The New York City Pedestrian Safety Study & Action Plan

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New York City Department of Transportation

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Dear fellow New Yorkers:

Over the past decade we have made tremendous progress in reducing traffic fatalities in New York City. 2009 was in fact the safest year on record since the City began collecting data in 1910; annual traffic fatalities are down by 35 percent compared to 2001.

New York's streets are far safer than any other big city in this country. Our traffic fatality rates are more on par with world class cities such as London, Paris or Berlin. But even one fatality is too many. DOT aims to reduce by half the number of traffic deaths by 2030. In order to do this the agency has collected and analyzed more data about the causes of traffic deaths and injuries and where they are happening. We are using this information to design better streets.

This first, unprecedented Pedestrian Safety Action Plan examines five years of data about traffic crashes that have caused serious injuries or fatalities to pedestrians, and identifies underlying causes that we can address to reduce these crashes. This plan builds upon DOT's strategic plan, *Sustainable Streets*, and the work the agency has done in accordance with Local Law 11 (Council Intro 567-A, §3), signed by Mayor Bloomberg into law in April 2008.

Designing streets that protect pedestrians and reinforce the speed limit are just one piece of the safety puzzle. DOT will also seek legislation to increase the City's enforcement capabilities, to prevent dangerous speeding and red light-running. And we will use our Safety Education and Communications offices to begin to transform the culture of New York City streets, building more respect and safety for all street users. We will also work with other City agencies including NYPD and the Department of Health to continue to collect better data and optimize our traffic safety initiatives.

Our goals are simple and clear, and they stem from Mayor Bloomberg's PlaNYC and public health agendas. We must continue making our streets safer for everyone, and promote more healthful and sustainable modes of transportation like walking. This action plan suggests ways to move forward on both fronts, so that we can continue to drive down traffic fatalities and ensure New York truly has world class streets that are safe for everyone.

Sincerely,

Janette Sadik-Khan
Commissioner

Key Findings of the New York City Pedestrian Safety Study

This landmark study is the most statistically ambitious of its kind ever undertaken by a US city. The researchers worked to identify the causes, common factors, and geographic distribution of over 7,000 pedestrian crashes in New York City. These are some of the results.

- 2009 was the safest year on record in New York City history.

- Traffic fatalities in 2009 were down by 35% from 2001.

- NYC's traffic fatality rate is about one-quarter of the national rate and less than half the rate of the next 10 largest U.S. cities.

- Traffic crashes cost the City's economy $4.29 billion annually.

- Pedestrians are ten times more likely to die than a motor vehicle occupant in the event of a crash.

- Pedestrians accounted for 52% of traffic fatalities from 2005-2009.

- Driver inattention was cited in nearly 36% of crashes resulting in pedestrians killed or seriously injured.

- 27% of crashes that kill or seriously injure pedestrians involved driver failure to yield.

- Serious pedestrian crashes involving unsafe speeds are twice as deadly as other such crashes.

- Most New Yorkers do not know that the standard speed limit for city streets is 30mph.

- 80% of crashes that kill or seriously injure pedestrians involve male drivers.

- 79% of crashes that kill or seriously injure pedestrians involve private automobiles as opposed to taxis, trucks and buses.

- Serious pedestrian crashes are about two-thirds more deadly on major street corridors than on smaller local streets.

- Manhattan has four times as many pedestrians killed or severely injured per mile of street compared to the other four boroughs.

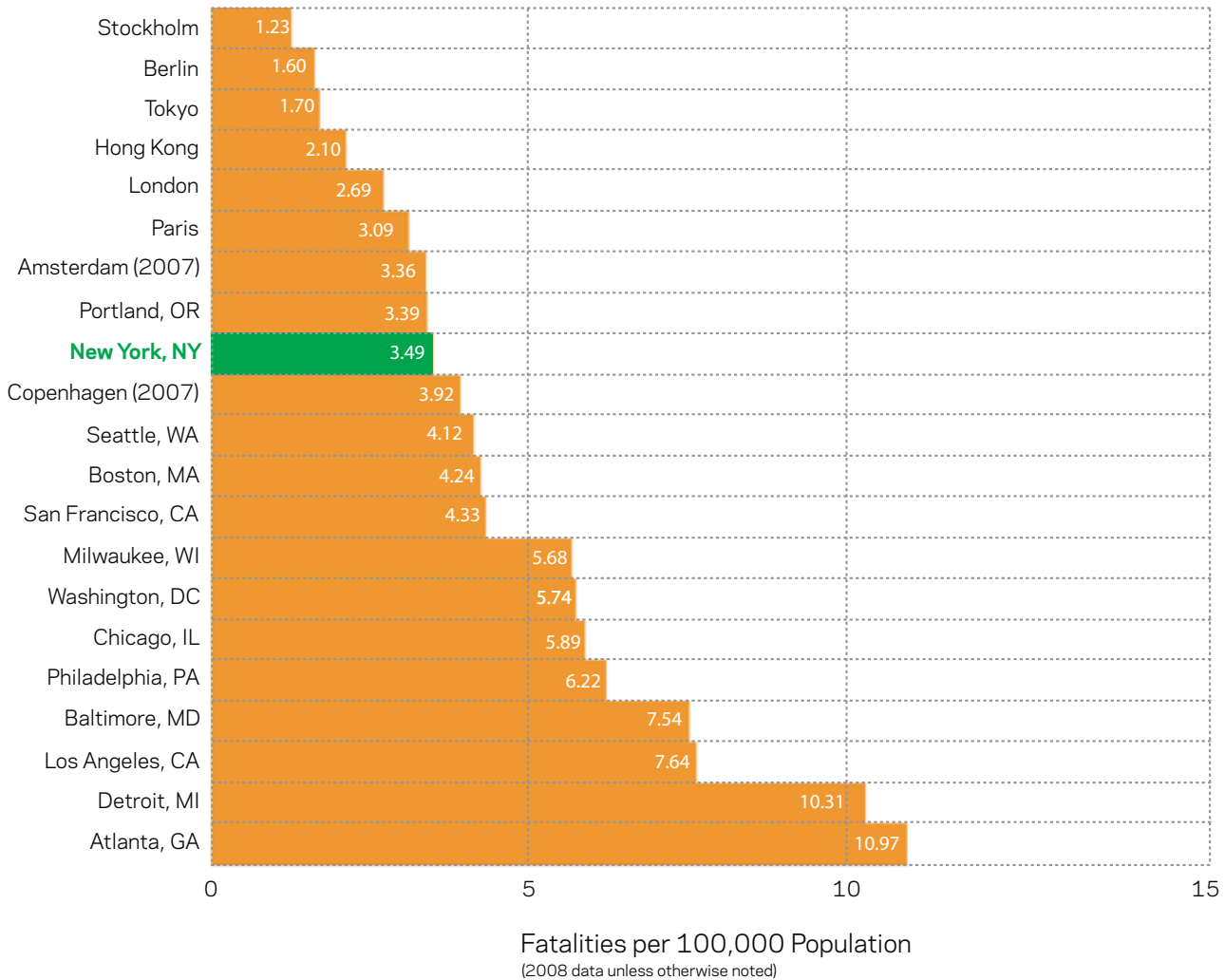- 43% of pedestrians killed in Manhattan lived in another borough or outside of New York City.

2010-2011 Action Plan

Based on the findings of this study, DOT recommends a comprehensive set of actions; select programs are shown below.

- Install countdown pedestrian signals at 1,500 intersections.

- Re-engineer 60 miles of streets for greater pedestrian safety, according to corridor crash data.

- Re-engineer 20 intersections for pedestrian safety on major Manhattan two-way streets.

- Launch a pilot program to test the safety performance of neighborhood 20 mph zone.

- Implement pilot program to improve visibility at left turns along avenues in Manhattan.

Traffic Fatalities in Perspective

New York City vs. International Cities & US Peer Cities*

City	Fatalities per 100,000 Population
Stockholm	1.23
Berlin	1.60
Tokyo	1.70
Hong Kong	2.10
London	2.69
Paris	3.09
Amsterdam (2007)	3.36
Portland, OR	3.39
New York, NY	3.49
Copenhagen (2007)	3.92
Seattle, WA	4.12
Boston, MA	4.24
San Francisco, CA	4.33
Milwaukee, WI	5.68
Washington, DC	5.74
Chicago, IL	5.89
Philadelphia, PA	6.22
Baltimore, MD	7.54
Los Angeles, CA	7.64
Detroit, MI	10.31
Atlanta, GA	10.97

Fatalities per 100,000 Population
(2008 data unless otherwise noted)

New York City's traffic fatality rate is lower than Copenhagen's and nearly equal to Amsterdam's

Current Trends in Traffic Fatalities

Something remarkable has been taking place in New York City. Traveling the streets of America's largest city has grown dramatically safer for all its users. From 1990 to 2009, annual fatalities involving all road users have dropped by 63%; the streets are now nearly three times safer than in 1990. Most impressively, since 2004, the number of annual traffic fatalities has been lower than 1910 levels, the first and historically lowest count on record. In 2009, the city experienced 256 traffic fatalities, an all-time record low.

NYC is the safest large US city and is growing safer

While national traffic fatalities have dropped significantly (24%) during this time period, the decrease in New York City was dramatically more pronounced. Moreover, as of 2008, national fatality rates per 100,000 residents were over three times higher than New York City's (3.5 vs. 12.2). Compared to the ten other largest US cities, New York ranks as the safest, with a fatality rate less than half their average (3.5 vs. 7.75).

In fact, New York City's safety record is comparable to that of major pedestrian-oriented European cities; in 2008 New York City's fatality rate was lower than Copenhagen (3.9), nearly equal to Amsterdam (3.4) and just above Paris (3.1) and London (2.7).

*NYC's US peer cities are cities with populations greater than 500,000, population densities greater than 5,000 per square mile and/or a rate of non-automotive commuting of over 20%.

New York City is also a safer place to walk than its peer cities* in the U.S. In 2008, New York City had a pedestrian fatality rate of 1.8 per 100,000, 15% lower than the average of 12 peer cities. The city's pedestrian fatality rate was also many times lower than such peer cities as Atlanta (11.0), Detroit (10.3) and Los Angeles (7.6). This is especially significant given that percentage of trips taken on foot is so much higher in New York City than in these more auto-oriented urban areas.

In terms of pedestrian safety, fatality rates have also declined dramatically over the last twenty years, dropping 41% from the decade of 1990-1999 to the decade of 2000-2009. This decline does not appear to have resulted primarily from better emergency response and life-saving techniques, since the pedestrian severe injury rate improved at the same pace as the fatality rate, decreasing 40% over the same period.

NYC Actual Traffic Fatalities & Reduction Target (1990-2030)
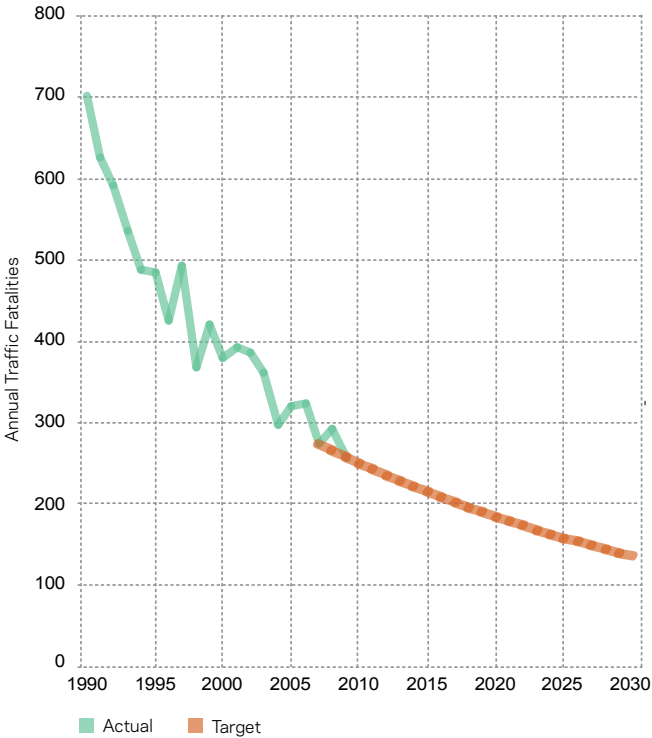
DOT Safety GOAL:
# Reduce Traffic Fatalities by 50% by 2030

Looking to the Future

Despite these significant gains, there is still much work to be done. Although great improvements have been made in the last two decades, the rate of improvement has slowed over the last few years. Mayor Michael Bloomberg and Department of Transportation (DOT) Commissioner Janette Sadik-Khan have called for a more aggressive safety approach for the future; the 2008 DOT Strategic Plan (*Sustainable Streets*) calls for cutting annual traffic fatalities 50% from 2007 levels by 2030, from 274 to 137. Reaching this goal would save over 1600 lives over the next two decades.

To reach this goal (an average 3% fatality reduction per year), DOT is formulating citywide strategies that engage key agencies like New York City Police Department (NYPD), New York City Health Department (DOHMH), and New York State Department of Motor Vehicles (DMV). As of 2009, the city is ahead of

schedule – with only 256 total traffic fatalities in 2009, slightly below the year's reduction target of 258.

Mayor Bloomberg has recognized the urgency of reaching this goal; as stated in *Sustainable Streets*, he "is committed to improving traffic safety as a fundamental public health issue." Traffic fatalities and injuries have wide impacts on the city in terms of economic, equity, environmental and quality-of-life costs. Moreover, traffic fatalities and injuries are not an unavoidable consequence of an auto-oriented society. Road safety is an issue that can be substantially addressed by informed design and engineering, education and enforcement.

To put the costs of the road safety issue into perspective, consider these impacts:
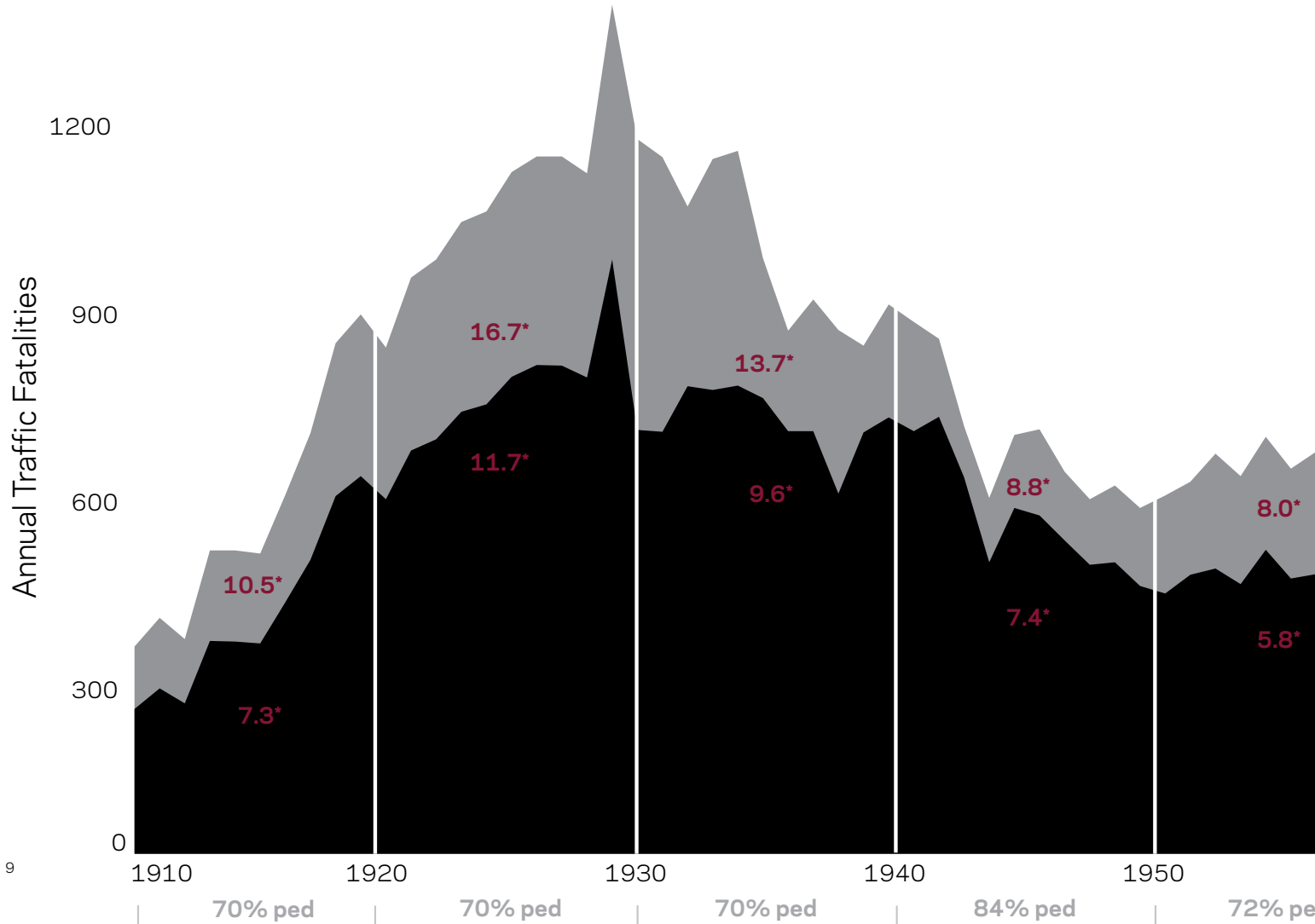
The Cost of Crashes

Public Health

The impacts of motor vehicle crashes are felt broadly across age groups in New York City, mostly sparing the very young but taking a toll on almost all others. Social costs are high, as most people killed are in their prime productive years who are likely to have dependent family members. [1]

Crashes are also a leading source of years of potential life lost (YPPL) and affect New Yorkers on a scale similar to cerebrovascular disease (strokes, hypertension) and influenza/pneumonia.[1]
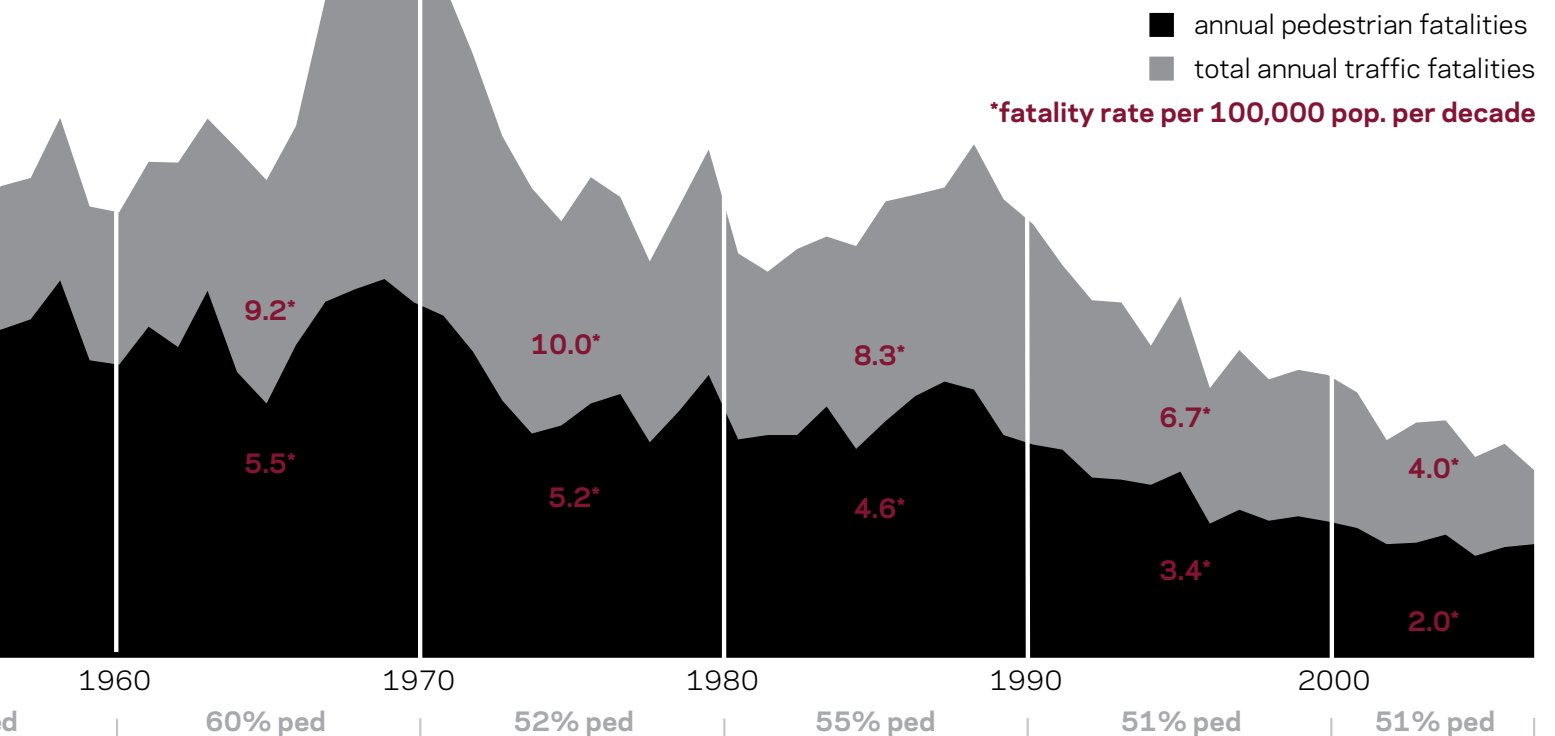
Though traffic deaths among the young are a small portion of the total, these crashes are a leading cause of death among people ages 5 to 24 - only homicide and cancer kill more people in this age group in New York City. Pedestrian crashes are the second-most common cause of injury deaths in New York among children 5 to 14 years old and among adults over 45 years old.

In terms of prevention, safer, pedestrian-friendly streets also encourage everyday walking, an important part of a healthy lifestyle. People that reside in areas with more high quality sidewalks and bike lanes are more likely to be active and less likely to be overweight.[2]

Crashes have a major impact on public health, comparable to strokes and high blood pressure

New York City Traffic Fatalities 1910-2009

■ annual pedestrian fatalities
■ total annual traffic fatalities
*fatality rate per 100,000 pop. per decade

9.2*

5.5*

10.0*

5.2*

8.3*

4.6*

6.7*

3.4*

4.0*

2.0*

1960	1970	1980	1990	2000

...d	60% ped	52% ped	55% ped	51% ped	51% ped

The Cost of Crashes

Economic

Since crashes often strike people in their prime productive years, are usually accompanied by property damage and cause extensive injury as well as death, the economic impacts of crashes are substantial.

The United States Department of Transportation (USDOT) estimates the national impact of crashes at $230.6 billion, representing 2.3% of GDP in 2000[3]. To put this in perspective, Medicare annual costs in 2008 were just above 3% of GDP[4].

Seniors comprise 38% of pedestrian fatalities, but only 12% of population

Crashes cost NYC $4.29 billion annually

USDOT also broke down the total costs for motor vehicle crashes by state. New York bore a nearly $20 billion burden and had the third highest cost per capita, at $1,027, following behind California and Texas. State cost per capita varied due to differing state income levels and state medical, insurance and legal costs[3].

Based on these New York State costs, NYCDOT estimates the annual cost of all traffic crashes in New York City at $4.29 billion annually, about 1% of the Gross City Product[5]. The annual cost for pedestrian crashes alone is estimated at $1.38 billion.

Equity

Traffic fatalities and injuries do not impact all people equally; certain demographic groups are threatened more by road safety problems than others, requiring solutions tailored to reach and protect specific populations.

For example, national studies have shown that populations with low socioeconomic status (lowest income level, low educational attainment, blue-collar occupation) and unemployed status are at a higher risk for traffic fatalities.[6]

Gender is also an indicator of risk. In New York City from 2004-2008, men died in crashes at more than twice the rate of women.

Age is a factor as well; in New York City in 2008, seniors comprised 38% of all pedestrian fatalities, but only 12% of population.

Economic Impact of Traffic Crashes

	USDOT Cost Estimate (2000)	Traffic Fatalities (2000)	Cost per fatal ratio (2000)	Cost per fatal ratio - adjusted for inflation (2009)	Traffic Fatalities (2009)	Cost Estimate (2009)
USA	$230.60B	41,821	5.51			
NYS	$19.49B	1,448	13.46	16.77	1224	$20.53B
NYC	$5.12B	380	13.46	16.77	256	$4.29B

Access to care is part of the equation as well: A study examining five years of data from Wisconsin found that the medically uninsured receive 20% less care when hospitalized after a serious crash. This disparity appears to lead to higher mortality rates, as the uninsured experienced a crash mortality rate 39% higher than the average.[7]

Sustainability

Safety risks, both real and perceived, are two factors that limit pedestrian trips, especially for children and seniors. Many of these trips are handled instead by less sustainable modes such as cars and paratransit, or on the over-burdened transit system.

As New York City continues to grow, the greenest and most cost-effective way to expand the transportation system will be to increase usage of transit and non-motorized modes. For example, in Marin County, CA, the number of children walking to school increased by 65% following the completion of pedestrian improvements around seven schools.[8]

In a recent poll conducted by the AARP, 50% of adults over the age of 50 reported that they could not cross the main roads near their homes safely. Half of the older adults who reported these problems stated that they would walk more if these conditions were improved.[9]

Safer streets promote walking, cycling and transit

Quality of Life

Street safety (and perceived safety) is a major quality of life concern, especially for families with children. Guaranteeing street safety, like reducing crime, is a key factor in attracting and retaining a middle class population in a city[10].

Road safety, like reduced crime rates, is a key factor in attracting and retaining residents to the city

Unsurprisingly, traffic calming improvements that reduce speed and volume have been strongly linked to increased home values, a key middle class factor in family location decisions.[11] Keeping New Yorkers safe will help keep New York City strong.

In a 2006 poll commissioned by the Tri-State Transportation Campaign, 42% of New Yorkers stated that unsafe conditions for pedestrians was a major concern in their daily life.[12]

Background of this report

Focusing on pedestrians is a key strategy in prioritizing resources and driving down overall traffic fatalities in New York City; pedestrian fatalities made up 52% of all traffic deaths in New York City from 2005 to 2009.

Thus, to further understand pedestrian crashes and to identify strategies to reach the Strategic Goal of a 50% reduction in fatalities by 2030, DOT undertook an extensive study of pedestrian safety. Utilizing grant funding from the Federal Highway Administration (FHWA) through the New York Metropolitan Transportation Council (NYMTC) and acting through the University Transportation Research Center (UTRC), Region II, DOT contracted the New York University Wagner Rudin Center for Transportation Policy & Management, in conjunction with Rensselaer Polytechnic Institute and the Center for Transportation Injury Research at SUNY-Buffalo.

These researchers worked to identify the causes, common factors, and geographic distribution of over 7,000 severe and fatal pedestrian injury crashes in New York City. This landmark pedestrian safety study is the most statistically ambitious ever undertaken by a US city; the findings form the basis of this report.

This report also fulfills the NYC Pedestrian Safety Act (Local Law 11 of 2008) mandate to study pedestrian fatalities and severe injuries and to develop a strategy and schedule for improving pedestrian safety.

Finally, FHWA has identified New York as a Pedestrian Safety Focus City. The Focus Cities have received pedestrian safety guidance and have been encouraged to produce their own pedestrian safety action plans.

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Focus on Vulnerable Road Users
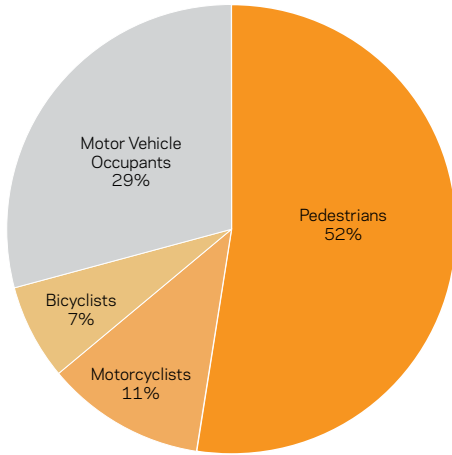
Pedestrians, Bicyclists and Motorcyclists

This report's focus on pedestrians is part of a broader effort to address the safety of all vulnerable road users: road users outside a closed vehicle, namely pedestrians, bicyclists, and motorcyclists.

Vulnerable road users account for 71% of all New York City traffic fatalities
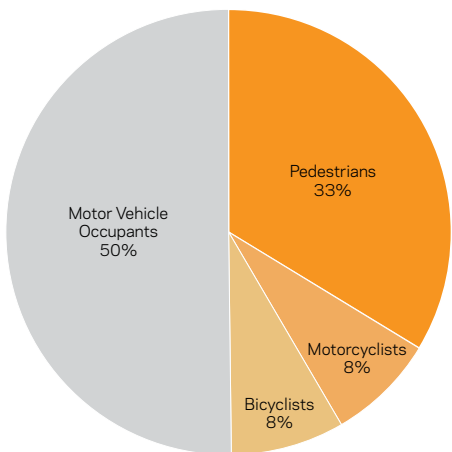
From 2005-2009, vulnerable road users accounted for 71% of New York City's traffic fatalities. As traffic fatalities are dominated by this group, addressing the safety of these users is key to bringing down fatalities and injuries citywide. Pedestrians make up the largest percentage of traffic fatalities in New York City (52% of traffic fatalities from 2005-2009).

Traffic Fatalities (2005-2009)

Motor Vehicle Occupants 29%
Pedestrians 52%
Bicyclists 7%
Motorcyclists 11%

Traffic Severe Injuries (2004-2008)

Motor Vehicle Occupants 50%
Pedestrians 33%
Motorcyclists 8%
Bicyclists 8%

Pedestrians account for 52% of all New York City traffic fatalities and 33% of all severe injuries

New York's high proportion of vulnerable road user fatalities is primarily a function of low overall motor vehicle fatalities. Car usage in New York City is very low compared to the rest of the United States. 45% of NYC households own a car vs. 91% in the U.S.[13], and fewer than one third of trips are taken in an automobile (vs. 90% in the U.S.)[14]. Since most automobile travel in New York City occurs on city streets rather than highways and suburban-style high speed arterials, average vehicle speeds are relatively low, limiting the deadliness of motor vehicle crashes to their occupants.

Probability of Fatality in a Crash (2004-2008)
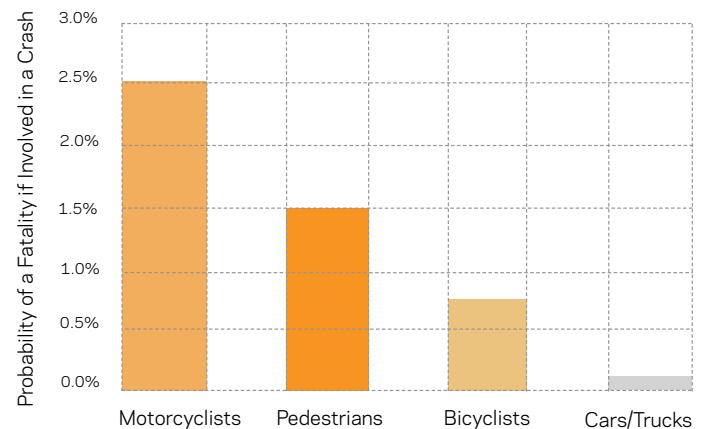
Another key rationale for focusing on vulnerable road users is their "vulnerability." When a crash occurs in New York City, pedestrians are 10 times more likely to be killed than a motor vehicle occupant and motorcyclists are 18 times more likely to be killed. Speed is a primary determinant of the severity of injuries in a crash – and motor vehicle occupants can survive much higher-speed crashes than vulnerable road users. Drivers can usually be expected to behave in ways appropriate for their own safety but may not always have the same commitment to the safety of people outside vehicles.

Finally, design treatments aimed at making streets safer for vulnerable road users increase safety for motor vehicle occupants as well. The installation of bike lanes, traffic calming initiatives such as road diets, speed humps and intersections designed to reduce pedestrian exposure have been shown to reduce injuries and fatalities for all road users.[15]

Existing Safety Programs Among Most Extensive in North America

Program	Launch	Goal	
You The Man DWI campaign	2010	Encourages New Yorkers to plan ahead with designated drivers, boosting the City's efforts to make streets safer for all users	
Top 20 Pedestrian Crash Locations	2008	Focus safety improvements on intersections with the highest annual crash rates for pedestrians	
Safe Streets for Seniors	2008	Increase pedestrian safety, mobility and access for seniors on New York City's streets, through engineering and education	
Five or More Injury Locations	2008	Investigate all locations having five for more pedestrian or bike injuries or fatalities over the course of the previous year	
Go Safe Go Green	2008	Provide traffic safety curricula emphasizing the health and environmental benefits of walking and bicycling through outreach programs and Mileage Clubs encouraging participants to walk 10,000 steps daily	
Safe Routes to Transit	2007	Improve safety and circulation and reduce congestion for pedestrians and motor vehicles around subway entrances and bus stops, making access to mass transit safer, easier and more convenient	
LOOK Bicycle Safety Campaign	2007	Aims to prevent collisions between motorists and cyclists by educating the public about bicycle safety and encouraging cars and bikes to share the road	
Traffic Safety Residency Program	2007	In-depth projects for students in grades 5 – 12, who work with teaching artists to create traffic safety signs, murals and theater pieces	
Bicycle Helmet Program	2006	Provide free bike helmets and helmet fittings to children and adults (including bike delivery workers) at events throughout the city	
Bicycle Network Expansion	2006	Accelerate the growth of safe cycling by quickly providing a citywide backbone system of bicycle routes while also creating a dense network of bike lanes in communities where cycling is already widespread	

An Aggressive and Comprehensive Approach

DOT has long had a standing commitment to the safe functioning of the New York City street network. Every day, the operations and maintenance staff of DOT redesign and retime signals, respond to requests for new signs, signals and and safety improvements, refurbish and upgrade markings and signage and are continuously improving the design standards by which New York City streets are fashioned. These efforts form the backbone of DOT's drive to reduce traffic fatalities and injuries.

In addition to this essential everyday safety work, DOT has developed an aggressive portfolio of strategic safety programs. Programs such as Safe Streets for Seniors, the LOOK Bicycle Safety Campaign, Safe Routes to Schools and Safety City have all helped to reduce crashes and make New York City's streets safer.

Program	Launch	Goal	
Safe Routes to Schools	2004	Focus safety improvements and educational outreach at city schools with the highest crash rates	
NYC Safe Kids Coalition	2003	DOT-led coalition provides injury prevention workshops and devices to help families create safe environments for their children	
S.A.F.E. Team	1998	The Severe Accident Forensic Evaluation (S.A.F.E.) Team investigates all locations where a traffic fatality occurred in the previous year	
Speed Reducer Program	1996	Reduce vehicle speeds to below the speed limit in mainly residential areas, using 'Speed Reducers' (commonly known as speed humps)	
Traffic Safety on the Road	1993	In school outreach to grades K -12 including interactive presentations and traffic safety theater programs and teacher training	
Safety City	1989	Conduct ~2,500 Safety City "learn-by-doing" sessions annually, teaching 3rd graders to cross streets, ride in cars, bike and skate safely	
Youth Educating for Safety (YES)	1985	Educate teens on the risks of impaired driving, speeding, safety belt use, pedestrian safety and other topics through workshops, a student-created magazine and creative residency programs	
School-based Safety Education	1985	Bring classroom-based traffic safety instruction to ~25,000 children annually (pre-K through 8th grade)	
Signalization Improvements	Ongoing	Improve pedestrian and vehicular safety via innovative traffic signal modifications such as Leading Pedestrian Intervals (LPIs), Split Phasings and Signal Calming	

Program Types   ▮ Engineering   ▮ Education   ▮ Marketing

Study Methodology

Using state-of-the-art data statistical modeling techniques and a wide-ranging dataset, the researchers examined dozens of factors that could be associated with each pedestrian injury and with the number of injuries in given geographic areas (e.g. street width, adjacent land use, nearby transit stops, socioeconomic status, racial/ethnic composition of neighborhoods, etc.) Variables with significant levels of correlation with pedestrian crashes were identified, then used to build a carefully designed statistical model.

The models attempted to control for pedestrian exposure to crashes, using factors like population, vehicle registrations, presence of traffic signals (generally located at higher-volume intersections) and transit usage. The study used two distinct approaches to modeling: crash frequency analysis and crash severity analysis. Crash frequency analysis aims to determine the causes of a high frequency crash location, while crash severity analysis aims to determine why some crashes resulted in a severe injury, while others resulted in a fatality.

The vast size and diversity of New York City's street network and neighborhoods presented a great opportunity for this advanced analysis, as crash rates could be compared across neighborhoods that differ by a wide variety of characteristics but contain very similar geometric dimensions and engineering treatments.

This report summarizes the findings of the study and synthesizes those findings with additional research conducted by DOT's own staff; details on both can be found in the Technical Supplement to this report. The study was based on severe and fatal pedestrian crashes in New York City over the period 2002-2006. DOT's research is mainly based on 2004-2009 data, but additional ranges were used as well. Unless otherwise footnoted, all background detail on years of data, data sources and analytical methodology that led to the findings in this report can be found in the Technical Supplement.

Where Manhattan

At first glance, the borough of Manhattan appears to be the most dangerous borough for pedestrians in New York City, possessing the highest rate per 100,000 population of pedestrians killed or severely injured (KSI). However, after accounting for the 1.4 million commuters entering Manhattan each day, the borough's pedestrian KSI rate is actually lower than Brooklyn and Queens and below average for the whole city.

Pedestrian safety in Manhattan, with the region's two largest business districts (Midtown and Lower Manhattan), is an issue for residents of all five boroughs. 43% of pedestrians killed in Manhattan resided in another borough or outside the city. This is due to Manhattan's vast commuter population, as well as its large number of tourists and business visitors. Efforts to make Manhattan safer will benefit pedestrians from all over the city as well as many non-New Yorkers.

43% of pedestrians killed in Manhattan resided in another borough or outside NYC

Major two-way streets account for 47% of pedestrian fatalities but only 12% of the road network

Still, Manhattan experiences an extraordinary density of crashes per street mile. From 2004 through 2008, four times as many pedestrians were killed or severely injured in Manhattan per mile of street (0.73) as in the other four boroughs (0.18). This finding is important for prioritizing safety treatments.

Within Manhattan, a disproportionate number of pedestrian crashes occurred on major two-way streets. Major two way streets (e.g. Canal, 14th, 125th, Park and Adam Clayton Powell) account for 47% of pedestrian fatalities and 34% of pedestrian severe injuries, but only 12% of the Manhattan street network.

Average Annual Pedestrian KSI (2004-2008)

Borough	Bronx	Brooklyn	Manhattan	Queens	Staten Island	NYC
Pedestrian KSI per mile of street	0.26	0.30	0.73	0.12	0.05	0.23
Pedestrian KSI	233	481	420	289	49	1472
Street Miles	898	1592	576	2416	983	6465
Pedestrian KSI (per 100,000 residential population)	17	19	26	13	10	18
Pedestrian KSI (per 100,000 daytime population)	19	21	14	15	12	17

Where Citywide

Intersections

In New York City, 74% of pedestrian KSI crashes occurred at intersections. This stands in sharp contrast with the rest of the United States, where pedestrians are mainly killed at non-intersection locations (76% in 2008).[16]

Crashes mostly occur at intersections, but are widely dispersed along dangerous corridors

The design of New York City's street infrastructure is a likely explanation for this difference; small block sizes and grid patterns result in a high intersection density and encourage crossing at intersections, while the nearly universal presence of sidewalks eliminates most walking along the roadway crashes (another form of non-intersection crash).

Nearly half (47%) of pedestrian fatalities and severe injuries occurred at signalized intersections; surprisingly, most (57%) of these crashes occurred while the pedestrian was crossing with the signal. This suggests that both drivers' failure to yield to pedestrians in the crosswalk as well as pedestrians' failure to follow traffic signals are both significant factors leading to KSI crashes at intersections.

Although crashes are clustered at intersections, they are widely dispersed along dangerous streets. The worst 52 intersections average one pedestrian KSI crash per year. They are the city's most common pedestrian KSI crash locations but they only account for 3.5% of all annual pedestrian KSI.

Arterial Streets

On the other hand, arterial streets (typically wide signalized streets that carry high volumes of traffic) account for ~60% of pedestrian fatalities but only 15% of the total road network. In addition, pedestrian KSI crashes on arterial streets are ~2/3 more deadly than crashes on non-arterial streets. This suggests that the most efficient and effective engineering, enforcement and education interventions should be focused on and near dangerous corridors rather than scattered individual intersections.

Arterial streets account for ~60% of pedestrian fatalities but only 15% of the road network

Where Citywide

Arterial Streets (cont.)

In New York City, these arterials carry large volumes of traffic at higher speeds than other streets. They tend to follow routes through dense residential and retail areas and commonly follow subway or bus routes. These characteristics (dense population, commercial land use, and transit ridership) are associated with high rates of pedestrian activity. This blend of uses inevitably leads to pedestrian/vehicle conflicts, some of which result in crashes. These conditions reflect a century and a half of residential and commercial development along transit routes, as well as the legacy of twentieth century street design that promoted high vehicle speeds and volumes even in dense urban neighborhoods.

In a related finding, the modeling results of the study showed that areas with a greater share of wide roads (four or more travel lanes) experienced much higher rates of pedestrian crashes. Inversely, narrow roads of less than 30 feet (roughly one moving lane with two lanes of parking) decreased the chance of a pedestrian crash.

These results confirm nationwide research showing that wider roads and wider lanes lead to increased speeding and diminished driver awareness, which raises crash risks for both pedestrians and drivers. Specifically, road widenings have been shown in multiple studies to occur at the expense of safety, even after controlling for traffic volumes.[15]

Bicycle Lanes

One of DOT's most ambitious projects in recent years is the dramatic expansion of the bicycle network, building 200 miles of new bike lanes between 2006 and 2009. This expansion has not only increased safety and access for bicyclists, but has improved safety for pedestrians as well. Controlling for other factors, pedestrian KSI crashes on streets with bike lanes were ~40% less deadly as crashes on other streets. The installation of bike lanes usually involves a narrowing of the motor vehicle portion of the roadway and indicates to drivers that they need to watch for other road users. These changes have a traffic calming effect, lowering speeds and increasing driver attention.

Pedestrian KSI crashes on streets with bike lanes were ~40% less deadly

When

40% of pedestrian KSI crashes occurred in the late afternoon/early evening

Nationally, a large portion of pedestrian crashes occur at night (46% between 8pm-4am).[16] New York City has a different crash profile, with a concentration of KSI crashes in the afternoon and evening (3-9pm). Most likely, the combination of late commuting, evening shopping and nightlife/entertainment traffic come together in these hours to create more unsafe conditions for pedestrians.

Late night pedestrian KSI crashes are nearly twice as deadly as other time periods

Even though late night KSI crashes (3-6am) are infrequent, they are twice as likely to lead to a fatality as other time periods. Higher vehicle speeds due to low overnight volumes is the most likely reason for the increased deadliness of these crashes. Also, extremely low late night pedestrian volumes could lead drivers to assume that pedestrian will not be in the roadway, leading to higher speeds and careless driving.


Nearly 20% more pedestrian KSI crashes occurred per month during the Winter holiday season

Pedestrian KSI crashes in New York City follow a seasonal pattern; nearly 20% more crashes occurred per month during the November/December holiday season, as compared to the monthly average for the rest of the year. Possible explanations for this include increased evening shopping activity, higher pedestrian and vehicle volumes, increased holiday alcohol use and poor winter road conditions. Hours of darkness and icy roads are not the only factor; though more 4pm -7pm crashes occur during the winter than at other times, January and February are among the lowest-crash months of the year.

Pedestrian KSI by Time of Day (2002-2006)
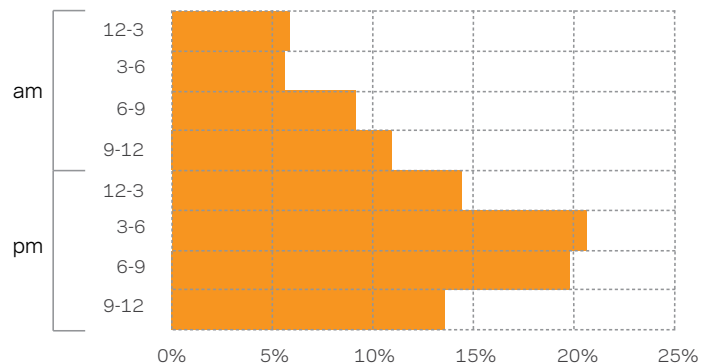
Pedestrian KSI by Time of Day Percent Fatal (2002-2006)
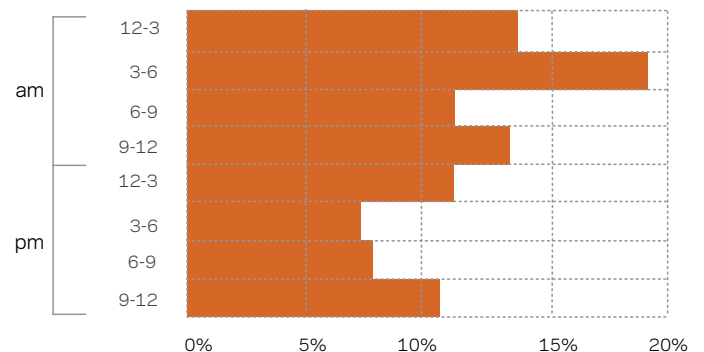
How

Driver Inattention

The most common reason listed for a crash was driver inattention, a factor in 36% of pedestrian KSI crashes. Also, the modelling results of the study showed that these crashes were found to be more than twice as deadly as others. While driver inattention has long been an important reason for crashes, this issue has recently become more pressing as cellphones, computers and other portable devices further distract the driver. In a dense urban environment like New York City, the failure to pay attention to who (and what) is in the road is crucial. The streets are consistently populated by a wide range of users (pedestrians, bicyclists, buses, trucks, taxis) all competing for the same roadway space.

Failure to Yield

Failure to yield to a pedestrian while turning is a primary driver action that contributes to crashes. "Failure to yield" is defined as the failure of a driver to yield to a pedestrian that is crossing the street with the light, at a legal crosswalk, or at a marked stop sign-controlled or uncontrolled crosswalk   Nearly all failure-to-yield pedestrian crashes occur at signalized intersections.

In New York City, the failure of drivers to yield to pedestrians in a crosswalk is a major factor in pedestrian crashes; 27% of pedestrian KSI crashes involved a pedestrian crossing with the signal and the driver's failure to yield. (A very small proportion of pedestrian KSI crashes involved red-light-running.) Although drivers must yield to pedestrians under state law, this violation is commonplace in New York City and may not be widely known by drivers to be the law.

Drivers that fail to yield account for 27% of pedestrian KSI crashes

Notably, failure-to-yield violations are more of a problem in New York City than nationally. Only 14% of all United States fatal pedestrian crashes in 2001 listed "failure to yield to pedestrian" as a contributing factor in the crash.[18]

Crossing Against the Signal

More pedestrians are struck while crossing the street with the signal (27% of pedestrian KSI) than crossing against the signal (20% of pedestrian KSI). However, crossing-against-the-signal pedestrian KSI crashes are 56% more deadly than crossing–with-the-signal crashes, a result of higher speeds and more direct transfer of energy from through-moving vehicles than from turning vehicles.

Crossing-against-signal pedestrian KSI crashes are 56% more deadly than crossing with the signal

Left Turns

Left turning pedestrian KSI crashes were more dangerous than right turning ones; they outnumbered right turning crashes 3 to 1. When turning left, the driver's visibility is partially blocked by the A-pillar (the support between the windshield and side window), making it harder to see pedestrians in the left crosswalk. In addition, the left-turning maneuver requires more mental effort than a right turn, leading to more driver error.[19]

Pedestrian KSI crashes involving unsafe vehicle speeds are twice as deadly as others

Left turning pedestrian KSI crashes outnumber right turning crashes 3 to 1

This finding is consistent with international research indicating that the likelihood of a pedestrian fatality in a crash is directly and exponentially related to the speed of a vehicle at impact. A pedestrian struck at 40 mph is four times more likely to die than one struck at 30 mph; a pedestrian struck at 30 mph is six times more likely to die than one struck at 20 mph.[20] Thus, controlling speed through engineering and enforcement is a crucial step in reducing pedestrian fatalities.

Speed

Speed-related factors are major contributors to pedestrian KSI crashes. 21% of all pedestrian KSI crashes could be attributed to factors such as speeding, limited sight distance, slippery pavement (i.e. driving too fast to stop under prevailing weather conditions). Yet, a recent series of DOT-sponsored focus groups found that most New York City residents were unaware of the city's default speed limit (30 mph). Moreover, failing to drive at an appropriate speed (often lower than 30 mph) that matches local conditions is illegal and can lead to pedestrian crashes. Pedestrian KSI crashes involving "unsafe vehicle speeds" are twice as deadly as others (20% vs. 10%).

Alcohol

8% of all fatal pedestrian crashes involved a driver who had been drinking, about 40% less than the national rate of 13%.[16] Alcohol also plays a role in the relative severity of a crash. In New York City, pedestrian KSI crashes that involved drivers under the influence of alcohol were more than twice as likely to result in a fatality (24% vs. 10%).

Lane Changing

The study's modeling results showed that, controlling for other factors, lane-changing pedestrian KSI crashes are more than twice as deadly as others. This suggests that road designs that promote frequent lane changing or weaving should be discontinued where feasible. Examples include: large roads with four or more moving lanes (more options for changing lanes), roads with high levels of curbside activity like double-parking and loading (frequent lane changes to avoid stopped vehicles) and high congestion streets without left turn bays (frequent lane changes to avoid cars waiting to turn left).

Who Pedestrians

Age & Gender

Seniors in New York City are less likely to be involved in a pedestrian crash than other New Yorkers, but due to physical fragility, have a higher risk of dying if a crash occurs. Senior pedestrians (over 65 years old) accounted for 38% of all pedestrian fatalities and 28% of severe injuries, yet seniors only constitute 12% of New York City's population. This disparity is more pronounced in New York City than nationwide, where seniors account for 18% of pedestrian fatalities[16], while constituting 13% of the population[21]. This is most likely due to much greater senior pedestrian exposure, as seniors have many more opportunities to walk and use transit in New York City than in other areas.

Seniors are 12% of NYC's population but account for 38% of fatalities

In the United States in general, males constitute the vast majority (70%) of pedestrian crash victims.[16] In New York City, male pedestrians in New York City were 1.4 times as likely as females to be involved in a pedestrian KSI crash, comprising 58% of KSI. However, this difference is more pronounced for males under 13 years old, a group often noted for higher rates of risk-taking. From 2004 through 2008, more than 3 times as many male children died in pedestrian crashes as females (40 vs. 12 fatalities).[22]
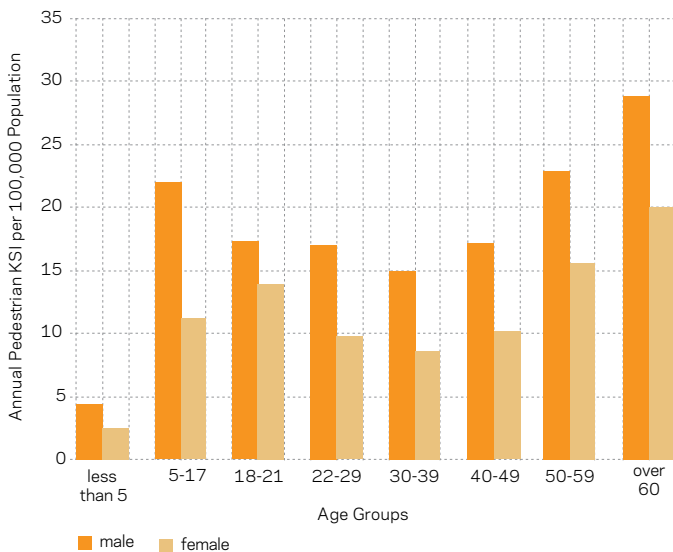
The modeling results of the study showed that children involved in a KSI crash while crossing against the signal were more likely to be killed than an adult struck while crossing against the signal. Visibility problems caused by children's shorter height may be an explanation. Also, pedestrians under the age of ten lack the cognitive maturity to accurately gauge vehicle speeds, potentially leading to unexpected movements that can take drivers by surprise.[23]

Race & Ethnicity

Risk of involvement in a fatal or severe pedestrian crash appears to vary by race/ethnicity. The study's modeling results show that, after controlling for other factors, areas of the city with higher percentages of Black and Hispanic residents had higher likelihoods of pedestrian KSI crashes. However, when examined citywide, Black and Hispanic pedestrians were not involved in more pedestrian fatality crashes than average. This suggests that the problem stems from dangerous environmental conditions and driver behavior in certain localities, rather than the actions of Black and Hispanic pedestrians.

Areas with higher proportions of Hispanic or Black residents experienced higher crashes rates

Pedestrian KSI by Age & Gender

Annual Pedestrian KSI per 100,000 Population vs. Age Groups (less than 5, 5-17, 18-21, 22-29, 30-39, 40-49, 50-59, over 60); legend: male, female

Pedestrian Fatality Rate by Race/Ethnicity & Age

Age	White	Black	Asian	Hispanic
Under 18	0.83	0.70	0.34	0.33
18 to 64	1.03	1.17	1.19	1.15
Over Age 65	4.68	2.16	7.81	4.03
All Ages	1.69	1.13	1.50	1.08

Nationwide, Blacks and Hispanics experience a greater rate of pedestrian fatalities (62% greater for Hispanics and nearly 70% higher for Blacks in 2001)[24]. This is usually explained by greater pedestrian exposure, caused by higher walking and transit usage rates of these groups. However, differences in transit use and walking are much less pronounced in New York City, where similar majorities of Whites (59%), Blacks (67%) and Hispanics (70%) rode transit or walked to work.[25]

# Asian Americans over 65 had nearly twice the average fatality rate for seniors

Asian Americans over 65 had nearly twice the average fatality rate for seniors (7.8 vs. 4.3 per 100,000). This discrepancy can be explained in part by neighborhood characteristics; older Asian American residents tend to be clustered in high-density, high traffic neighborhoods (Chinatown, Flushing, Jackson Heights) with generally acknowledged pedestrian safety challenges.

Black and White child pedestrians were also more at risk for a fatality than the rest of the city's population. Their pedestrian fatality rates were both more than double the Asian or Hispanic rates.

Education

The study's modeling results indicate that areas with higher proportions of residents who had not completed high school experienced higher levels of pedestrian crashes. This disparity is borne out in the citywide statistics as well; residents with a high school education or less accounted for 52% of adult residents[17] but 70% of fatalities among adult residents.

Adult Pedestrian Fatalities & Population by Education
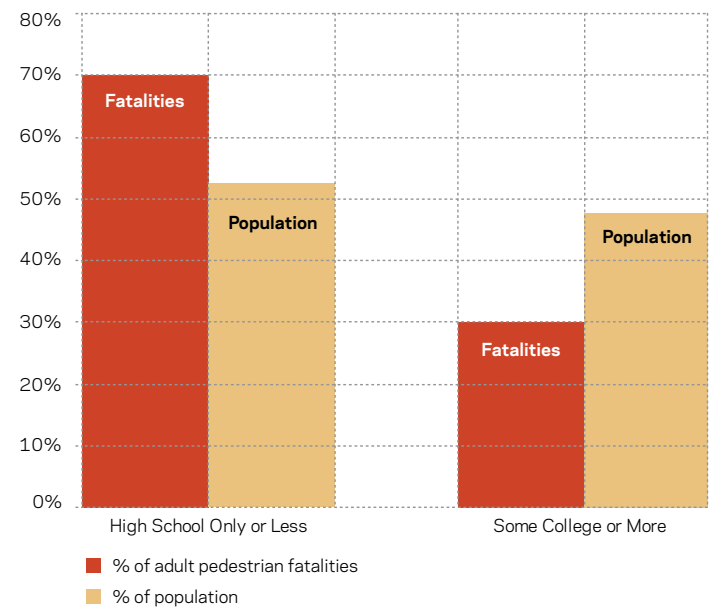
Foreign-born

Finally, foreign-born residents are more at risk than others, accounting for 36% of residents[17] but 51% of fatalities among residents. It is likely that there is significant overlap between this category and other high-risk groups, such as older Asian Americans, Hispanics and those with a high school education or less.

# Foreign-born are 36% of NYC's residents but 51% of fatalities

Who Drivers

Gender

The drivers that kill and seriously injure pedestrians are overwhelmingly male. 80% of pedestrian KSI crashes involved male drivers, while only 57% of New York City vehicles are registered to men.[26] Per 100,000 population, male drivers in their 40's are the most likely age to be involved in a pedestrian KSI crash. As male drivers pass into their 80's, their likelihood of involvement in a pedestrian KSI crash also spikes.

80% of pedestrian KSI crashes involved male drivers

Pedestrian KSI Crashes by Age and Gender Per 100,000 Population (2002-2006)
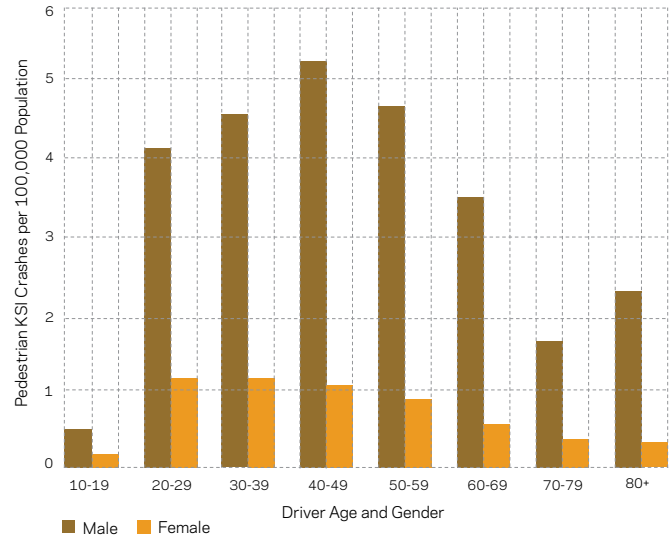
Private passenger cars account for 79% of pedestrian KSI crashes

Vehicle Types

Private passenger cars dominate pedestrian KSI crashes, accounting for 79% of the total. Even in taxi-saturated Manhattan, only 16% of pedestrian KSI crashes involved a taxi or livery car. Similarly, trucks (4%) and buses (3%) only accounted for small proportions of pedestrian KSI crashes citywide. Since professional drivers depend on driving (and their vehicles) for their livelihood, they are highly incentivized to avoid crashes.

Pedestrian Crashes by Vehicle Type (2002-2006)

Vehicle Type	% of Registrations (2009)	Fatal Crashes	Severe Injury Crashes	Total KSI Crashes	% of Total (minus unknown)
Bus	0.4%	44	133	177	3%
Truck	3.6%	74	172	246	4%
Taxi/Livery	2.1%	44	727	771	13%
Passenger	90%	439	4,091	4,530	79%

Although buses and trucks do not constitute a very large proportion of overall pedestrian KSI crashes, trucks and bus crashes were nearly 3 times more likely to result in a pedestrian fatality than others. These results are expected, given the larger dimensions and weight of trucks and buses.

Notably, 31% of pedestrian KSI involving trucks resulted from a right turn, compared with 6% for all vehicles. Since the cab of a truck sits significantly higher than a car, right turning trucks have a large blind spot at the front of the vehicle, an especially dangerous condition for shorter pedestrians.

8% of pedestrian fatalities involved a driver without a valid license

31% of pedestrian KSI crashes involving trucks resulted from a right turn

Drivers Without a License

Between 2006 and 2008, 8% of pedestrian fatalities in New York City involved a driver without a valid license. Although nationwide pedestrian fatality statistics were not available in this case, 18% of all fatal crashes in the United States involved at least one driver without a valid license at the time of the crash[27]. It is likely that people without a valid license drive less frequently in New York City than in the rest of the country, due to the numerous non-automotive transportation options available.

ACTION PLAN

Based on the findings presented previously in this report, DOT recommends a comprehensive set of actions. This action plan consists of highly targeted, data-driven policies and programs identified to have the highest impact on reducing pedestrian fatalities and severe injuries, while safely maintaining traffic operations.

Using a three-pronged approach to road safety (Engineering, Enforcement and Education), these policies and programs will be vital tools in driving DOT to reach its strategic goal of reducing fatalities by 50% by 2030.

The formulation of these recommendations was the result of a partnership with NYPD, as well as the coordination of many programs and offices within DOT. Going forward, the implementation of these policies will require these partnerships to be continued and strengthened, to guarantee that all aspects of pedestrian safety in New York City are being addressed.

Engineering

Traffic engineering and road design have the most day-to-day impact on how we experience the streets of the city. These decisions not only impact access and travel speeds, but they also determine our ability to travel comfortably and safely. DOT's engineering recommendations are focused on pedestrian safety, but also aim to increase safety and quality of life for all users of New York City's streets.

Severity-weighted injuries
per mile of street
(2004-2008)

0.4 to 62.8 ■
0.2 to 0.4 ■
0.1 to 0.2 ■
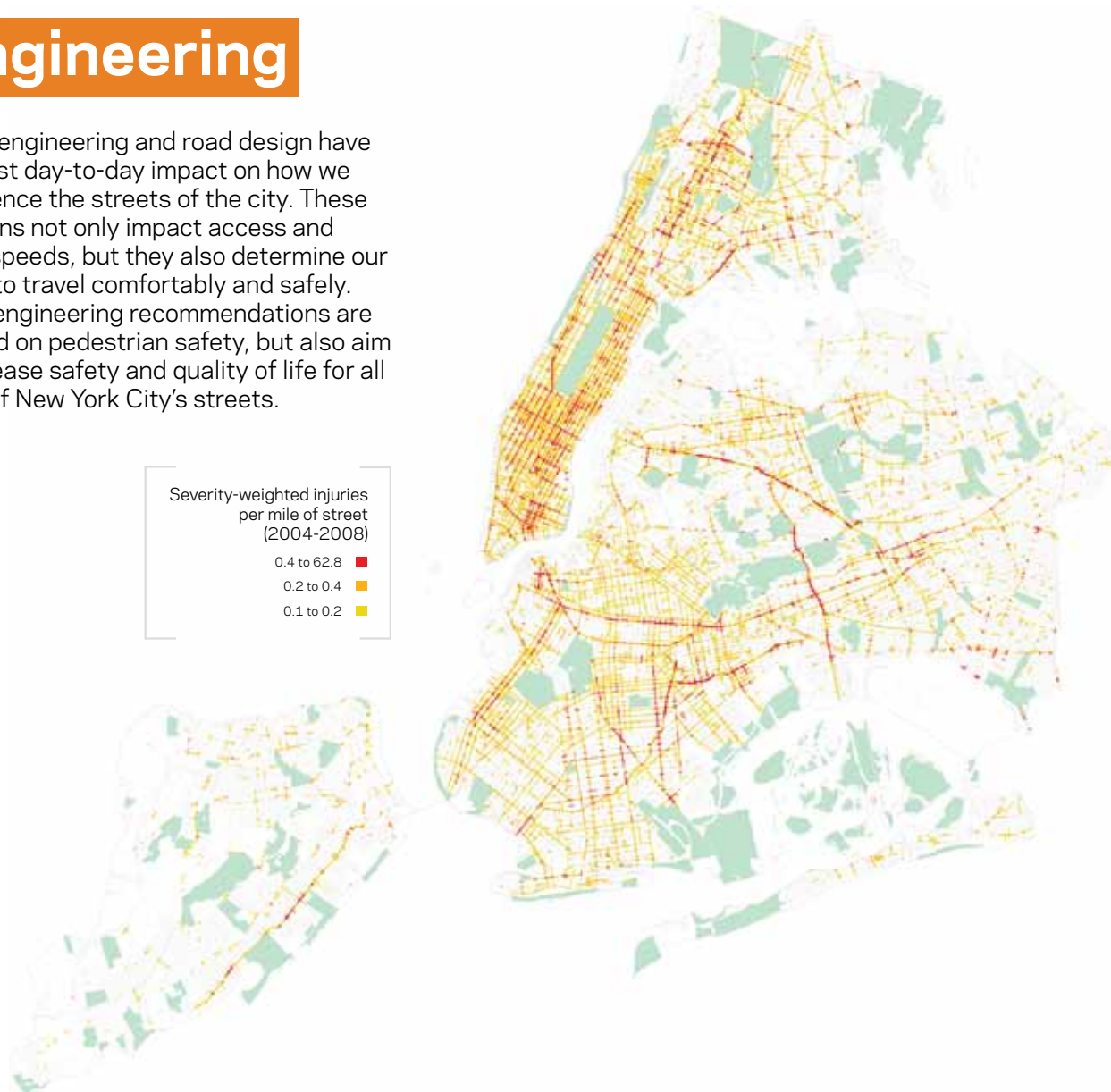
Corridor and Intersection Rankings

To better identify, prioritize and evaluate projects

DOT will create a ranking system for both corridors and intersections, capable of assigning a percentile rank based on severity-weighted injuries (intersections) or severity-weighted injuries per mile (corridors). Locations will be compared with other locations in the same borough and citywide.

Using crash data from NYPD, New York State DOT/DMV and NYCDOT, as well as geographic information from New York State DOT and the Department of City Planning, this system will allow planners to efficiently identify high-crash corridors, prioritize proposed projects based on crash data, and evaluate the effectiveness of projects after implementation.

High Crash Corridors

DOT will address minimum 60 miles per year

Using the corridor ranking system, DOT will create a dataset of the most dangerous corridors in New York City and, based on feasibility, will address safety issues on a minimum of 60 miles per year of these streets.

A minimum of 20 miles of these streets per year will be addressed by intensive safety redesigns. These projects would employ a full toolbox of design options, including pedestrian refuge islands, road diets, sidewalk extensions, pedestrian plazas, bicycle lanes, lane reconfigurations, signal timing modifications, countdown signals, markings, signage and parking regulation modifications.

In cases where full street redesigns are not feasible due to factors such as traffic volumes or geometric constraints, DOT will employ safety upgrades. These projects would employ a more limited toolbox of operational improvements, such as signal timing modifications, countdown signals, markings and signage refurbishments/upgrades and parking regulation modifications.

Pedestrian Countdown Signals

DOT will install at 1,500 intersections

Countdown signals have been shown to reduce pedestrian injury crashes and are strongly preferred by pedestrians, who find them easier to understand than other signal types.[28]

DOT will install pedestrian countdown signals at 1,500 intersections by the end of 2011. Locations on high-crash multi-roadbed streets (e.g. Queens Blvd, Eastern Parkway) and Top 20 Pedestrian Crash Location intersections will be given priority.

Slow Speed Zones

DOT will implement 75 additional 20mph school speed zones and develop a pilot program for neighborhood 20 mph zones

This year, DOT is tripling its reduced speed zones around schools from 25 to at least 75. In 2011, DOT will implement at least an additional 75 reduced speed zones. In addition, DOT is developing a pilot neighborhood 20 mph zone program that would slow traffic on an area-wide, rather than individual street, basis. Projects will be developed in collaboration with local communities and at least one pilot project will be implemented in 2011.

Tame the Two-Ways

DOT will address a minimum of 20 two-way Manhattan crosstown intersections per year

This program will concentrate on high-crash, high-volume intersections of the Manhattan avenues with major crosstown two-way streets (e.g. Canal St, 57th St, 125th St). Each intersection will be examined individually and solutions will be tailored to local conditions. As in safety redesigns, a full toolbox of design options will be considered.

Left Turn Daylighting

DOT will pilot daylighting all left turns on a Manhattan Avenue

"Daylighting" refers to removing curbside parking spaces at the approach to an intersection. This technique is employed to increase pedestrian visibility and reduce turning-vehicle pedestrian crashes.

DOT will pilot the daylighting of all left turn approaches on a major Manhattan avenue with high rates of left-turn pedestrian crashes. Rigorous before and after data will be collected; if evaluation attributes a substantial reduction in injury crashes to the design, the program will be extended to other major Manhattan avenues.

Engineering

Current Engineering Programs

In addition to new programs set forth in this report, DOT has a wide range of ongoing safety programs focused on pedestrians; many of these are being expanded and updated.

Safe Routes to Schools

DOT introduced Safe Routes to School to focus safety improvements at city schools with the highest crash rates. As of December 2007 studies at the first group of 135 priority schools were completed and safety measures installed at each school. These included improvements such as signs, high visibility school crosswalks, speed reducers, traffic signal improvements and bike lanes. As of May 2010, capital construction (neckdowns, pedestrian islands, raised medians, sidewalk widenings) has been completed for 15 of the Priority Schools.

 School crosswalks and advanced school warning signs are currently being installed for all New York City high schools with enrollment greater than 250. DOT also maintains school crosswalks and warning signs for all 1400 middle and elementary schools with enrollment over 250.

Looking to the future, the selection of a second group of 135 Priority Schools has been completed; a contract has been awarded and studies are underway at 75 of these schools.

Speed Reducers

Speed reducers (commonly known as speed humps) are traffic calming devices designed to slow vehicle speeds to either 20 or 15 mph. Launched in 1996, this program allows New York City residents concerned about speeding to request a speed reducer installation. As of July 2010, 1,469 speed reducers have been installed throughout the city, mostly on residential streets.

The program is effective and continues to be popular; DOT installs about 75 speed reducers per year and DOT before/after studies found an average of 19% reduction in speeds where speed reducers are in place. speed reducers have been shown to reduce crashes as well; an ongoing DOT study has found that speed reducers reduce injury crashes by approximately 40%.

Safe Streets for Seniors

Safe Streets for Seniors is a pedestrian safety initiative targeted at 25 neighborhoods with high densities of senior pedestrian crashes. Safety improvements were implemented in the first five pilot areas in 2008 and, as of July 2010, six areas have been completed and work is underway in ten additional areas. The remaining neighborhoods are currently under consultant study. Within the project areas, DOT has added crossing time at over 400 traffic signals, installed 25 pedestrian refuge islands and numerous curb extensions,median extensions, pedestrian ramps and LPIs.

Park Avenue Tunnel: 74% Reduction in Injury Crashes

The Park Ave. Tunnel runs between E. 33rd St. and E. 40th St., just south of Grand Central Station. From 1996-2007, the mouth of the tunnel at E. 33rd St. was one of the top pedestrian crash locations in the city, averaging 12 pedestrian crashes per year.

In 1999, DOT undertook an initial round of safety improvements, including the installation of pedestrian fencing and jersey barriers and banning westbound traffic at E. 33rd St. In 2007, DOT developed a more ambitious concept: convert the tunnel to one-way operation and close it to southbound traffic. This design was implemented in 2008, along with new pedestrian islands, neckdowns, signage and lane markings. These changes simplified the intersections, made them easier to navigate for both pedestrians and vehicles and reduced the potential for pedestrian/vehicle conflicts.

In a before/after analysis conducted by DOT in the summer of 2009, the Park Ave./E. 33rd St. intersection was found to have experienced a dramatic drop in both pedestrian injury crashes (100%) and all injury crashes (74%).

33rd Street Facing South

Before

After

Enforcement

Road users can usually be guided towards making safe decisions by well-informed street design and traffic engineering. However, some problems can only be addressed with the deterrence that comes from strong enforcement of traffic law. NYPD and DOT are committed to working together to implement enforcement policies that reflect the findings of this report and improve safety conditions for pedestrians.

Targeted Enforcement

NYPD and DOT will work together to examine multi-year crash trends to identify the highest crash corridors and intersections. This collaborative and strategic approach will utilize NYPD's accident prone locations and DOT's corridor ranking system to prioritize enforcement deployment.

In coordination with DOT's education and marketing efforts, NYPD will focus resources on a citywide campaign against aggressive driving. Using detailed crash data to identify locations and to inform enforcement strategy, NYPD will target speeding along major corridors and failure-to-yield prone intersections.

To provide resources for this new program, NYPD and DOT are jointly pursuing a federal 402 grant, a source of funding for programs that reduce traffic crashes and resulting deaths, injuries, and property damage.

Drivers Without a Valid License

National research suggests that those who drive without a valid license are more likely to be involved in fatal crashes.[29] One California study estimated that drivers whose license has been suspended or revoked are nearly 4 times more likely to be involved in a fatal crash, while unlicensed drivers are nearly 5 times more likely.[30]

NYPD will continue their successful efforts to identify and apprehend unlicensed drivers.

Cellphone/Texting While Driving

Nationwide attention has recently been focused on the issue of distracted driving, especially as it relates to cell phone use and texting while driving. In fact, driving while using a cell phone has been shown to be more dangerous than driving drunk.[31] Using a hand-held cell phone while driving is also illegal in New York City; any cell phone use is illegal while driving a taxi or livery vehicle.

In 2009, the NYPD issued on average 617 summonses a day to drivers using hand-held cell phones. On January 21st, 2010, during an announced 24-hour blitz, over 7000 summonses were issued for this infraction.

NYPD will continue to crackdown on drivers using hand-held cellphones or who text while driving.

Data Collection and Sharing

NYPD and DOT will coordinate and share techniques on geographic and crash severity analyses in order to enhance strategic resource deployment. In addition, the sharing of New York State crash data and NYPD Police Officer local knowledge will be expanded and improved, allowing both agencies to conduct more sophisticated analysis.

TrafficStat is a data driven tracking and accountability system for traffic enforcement based on CompStat, the NYPD's highly successful and influential crime tracking system. At TrafficStat meetings, Precinct Commanders report back to the NYPD Chief of Transportation on crashes and traffic enforcement. Additionally they discuss engineering recommendations with DOT Borough Commissioners in an effort to reduce traffic crashes.

NYPD and DOT will continue to work together via the TrafficStat meetings, sharing data and developing new enforcement strategies.

NYPD and DOT will also continue to work together to coordinate updates to the New York State DOT crash report (MV-104) format. Techniques for speeding the transmission of these reports from NYPD to DOT will also be explored.

Public Communication

Engineering and enforcement alone are not enough. There is a deep acceptance of speeding and reckless driving by many in New York City that needs to be transformed in order to save lives and prevent injuries.

Education

Based on this report's findings, DOT's Office of Safety Education (OSE) will launch new initiatives and expand a number of existing programs.

School Programs

- Continue to provide Safety City and in-school presentations for children ages 5-14 focused on navigating streets safely with an increased emphasis on arterial streets and high risk corridors
- Develop intensive traffic safety workshop, theater and art programs (after-school and summer) for students aged 11-17 that reside near the highest risk corridors in each borough
- Expand sign and mural artist-in-residence programs for students to engage local communities in traffic safety issues through the creative arts
- Expand the use of web-based social media resources such as YouTube, Facebook and Twitter for teens to share their involvement in traffic safety programs with peers

- Provide Train-the-Trainer programs to Substance Abuse Prevention and Intervention Specialists (SAPIS) at the City's Department of Education to help incorporate traffic safety education into classroom curricula

Parents

- Host parent workshops and "Safety from the Start" program for new parents, targeting low educational attainment populations
- Focus new effort on pedestrian, passenger and bicycle safety through Safe Kids Coalition injury prevention outreach out to new immigrant groups
- Expand non-English outreach programs and education efforts, targeting neighborhoods that face a higher risk for pedestrian fatalities

Older Adults

- Provide Safe Streets for Seniors presentations at senior centers located near high–risk corridors and major arterial streets
- Expand multi-language pedestrian safety programs, particularly to Asian residents ages 65+ who face higher risk for pedestrian fatalities
- Develop comprehensive active transportation programs for older adults including information on pedestrian safety, biking, fall prevention, nutrition, medicine and fitness

Materials

- Update and create new printed educational materials highlighting dangerous behaviors including failure to yield, speeding, aggressive driving and inattention
- Translate additional materials for high risk non-English speaking populations

Traffic safety sign designed by students at PS 5 in Manhattan through DOT's artist-in-residence program.

Public Communication

Marketing

The findings of this report dictate that DOT should focus on the following traffic safety messages and develop a sophisticated marketing and media campaign to begin to change driver and pedestrian behavior to support the DOT's traffic safety efforts.

Traffic Safety Marketing Messages

- **Know the speed limits and the exponential danger of speeding**
- **Yield to pedestrians in crosswalks**
- **Don't allow unlicensed drivers behind the wheel**
- **Always cross with the light, not against it**

Use marketing and advertising to raise awareness about traffic safety issues identified in this report.

DOT will develop and implement a broad-based marketing and PR campaign to address traffic safety. This campaign will be informed by the findings in this report as well as market research and stakeholder feedback. DOT will deploy the campaign for three years, refreshing the contents of the campaign as needed. The campaign will combine broad-spectrum communication channels including television and radio with more grassroots efforts including a speaker's bureau, outreach to civic and religious institutions and social media. The campaign will also strive to leverage additional press coverage of these issues to extend the reach of the campaign.

DOT will also develop a "Countdown to Safety" campaign to educate New Yorkers about crosswalk safety in coordination with the rollout of the pedestrian countdown signals. The campaign will highlight facts about why they work, and use community outreach and social media to broadcast these facts as well as safety tips in neighborhoods as they are due to receive the new signals.

Use targeted tactics to further raise motorist awareness.

DOT will leverage relationships with DMV to get campaign materials and messages into the hands of Driver's Ed teachers and students. Marketing efforts will also be coordinated with OSE to introduce campaign materials and messages into car-seat fittings and other motorist education events.

Use targeted tactics to further raise pedestrian awareness.

DOT will use the installation of new countdown crosswalk signals to raise awareness of the importance of crossing with the light. In coordination with the installation of new crosswalk signals and/or enforcement efforts, multi-lingual "street teams" will be deployed to hand out multi-lingual brochures at key intersections; in general, messaging aimed at pedestrians will focus on areas with high populations of foreign-born residents. Marketing efforts will also be coordinated with OSE to introduce campaign materials / messages into Safety City (youth education) and seniors outreach events.
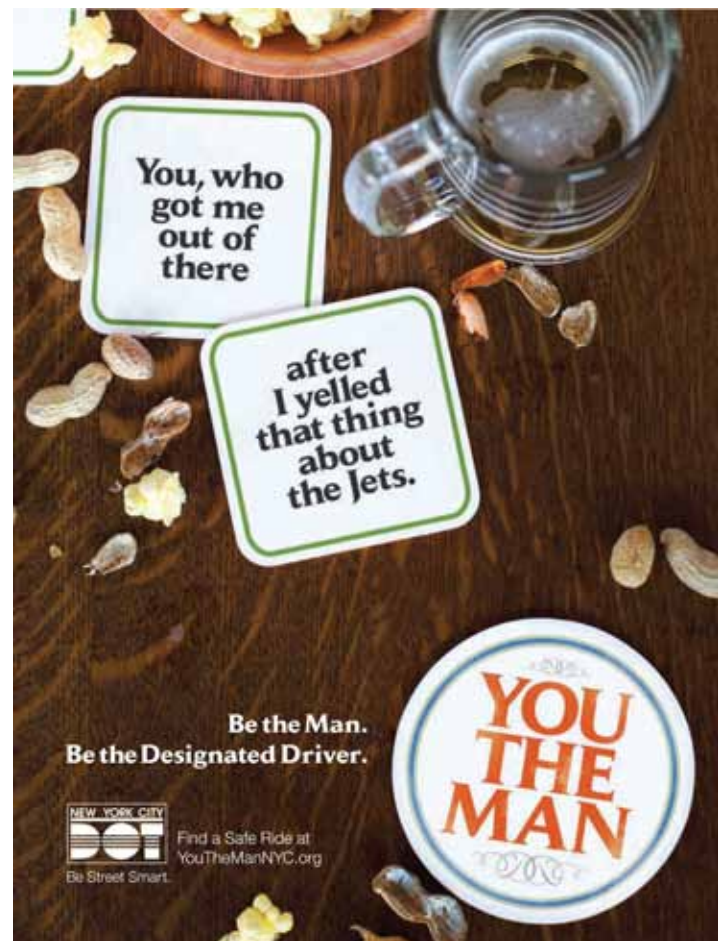
Past Campaigns

DOT has already used marketing to increase awareness about traffic safety via its "Look" bicycle safety campaign and it's "You the Man" anti-drinking and driving campaign.

Avoiding a crash comes down to one simple action.
LOOK
NYC Bicycle Safety Coalition
looknyc.org

"You the Man" used research and focus group insights to develop a campaign targeted towards those most likely to drink and drive. This audience is aware that drinking and driving is wrong, but they often failed to make a plan to get home safely at the end of a night out. "You the Man" was created to valorize the designated driver and people who plan a safe ride home.

You, who got me out of there after I yelled that thing about the Jets.

Be the Man.
Be the Designated Driver.

NEW YORK CITY DOT
Be Street Smart.
Find a Safe Ride at YouTheManNYC.org

YOU THE MAN

"Look" was created after a study of bicyclist serious injuries and fatalities. The study found that driver and cyclist inattention was the number one reason for these crashes. "Look" asks driver and cyclists to literally look out for one another on the streets. Ads were created for TV, radio, outdoor, internet and direct mail, creating 130+ million impressions.

Policy and Legislation

The majority of this report's recommendations concern actions that DOT and NYPD can implement within their operational capacities. To achieve more, DOT will advocate for a series of legislative changes that would enable New York City to make even greater gains in the area of pedestrian safety.

Expand Red Light Cameras

Red light cameras capture the license plate information of cars that fail to stop at red lights. Owners of these vehicles are automatically contacted and required to pay a fine. Extensive national reviews show that red light cameras reduce side-impact crashes, increase rear-end crashes and overall, reduce crash severity.[32] In New York City, existing red light cameras have been shown to decrease injuries by 24% at monitored intersections. Red light cameras are a cost effective way to increase enforcement without requiring NYPD to divert additional resources.

Currently, New York City is limited by state law to only operate 150 red light cameras at one time. However, with approximately 12,000 signalized intersections throughout the city, DOT could employ many more. In addition, red light cameras are a cost effective way to increase enforcement without requiring NYPD to divert additional resources.

DOT will pursue legislation in Albany for additional red light cameras.

Introduce Speed Cameras

Speed cameras capture the license plate information of cars that exceed the speed limit. Owners of these vehicles are automatically contacted and required to pay a fine. A 2007 international review by NHTSA found that the cameras installed at conspicuous, fixed sites led to injury crash reductions of 20% to 25%.[33] Eleven states (e.g. Maryland, Massachusetts, Ohio and Washington, DC) currently employ speed cameras.

Currently, speed cameras are not legal in New York City, as legislation to allow their use has repeatedly stalled in the state legislature. Like red light cameras, speed cameras are a cost effective way to increase enforcement without requiring NYPD to divert additional resources.

DOT will pursue legislation in Albany to allow speed cameras.

Require Truck Crossover Mirrors

Crossover mirrors are convex mirrors that, when installed, significantly reduces blind spots in front of their vehicles, effectively reducing the risk of pedestrian injury and death. Crossover mirrors have long been mandatory on school buses.

DOT will pursue legislation in Albany to require trucks over 26,000 pounds to be equipped with a convex or "cross-over" mirror when operated on city streets.

Update NYC Pedestrian Safety Act

The New York City Pedestrian Safety Act (Local Law 11 of 2008) mandates that DOT annually investigate and address NYC's Top 20 Pedestrian Crash Locations. DOT will pursue a revision to this legislation in the City Council to include the severity of injuries and multiple years of data in the calculation of the Top 20. These changes will more accurately point DOT towards the most chronically dangerous locations and filter out year-to-year anomalies.

Tougher Penalties for Unlicensed Drivers

DOT will take a two-pronged approach to keeping drivers without a valid license off the road. First, DOT will pursue legislation in Albany to increase the penalties for driving without a valid license. Second, DOT will work with the NYC District Attorney's offices to ensure that those who are convicted are given tough sentences.

Interagency Coordination

### Establish NYPD/DOT Road Safety Task Force

Enhancing their existing collaboration, DOT and NYPD has formed a permanent inter & intra-agency working group. This task force meets monthly to develop policy, coordinate campaigns and projects, promulgate standards and best practices, and coordinate funding.

Expand DOT/DOHMH Collaboration

DOT and the Health Department both recognizes traffic injuries and fatalities as one of New York City's most pressing public health issues. The two agencies will continue to work together on sharing data and identifying new opportunities for traffic injury research and prevention activities.

Update Driver's Education Curriculum

DOT will work with New York State DMV to incorporate more information regarding urban driving, pedestrian and bicycle safety in the Driver's Education curriculum and in the training materials for Driver's Education instructors.
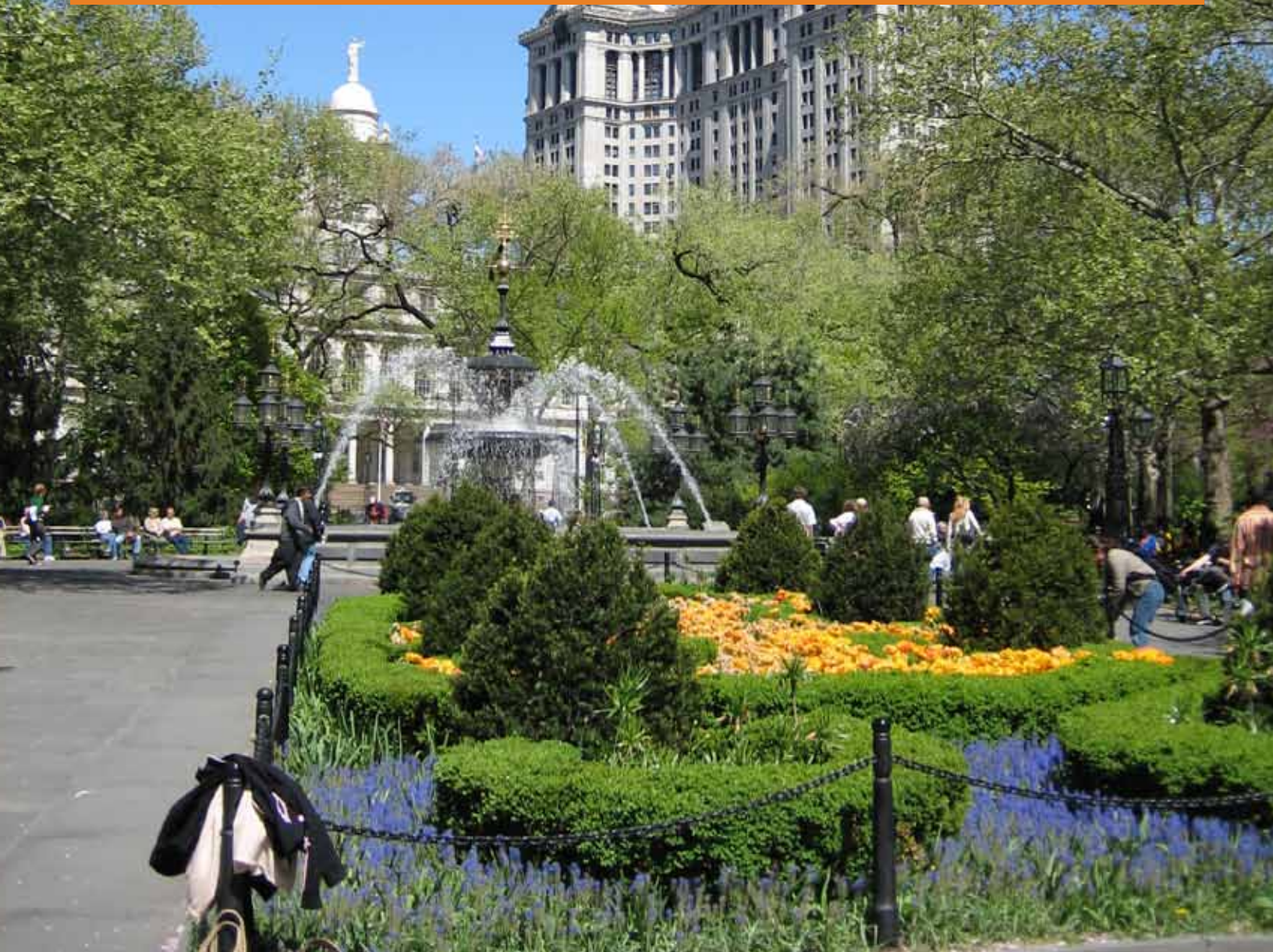
REFERENCES

Description of the Technical Supplement
Unless otherwise footnoted, all background detail on findings, years of data, data sources and analytical methodology that led to the content of this report can be found in the Technical Supplement.

Section 1: Crash Characteristics – Describes the characteristics of drivers and pedestrians involved in crashes, frequency and location of pedestrian crashes, crash trends, correlations between crashes and intersection/corridor types, and the public health burden of pedestrian severe injury and fatality crashes.

Section 2: Spatial Analysis – Applies and describes techniques for identifying geographic "accident clusters" and evaluates potential techniques for identifying high-crash locations.

Section 3: Crash Cause/Frequency and Severity Modeling - Describes the results of models of pedestrian KSI crashes in New York City. Crash frequency modeling uses causal factors to explain the frequency of pedestrian severe injuries and fatalities in geographic areas, and crash severity modeling investigated the effects of these factors in determining whether a crash result was severe or fatal.

Section 4: NYCDOT Supplementary Study Material - Reports crash characteristics studied by NYCDOT, supplementing the NYU Rudin Center research team's findings in Chapters 1 – 3. Material in this chapter includes long-term fatality and severe-injury data outside the five-year scope of the NYU Rudin Center study, and summary crash characteristics investigated in response to model findings.

Appendix A: Data Acquisition Process
Appendix B: Crash Characteristics - Tables and Maps
Appendix C: Model Process and Outputs
Appendix D: Data Dictionaries

Endnotes

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