next few days, you can choose colors and width for lines, symbol types and sizes for a variety of points and colors for polygons. You can also ask questions of the data (called "query attributes"), and analyze spatial relationships. You can design maps and save map layouts, and prepare professional looking maps that are ready for printing. Your maps can also be saved as pdf files and included in Powerpoints.

STEP 3: A BRIEF INTRODUCTION TO LAYOUTS:

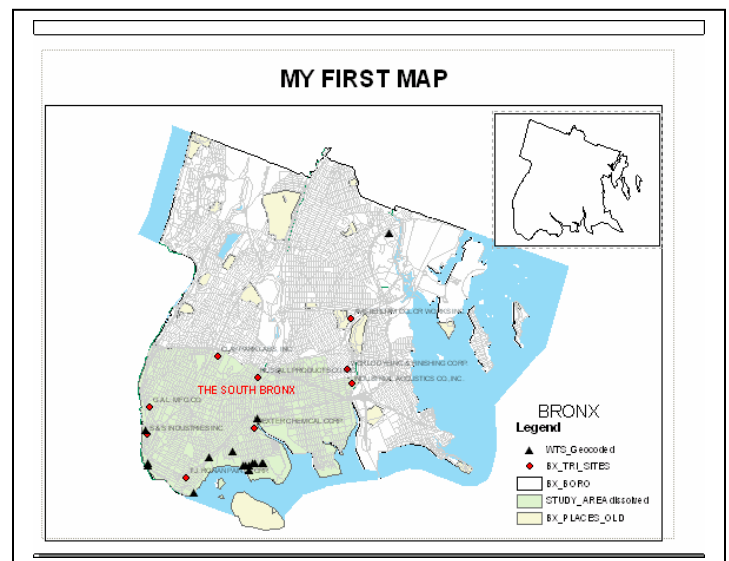
To go to **Layout**, please click on **View** on the Main Menu and select “Layout View”. Note that the map looks different in a “Layout” view (shown on the right). It has a frame around it and there is a second small map of the Bronx.



You can customize your maps in the layouts and prepare them for printing. For example, you can add a Legend (see the layout on the right), add Titles, a North Arrow, a scale, “Produced by John Doe”, add Data Source information and other annotations or a Logo, to your layout.

This is easy to do. Let’s try adding a title. Just go to Insert and click on TITLE. In the box that appear on you map you can write “MY FIRST MAP”. Below I describe briefly how I designed this layout. First, I selected the map so the frame shown above is available. I pulled the frame down to make some room for “MY FIRST MAP”. I used the “Pan” Tool to move my frame down a bit.

The Legend was already there and I could have added a North Arrow – it is also available under Insert on the main menu. We will have a color printer in the lab, so if you wish you can print this first map.



STEP 4:**A CLOSER LOOK AT THE TABLE OF CONTENTS**

On the left of the ArcView display window is the Table of contents, showing you which geographic layers are available to display. On the right is the map display area.

This particular map contains the following layers in the Data Frame:

Waste Transfer Stations	Data from the NYC Department of Sanitation
Toxic Release Inventory Sites	Data downloaded from the NYS DEC website
Bronx Streets	Data from the NYC Dept. of Planning website
The South Bronx Study Area	Prepared by Zvia Naphtali
Water lines and regions	Perpared by Zvia Naphtali

All the layers are displayed since the BOXES next to them are checked. Try checking and un-checking the BOXES and see what happened to the map.

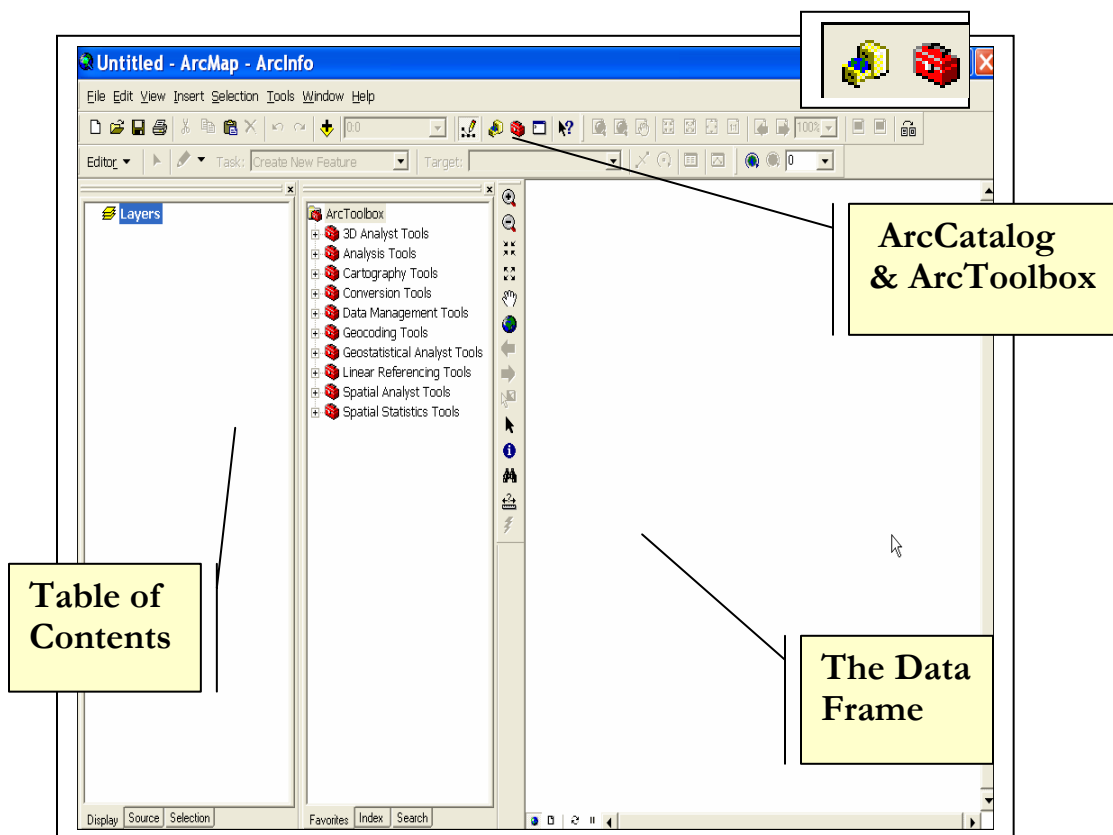
Write down what happens when you un-check

The streets _____

The Borough map _____

The Water Regions _____

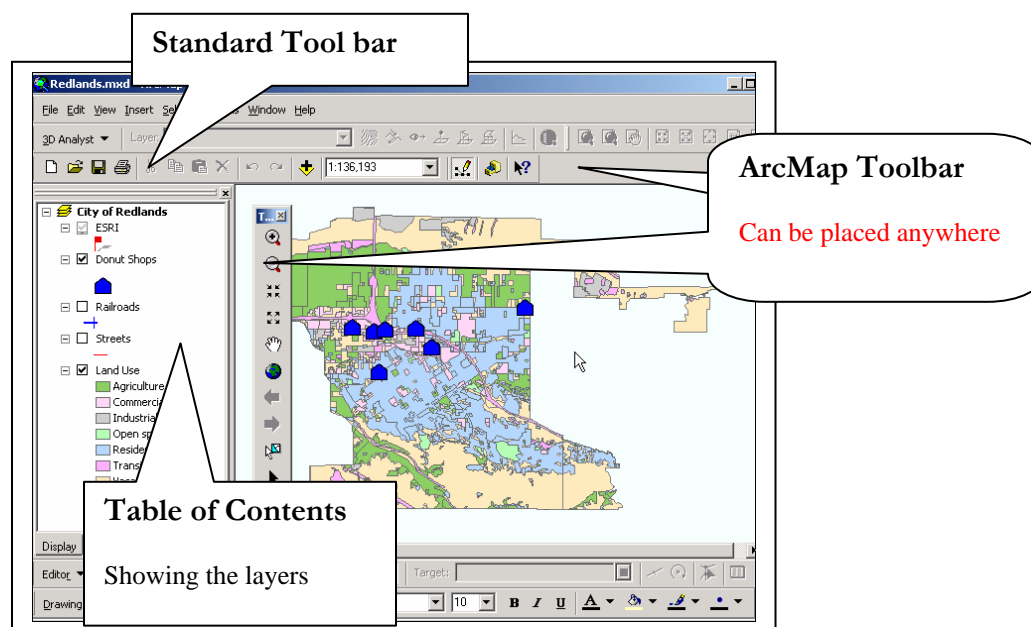
STEP 5: The ArcMap Interface and the Toolbars



The ArcMap interface included a number of parts. On the left is the Table of Contents (TOC) where all the layers that you bring in are listed. Maps are displayed in the Data Frame.

Step 6: The Tools

There are a number of tools that you will get acquainted with today.



We will inspect the menus, tools and buttons and try them out in the following exercises! However, let me introduce you to some of them right now.

The ArcMap Tool Bar includes tools for moving around a map. This tool bar can be moved and parked anywhere around the map. I highly recommend that you place it as shown above. Try moving it around now. We will explore all these tools in the course of the following exercises. Let me introduce you to some of these tools.



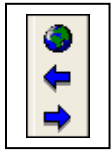
Here are some of the tools:



Zooming Tools



Fixed Zoom in and Zoom out





These three tools allow you to go back to previous views. The globe allows you to go to the full extent of the map. The arrows take you to the previous view and back again.



The Pan tool is used for panning a map to see different areas of the map at the same scale.

Try moving around the map briefly. We will do it much more systematically later on

today. Using the  tool click on the center of the South Bronx Study Area.

The map will move to the right, please bring in back to the center by using the 

Pan tool. To return the map to its original size us the little globe .

NOTE: When you place your cursor on each of the tools, you will see their names.

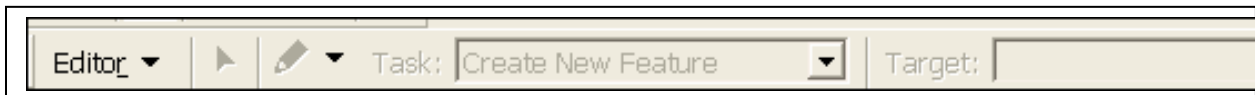


The Select features tool



The Identify Tool. We use it to find information about any of the layers on our map.

There is an Editor Tool Bar. When you activate it, you can use it to create New Features on you map or reshape them.



There is also a Drawing Tool Bar that allows you to add Text and labels to your maps.



**New York University
Robert F. Wagner Graduate School
of Public Service**

GIS WORKSHOP

LESSON 6:

GEOCODING REVISITED

**July 12-13, 2006
10:00am-2:00pm**

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MORE ON GEOCODING & DATA MANAGEMENT

EXERCISE 1: Downloading Data from the Web and Geocoding. We will be downloading data from the NYS Office of Temporary and Disability Assistance about the location of Electronic Benefits Transfer (EBT) locations.

NOTE:

Below is Part 2 of Geocoding. Continue only if you finished the first exercise on Geocoding, that is, **LESSON 4.1 Bronx Geocoding**.

STEP 1: Go to <http://www.dfa.state.ny.us/>. Click on Office of Temporary & Disability Assistance. Search the site for **Electronic Benefits Transfer (EBT)**.



<http://www.otda.state.ny.us/otda%20internet%20search/ebt/zips/default.asp>

On the **State EBT Cash Access Location Search page** choose Bronx and select ZIP Code 10451.

Important Step: A table (shown below) will open. Simply copy this table from the web into an Excel sheet (pasting into an Excel sheet really works in this case.).

Provider Name	Address		ATMs	Hours	Type
Hour Mini Market	346 E 149th St	Bronx, NY 10451	1	Location Hours	ATM
283 An Grocery Corp.	283 E. 161st	Bronx, NY 10451	1	Location Hours	ATM
760 Grand Concourse Food	760 Grand Concourse	Bronx, NY 10451	1	Location Hours	ATM
Apple Bank for Savings	44 East 161st Street	Bronx, NY 10451	3	24 HOURS	ATM
Archer Convience	3047 3rd Avenue	Bronx, NY 10451	1	LOCATION HOURS	ATM
Chase Bank	76 E 161st Street	Bronx, NY 10451	1	24 HOURS	ATM
Citibank	349 E. 149th Street	Bronx, NY 10451	4	24 HOURS	ATM
J.M. Meat Market	759 Gerard Ave	Bronx, NY 10451	1	Location Hours	ATM
Julie Supermarket	635 Courtland Avenue	Bronx, NY 10451	1	LOCATION HOURS	ATM
Lincoln Deli & Groceru	522 Morris Ave	Bronx, NY 10451	1	LOCATION HOURS	ATM
New Century Supermarket	714 Courtlandt Ave.	Bronx, NY 10451	1	24 hrs	ATM
R & A Deli	630 Walton Ave	Bronx, NY 10451	1	Location Hours	ATM
Washington Mutual	75 East 161st Street	Bronx, NY	3	24 HOURS	ATM

A NOTE OF CAUTION:

When you inspect the data you downloaded in Excel make sure to widen the fields so that each location is on one line. Next, save the file as a dBase file in the folder you will create and call **“OTDA.”**

Call the dBase file **“BX10451.dbf.”** **Hint:** To save as a dBase file, select ALL the cells to be converted including the row containing the field names. Make sure to select the cells starting at the lower right corner and holding the left mouse button go to the upper left corner of the range of cells.

Note: Save the Excel sheet as a dBase in **“...\OTDA\BX10451.dbf”**

THE GEOCODING PROCESS: REVISITED

Open ArcMap. Using Add Files, bring in the file **“...\OTDA\BX10451.dbf”**. In addition, please bring from **“...LESSON 1\BRONX BASIC LAYERS”** the **“BX_streets_LION_2005.shp”** and **“BX_boro.shp”** layers.

Please open and examine the Attributes Table for **“BX10451.dbf”** and you will see that the Borough, State and ZIP are all in one field. You must have a separate field for ZIP Codes so that the Address Locator that uses Zone (or ZIP Code) can be used. To create a new field for the ZIPCODE, click on the **“Options”** button on the **“Attributes of “BX10451.dbf”** window, and select **“Add Field”**. In the **“Add Field”** window, insert the name **“ZIPCODE”** and make the field a **“Text”** field and a Length 5. Click **“OK”**.

Right click on the name of the field **“ZIPCODE”** and select **“Calculate Values.”** In the window that opens, make sure to make it a Type **“String”**. Next, write in **“10451”** below the **ZIPCODE =**. Click OK. Note that the ZIPCODE field will now have the value **“10451”**.

CREATING AN ADDRESS LOCATOR

Generally you create an Address Locator for your street file and it is available for you in the ArcCatalog tree.

This is where I generally keep existing Address Locators as well as create new ones on my home computer. In the computer lab they are usually not saved. Therefore, you may have to create a new Address Locator before geocoding today.



Consult **LESSON 4.1 Bronx Geocoding**.

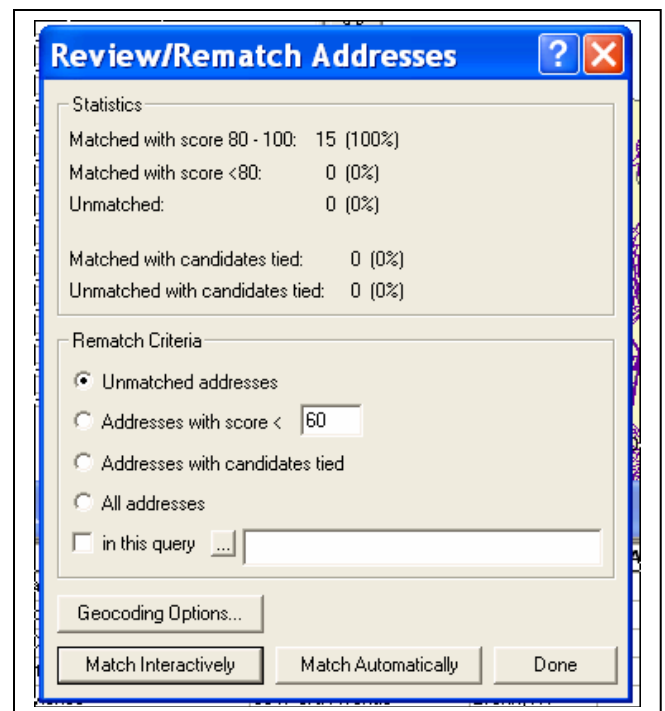
On how to create an Address Locator. Once this task is completed, you can continue and follow the steps below:

STEP 1: To start the geocoding process, right click on the layer “**BX10451.dbf**” and select Geocode Addresses.

STEP 2: You will be asked to add an Address Locator.

My Address Locator is called “ZVIA.BRONX file based.” I selected it and clicked OK.

The results of the Geocoding are perfect this time: All 15 were matched with 80%-100% certainty. No addresses were unmatched.



Take Notes:

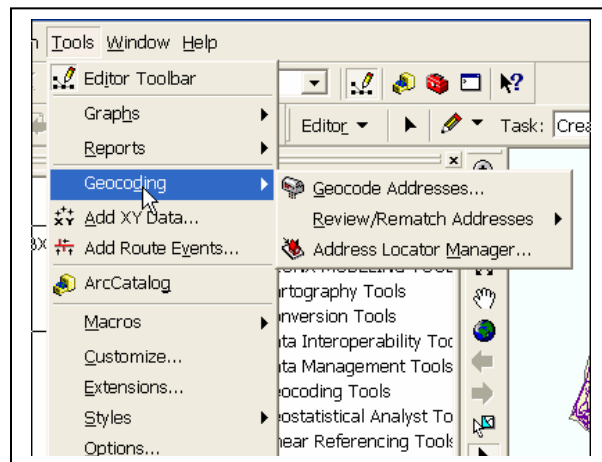
MORE ON GEOCODING & DATA MANAGEMENT

EXERCISE 2: Downloading Data from the Web and Geocoding: You will be downloading data from the NYS Office of Temporary and Disability Assistance about the location of Electronic Benefits Transfer (EBT) locations.

Your next task is to select another ZIP Code in the South Bronx and download data from the NYS Office of Temporary and Disability Assistance. (To find out which ZIP Codes to use I brought in the Bronx ZIP Code map).

If an address failed to geocode you must try again by Matching Interactively. You will find the “Review/Rematch Addresses” under **Tools**.

Addresses fail to geocode for a variety of reasons among them the most common is bad street names.



GEOCODING ADDRESSES THAT FAILED TO GEOCODE

Please download addresses of the location of Electronic Benefits Transfer (EBT) for another ZIPCODE in the South Bronx. Go ahead and geocode these addresses. You can add points for the addresses that “failed to geocode” in the way described below:

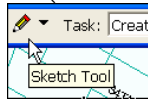
The geocoded address file is generally called “Geocoding Results.xxx.” I recommend that you save it under a new name, for example, “BX10451_geo”.

Go the Street map and label all the Streets. Next, make the file of **Electronic Benefits Transfer** addresses editable by going to the **Editor** and clicking on “Start Editing”.



You can do manual geocoding as follows: You can find an address that “failed to geocode” on the Street map “BX_Streets_LION” -- and place a point on the approximate address. Below I describe how to place a point on the map.

After you make the file of your addresses editable, you will see the Sketch Tool (it looks like a pencil). You can use the tool to add addresses.



Using the Sketch Tool place points in an area of your choice on the map. Each time you place a point a new line will appear at the bottom of the Attribute Table.

The information about this point can be added to the file of geocoded addresses. How do you do this?

EXAMPLE

The Example below comes from a Geocoding exercise using data for ZIPCODE 10001 in Manhattan. The three addresses failed to geocode they were all in “2 Penn Plaza”, an address that is not in the Manhattan Streets file. I simply added these three Electronic Benefits Transfer (EBT) locations using the Sketch Tool.

ARC_Zone	PROVIDER_ID	ADDRESS	H3	ATMS	HOURS	TYPE	ZIP
10001	Fashion Institute	227 West 27th Street	New York, NY 10001	1	LOCATION	ATM	10001
10001	Gristedes Sloan	307 West 26th Street	New York, NY 10001	1	LOCATION	ATM	10001
10001	NY Metro Postal FC	350 West 31st Street	New York, NY 10001	1	LOCATION	ATM	10001
10001	North Fork Bank	370 7th Avenue	New York, NY 10001	3	24 HOURS	ATM	10001
10001	Old Navy	150 West 34th Street	New York, NY 10001	1	Location	ATM	10001
10001	Washington Mutual	1260 Broadway	New York, NY 10001	2	24 HOURS	ATM	10001
	Chase	2 Penn Plaza		0			
	Duane Reade	2 Penn Plaza		0			
	Greenpoint Bank	1 Penn Plaza		0			

Record: 1 24 Show: All Selected Records (1 out of 23 Selected) Options

When you are finished, stop Editing. You will be asked if you want to save the edits and you will answer “Yes”. The file will be saved with the new points you added.

You are done! **Close ArcMap.**

A NOTE: In many cases, the addresses you have may not be suitable for geocoding in ArcMap. It is a good idea to go through the geocoding process and find out which addresses are wrong. Next, leave ArcMap and correct some of these “bad” addresses in Excel or Access or SPSS and then go through the process of geocoding in ArcMap once more.

Take some notes:
