Walk the Walk: Connecting Senior Pedestrian Safety to Seniors in New York City

Safe Routes FOR SENIORS

Transportation Alternatives

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All views expressed here are the views of T.A., and solely of T.A.

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Executive Summary

In this study Transportation Alternatives (T.A.) identifies dangerous intersections, streets and walking zones of particular use to seniors, and aims to transform them into places that are safe and enjoyable for seniors. T.A. examines specifically the neighborhoods of Lower East Manhattan within the boundaries of Council District 2.

T.A. seeks to augment New York City's Department of Transportation (DOT) Safe Streets for Seniors program. The current DOT program defines senior pedestrian safety improvement areas by examining crash statistics where pedestrian seniors are hit by vehicles and suffer a fatality or sustain serious injuries. While the newly adopted initiative is a good starting point with its 25 improvement areas, T.A. recommends identifying improvement areas that relate more directly to where seniors live and walk.

DOT's nine-block improvement area in City Council District 2 does not address any of the East 23rd Street intersections that several seniors have long complained about to their elected officials, nor does it encompass the many senior-dense developments that line the East River. In fact, the only improvement area, a nine-block area, could do more to relate to senior populations.

As an alternative, T.A. examines populous senior census tracts and residential developments in Council District 2 as well as Manhattan senior walking data. T.A. met with five senior focus groups in these areas to collect feedback and understand their top priorities for pedestrian safety. This report compares residential senior population analysis of this community district with DOT's trauma reduction method, discusses pros and cons, and makes citywide policy and local design recommendations

It is important for a program such as Safe Streets for Seniors to focus on geographic areas where seniors live. The senior population in New York City is projected to grow from 11.8% of the overall population in

2008 to 20% in 2030, with a 46% increase over the next 25 years.[1,2] People aged 65 years and older make up 12% of the population, yet they comprised 39% of New York City's pedestrians fatalities between 2002 and 2006.[3] Seniors are more prone to suffer a fatality if involved in a crash when compared to the general population.[4] Tri-State Transportation Campaign (TSTC) found in a December 2008 report that the rate of fatalities for senior pedestrians in Manhattan is 40 times greater than the rate of fatality for children when comparing data from the Department of Health and Mental Hygiene (DOHMH).[5]

We define "senior" as Age 65 or older and employ data from the 2000 Census tract in our maps. We focus on tracts with large senior populations (over 500), Census Block Group data within the Census tract areas and specific senior populations within high senior population densities in order to pinpoint priority improvement areas.

T.A. uses a variety of spatial dataset sources, such as Census 2000 data, crash statistics from New York State Department of Motor Vehicles 1995-2005, grocery markets locations data collected by the New York Department of Agriculture and Markets in 2006 and truck routes from the New York City Department of Transportation 2006. Overlaying this range of spatial data shows clusters of large senior populations. It also maps routes to food sources (and other senior

1 DOT Safe Streets for Seniors press release.

2 Michael Barbaro, "Bloomberg Retreats on Overhaul of Programs for the Elderly," New York Times, December 19, 2008. This article also reports that only 8% of seniors use senior centers.

3 New York City Mayor's Office, Mayor Bloomberg Launches Safe Streets for Seniors to Reduce Traffic Fatalities among Seniors in 25 Neighborhoods across New York City, PR-033-08, January 29, 2008 citing a study of data from 2002 to 2006.

4 Loukaitou-Sideris, Anastasia, Is it Safe to Walk? Neighborhood Safety and Security Considerations and Their Effects on Walking, Journal of Planning Literature, Vol. 20, No. 3, February 2006, p. 226.

5 Tri-State Transportation Campaign, "Older Pedestrians at Risk," December 2008 and Department of Health and Mental Hygiene, "New York City Child Fatality Report 2007." The two reports use different data sets from different years; age coded data about crashes is very hard to get.

pedestrian activity destinations) and illuminates interfering truck routes.[6]

The DOT program would benefit from broadening its senior pedestrian improvement areas to match where seniors live, not just where severe injuries and fatalities have occurred.

Recommendations

To fully target the needs of seniors in a Safe Streets for Seniors program, T.A. recommends that the DOT create a senior pedestrian zone composed of an 1/8th mile radii around significant residential senior populations of 500 seniors or more and around nearby hospitals. Within this zone, T.A. recommends inexpensive safety improvements, including leading pedestrian intervals (LPIs) and a reduction in all signalized crossing speeds to 2.5 feet per second from the current 3.5 - 4 feet per second speed. Design solutions akin to the special signage that school zones receive is also another way of highlighting senior safety. Finally, the DOT should collaborate with the Department of Aging or the Department of Health and Mental Hygiene to conduct research and collect data on senior pedestrian injuries and fatalities. The data should be examined to show how they are related to locations and intersections frequented by seniors.

6 Bakelaar, Dwyer, Roy, and Jones-Robinson, Mapping an End to Hunger, New York City Coalition Against Hunger, 2006. nyccah.org/files/NYC_Food_Sources_2006.zip

Introduction

Transportation Alternatives

Though seniors make up roughly 12% of New York City's population, they account for 39% of pedestrian fatalities.[1] Seniors are more likely than any other demographic to suffer a fatality as a pedestrian when involved in an automobile crash.[2] This issue will become more critical as time goes on: as baby boomers retire, New York City's senior population is projected to nearly double to 1.35 million by 2030, a population larger than the city's current 1.1 million school-age children, according to the Mayor's Office and the New York City Department for the Aging (DFTA).[3]

In January 2008, the New York City Department of Transportation (DOT) introduced its *Safe Streets for Seniors* program, an adaptation of the T.A.-founded *Safe Routes for Seniors* program that has been in existence for the last five years. The agency adoption of a senior pedestrian safety improvement program is a strong step towards more holistic transportation planning and a reflection of Commissioner Sadik-Khan's progressive vision. It is the first program of its kind to be run by a city transportation agency and has been recently adopted by the New York State Department of Transportation. Due to the high rate of pedestrian accidents among seniors and the rapidly growing senior population, we applaud NYCDOT for implementing its *Safe Streets for Seniors* program.

An initial examination of the first 25 study areas sparked questions about how improvement areas were being defined by the City. Community leaders with the Lincoln Square Naturally Occurring Retirement Community (NORC) in the Upper West Side, for example, were concerned that the DOT Safe Streets for Seniors program

1 New York City Mayor's Office, Mayor Bloomberg Launches Safe Streets for Seniors to Reduce Traffic Fatalities among Seniors in 25 Neighborhoods across New York City, PR-033-08, January 29, 2008 citing a study of data from 2002 to 2006.

2 New York Police Department, Safety Tips for the Older Person, Rev 03-07, citing the National Center for Statistics and Analysis at the National Highway Traffic Safety Administration (NHTSA), 2001. home2.nyc.gov/html/nypd/downloads/pdf/community_affairs/NYPD_SafetyTips_for_the_OlderPerson.pdf

3 New York City Mayor's Office, Press Release PR-033-08; DFTA Commissioner Mendez-Santiago testimony to City Council, Modernizing Aging Services, March 3, 2008. nyc.gov/html/dfta/downloads/pdf/hmdl_testimony.pdf

overlooked West End Avenue which seniors did not cross because it was so difficult to navigate. (The DOT has since added West End Avenue to the improvement area after the NORC requested the inclusion.) This raised the question: how are senior pedestrian safety improvement areas defined?

DOT relied on crash data from the entire city to define its first 25 Safe Streets for Seniors project areas. It looked specifically at areas where there were a high number of senior severe injuries and/or fatalities. Based on this, some DOT improvement areas are as small as four blocks. Others, such as in Chinatown, are two contiguous improvement areas. The area for Chelsea is large and rambling. The inconsistency of the pilot areas led us to ask:

- What criteria should be used to define improvement areas?
- Which street safety improvements would directly help seniors?

T.A.'s Safe Routes for Seniors campaign started in 2003 with the primary goal of encouraging senior citizens to walk more by improving their pedestrian environment. Funded by the New York State Department of Health's Healthy Heart program, this was the first program of its kind to address the unique needs of elderly pedestrians and consider the role of street design in maintaining good cardiovascular health in old age. The Center for Disease Control has found that the risk of perceived danger outdoors in one's neighborhood is especially constraining for people over 65, and planners have found street safety improvements can ameliorate those fears.[4]

T.A.'s annual neighborhood-based studies range from responding to the pressing needs of a few intersections[5] to analyzing neighborhood-wide crash data and making design recommendations along

4 Loukaitou-Sideris, Anastasia, Is it Safe to Walk? Neighborhood Safety and Security Considerations and Their Effects on Walking, Journal of Planning Literature, Vol. 20, No. 3, February 2006, pp. 221 (citing CDC 1999), 226.

5 Transportation Alternatives, Street Design Recommendations: Washington Heights, November 2004.

problematic corridors,[6] to publishing important data about New York City senior pedestrians that has not been previously available.[7]
In this study our goal is to determine how improvements can directly improve the safety and enjoyment of senior pedestrians. We hope to reach this goal through two strategies:

- Identify obstacles to walking for seniors in City Council District 2
- Evaluate NYCDOT Safe Streets for Seniors improvement area selection strategies

We hope this report will be used to augment DOT's Safe Streets for Seniors program.

6 Transportation Alternatives, Street Design Recommendations: Nagle Avenue, Inwood, February 2005.

7 Transportation Alternatives, Discriminatory by Design: A senior citizen focused study of streets and intersections on New York City's Upper East Side, December 2007.

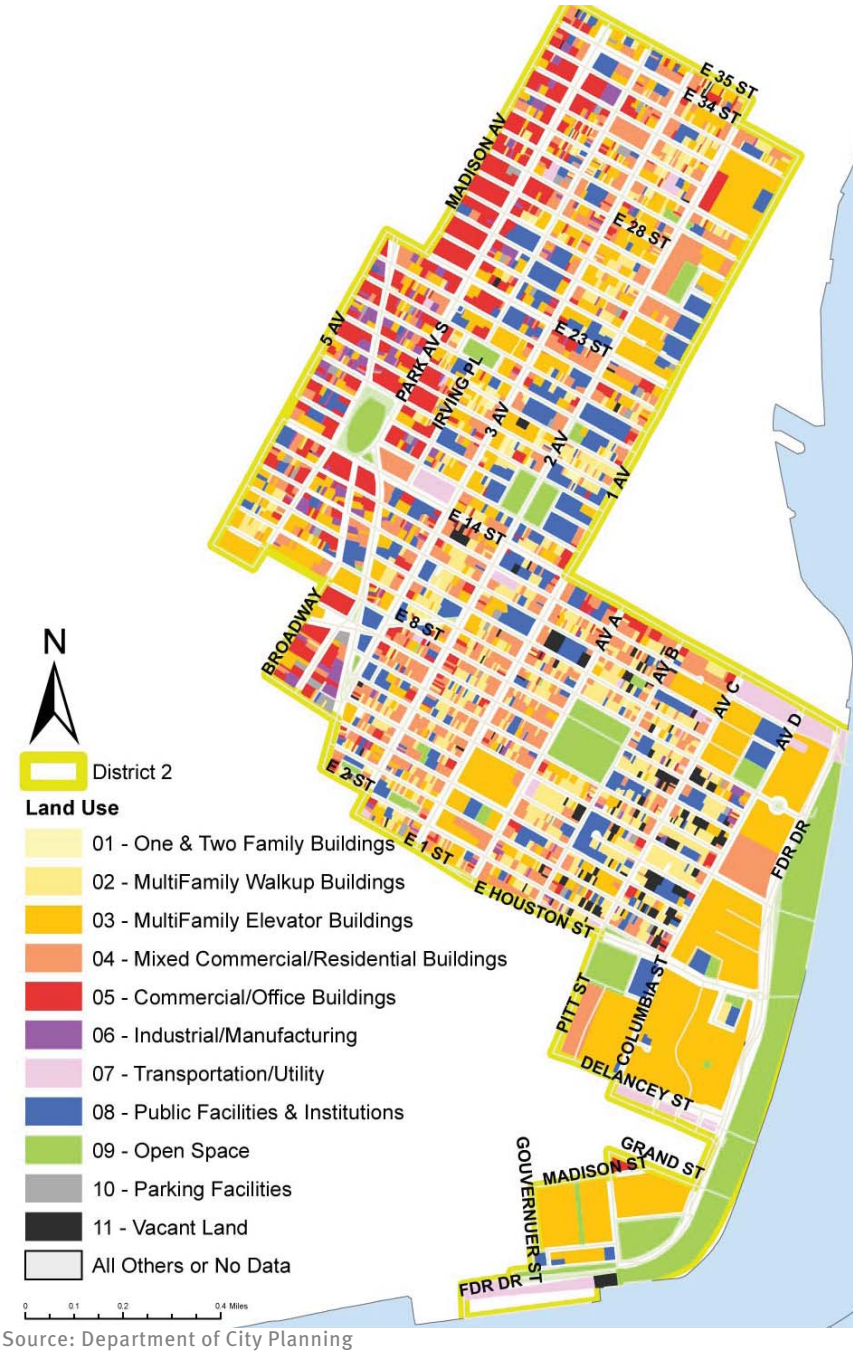
Study Area

The focus of this study is on City Council District 2, which covers East 35th Street south to Houston on most of the East Side with a tail that wraps around to Governeur Street. This focus permits T.A. to review how the DOT program performs in a neighborhood with a significant senior population both inside and outside of a DOT improvement area. A large number of seniors reside in the district and many of them have complained to Councilmember Rosie Mendez about traffic and pedestrian safety. (Although this is focused on Council District 2, it is worth noting that residents from Peter Cooper Village and Stuyvesant Town, two housing developments located in Council District 4, need to cross First Avenue, located in Council District 2, in order to accomplish daily like activities such as going to the grocery stores or using public transit.)

We contacted senior centers in the area to survey and interview seniors about pedestrian environments. In total, we gave presentations to and solicited feedback from five senior centers in City Council District 2.

Aside from streets and sidewalks, Council District 2's open space is a handful of small parks, including Union Square, Tompkins Square Park, Gramercy Park, Stuyvesant Square Park, Hamilton Fish Park, the East River Park and many community gardens.

Manhattan Council District 2 Land Use



Source: Department of City Planning

Census 2000 Block Groups with more than 500 seniors shaded by population density with the specific population in orange. Senior centers are starred and DOT improvement areas are in red.

The most densely populated residential areas in District 2, mostly east of Lexington Avenue, Irving Place, and Fourth Avenue, are dominated by wide avenues, notably Third, Second, and First.

As can be seen from the map on this page, many of the superblock developments that line the periphery of the district, notably First Avenue, Avenue D, and Columbia Street, are dense with seniors. The red line outlines DOT's Safe Streets for Seniors Pedestrian Focus Areas (SPFAs). It is also worth noting that there are hospitals in this area. The Veteran's Hospital is at 23rd Street and 1st Avenue, and Bellevue Hospital and New York University Medical Center reside along 1st Avenue from 25th Street to 34th Street.

District peripheries, like First Avenue and East Houston, have a high volume of crossings by senior pedestrians because they are lined with high-rise buildings where large senior populations reside. These senior pedestrians must contend with five travel lanes of speeding cars, trucks on their designated route, accordion buses and crosstown traffic exiting and merging onto the FDR Drive at East 23rd Street, in addition to one service road and four parking lanes. Bicycles add to the complexity, particularly because their movements are less predictable. There are few bicycle facilities on First Avenue, or anywhere else on the far East side of Manhattan above East 14th Street.

Methodology

To collect information for this report, T.A. researched Manhattan senior demographics, analyzed pedestrian and spatial datasets and coordinated and presented to senior focus groups at five senior centers in Council District 2.

T.A. used GIS data on crashes, seniors and their pedestrian activities to identify and critique improvement areas. Our process was as follows:

- Identify where seniors live using senior residential census data
- Identify popular neighborhood destinations for seniors with survey results from past studies conducted with seniors
- Map locations of neighborhood services near census block groups that are rich with seniors
- Overlay with vehicular-pedestrian crash data
- Arrive at set of potentially problematic intersections or streets and design elements that are potentially problematic
- Compare initial findings with senior feedback at five neighborhood senior centers
- Conclude with identification of locations and design elements that are obstacles to senior mobility
- Recommend city-wide policy to more effectively target safety improvements for seniors

Defining Seniors for New York City

We define "senior" as Age 65 or older and depict 2000 Census tract data in our maps. As baby boomers retire, the senior population in New York City is projected to grow from 11.8% of the overall population in 2008, to 20% in 2030, and double in total population by 2033.[1] The growing senior demographic is, and should continue to be, a concern for pedestrian transportation planners. Though they make up less than 12% of the population, people aged 65 years and older comprise 39%

1 DOT Safe Streets for Seniors press release 2008.

of New York City's pedestrians killed between 2002 and 2006.[2] This rate is of great concern because seniors, due to general physiological traits that develop as one ages, are more likely to suffer a fatality if involved in a crash than the general population.[3]

We focused on census block groups with large senior populations (over 500). T.A. also sought out senior populations of specific developments within high senior population densities in order to pinpoint priority improvements areas. Some developments (e.g., Stuyvesant Town, Peter Cooper Village, Jacob Riis Houses, Lillian Wald Houses) are the only land use in their census-tract block group. Others host Naturally Occurring Retirement Communities (NORC)[4] and senior centers that publish or know their senior populations.[5] Mitchell-Lama properties—many of which are presumed to house hundreds of seniors and are adjacent to other developments that have senior population data—do not officially collect age data.[6]

2 New York City Mayor's Office, Mayor Bloomberg Launches Safe Streets for Seniors to Reduce Traffic Fatalities among Seniors in 25 Neighborhoods across New York City, PR-033-08, January 29, 2008 citing a study of data from 2002 to 2006.

3 Loukaitou-Sideris, Anastasia, Is it Safe to Walk? Neighborhood Safety and Security Considerations and Their Effects on Walking, Journal of Planning Literature, Vol. 20, No. 3, February 2006, p. 226.

4 Paul J. Masotti, PhD, MSHSA, Robert Fick, BA, BEd, Ana Johnson-Masotti, PhD, MA, and Stuart MacLeod, PhD, MD, "Healthy Naturally Occurring Retirement Communities: A Low-Cost Approach to Facilitating Healthy Aging," Community Matters in Healthy Aging, Peer Reviewed, Baker et al. American Journal of Public Health, July 2006, Vol 96, No, 7.

5 United Hospital Fund. A Directory of NORC Supportive Service Programs in New York City, 2005. uhfnyc.org/usr_doc/NORC_March_2005).pdf

6 Phone call with Gary Sloman, Director of Operations, Division of Housing Supervision, NYC Department of Housing Development and Preservation, Nov 14, 2008.

Where Seniors Like to Walk

T.A. visited 10 Manhattan senior centers between 2003 and 2005 and asked 241 seniors where they walk (see Table 1). Over 80% of seniors replied that they walked between home, grocery markets and senior centers, as well as to parks and places of worship over 70% of the time.

Map of Council District 2, common destinations for the senior population and an outline of the one and only DOT Senior Pedestrian Focus Area in Council District 2.

Table 1: Do you walk regularly to the following places? (N=241)

Grocery Store/Supermarket	96.2%
Senior Centers	94.2%
Other shopping	81.7%
Train Stops/Stations	80.6%
Church/Religious Activity	76.2%
Park	73.9%
School	32.0%

Source: T.A. research at 10 Manhattan senior centers, 2003-2005

Pedestrian Collision Datasets

T.A. makes New York State Department of Motor Vehicle pedestrian collision data available to the public at www.crashstat.org [from 1995-2005]. The Tri-State Transportation Campaign (TSTC) uses the National Highway Transportation Safety Administration's (NHTSA) Fatality Analysis Reporting System (FARS) data (2005-2007) to report the City's most dangerous streets.[1] The DMV data includes injuries, while the FARS data only includes injury data when at least one fatality was reported at the site. The TSTC FARS data from 2005 - 2007 was the basis of a report that found that 1st and 3rd Avenues, which run through Council District 2, are among the five most dangerous streets for pedestrians in Manhattan.

1 Tri-State Transportation Campaign, "Most Dangerous Roads," 2008.

Focus groups with seniors

For this study, we visited five senior centers in City Council District 2: the Stein Senior Center (East 24th Street: October 2 2008); the Sirovich Senior Center (East 12th Street: October 7 2008); Village View Housing (East 4th Street: October 9 2008); Gompers Senior Center (Pitt Street: October 16 2008); and Baruch Elder Services Team (Columbia Street: October 23 2008). During the workshops T.A. made a presentation about pedestrian safety and then asked the seniors to give feedback in discussion and on a handout (See Appendix C for sample handout) about which streets and intersections they found most dangerous and difficult to navigate. In total, 118 seniors attended the workshops. Forty-three seniors completed the survey in its entirety, but about 75% of all senior participants filled out the survey at least partially.

On the survey and in the general discussion that took place senior participants identified places where they feel in danger. They also made comments in categories related to safety improvements, enforcement and maintenance, pedestrian capacity and connections, and top priorities and improving the pedestrian experience.

Summary of Responses

Problems identified vary depending on what intersections seniors live near, but many responses about safety and enforcement were similar in all five workshops. Appendix D has a full summary of the feedback.

Excessively wide streets encourage speeding by cars and are difficult to cross by pedestrians without some extra safety improvements. The street above is Delancey St . by the Williamsburg Bridge Overpass.

Seniors are avid bus riders. Seating and shelter at bus stops would improve their access to buses.

Predominant Issues:

Safety

- More time is needed to cross the street, particularly at busy intersections, such as 23rd and First Avenue, First Avenue and 14th Street[1] and those along Houston and Delancey.
- Speeding drivers - the most noted being along First Avenue (at 14th street and 23rd street), Houston Street and Delancey Street.
- Seniors also saw bikes as an issue, mainly because they do not have designated lanes and their travel routes are unpredictable.

Enforcement

- Many seniors noted that cars and police vehicles park and/or stop in bus stops. This prohibits buses from pulling directly up to the curb and leads seniors to climb down to the street without a curb cut.

Improvements

- Make pavement more even and smooth
- Extend the time pedestrians are given to cross the street
- Construct bus bulb-outs that bring the passenger to the bus and keep vehicles from parking or standing in the bus stop
- Make bike travel more predictable
- Decrease speed of cars.

1 1st and 14th Street is the Stuyvesant Park DOT SPFA.

Discussion

In this section we discuss the changing paradigm in urban transportation planning from less of a focus on cars, to more of a focus on people. We then compare the logic behind transportation planning that only focuses on crash statistics, versus planning that focuses on improving areas where seniors live and walk.

Active Aging

Pedestrian Planning Increases Senior Activity and Improves Senior Public Health

The thesis of "active aging," which is promoted by several health organizations including the World Health Organization and the National Institute on Aging, is that walking, biking and other regular outdoor activity is a preventative measure that keeps seniors in good health and also decreases depression that comes from staying at home and being afraid of the dangers of the outside world, including crossing the street.[1] The task at hand, thus, is to make pedestrian safety improvements and also make sure seniors perceive that their streets are safer to walk in so that they can achieve these physical and mental health benefits.

Evidence of increased pedestrian planning as a strategy to improve public health can be found in many public health journal articles. In urban areas, the perception that streets are unsafe due to speeding traffic (as opposed to crime) has led many seniors to stay at home and not go outside.[2] Researchers also argue that elderly in the Netherlands, Denmark, Sweden and Germany who walk and bike for the majority of their transportation live anywhere from 2.5 and 4.4 years longer than the elderly in the United States. The per capita health costs in those countries are half of ours.[3] More walkable streets also correlate to decreases in elderly depression.[4]

1 Growing Older - Staying Well: Ageing and physical activity in everyday life, World Health Organization Ageing and Health Programme, WHO/HPR/AHE/98.1, 1998

2 Loukaitou-Sideris, p, 221.

3 Pucher, John and Lewis Dijkstra, Promoting Safe Walking and Cycling to Improve Public Health: Lessons from the Netherlands and Germany, American Journal of Public Health, Vol. 93, No. 9, September 2003, p. 1514.

4 Journal of the American Geriatrics Association, Protective Association Between Neighborhood Walkability and Depression in Older Men, Vol. 55, No. 4, February 2007.

Pedestrian planning and street maintenance can also address outdoor falls. Public health researchers find that walking—which 70% of seniors report as their predominant choice of physical activity[5]—on sidewalks, curbs, and streets is the most common sites of falls. Falls are estimated to cost the United States $19 billion per year[6] and are frequently and usually caused by uneven surfaces, litter, and other physical factors that can be corrected through preventative planning improvements and street maintenance. [7]

A national AARP survey in July 2008 also found that 29% of respondents are walking more frequently, 57% were somewhat, very, or extremely likely to walk, ride a bike, or catch a bus if their neighborhood were accommodating, and 83% of urban respondents supported the ideas behind Complete Streets.[8] Although this poll was conducted during an uptick in gas prices, there is increasing consumer preference towards fuel efficiency, so these opinions remain relevant.

Senior Pedestrians' Transportation Use in New York City

Walking and public transit are the most common modes of transportation for older people in New York City. A 2006 survey of older AARP members in the metropolitan area found that 52 percent of city-dwelling respondents often walk to get where they want to go; 52 percent regularly use public transportation; 39 percent drive; 26 percent use taxis; 26 percent get rides with family or friends; 10 percent use private drivers; and 10 percent take community vans designated for older adults and/or people with disabilities.[9] A recent report published by the NYCDOT showed that public transit absorbed most of the travel needs of New York City's population growth; from

5 Outdoor Falls Among Middle-Aged and Older Adults: A Neglected Public Health P... Wenjun Li; Theresa H M Keegan; Barbara Sternfeld; Stephen Sidney; et al American Journal of Public Health; Jul 2006; 96, 7

6 Gross, Jane, "Catching Seniors Before They Fall," New York Times, September 11, 2008.

7 American Journal of Public Health, Outdoor Falls Among Middle-Aged and Older Adults: A Neglected Public Health Problem. July 2006.

8 Skufca, Laura, Is the Cost of Gas Leading Americans to use Alternative Transportation? (AARP, 2008)

9 New York Academy of Medicine, Toward an Age-Friendly New York City, Fall 2008 referencing AARP, Good to go: assessing the transit needs of New York Metro AARP Members, 2006. (AARP's results, p. 3, are for city dwellers. Walking may be more common in Manhattan).

2007-2008 there was an increase in public transit use and no vehicular traffic growth.[10]

Pedestrian Planning

NYCDOT, under Commissioner Janette Sadik-Khan's leadership, is making great strides to include pedestrians in transportation planning and street design. This is demonstrated most recently by the release of the "World Class Streets" report, where the DOT commissioned Gehl Architects to examine New York City's street design and make recommendations that go beyond basic safety and include considerations for health and livability.[11]

The need for pedestrian planning is especially important in Manhattan, where over 77% of borough households do not own a car,[12] where over 72% of commuters take mass transportation to work[13] and where 6% of adults walk or bicycle to work[14] or to do their regular errands. For Manhattan's seniors, it's not the experience of losing one's driver's license that is isolating, but the realization that they cannot walk as far, that the subway's stairs pose too hard a challenge and only 5% of stations are ADA accessible.[15] Seniors who cross streets at 2.5 feet per second on average[16] do not move fast enough to cross the street in a typical New York City pedestrian crossing cycle which is typically

10 New York City Department of Transportation, "Sustainable Streets Index 2008."

11 World Class Streets: Remaking New York City's Public Realm, Gehl Architects and NYCDOT, 2008

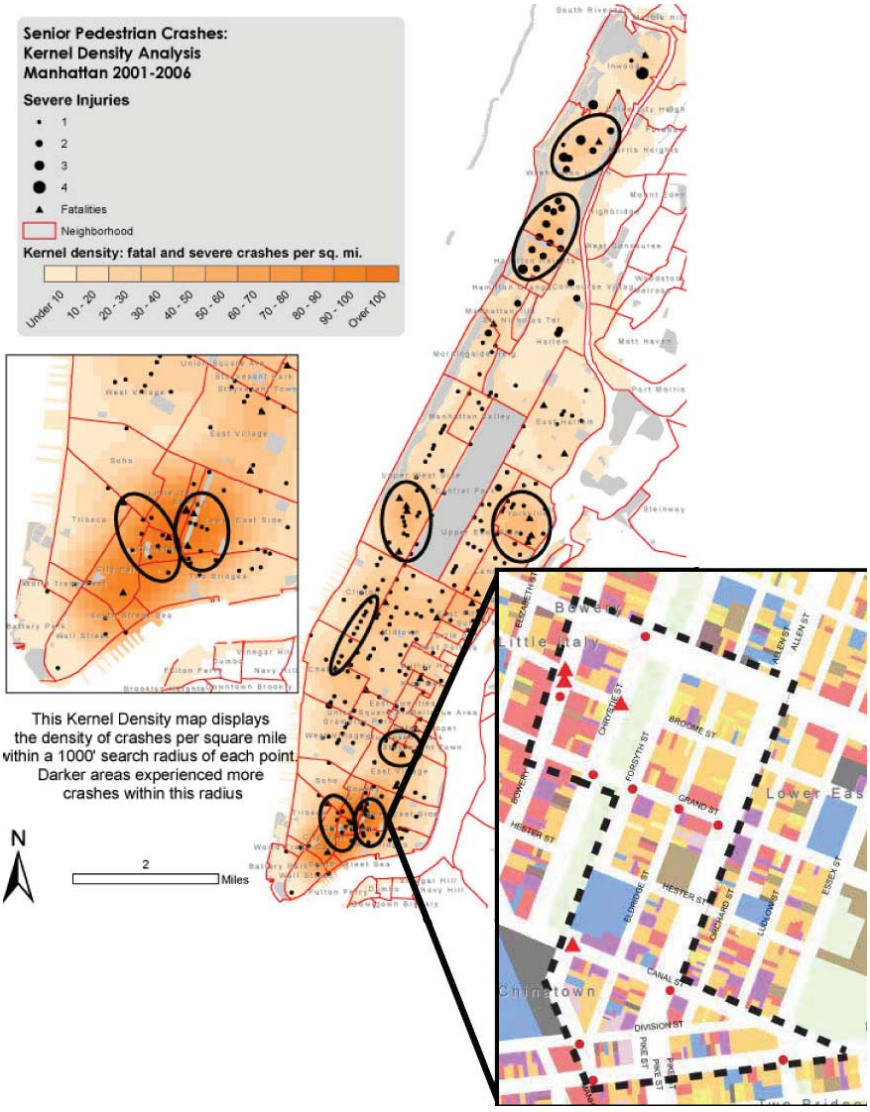
12 Census 2000, Data table H041 "Tenure by Vehicles Available: Occupied Housing Units" for New York County, New York: Total households divided by total no car available for owner-occupied and rental housing. census.gov.

13 DCP, New York City Pedestrian Level of Service Study Phase I, 2006, p. 4. home2.nyc.gov/html/dcp/pdf/transportation/td_fullpedlosb.pdf

14 DOHMH, Press Release 087-06. nyc.gov/html/doh/html/pr2006/pr087-06.shtml (This statistic, for all 5 boroughs, is likely higher now since DOT found a monumental 35% increase in bicycling to work in 2007-2008: nyc.gov/html/dot//html/pr2008/pr08_047.shtml).

15 Pucher and Renne, 2003.

16 "Discriminatory by Design," Transportation Alternatives, 2007.



DOT's Methodology: Outlines drawn around kernel density analysis of vehicular-pedestrian fatality and severe injury data, 2001-2006, in Manhattan. Source: DOT Safe Streets for Seniors presentation page 11, accessed October 2008.

timed at 4 feet per second. Seniors who are able-bodied walk a short distance to do crucial errands; if possible most take a bus or a cab to other destinations. As such, the details of street layout, bus stops, crosswalks, traffic calming, and ADA accessibility become a very important concern for senior pedestrians. Given the greater number of pedestrians as opposed to private vehicles, using city streets, pedestrian safety/planning should arguably be a bigger budget priority.

Pedestrian Safety Planning: how to identify improvement areas

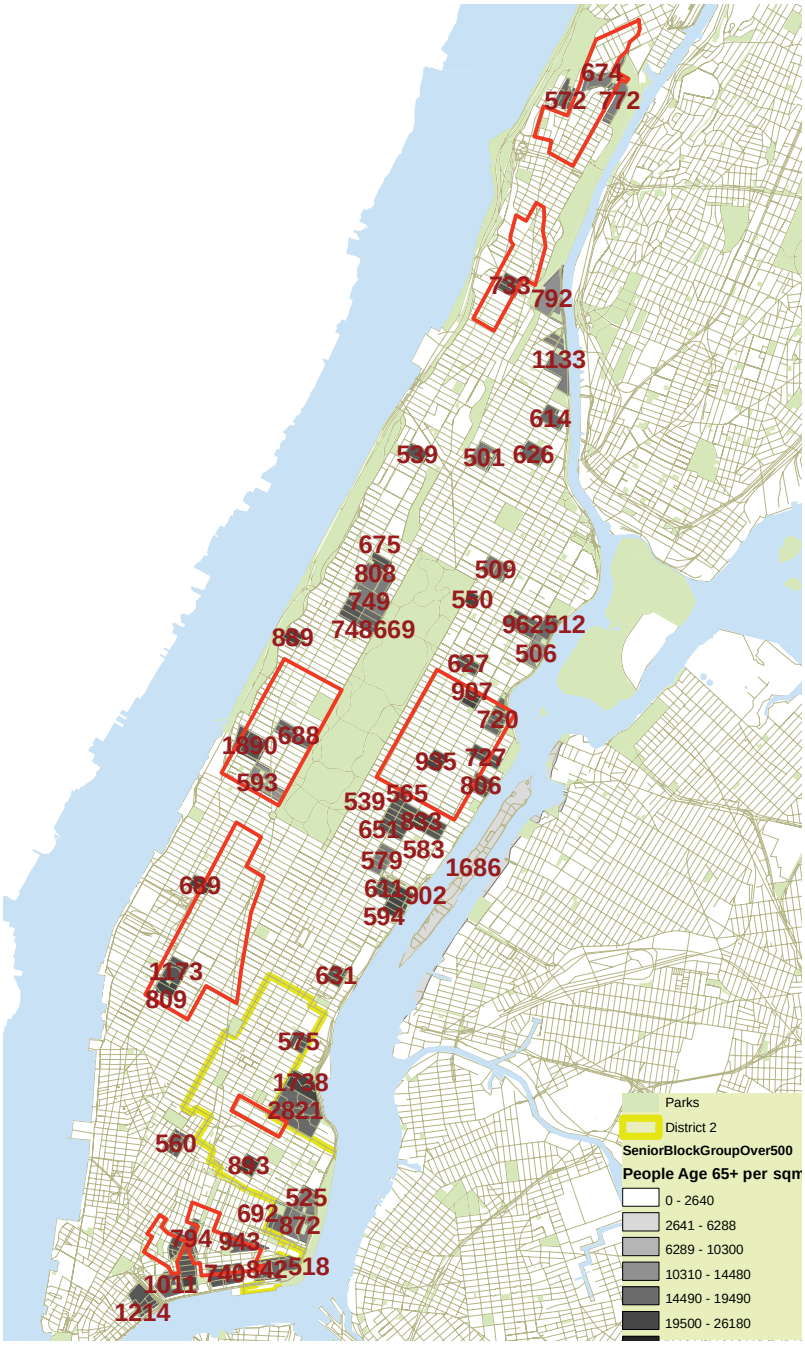
One way of approaching the identification of improvement areas is to identify where there is a high number of crashes and draw a cordon around that area. The GIS Kernel-based selection strategy is based on a spatial algorithm that weighs a senior fatality four times as much as a severe senior injury. This is the strategy used by DOT in their senior pedestrian safety planning.

A second way to select sites for street improvements is to focus on a buffer zone around a specific site that attracts a target population for whom the improvements are intended. This is the strategy DOT uses for its Safe Routes to School program, a similar pedestrian safety improvement program. Safe Routes to School focuses on improving areas around elementary

and middle schools, a reaction to the startling statistic that 71% of child deaths occur within 700 feet of schools.[17] Both Safe Routes to School and Safe Streets for Seniors nominally focus on making streets safer for the New York City populations most vulnerable to dying in a crash with a motor vehicle – its very young and very old.

Table 2 to the right compares the rate of fatality of children ages 1-12 years against the rate of fatlities of senior pedestrians. The fatality rate of senior pedestrians is 40 times greater than that of children. This is less ideal as a comparison because it compares data from different data sources and different years. However, the comparison is stark enough tomake a strong case for giving senior pedestrian safety at least as high a priority as Safe Routes to School improvements. A better comparison with data from similar years should be completed on a regular basis and with the same data set so that pedestrian improvement areas can be prioritized.

A map to the right showing the most populous senior block groups from Census 2000 and the DOT Safe Streets for Seniors pilot areas in Manhattan reveal some discrepancies. While there is a relationship between some Safe Streets for Seniors pedestrian focus areas (outlined in red) to senior population density (in shades of gray, with the darkest shade illustrating greater density), there are pilot areas that do not encompass Census block groups that have high density of seniors. The senior



DOT Safe Streets for Seniors Sites (red) overlaid on Manhattan. 2000 Census tracts with 500+ seniors (age 65+) show senior population (number, shaded). Source: DOT Safe Streets for Seniors: Manhattan site maps; 2000 Census: Age 65+ tract populations.

17 NYC DOHMH, New York City Child Fatality Report, 2007. http://www.nyc.gov/html/doh/downloads/pdf/episrv/episrv-childfatality-book.pdf

pilot area on E 14th Street in particular is of concern because of the senior rich housing developments adjacement to the improvement area but does not incorporate the blocks of housing north of 14th Street. Something as simple as not being able to cross the street can inhibit independence.

How should pedestrian safety improvement areas be defined when there is no single identifiable site from which to create a buffer for a target population? We offer an alternate method of identifying sites – a population-based /destination-based strategy.

Table 2: Rate of fatalities between children ages 1-12 years and senior pedestrians ages 65 and older

Borough	Children (1-12 yrs) Fatalities Rate per 100,000 (2001-2005)	Average Older Pedestrian Fatalities Rate per 100,000 (2005-2007)
Manhattan	.2	8.27
Staten Island	.5	6.47
Brooklyn	1.2	6.22
Queens	.9	4.37
Bronx	.8	4.21
	Source: DOHMH 2007	Source: TSTC 2008

This chart compares the rate of fatalities of children ages 1-12 years with that of older pedestrians. It is not an accurate depiction because the data sets are from different years and different sources. However, the comparison is stark enough to advance the idea that senior pedestrians should receive as many street safety improvements as are given to children. Data computation for similar years is difficult to acquire and should be completed by the DOT, State DMV or the DOHMH to improve targeting pedestrian improvement areas. Source: "Older Pedestrians at Risk," Tri-State Transportation Campaign, 2008; "New York City Child Fatality Report," New York City Department of Health & Mental Hygiene, 2007.

An Alternate Strategy: Senior Pedestrian Zones

Using the 2000 Census populations for age 65 and above in each census tract, we looked for unusually high senior block group populations in, or immediately adjacent to, City Council District 2. Comparing NORC, senior center, Mitchell-Lama and NYCHA maps, we determined buildings and complexes with over 500 seniors.[18] We then drew 1/8th mile buffers around the outlines of these developments, senior centers and hospitals to determine the Senior Pedestrian Zones that we propose (see map on following page). This is the same planning technique that Transportation Oriented Development (TOD) planners use to plan for heavily walked areas near subway stops, except they generally use a ¼ mile radius.

As a starting point, the NYCDOT could simply use census block groups to ensure that pedestrian safety improvements capture the access points that seniors are most likely to use. The 2010 Census data will be released soon. Now is a perfect opportunity to get in the habit of understanding how target population and improvement areas may grow or shift.

18 According to the U.S. Department of Health and Human Services, NORC is a demographic term, but not numerically defined. aspe.hhs.gov/daltcp/Reports/NORCssp.htm. We called area NORCs to find out their senior populations, and picked the threshold of 500, as it is incontestably high.

Table 3: Differences between DOT Safe Streets for Seniors program and proposed Senior Pedestrian Zones

	Short Term Impact	Long Term Impact	Highest #Population impacted	Effectively addresses senior pedestrian needs	Cost
DOT Safe Streets for Seniors methodology	X			Immediate impact, but no direct relationship to senior populations in city. Related to sites of statistically significant senior severe injuries and fatalities	Less upfront study cost.
Senior Pedestrian Zones	X	X	X	Directly related to where seniors live and where they like to walk, potentially impacting more seniors.	More upfront study cost.

The map above shows how safety improvement areas could be drawn if they were based on a buffer zone around high-density senior populations. The improvement areas would encapsulate more dangerous intersections and require more emphasis on corridor planning for pedestrians than the DOT's current Safe Streets for Seniors safety improvement areas.

Recommendations

We have discussed the merits of the DOT's process for defining safe senior improvement areas and the many benefits of making streets safer for senior pedestrians. Based on this, we make the following recommendations.

Research geographic trends in senior pedestrian accidents

The lack of research about proximity between pedestrian senior fatalities, severe injuries, senior residences, senior centers and other senior walking destinations (similar to the DOHMH research on proximity of child fatalities to schools) begs the question of why so many senior crash victims are hit so far away from places where seniors tell us they walk. Further, what spatial trends are there in senior pedestrian collision victims?

There is no current age-coded publicly released collision data, so DOT should commission the research. This research would inform prioritizing street safety improvements for seniors. It would also correlate senior pedestrian injuries and fatalities to residential populations, street characteristics and proximity to pedestrian destinations in order to inform future senior pedestrian safety improvement areas. This type of geographic understanding of crashes for children under 14 years of age exists; it should also exist for senior citizens.

Shift to senior residence-based improvement areas

Drawing outlines around selected years of crash data may yield arbitrary improvement areas. Comparing DOT's Safe Streets for Seniors spatial kernel (2001-2006 NYS DMV data) to TSTC's "Most Dangerous Roads" (2005-2007 NHTSA FARS data) yields different areas considered most "dangerous" to seniors. These areas would also change if either analysis used different years of data.

A bus bulb in Brooklyn NY allows the bus to stay in its lane, bring the passenger closer to the bus and is an opportunity to decrease crossing distances for other pedestrians because bus stop are often located at an intersection. (This image received the most positive comments in the focus group sessions.)

Pedestrian and street design improvements for seniors will not be arbitrary if they are done within measurable radii around places where large senior populations live and walk. Almost every trip a senior makes begins at their residence, and therefore improvements directly outside
of her or her residence is especially important. If seniors are afraid to cross the first few streets, they risk becoming homebound and may not go anywhere else. Further, residence-based improvement areas will encourage seniors to continue walking as they age.

Develop Senior Pedestrian Zones and Increase Street Crossing Times

Using census data and GIS mapping, DOT can determine block groups, buildings and complexes with over 500 seniors. We picked 500 as a threshold to test — the DOT could pick another threshold for a high population, as long as it is applied consistently. Based on this information and knowledge about where seniors walk, an 1/4th or 1/8th mile buffer can be created that serves as a zone outlining where seniors walk. This may seem small, but zones can overlap to encourage pedestrian connectivity.

Senior Pedestrian Zones should universally receive the easiest and most inexpensive improvements, including the “short-term safety improvements” made adjacent to priority schools at Safe Routes to Schools sites, with at least 5 to 9 second leading pedestrian intervals (LPIs) and longer pedestrian crossing times (2.5 feet per second, the speed recommended by TA’s 2007 research on Upper East Side seniors).

Increasing crossing times to 2.5 feet per second would be better suited than the 3 feet per second that DOT’s Safe Streets for Seniors is currently using for its increased crossing times in improvement sites. Longer-term projects should be made through the capital improvements process. The B57 bus which stops at a bulb out bus stop at Flushing and Marcy in Brooklyn, was by far the audience favorite in

the five pedestrian safety workshops we gave for this report. T.A. recommends installing these bus stops as much as possible. They preclude other vehicles from using bus stops for parking or loading, and also decrease street crossing distances.

Create design solutions for senior pedestrian improvement areas

To date, DOT has dedicated more resources to making improvements for child pedestrian safety than seniors, despite collision data showing there to be much greater need for senior pedestrians (see Table 3). The Safe Routes for School Program has developed many additional safety meaures such as flashing yellow lights and fluorescent yellow signs that are now accepted as safety conventions when indicating school zones.

A overly wide street and no pedestrian refuge make this intersection a difficult one to cross for seniors.

Work more closely with public health and aging organizations, and with community representatives

Information and research should be shared between city agencies. Collaborations between transportation planning, senior and public health organizations can be forged and outreach to seniors can be more effective. New York City's Department of Health and Mental Hygiene (DOHMH) and its Department for the Aging (DFTA) should share any relevant data on senior fatalities and senior population locations to pick improvement areas and street design improvements. To streamline neighborhood selection and make successful plans the DOT could send a letter to Community Board District Managers to solicit input on specific intersections in their district that need senior pedestrian safety attention.

Conclusion

Transportation Alternatives' 5th report on the Safe Routes for Seniors campaign marks an evolutionfrom a trauma reduction focus at streets and intersections, to a holistic view at neighborhoods that incorporate preventative measures.

Constructively reviewing New York City's Safe Streets for Seniors program while still in its infancy allows T.A. to illuminate research that DOT should pursue for future pilot areas.

Turning today's pedestrian threats and barriers into safer and attractive places will lower traffic injuries and fatalities among elderly pedestrians. Moreover, safe streets for seniors will encourage outdoor activity which has been shown to decrease depression, increase life expectancy, and thereby improve public health overall. Better yet, street safety improvements for senior pedestrians are improvements for all pedestrians.

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Appendices

Appendix A: Current New York City Initiatives for All Age Street Users

NYC DOT Safe Streets for Seniors

New York City Department of Transportation announced Safe Streets for Seniors in January 2008. The DOT analyzed crash data to select 25 neighborhoods distributed across the five boroughs in which to make pedestrian improvements. Five pilot areas, including Brighton Beach, the Lower East Side (in District 1), and Flushing began to receive senior pedestrian safety improvements in 2008.

American Association of Retired Persons (AARP) Livable Communities Initiative

Rising gas prices have prompted Americans to examine their transportation and energy use preferences and consider transportation alternatives. AARP is among a broad range of planning organizations, nonprofits, foundations, and cities that support the Complete Streets idea to redesign streets for users of all ages and modes of transportation through its Livable Cities Initiative.

World Health Organization (WHO) Global Age-Friendly Cities Initiative

New York City was chosen by the World Health Organization (WHO) for inclusion in the Global Age-Friendly Cities initiative, and is working with the New York Academy of Medicine as its local affiliate. WHO's recommendations for outdoor areas to city planners are similar to AARP's Livable Communities Initiative: Outdoors be clean and pleasant, provide green spaces and outdoor seating, age-friendly pavements and safe pedestrian crossings with enough time to cross, streets be accessible, safe, and have public toilets, and provide walkways and cycle paths.

The All Ages Project

Announced in the 2008 State of the City address, the All Ages Project is a collaboration between the New York City Council and the New York Academy of Medicine to ready all aspects of the city its growing senior population. Twenty percent of the city's residents are projected to be over the age of 65 by 2030.

Complete Streets

Complete Streets is a campaign to make streets inclusive for all their users including all ages and modes of transportation users. While not specifically a campaign for or about seniors, Complete Streets are defined as places that meld traffic calming, sensible transit, play streets, universal design and community building. A complete street is one in which car travel lanes are narroved, curbdisde parking is reduced or removed, and space is repurposed as broader sidewalks, protected bike lanes, secure rights of way for buses and more pedestrian-oriented intersections. Overall, the Complete Streets philosophy puts people first in the street hierarchy and focuses on how transit can benefit the community and improve the public health. Literally, complete streets have more pedestrian space, more crosswalks, and bike lanes.

Transportation Alternatives' Safe Routes for Seniors

Beginning in 2004, this initiative, sponsored by the New York State Department of Health's Healthy Heart Program, has worked with neighborhood advocates, elected officials, and done neighborhood outreach to local communities to produce five studies advocating for street improvements to make streets safer for Manhattan's pedestrian seniors.

Department of Health Organizations (DPHO)in 5 Boroughs

NYC's Department of Health Organizations are focusing on addressing how transportation and street design impact public health.

Appendix B: Survey Handout used at five Senior Center Workshops

Instructions: Help us identify some common dangers of walking on the street in your neighborhood. Be descriptive! Be sure to mention adjacent landmarks or stores.

Safety Improvements

1. Please identify:
   - Confusing Signals
   - Areas where Drivers Speed
   - Intersections where traffic fails to yield to Pedestrians
   - Intersections with Not Enough Time to Cross the Street

Enforcement and Maintenance

2. Please identify:
   - Areas with Illegal Parking
   - Poor Pavement Conditions
   - Lack of Enforcement of Traffic Rules for Drivers and Bicyclists
   - Demographic Information (Optional)

Do you use a mobility aid (e.g., a cane or walker)? Yes / No (Circle One)

Pedestrian Capacity and Connections

3. Please identify any sidewalks or pedestrian areas that you don't feel are wide enough.

4. Are there any walkways, paths, or skyways that you think need improvements?

Top Priorities and Improving the Pedestrian Experience

5. What are your five top priorities for improving pedestrian safety in your neighborhood?

6. In conclusion, can you think of other changes that would make walking and moving through your neighborhood more enjoyable?

Thank you for your input! Can we contact you for more information?

If yes, what is your:

Name:_____Phone/Email:_____

Your Age: _____ Your Gender: _____

Appendix C: Full Survey Summary from Senior Center Workshops

Findings from Senior Surveys and Workshops
Fall 2008

Quotes
"First Avenue and 14th Street - double parking by cars and police cars forces buses to make dangerous pickups and dropoffs"
"More bike routes so they don't ride on the sidewalk"

Transportation Alternatives visited five senior centers in October to collect information on how seniors use the streets in their neighborhoods and what they think could make them more accessible. Workshops were held at:

- The Stein Senior Center (East 24th Street: Oct 2 2008);
- The Sirovich Senior Center (East 12th Street: Oct 7 2008);
- Village View Housing (East 4th Street: Oct 9 2008);
- Gompers Senior Center (Pitt Street: Oct 16 2008); and
- Baruch Elder Services Team (Columbia Street: Oct 23 2008).

Surveys were reviewed collectively at some workshops and notes were taken on discussion. Spanish translators were used at the last two workshops.

Workshop	Surveys filled out	Number Attended
Stein Senior Ctr	9	16
Sirovich Senior Ctr	3	9
Village View Housing	5	20
Gompers Senior Ctr	22	50
Baruch Elder Svs	2	23
Total	41	118

It was optional to provide demographic information about age, gender, and use of a mobility aid, so the information we have is approximate. The average age of respondents was approximately 73 years old. The gender of participants was a mix, with more women attending than men. We did not count at the workshops. Eight survey respondents said they use a mobility aid, but we also did not count or require a response to this question.

FEEDBACK

During the workshops T.A. asked seniors present—both in a discussion and on a survey handout - which streets and intersections they found most dangerous and difficult to navigate, and why.
Their feedback has been instrumental in developing our recommendations for NYCDOT.

On the survey and in the general discussion that took place senior participants identified a number of issues within categories related to safety improvements, enforcement and maintenance, pedestrian capacity and connections, and top priorities and improving the pedestrian experience.

In more detail, the categories were:

Safety improvements:

- Confusing signals
- Areas where drivers speed
- Intersections where traffic fails to yield to pedestrians
- Intersections with not enough time to cross the street

Enforcement and Maintenance:

- Areas with illegal parking
- Poor pavement conditions
- Lack of enforcement of traffic rules for drivers and bicyclists

Pedestrian capacity and connections:

- Identify any sidewalks or pedestrian areas that they don't feel are wide enough
- Are there any walkways, paths, or skyways that you think need improvements

Top priorities and improving the pedestrian experience:

- What are your top five priorities for improving pedestrian safety in your neighborhood?
- In conclusion, can you think of other changes that would make walking and moving through your neighborhood more enjoyable?

Summary of Responses

Problems identified vary depending on what intersections seniors live near, but many responses about safety and enforcement were similar in all 5 workshops. Predominant issues:

Safety

- More time is needed to cross the street, particularly at busy intersections, such as 23rd and First Avenue, First Avenue and 14th Street, and crossing Houston and Delancey.
- Speeding drivers - the most noted being along: First Avenue (at 14th street and 23rd street especially), Houston Street, and Delancey Street.

Enforcement

- Many seniors noted that cars and police vehicles park and/or stop in bus stops. This prohibits buses from pulling directly up to the curb and leads seniors to climb down to the street without a curb cut.
- Seniors also saw bikes as an issue, mainly because they do not have designated lanes and their travel routes are unpredictable.

Improvements

- Improvements can be made by making pavement more even and smooth, extending the time pedestrians are given to cross the street, making bike travel more predictable, and decreasing cars that speed.

Safety improvements:

<u>The Stein Senior Center</u>

- Avenues are too wide to cross
- Intersections

First Avenue

- 25th St and 1st Ave: trucks vs. wheelchair
- 27th St and 1st Ave

- 1st Ave and 26th St: Going to Bellevue
- 23St and 1st Ave: while you're crossing the street cars will turn thru you (elderly lady walking with even older father)
- 23St and 1st Ave-2nd Ave: lights go fast, so slow people get stuck
- 23St and 1st Ave and 2nd Ave: taxis, buses, and young kids are problematic drivers

Second Avenue

- 2nd Avenue is a speedway
- 26th St and 2nd Ave: the crossing from the pizza place to Duane Reade
- 26th St is two way now, it should be one way (1Av+2Av) like it used to be
- 2nd Ave and 24th (Mike's pizza to subway store): fell 3 times.. It was fixed and now the street is bumpy -- in the pavement -- not obvious that pavement is rough
- 2nd Ave: Double parking makes it hard for bikers
- 23St and 2nd Ave: crosswalk on south side of 2nd Ave from bus stop
- Third Avenue
- 27th St and 3rd Ave

<u>The Sirovich Senior Center</u>

Speed:

- Astor Place at Kmart too fast
- 1Av and 14th: west side (crossing 1st Av): too fast turning movement, not enough time to cross
- LOOK signs (telling you which way to look) needed

Intersections:

14th Street

- 14th St and 1st Ave -- very dangerous
- 6Av and 14St
- 1Av and 14th: coming East
- 1Av and 14th

Houston

- Houston and Columbia

- Houston is too wide

1st Avenue

- 1 Ave and 10St: crossing Avenue on north side.
- 1 Ave and 14th: coming East
- 1 Ave and 14th

Buses:

- Buses going in and out of stores are good
- bus bulbs!
- Lex and 26: Outside Armory, military and police in bus stops force bus to stop in the middle of the street

Village View Housing Corporation

- Houston/AveA
- Houston/1Ave

Gompers Senior Center

Intersections

Houston

- Houston
- Columbia and Houston: light needs an arrow indicating we can cross
- Houston at Baruch: not enough time to cross
- Houston at Columbia: too fast
- Pitt and Houston: too fast
- Pitt and Rivington: Sidewalk needs repairs

Near District 2

- Grand St: speeding
- Delancey and Essex: crossing
- Delancey and Clinton: not enough time to cross, double parking by buses
- Essex: not enough time to cross, double parking by buses
- Rivington and Clinton: not enough time to cross, double parking by buses
- Attorney and Delancey: no place to cross, must walk in street; sidewalk crooked, needs repairs
- Rivington
- Pitt and Grand: sidewalk near police is too elevated

Baruch Elder Services Team

Intersections/Streets

- Masaryk Passage: it's the way to fresh produce shopping (Essex Market); Houston and Delancey too far and too dangerous
- Columbia Key Food: potholes 2 or 3 big ones in front that they never actually fix

Delancey:

- Delancey: holes and cracks
- Delancey/Columbia: bikes are crazy
- Delancey under the bridge: cars don't pay attention to signs.
- No lights
- Pitt and Delancey: signal needed. Only way cars will pay attention.
- Delancey bet Pitt and Columbia: long sidewalks dangerous
- Delancey south side: big puddles. Force walking in the middle of street.

Houston:

- Houston between Columbia and FDR
- Crossing Houston: impossible with walkers and scooters
- Houston, Delancey: cars speed on to our streets

Enforcement and Maintenance

The Sirovich Senior Center

- Need better education (PSAs) about how seniors get around
- 1Av and 14St: double parking by cars and police cars forces buses to make dangerous pickups and drop-offs

Village View Housing

- Bikes/Bus/Subway
- AveA bus service: There are 5 or 6 M14Ds to each M14A
- Subway access good (if you can do the train, you can do its small sidewalks)

- More bike routes so they don't ride on the sidewalk

Gompers Senior Center
Double Parking:
- Double parking in bus stops
- Double parking in handicap areas

Bikes:
- Bikes knock seniors down on Clinton, Delancey, and Rivington
- Bike riders don't stay in their boundaries
- Bikes inside the Lillian Wood Houses are a problem

Pedestrian capacity and connections:

The Sirovich Senior Center
- Curb cuts are too steep
- Uneven pavement at 2Av and 12th
- not enough curb cuts: Av A and 14St
- 12th and 13th St potholes, unpaved gutters collect fallen rain
- East side of 1Av: bad pavement

Village View Housing
- Sidewalks/Crosswalks
- 1Ave/5St Rite Aid-- curb cut too steep
- 1Ave: gutter/paving: valleys and dunes: road bad (inspectors should inspect it after it's repaced They're worse after they're fixed)
- Sidewalk Cafes take up too much space
- AveA/7St: Sidewalk cafes
- 2Ave, AveA: Sidewalk cafes
- People shouldn't use cell phones when crossing the street