

Master's Degree Professional Project



Planning Safer Streets for Age-friendly Cities

A Comparison Study between
New York City and Shanghai



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Executive Summary



An age-friendly city maximizes opportunities to ensure livability for its increasing aging population. One critical component to become age-friendly is to offer equal transportation opportunities for seniors. As people age, challenges could frequently affect their abilities to get around safely. Therefore, addressing the transportation needs of seniors becomes an important issue in urban planning. This report looks into how Shanghai and New York City respond to their aging populations in safe street policies. In the first section, demographic shifts faced by these two cities have been identified respectively. The second section compares and contrasts these two cities' safe street policies with attention towards senior users. Discussions are provided with potential refinements of these policies. The third section offers lessons could be learned from these two cities. In the end, three key design and planning principles are recommended in planning safer streets for age-friendly cities: (1) complete street; (2) make it easy for seniors; and (3) slow down the vehicles.

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1. Introduction

The Definition of “Aging”

The United Nations (“UN”) defines the age of 60 or 65 as the beginning of old age. Most developed countries, like the United States (“U.S.”), have accepted the age of 65 years old as a definition of “elderly” or older person.¹ In China, people who are 60 years old or more are regarded as seniors.

An aging society refers to a society where the proportion of aging population has reached a certain level of the total population. According to the UN’s definition, a city is considered as “aging” when the proportion of the elderly population aged 60 and above exceeds 10% of the total population. Another commonly used criterion by the UN defines a place as “aging” when it has more than 7% of the population that is 65 years old or over. In order to make the comparisons easier, this report uses 65 years old as the “aging” threshold. In the following passages, unless otherwise pointed out, terms such as “seniors”, “the aging population”, “the elderly” all refer to the cohort that is 65 years old or over.

1.1 Global Age-friendly Cities Initiative By the World Health Organization

According to the report *World Population Ageing: 1950-2050* by the UN, unprecedented demographic changes are transforming the whole world. These changes had their origins in the nineteenth and twentieth centuries and are continuing well into the twenty-first century, bringing enormous opportunities as well as enormous challenges for all societies.² Planning efforts which aim to ensure that this planet will maintain itself as a vibrant, safe and healthy place to grow older are becoming more and more important than ever before.

In 2007, the World Health Organization (“WHO”) launched its Global Age-friendly Cities initiative, dedicated to preparing the world’s urban centers for an increasing older population. Age-friendly cities are envisioned by the WHO as the ones that maximize opportunities to maintain and improve the quality of life for the elderly.³ Thirty five cities around the world participating in this initiative are expected to evaluate their communities and neighborhoods through the lens of the WHO’s “Age-friendly City Framework” (illustrated by Figure 1, see page 2).

1. “Definition of an Older or Elderly Person,” WHO, accessed July 13th, 2016, <http://www.who.int/healthinfo/survey/ageingdefolder/en/>.

2. “World Population Ageing 1950-2050,” UN, accessed June 13th, 2016,

http://www.un.org/esa/population/publications/worldageing19502050/pdf/62executivesummary_english.pdf.

3. “Global Age-Friendly Cities: A Guide,” WHO, accessed June 13th, 2016,

http://www.who.int/ageing/publications/Global_age_friendly_cities_Guide_English.pdf.

Shanghai and New York City (“NYC”) are among all the participating cities. As two cities with the highest aging population, they are age-friendly policy pioneers leading the way for other cities to follow.



Figure 1. Age-friendly City Framework.
Source: WHO.

1.2 Case Study Rationale

Shanghai and NYC share different characteristics as aging cities. *The Megacity State*⁴ report defines Shanghai as a megacity at Medium maturity level, which shows early signs of aging; while NYC is at high maturity level with a dramatically aging population.

1.2.1 Shanghai

Located on the eastern part of Yangtze River Delta and halfway along China’s eastern coastline (see Figure 2), Shanghai is one of the largest and most populous cities in China. Decreased fertility due to the “One Child” policy (see Appendix 1 for more information) along with the



Figure 2. Location of Shanghai.
Source: Encyclopedia Britannica.

lengthening life expectancy has reshaped the age structure of Shanghai. In 1979, the cohort of registered population⁵ 65 and over reached 7.2% of the total.⁶ This figure marked Shanghai as the first city in China to enter an era of aging society. Despite the fact that Shanghai attracts a large number of young people every year, the aging proportion keeps climbing. Figure 3 (see page 3) depicts the population change of 3 cohorts of seniors from 1996 to 2015.

In 2015, the total population in Shanghai was approximately 24.7 million covering 320 square miles. The aging population is 19.6% of the total population. In the years to come, parents of the first generation “One Child” will reach retirement age, increasing elderly population of Shanghai. Figure 3 also shows that there is a large proportion of relatively lower-aged seniors (age 60 to age 80). Most of these younger seniors

4. “The Megacity State: The World’s Biggest Cities Shaping Our Future,” Allianz Risk Pulse, published in November, 2015, https://www.allianz.com/v_1448643898000/media/press/document/Allianz_Risk_Pulse_Megacities_20151130-EN.pdf.

5. Registered population in Shanghai refers to residents who have a “hukou” in Shanghai. “Hukou” is a household registration record officially identifies a person as a resident of an area. Another term that represents residents currently reside in Shanghai (but not necessarily have a “hukou” in Shanghai) is residential population. See more at https://en.wikipedia.org/wiki/Hukou_system.

6. “Changes and Responses in Aging Population Curve of Shanghai,” Shanghai Research Center on Aging, accessed May 23rd, 2016, <http://www.shrca.org.cn/5203.html>.

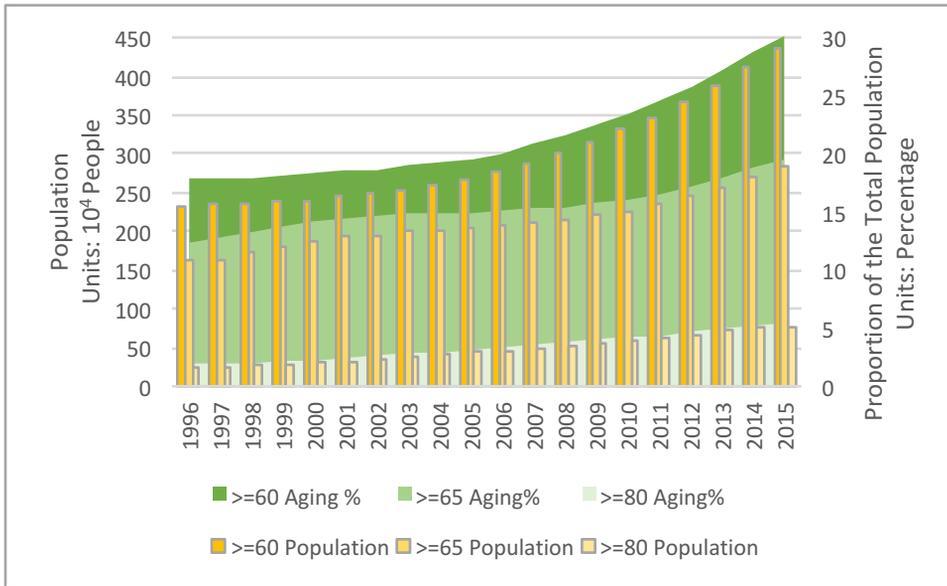


Figure 3. Senior Population in Shanghai from 1996 to 2015.
 Source: Data from 1996-2015 Information of Shanghai Senior Population and Senior Industry Development. Figure created by Author.

maintain healthy conditions by themselves without additional sources of care. How to help them sustain independence and remain healthy as long as possible becomes an important issue to address.

Local Municipalities in Shanghai

Shanghai is one of the four direct-controlled municipalities⁷ in China, administratively equal to a province (similar to states in the U.S.). It is divided into 16 county-level divisions: 15 districts and 1 county (note that in China, a city is at the higher political hierarchy than a county).

Figure 4 shows the spatial pattern of aging degrees in Shanghai. Despite Chongming County, for the rest 15 districts, the urban core areas in Shanghai have higher percentages of senior population. Conversely, the periphery areas of the city have lower degrees of aging.

- A Huangpu District
- B Jing'an District
- C Xuhui District
- D Changning District
- E Putuo District
- F Zhabei District
- G Hongkou District
- H Yangpu District

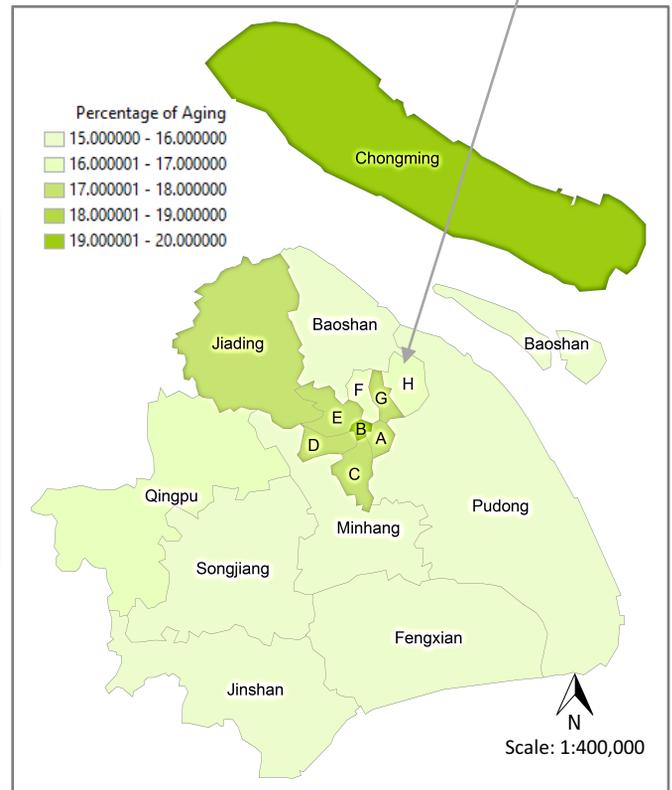


Figure 4. Spatial Pattern of the Aging Degrees in Shanghai.
 Source: National Census Bureau, the Sixth Census Data 2010. Map created by Author.

7. A direct-controlled municipality is the highest level classification for cities used by unitary state, with status equal to that of the provinces in the respective countries. See more at https://en.wikipedia.org/wiki/Direct-controlled_municipality.

The degree of aging in Shanghai will further deepen in the decades to come (see Figure 5). Demographers warn that Shanghai needs 35 million people by 2050 to ensure it has enough workers to support the increasingly aging society.⁸

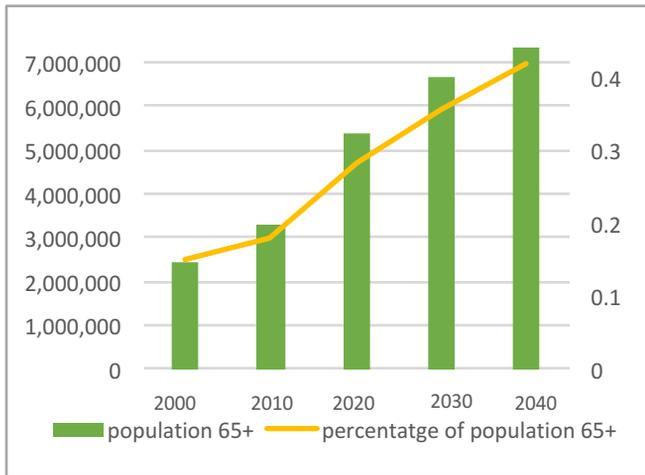


Figure 5. Shanghai Senior Population Projection. Source: Data from Poston, et al., 2009. Figure created by Author.

1.2.2 New York City

Located at the Southern tip of the State, NYC is at the center of the New York metropolitan area (see Figure 6). In 2015, the U.S. Census Bureau estimated a population of approximately 8.5 million⁹ covering 305 square miles, making NYC the most densely populated major city in the U.S.

Local Municipalities in New York City

NYC consists of five boroughs. Each of these boroughs is a separate county of the State.

Among all the boroughs, Manhattan ranks as the most aging borough, followed by Queens. Figure 7 (see page 5) shows the share of senior population of each



Figure 6. Location of New York City. Source: Encyclopedia Britannica.

borough in 2010. While NYC as a whole has an aging population of 12.2%, the aging percentages of boroughs vary from 10.5% to 12.8%. The overall spatial difference of aging is not as significant as in Shanghai.

NYC entered into an era of aging society in 1950s, about 2-3 decades earlier than Shanghai. The degree of aging in NYC is projected to be steady in the future (see Figure 8).

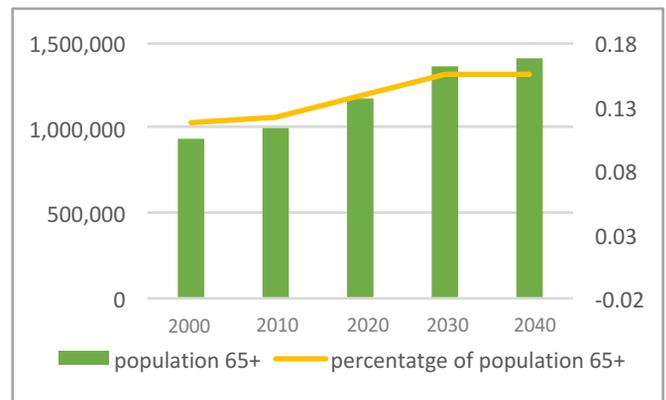


Figure 8. NYC Senior Population Projection. Source: Data NYC 2010-2040. Figure created by Author.

8. "Ageing Shanghai Needs 35m People by 2050, Demographer Warns," South China Morning Post, published on Oct 13, 2014, <http://www.scmp.com/news/china/article/1615335/ageing-shanghai-needs-35m-people-2050-demographer-warns>.

9. "Current and Projected Populations," NYC Planning, accessed June 13th, <http://www1.nyc.gov/site/planning/data-maps/nyc-population/current-future-populations.page>.

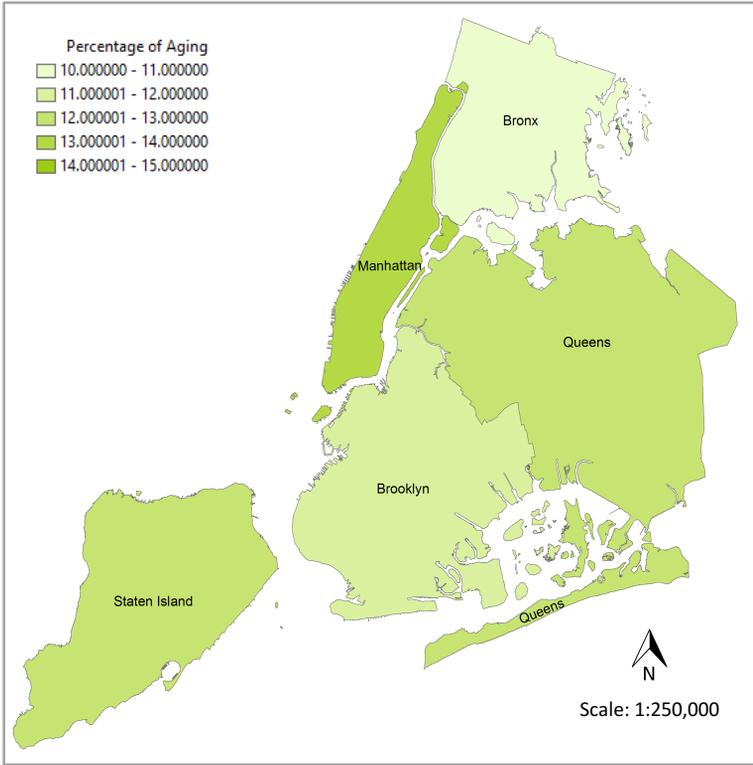


Figure 7. Percentage of Senior Population in Each Borough of NYC.
 Source: Data from 2010 U.S. Census. Figure created by Author.

1.2.3 Summary

The key differences of aging characteristics between Shanghai and NYC can be summarized in Table 1. In the decades to come, the aging will be an issue in both cities. For NYC, the aging of the large baby boom cohorts, modest growth expected in the number of children, and improvements in life expectancy all contribute to what will be a big demographic shift in the city’s age structure. For Shanghai, despite the fact that the migration policies may be adjusted to attract more young people and the “One Child” policy being loosened, the current age structure will still affect Shanghai for the next 2 to 3 decades.¹⁰

Changing demographics confirm that embarking a planning process aimed at enhancing cities’ responsiveness to older adults is critical.

Table 1. Key Differences of Aging Characteristics between Shanghai and NYC.

	New York City	Shanghai
Begin Year	1950s	1979
Population Density (people per square mile)	27,869	77,188
Spatial Pattern	Relatively even among each borough	Higher in urban core districts, lower in peripheral areas
Aging Proportion in 2015	12.9%	19.6%
Aging Population Projection	Steady growth	Steep growth
Major Contributor in the Near Future	Baby boomers	Parents of first generation “One Child”

Source: Created by Author.

10. Jianzhong Huang and Meng Wu, “An Investigation and Analysis of Travel Characteristics and Related Factors of the Elderly Population in Megacities- The case of the Central Area in Shanghai,” Urban Planning Forum 2 (2015): 222

1.3 How Transportation is Affected by the Normal Process of Aging

Transportation is considered as a key segment of an age-friendly city by the UN (see Figure 1). Being able to move around the city determines essential access to community services and stimulates social and civic participation.¹¹ However, this ability could be weakened by aging.

Challenges that frequently affect people’s mobility as they age include the following: declining vision, decreased physical fitness and flexibility, decreased ability to focus attention, and increased reaction time.¹² NYC has reported that senior cohorts are overrepresented in pedestrian traffic fatalities. In 2014, 13% of the NYC populations were seniors; while 39% of NYC pedestrian traffic fatalities were seniors (see Figure 9).

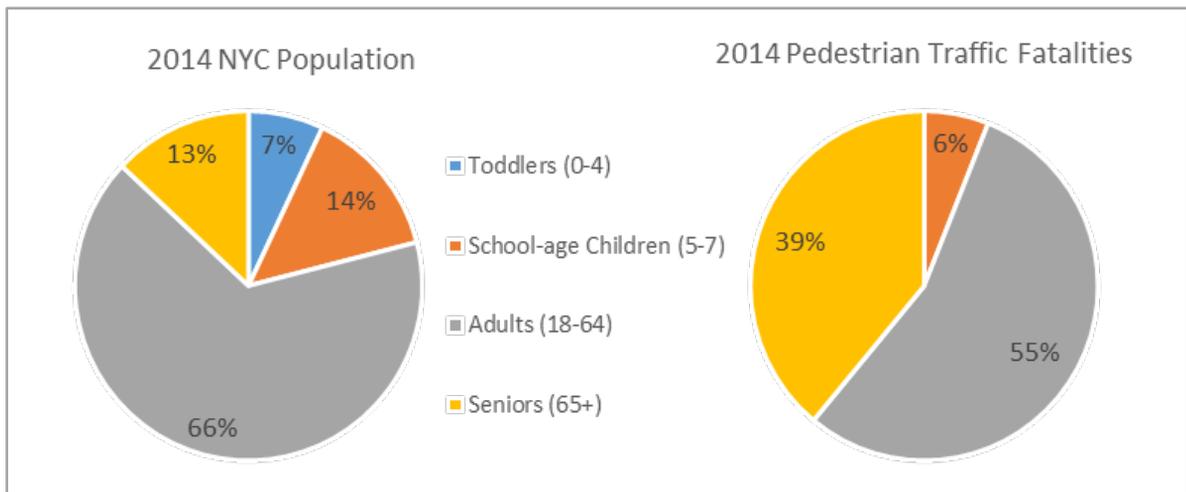


Figure 9. 2014 NYC Population and Pedestrian Traffic Fatalities Share by Age. Source: Modified from Safer Streets for Seniors.

A recent research study in Shanghai also indicates that walking is the most frequent travel mode used by seniors. In the case study areas of this research, over half of all the trips by seniors were completed on foot (Figure 10). Seniors need to walk to connect to bike ramps, public transit and destinations of other transportation modes, which adds more weight to the importance of a safer walking environment.

serve a growing segment of the population. Making streets safer for seniors could be one important part of transportation efforts.

Transportation policies which explicitly recognize these challenges will better

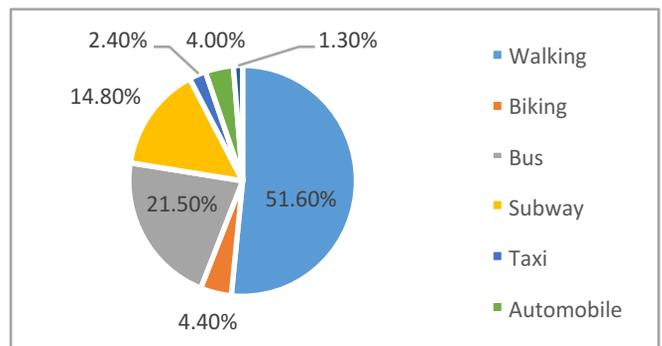


Figure 10. Senior Travel Mode Share in Shanghai. Source: Jianzhong Huang and Meng Wu, 2015.

11. “Global Age-Friendly Cities: A Guide,” WHO, accessed June 13th, 2016, http://www.who.int/ageing/publications/Global_age_friendly_cities_Guide_English.pdf.

12. “Planning Complete Streets for An Aging America,” AARP Public Policy Institute, published in February, 2009 <http://assets.aarp.org/rgcenter/ppi/liv-com/2009-12-streets.pdf>.

2. Identification & Analysis of Existing Policies

This section explores how Shanghai and NYC respond to transportation issues of the growing aging population. City-level policies which are aimed at promoting safer streets are examined with attention towards seniors. These policies can take many forms: plans, programs, legislation/ordinances, resolutions, design manuals/standards, etc. An inventory of the safe street policies are identified for each city respectively. Along with the inventories, evaluations and potential refinements are provided.

2.1 New York City

As the major agency to carry out city-wide transportation planning, the New York City Department of Transportation (“NYCDOT”) has put a lot of effort to make the Nation’s safest big city even safer. It is reported that NYCDOT has helped reduce annual NYC traffic fatalities by 55% and serious injuries by 17.4% over the last ten years.¹³ However, seniors still remain the most vulnerable group in transportation accidents.

Table 2. Inventory of Safe Street Policies in NYC.

Year	Name	Type of Policy	Agency	Summary
2008	Sustainable Streets Strategic Plan	Plan	NYCDOT	<ul style="list-style-type: none"> The first detailed transportation plan of NYC; Under the Vision Zero (see Appendix 2) goal led by City Hall to protect the public and bring traffic fatalities to zero; Safety is marked as the first priority in this plan, where New Yorkers of all ages should be treated equally.
2008	Safer Streets for Seniors Program	Program	NYCDOT	<ul style="list-style-type: none"> A pedestrian safety initiative for older New Yorkers; Studies crash data and then develops and implements mitigation measures to improve the safety of seniors, as well as all other road users city-wide.
2009	Sustainable Streets Progress Report	Progress Report	NYCDOT	<ul style="list-style-type: none"> Checks the performance of programs carried out by the Strategic Plan; 10 pilot areas with high senior density and high senior traffic crashes are identified for improvements.
2010	Pedestrian Safety Study and Action Plan	Plan	NYCDOT	<ul style="list-style-type: none"> Traffic fatalities and injuries do not impact all people equally—age is an indicator of risk; 25 neighborhoods with high densities of senior pedestrian crashes are targeted; As of July 2010, 6 areas have been completed, with work underway in additional areas; Within the project areas, improvements including 400 traffic signals, 25 pedestrian refuge islands, curb extensions and pedestrian ramps.
2013	Making Safer Streets	Design Guidelines	NYCDOT	<ul style="list-style-type: none"> Committed to continuing to improve the safety of streets, with a goal of cutting traffic fatalities in half by 2030; Raises 5 key design concepts for safer streets: <ul style="list-style-type: none"> Make the street easy to use Create safety in numbers Make the invisible visible Choose quality over quantity Look beyond the (immediate) problems
2013	Sustainable Streets 2013 and Beyond	Progress Report	NYCDOT	<ul style="list-style-type: none"> Summarizes methods, practices, designs and results from the street policies implemented in NYC from 2007 to 2013; Safe Streets for Seniors program expanded to add senior focus areas for pedestrian safety in 2012.

Source: Created by Author.

13. “Sustainable Streets Strategic Plan for the New York City Department of Transportation 2008 and Beyond,” NYCDOT, accessed June 13th, 2016, http://www.nyc.gov/html/dot/downloads/pdf/stratplan_compplan.pdf.

The major program to improve senior transportation safety in NYC is called “Safer Streets for Seniors”. It is aimed at increasing pedestrian safety, mobility and access for seniors on NYC’s streets, through engineering and education. Locations with both a high density of seniors and a high number of senior traffic crashes have been targeted for improvements. Strategies involve with the improvements include but not limited to: retiming traffic signals, building refuge medians, painting crosswalks, widening walkways, and repairing curbs. The other polices implemented after this program updated the performance of this program periodically.



*Figure 11. Seniors in NYC crossing the sidewalk.
Source: NYC Safer Streets for Seniors.*

Ever since the program began, the annual senior pedestrian fatalities have decreased 10% citywide, from 58 senior fatalities in 2008 to 52 in 2015 with marked gain in some districts.¹⁴ Crashes have fallen 60% since the program was implemented in the Lower East Side of the NYC.¹⁵ The process is still ongoing with a resolution to further increase senior pedestrian safety.

14. “Safe Streets for Seniors,” NYCDOT, accessed June 13th, 2016, <http://www.nyc.gov/html/dot/html/pedestrians/safeseniors.shtml>.

15. “Sustainable Streets 2013 and Beyond,” NYCDOT, accessed June 20th, <http://www.nyc.gov/html/dot/downloads/pdf/2013-dot-sustainable-streets-lowres.pdf>.

16. “Planning Complete Streets for An Aging America,” AARP Public Policy Institute, published in February, 2009 <http://assets.aarp.org/rgcenter/ppi/liv-com/2009-12-streets.pdf>.

Analysis

This program is specifically designed for senior pedestrians. The outreach of the program is conducted with both quantitative and qualitative methods. Since 2009, 137 street improvement projects have been implemented within the targeted locations citywide. Of the total, 78 projects have at least one year of crash data available for analysis. The richness of data supports empirically based analysis of existing conditions and the targeted recommendations. Also, these projects are implemented in phases to prioritize locations with the most urgent improvements. In the meanwhile, qualitative methods of collecting feedback through workshops and presentations also allow planners and engineers to listen to the voices of the seniors.

However, this program doesn’t cover the safety improvement strategies for senior drivers. People in the U.S. who were born following the end of WWII and experienced decades of auto dependence are becoming seniors now. They are more willing to drive if the walking environment is not friendly. As they age, they may often have difficulty making decisions quickly on roads. This will put seniors themselves and other road users at a higher risk for being struck or killed. The American Association of Retired Persons (“AARP”) finds that sometimes recommendations to improve older drivers’ safety results in conflicts for that of older pedestrians.¹⁶ For example, zebra stripping draws more attention than two parallel lines for drivers. But in the meantime, the painting walking surface becomes slippery when wet, which is dangerous especially for old pedestrians.

This calls for a holistic view of recommendations that balance the needs of all older road users. Therefore, for this program, more discussion and considerations on senior drivers would be a good supplement.



Figure 12. Combination Crosswalk: uses zebra strips to grab drivers attention but keep the walking surface free of paint which can become slippery when wet. Source: AARP, Photo by Jana Lynott.

2.2 Shanghai

Limited land resources lead to a dense development pattern in Shanghai. Initially this pattern made Shanghai highly location efficient where people can walk, bike or ride a moped within an acceptable distance for their daily errands. However, with the economic development, the ownership of automobile per household increased, which led to an urging demand of wider roads. Transportation planning in Shanghai emphasized auto mobility to favor driving from 1990s to 2000. This not only promoted road traffic, but also brought potential conflicts between auto users and non-auto users. To shift from these situations to a more sustainable transportation, Shanghai implemented a series of policies to promote non-motorized transportation and location efficiency.¹⁷ Table 3 provides an inventory of these policies.

Table 3. Inventory of Safe Street Policies in Shanghai.

Year	Name	Agency	Type of Policy	Summary
2002	Shanghai Urban Transportation White Paper	Shanghai Municipal Government	Resolution	<ul style="list-style-type: none"> • First time raised the concept of “non-motorized transportation”; • Promotes slow traffic forms.
2007	Non-Motorized Transportation	Tongji University	Research	<ul style="list-style-type: none"> • Conducted with different transportation modes to advocate walkability and bike-ability.
2007	Planning and design guidelines for Shanghai city road pedestrian crossing facilities	Shanghai Municipal Engineering Administration	Design Guidelines	<ul style="list-style-type: none"> • Builds upon “non-motorized transportation” to ensure safe, convenient and organized pedestrian crossings; • Presents instructions and demonstrations from a civil engineering perspective.
2010	Shanghai Barrier-Free Facility Design Standards	Shanghai Municipal Government	Regulation	<ul style="list-style-type: none"> • Requires all construction projects, as well as redevelopment programs, including roads, pedestrian overpasses and underpasses, public transit stations to be barrier-free.
2010	Shanghai Manual: A Guide for Sustainable Urban Development of the 21 st Century	United Nations, Bureau International des Expositions, Shanghai 2010 World Exposition Executive Committee	Resolution	<ul style="list-style-type: none"> • An important and novel outcome of the 2010 Shanghai Exposition in echoing the slogan “Better City, Better Life”; • Identifies seniors as one of the disadvantaged groups in urban traffic; • Considers barrier-free facilities as a significant enhancement for senior mobility.
2016	Planning Guidance of 15-Minute Community-Life Circle	Shanghai Urban Planning and Land Resources Administration Bureau	Plan	<ul style="list-style-type: none"> • Similar to the essence of “Complete Street”; • Guides developments with location efficient land development patterns; • Highly promotes walkability and bike-ability; • Acknowledges community services and facilities need to be affordable and accessible to seniors.
2016	Shanghai Street Design Guidelines	Shanghai Urban Planning and Land Resources Administration Bureau	Design Guidelines	<ul style="list-style-type: none"> • Responds to the goals raised by the 2015-2040 Shanghai Comprehensive Plan; • Seniors are explicitly identified as an important group that a barrier-free street design should consider; • Limited discussion on improving senior road safety.

Source: Created by Author.

17. Location-efficiency refers to those communities that are dense and vibrant, with walkable streets, access to transit, proximity to jobs, mixed land uses, and concentrations of retail and services. See more at <http://www.cnt.org/projects/location-efficiency-hub>.

Unlike NYC, Shanghai don't have a policy specifically designed for senior road safety. Although some of the policies listed in the Table 3 do acknowledge the seniors as one of the disadvantaged groups in urban traffic; this acknowledgement only considers barrier-free facilities for seniors. There is limited specific references to the special considerations and design standards that are necessary to properly accommodate older adults on streets. Take the most recent policy *Shanghai Street Design Guidelines* as an example. In the Section of Smart Streets, potential improvements are raised to address safety of the disadvantaged groups with intelligent street facilities, such as providing both audible accommodations for visibility-impaired populations as well as infrared sensors placed in the pedestrian walkways. The guideline also sets specific figures for the coverage of these facilities.



Figure 13. A Traffic Policeman Helping a Senior to Cross the Sidewalk in Shanghai.
Source: East Day Shanghai.

However, it is not clear how these strategies will improve senior road safety. Also, what the policy means when it says “coverage” seems ambiguous. What roads and what types of projects does the policy cover? Are there any exceptions? Clarifications are needed to indicate the applicability of those figures. Moreover, these recommendations could have the unintended consequences of geographical bias for those facilities. In considering this, even if some areas are doing better than others, the overall percentage could still seem to be decent-- reach or surpass the standard. The excitement of the figure could cover the geographical inequality behind it. There is room for much more information on these standards. Refinements to be made based on different existing conditions will help identify more urgent problems and set up more targeted solutions to achieve greater compatibility with these goals in mind.

Despite several districts have implemented district-wide non-motorized transportation plan; there is minimum studies indicating the performances of these policies. How far do they reach in affecting road planning and construction decisions? Is it likely to be implemented? The lack of information suggests a need for more research.

Analysis

Compared to NYC, Shanghai is still at the initial stage of implementing policies to address senior road safety. Despite news reports of severe senior transportation injuries and fatalities, Shanghai does not have extensive transportation fatality data regarding to the aging population.

Lessons learned from NYC shows a strong database could provide abundant facts for more empirical-based studies. This kind of quantitative methods would greatly enhance the current policies which are highly focused on qualitative analysis. Areas with critical safety issues can be navigated quickly and solutions can be more targeted and immediate. Also, a feedback mechanism is important to check the performance of current policies. This could also help to determine the applicability of design standards which may vary from one area to another with the different existing road safety conditions.



Figure 14. Workshop of Senior Traffic Safety Education. Source: NYC Safe Streets for Seniors.

Another major difference is that Shanghai has multiple agencies to implement safe street policies; while NYCDOT is the major character of that in NYC. Take non-motorized transportation as an example, it was proposed by Shanghai Municipal Government, developed by Tongji University and imbedded in the 2 recent policies by Shanghai Urban Planning and Land Resources Administration Bureau. Yet it is unclear how these policies are correlated. Are they supplementary to each other or do they have overlaps with each other?

Moreover, the reasons behind several extremely severe accidents involving seniors indicate a lack of safety awareness. Accidents that happen among seniors who are biking or riding a moped often because of an inadequate dedicated space—which force them to occupy the driveways. Some other senior pedestrians who are struck or killed on the road often lack basic traffic knowledge—they may still pass the streets when it is forbidden. This is extremely dangerous especially when the drivers don't yield to them. Strategies like education of transportation safety through senior centers and community boards could also be borrowed from NYC.



Figure 15. City Bench on Second Ave. Bus Stop, Manhattan. Source: NYC Safe Streets for Seniors.

NYCDOT shows that a singular agency can ensure policies are implemented in a systematic and consistent way. In the meantime, NYCDOT also sets a good example of partnership. The Safe Streets for Seniors program has worked collaboratively with NYCDOT's City Bench program –seating areas are placed near locations that seniors have more frequency. NYC's experience shows that Shanghai may also benefit from coordination of its multiple agencies to install a senior traffic safety program.

3. Safe Street Planning & Design Principles for Age-friendly Cities

Traffic fatalities and injuries do not impact all people equally. Certain demographic groups, such as seniors, are threatened more by road safety problems than the rest. This fact requires solutions tailored to reach and protect this specifically vulnerable group.

Although Shanghai and NYC are at different stages of implementing safer street policies with a consideration of seniors; current policies of both cities have shown how road safety can be integrated into urban mobility towards an age-friendly future in the long run. Combining policies conducted by the two cities, 3 principles to help make streets safer for seniors are recommended: (1) complete street; (2) make it easy for seniors; (3) slow down the vehicles. Table 4 (see page 13) provides a list of strategies fallen into the category of each principle.

3.1 Complete Street

AARP's *Planning Complete Streets for an Aging America* defines "complete street" as those designed for the safety and comfort of all road users, regardless of age and ability. The different needs of all road users shall be accommodated and balanced through all types of transportation projects, so that even the most vulnerable-children, elderly and persons with disabilities- can travel safely. Complete street does not only mean improving streets. A compact land use pattern in the city also plays an important role in creating

a safer travel environment both actual and perceived. This can be achieved by smaller block size and high connectivity and accessibility to destinations (location efficiency). Land use regulations can have a strong enforcement of this kind of land development.



Figure 16. Small Block Size in Urban Core Areas in Shanghai Foster a More Walkable and bike-able Environment. Source: *Cities Safer by Design*.

3.2 Make it Easy for Seniors

The aging population may suffer with the challenges to understand and execute in a timely manner on roads. Therefore, making the conditions easier for them could help them feel safer when getting around. Strategies are then required to be focused on prioritizing the right-of-way for seniors when they are present on the road. These strategies include, but not limited to installing pedestrian safety islands, giving longer cross time, adding countdown and audible signals, enhancing paving of crosswalks, etc.

Table 4. Planning and Design Toolbox for Safe Streets for Seniors.

Planning and Design Principles	Strategies/ Measures
Complete Street	<ul style="list-style-type: none"> • Smaller block size: foster walkability and bike-ability; • High connectivity and accessibility to destinations (location efficiency): less dependence on automobiles.
Make it easy for seniors	<ul style="list-style-type: none"> • Pedestrian safety islands: shorten crossing on wide streets; • Countdown and audible signals: let seniors know how much more time they have to wait/cross; • Enhanced paving: not slippery to prevent fall; bold enough to warn other road users; • Repaired drainage/ ponding in crosswalks: prevent slippery by rains; • Sidewalk extensions: more room to walk, shorten crossing distance, slows turning cars; • Visitability: add and maintain pedestrian ramps; • Visibility: adequate lighting; bigger signs with larger letters; • Aesthetic of walking and biking: provide an “elements of furnishing zone”- trees, vegetation, trash cans, benches, tables, etc.
Slow Down the Vehicles	<ul style="list-style-type: none"> • Traffic calming through a series of methods: speed humps, speed cushions, chicanes, chokers, curb extensions, raised intersections/ crossings, traffic circles, roundabouts, etc.; • Road diet: minimize vehicle travel lane width to scale to the community and prioritize pedestrians; • Signaling: reorganize traffic priorities at the intersections to reduce conflicts, e.g. ban low volume left turns that conflict with high volume crosswalks; • Speed limit: controlled through regulations and bans near the desired paths by seniors; • Reducing turning radius: make the turning vehicles slow down; • Planting grassy medians to separate driveways from non-driveways: avoid vehicles to trespass sidewalks.

Source: Created by Author.

3.3 Slow Down the Vehicles

The major threat to the safety of seniors on the street is the fast speed of auto vehicles. Regulations and civic structures could be added to where drivers and seniors conflict most to reduce vehicle travel speed. Also, cities can do much more to promote a safe driving culture among the drivers to always yield to seniors on the roads.

These design principles are highly replicable or adaptable to a wide variety of urban contexts around the world. Integrating them into safer street policies helps to give senior road users a consideration at the very beginning. Following NYC and Shanghai, cities have the opportunity to become safer for the growing aging population. Urban planners can absolutely make a profound difference!



BEFORE: First Avenue



AFTER: First Avenue

Figure 17. First Avenue in NYC before & after Improvement.

Source: Sustainable Streets 2013 and Beyond

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Appendix 1. “One Child” Policy in China

“One Child” policy is the main strategies of family plan in China to control its drastically growing population since the late 20th Century. Each family is restricted to have only one child. Over six million families were awarded with the honor of just having one child in the family in 1979. In 2010, the average fertility rate in China has narrowed down to 1.44, compared to 5.81 in 1950. After 3 decades of the execution of this policy, Chinese families are characterized with a structure called “4-2-1”—4 seniors, 2 adults and 1 child comprise for a family. This policy is part of the reason that China is now faced with severe aging issues. The policy is expected to be loosened to encourage more fertility. But the age structure changes brought by the policy will need decades to relief. See more at <http://mt.sohu.com/20150312/n409705057.shtml>.

Appendix 2. Vision Zero

Vision Zero is an action plan in New York City. Based on Swedish model, this plan is the foundation of ending deaths and injuries on streets city-wide. NYC is making this bold new commitment to improve street safety in every neighborhood and in every borough. Designing facilities with zero fatalities is the main goal of this plan. See more at <http://www.nyc.gov/html/visionzero/pages/home/home.shtml>.