



# SAFE STREETS NYC

DEPT OF TRANSPORTATION

## TRAFFIC SAFETY IMPROVEMENTS IN NEW YORK CITY



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**DECEMBER 2008**



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# SAFE STREETS NYC:

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### DECEMBER 2008

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Note:

All new content since the last publication of this report (June 2007) is identified by **red bold fonts**.

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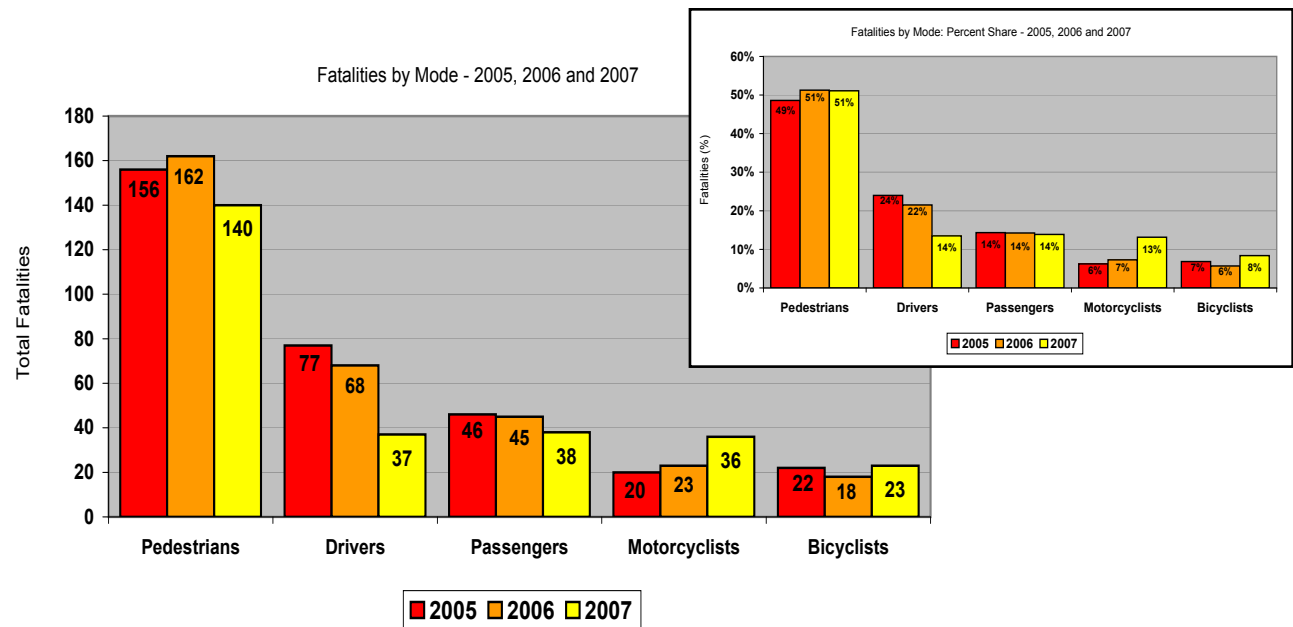
# IMPROVING SAFETY



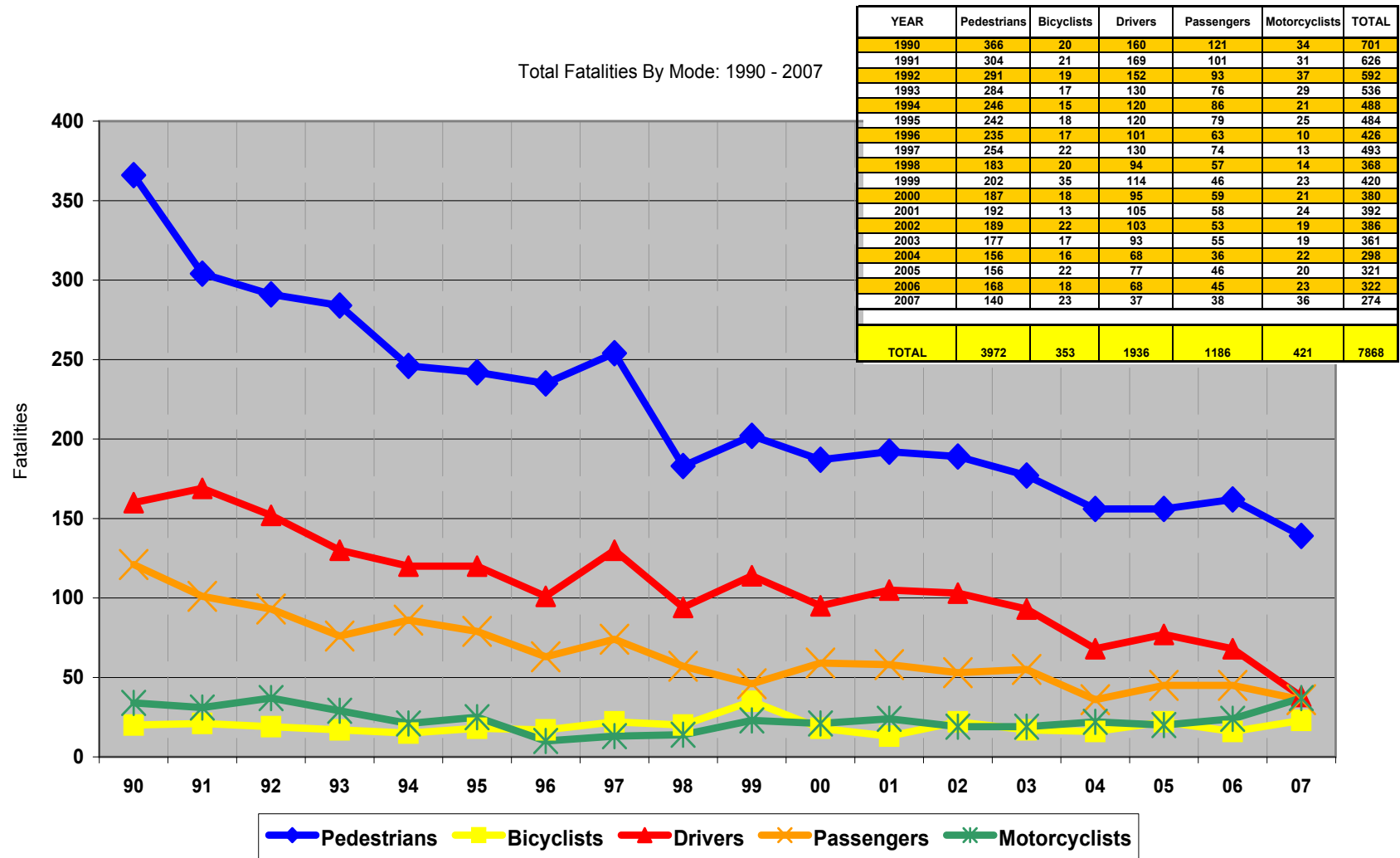
# TRAFFIC

## FATALITIES

Over the past several years, the Department of Transportation (DOT) has actively accelerated its efforts to improve pedestrian and traffic safety by instituting a proactive and systematic approach to the identification of locations throughout the city where innovative safety mitigation measures need to be implemented. While the scope and scale of these projects vary in terms of improvements, there is no greater testament to the City's efforts than the decline of both pedestrian and vehicular fatalities over the past eighteen years. Some of the most remarkable strides have been made over the past three years as the Department has seen fatalities reach historic lows. **In 2007, the Department recorded the lowest number of traffic fatalities on record at 274. Previously, 2004 had been a watershed year, recording the lowest number (298) since 1910 when there were 332 fatalities. The past four years have experienced the lowest number of fatalities in nearly 100 years.**



Since 1990, traffic fatalities have decreased by 61%. Some of the most noticeable improvements have occurred more recently. Fatalities have declined by 30% since 2001. An examination of fatalities by mode finds that most modes have experienced significant declines over the past 17 years. As indicated in the table and chart below, pedestrian fatalities fell by 62% between 1990 and 2007 – from 366 to 140. Pedestrians continue to account for approximately 50% of all fatalities. Driver fatalities reached an all time low



in 2007 – 37 fatalities from a high of 169 in 1991; a 78% decrease, which was the single greatest percentage decline by mode. The percentage decline in passenger fatalities was 69%, from 121 in 1990 to 38 in 2007. Particularly in the last four years, nearly all modes have experienced historic lows. However, fatalities as a percentage by mode have remained relatively consistent on an annual basis. Despite the sizeable decrease in the overall number of pedestrian fatalities, they continue to be the single largest at-risk group, comprising approximately half of all traffic fatalities. The table below represents these trends over the past 17 years.

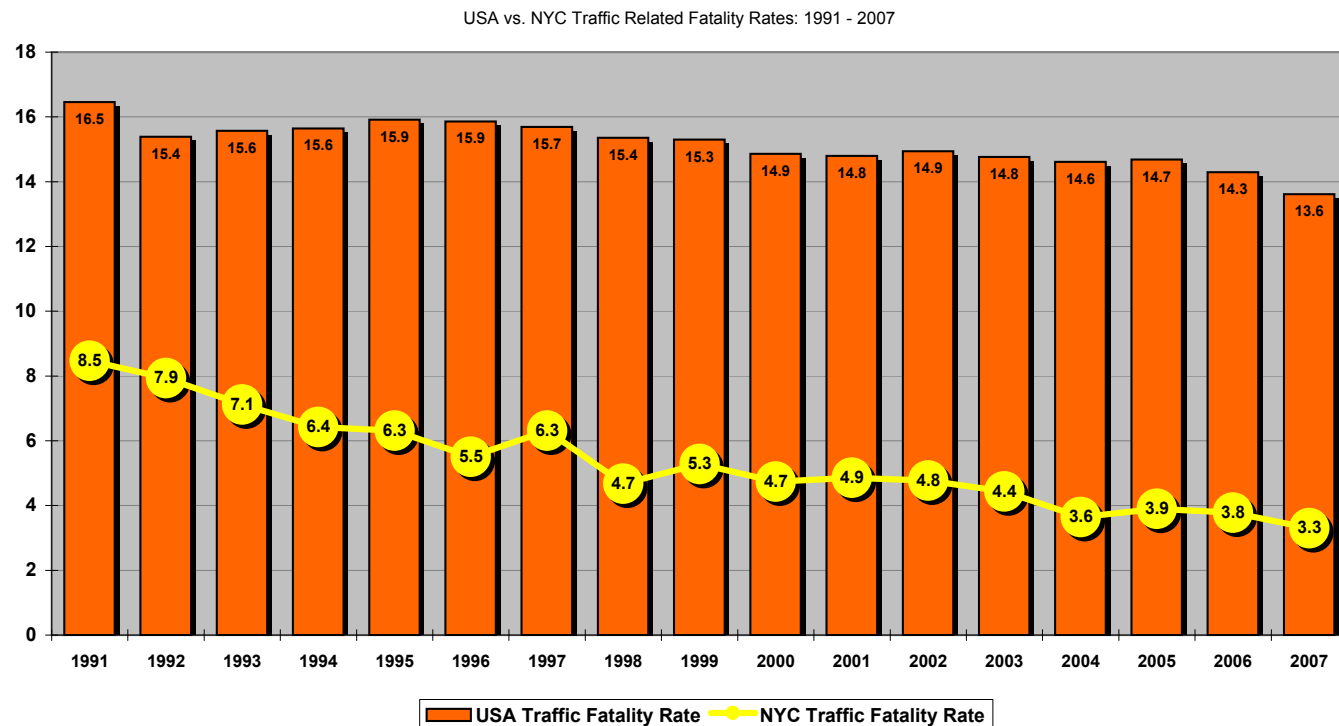
Fatalities as Percentage (%) by Mode 1990-2007

Fatalities as Percentage (%) by Mode 1990-2007

| YEAR                          | Pedestrians | Bicyclists | Drivers | Passengers | Motorcyclists | TOTAL |
|-------------------------------|-------------|------------|---------|------------|---------------|-------|
| 1990                          | 52.2%       | 2.9%       | 22.8%   | 17.3%      | 4.9%          | 701   |
| 1991                          | 48.6%       | 3.4%       | 27.0%   | 16.1%      | 5.0%          | 626   |
| 1992                          | 49.2%       | 3.2%       | 25.7%   | 15.7%      | 6.3%          | 592   |
| 1993                          | 53.0%       | 3.2%       | 24.3%   | 14.2%      | 5.4%          | 536   |
| 1994                          | 50.4%       | 3.1%       | 24.6%   | 17.6%      | 4.3%          | 488   |
| 1995                          | 50.0%       | 3.7%       | 24.8%   | 16.3%      | 5.2%          | 484   |
| 1996                          | 55.2%       | 4.0%       | 23.7%   | 14.8%      | 2.3%          | 426   |
| 1997                          | 51.5%       | 4.5%       | 26.4%   | 15.0%      | 2.6%          | 493   |
| 1998                          | 49.7%       | 5.4%       | 25.5%   | 15.5%      | 3.8%          | 368   |
| 1999                          | 48.1%       | 8.3%       | 27.1%   | 11.0%      | 5.5%          | 420   |
| 2000                          | 49.2%       | 4.7%       | 25.0%   | 15.5%      | 5.5%          | 380   |
| 2001                          | 49.0%       | 3.3%       | 26.8%   | 14.8%      | 6.1%          | 392   |
| 2002                          | 49.0%       | 5.7%       | 26.7%   | 13.7%      | 4.9%          | 386   |
| 2003                          | 49.0%       | 4.7%       | 25.8%   | 15.2%      | 5.3%          | 361   |
| 2004                          | 52.3%       | 5.4%       | 22.8%   | 12.1%      | 7.4%          | 298   |
| 2005                          | 48.6%       | 6.9%       | 24.0%   | 14.3%      | 6.2%          | 321   |
| 2006                          | 52.2%       | 5.6%       | 21.1%   | 14.0%      | 7.1%          | 322   |
| 2007                          | 51.1%       | 8.4%       | 13.5%   | 13.9%      | 13.1%         | 274   |
| Percent of TOTAL<br>1990-2006 | 50.5%       | 4.5%       | 24.6%   | 15.1%      | 5.4%          | 7868  |

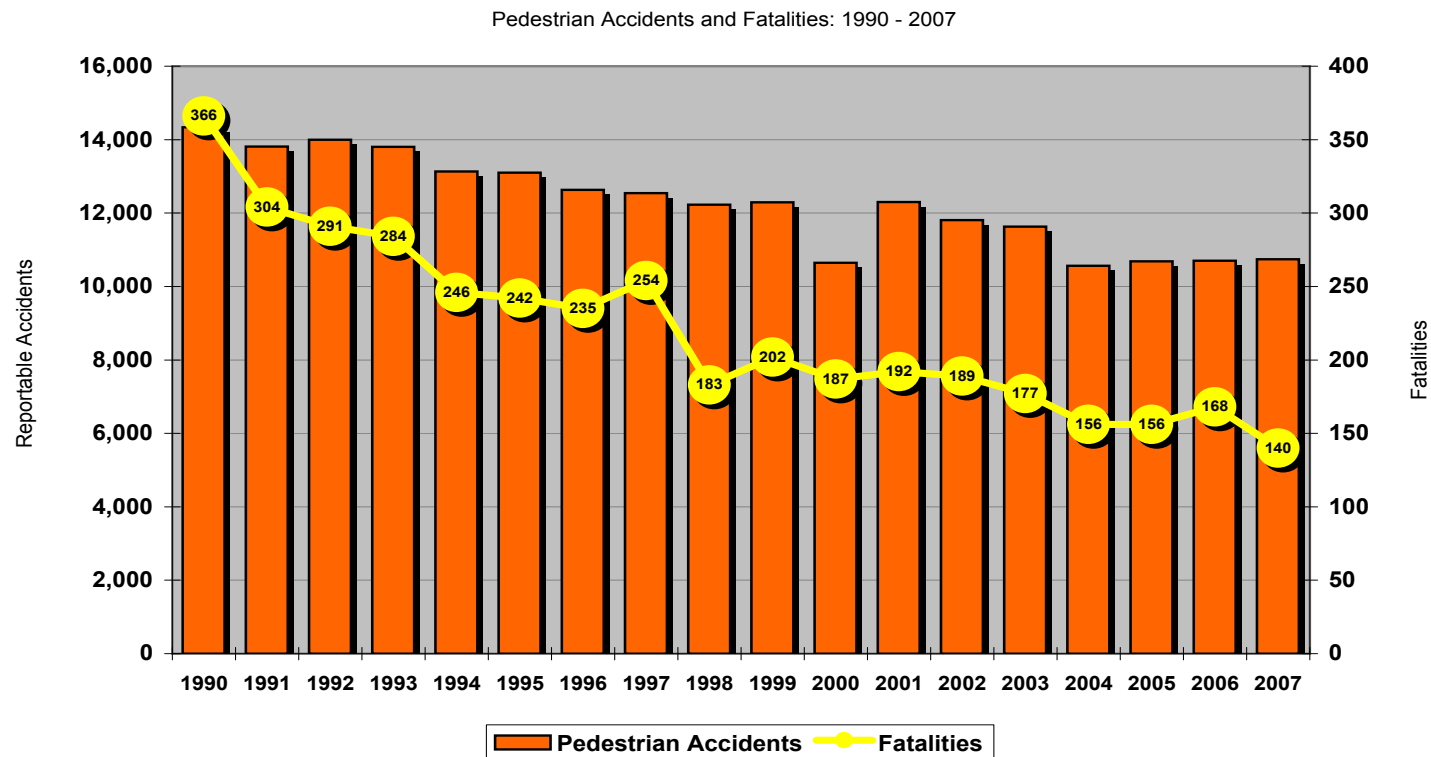
# NYC COMPARED TO THE U.S.A.

Traffic fatality statistics provide strong evidence that New York City has the safest streets of any large city in the United States, and that safety has improved dramatically over time. Of all the cities in the nation with populations exceeding 250,000, New York City has the lowest traffic fatality rate per 100,000 persons. A 2004 report by the U.S. Department of Transportation found that the City's rate of 3.6 traffic fatalities per 100,000 persons was the lowest of all major cities. In 2007, New York City again had the lowest total traffic fatality rate among the top ten cities by population, at 3.3 per 100,000 residents - lower than the rate in Chicago (6.8), Los Angeles (7.0), and Philadelphia (8.6). Based on FARS (Fatality Analysis Reporting System) data and annual population estimates by the U.S. Census Bureau, the rate of traffic fatalities in New York City decreased by 61% from 8.5 in 1991 to 3.3 in 2007, while across the nation as a whole, the rate



of total traffic fatalities decreased during this same time period by 17% from 16.5 to 13.6 per 100,000 population.

Not only has New York City achieved significant declines in total traffic fatalities, but pedestrian fatalities declined by 62% between 1990 and 2007, compared to a 33% national decline. With 1.6 pedestrian fatalities per 100,000 population, New York City had a lower pedestrian fatality rate in 2007 than Chicago (1.8), Los Angeles (2.2), and Philadelphia (2.4). New York City maintained its low pedestrian fatality rate despite a very large percentage of trips involving walking - nearly 57% of workers in New York City used public transportation or non-motorized transportation to travel to work, versus 16% in Chicago.



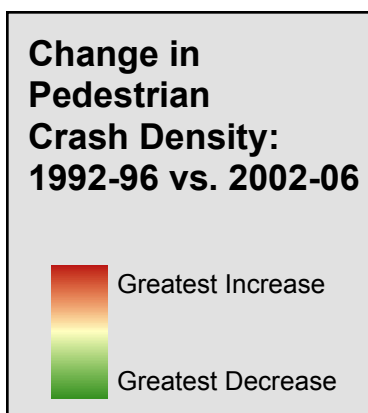
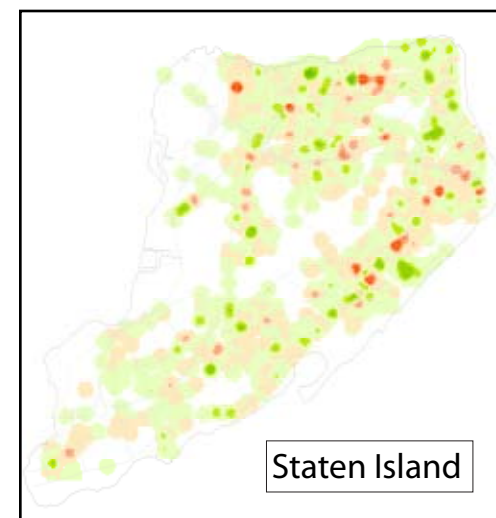
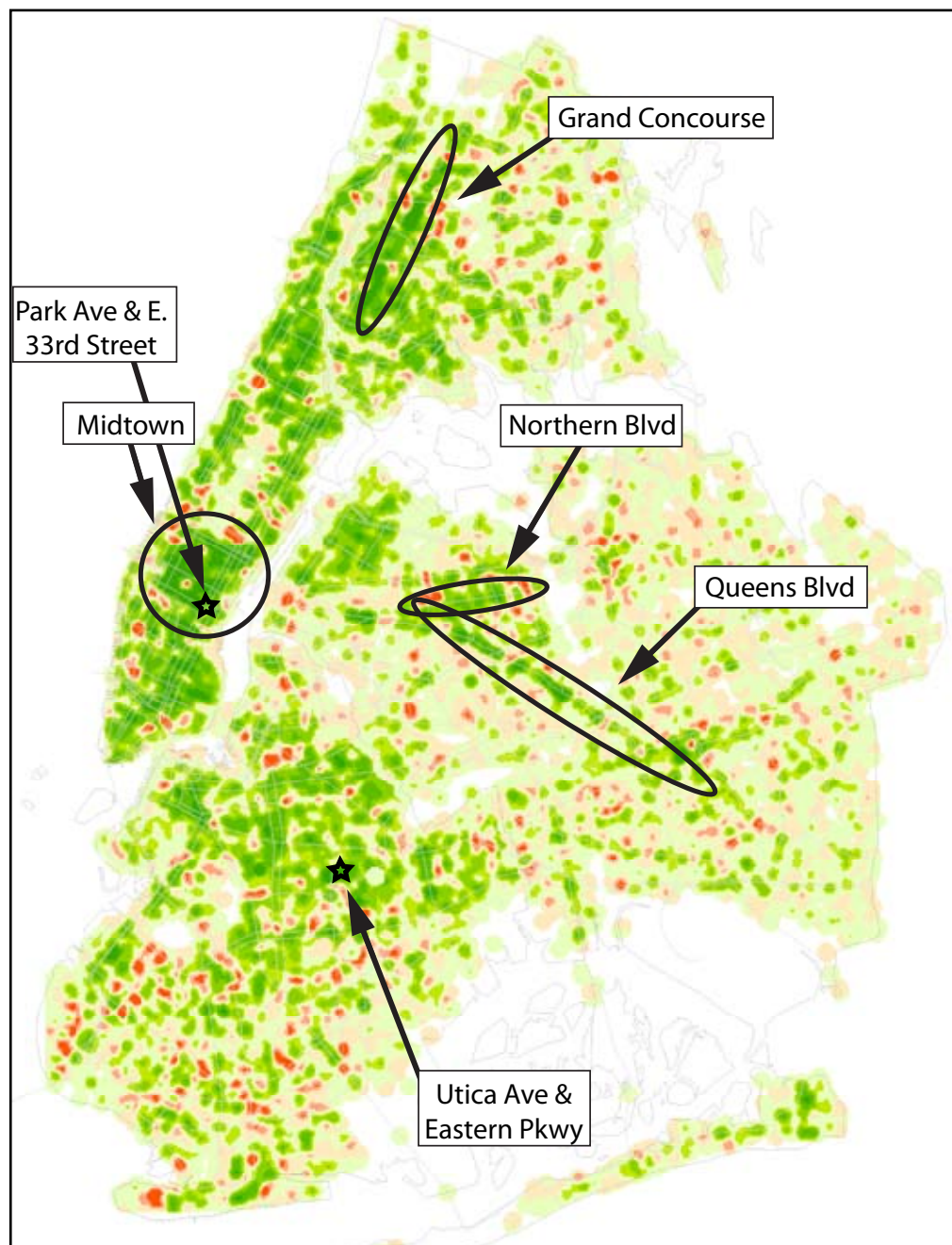
# NYC PEDESTRIAN CRASH TRENDS

Pedestrian crashes in New York City decreased in severity and frequency from the mid-1990s to the mid-2000s, but these changes were not evenly distributed across New York City. Over a period of 15 years a “weighted crash density” analysis, accounting for both severity and frequency of pedestrian crashes per square mile, was conducted to identify areas of decreasing and increasing crash density.

The “Change in Pedestrian Crash Density” map on the following page shows the change in pedestrian crashes from the “before” period (1992-1996) to the “after” period (2002-2006). Areas with the greatest increase in crash “density” are red; those with the greatest decrease are green. Areas with more minor changes will appear in paler colors.

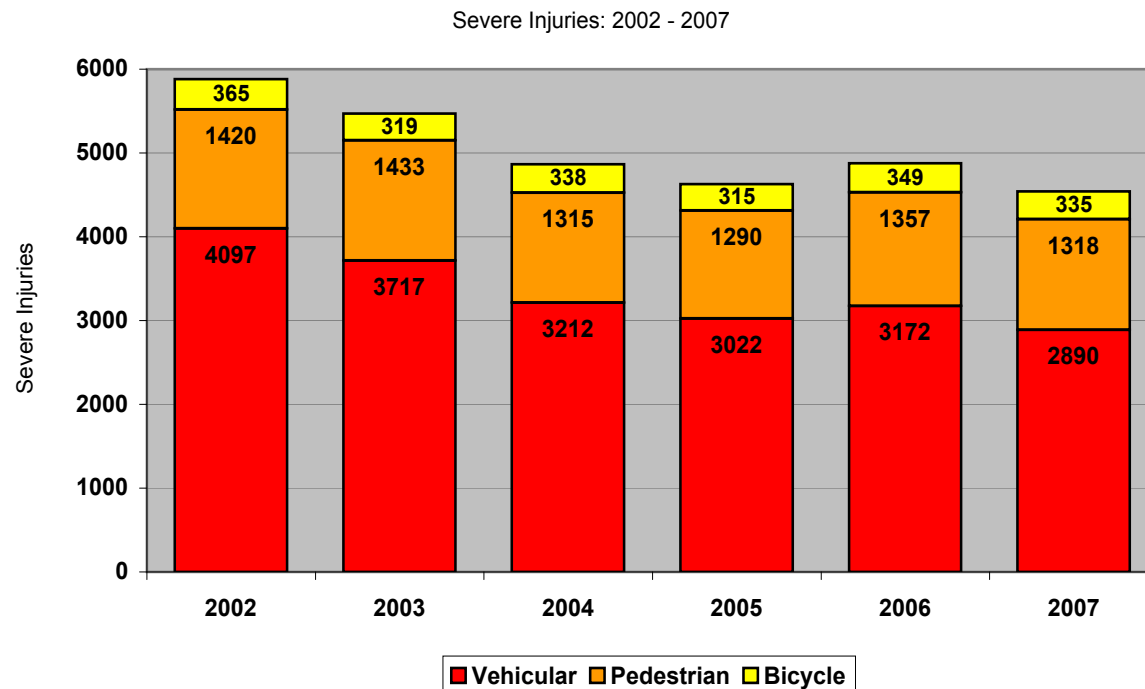
Areas with large decreases in pedestrian crashes include Northern and Queens Boulevards in Queens, the Grand Concourse and surrounding areas in the Bronx, and Midtown Manhattan including the intersection of Park Avenue and East 33rd Street, and the Eastern Parkway & Utica Avenue intersection in Brooklyn. Although some of these areas still have a relatively high density of crash rates, they have also shown the most dramatic improvement.

Finally, many emerging areas of concern, such as Flushing, Queens and Bensonhurst, Brooklyn, where the severity or frequency of crashes increased from the “before” period to the “after” period, are being targeted by the Safe Streets for Seniors program.



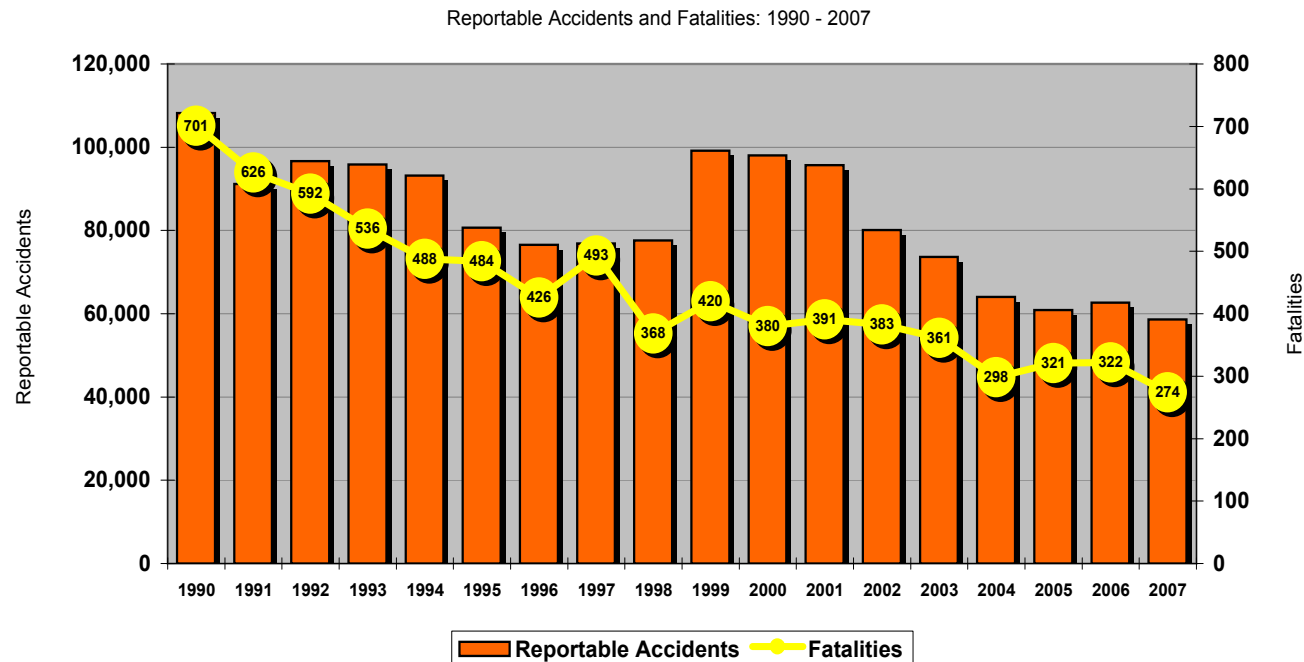
# SEVERE INJURIES

Similar to the overall trend of fatalities between 2002 and 2007, severe injuries (also known as Type A or incapacitating injuries) also decreased markedly during this period. Total severe injuries resulting from vehicular crashes decreased by 22.7% between 2002 and 2007. The number of severe injuries involving bicyclists and pedestrians also decreased during this time by 8.2% and 7.2%, respectively. Not only has the number of the most severe injuries gone down, but Type B (minor bruising or bleeding) and Type C (no visible injury but complaint of pain) injuries have also declined. Between 2002 and 2007, Type B and C injuries declined by 27.5% and 36.6%, respectively.



# TRAFFIC CRASHES

Beginning in the late 1980's, DOT's efforts have significantly reduced the number of traffic related crashes throughout the city. The downward trend in crashes continues to solidify New York City's status as one of the safest large cities in the United States. **Prior to 2002, the New York State crash data previously used in this report included total crashes, both reportable and non-reportable. During this time, total crashes decreased by 27.8% - from 307,492 in 1990 to 221,983 in 2001. Beginning in 2002, the State discontinued tabulating non-reportable crashes, making comparisons with previous years difficult. However, an analysis of reportable crashes from 2002 to 2007 reaffirms the downward trend of previous years. Reportable crashes declined by 15% - from 95,562 in 2002 to 81,305 in 2007. Since 1990, the total number of reportable crashes has decreased by 25%, confirming the Department's successful efforts to improve traffic safety.**



# HIGH CRASH LOCATIONS

Throughout New York City, there are several corridors and/or intersections which consistently experience a relatively high number of crash occurrences. While each of these locations is unique in its characteristics and layout, these locations are generally more crash prone due to one of four factors: 1) Physical environment (e.g., grade, road alignment, visibility, roadway conditions, lighting, wet pavement); 2) Traffic Conditions (e.g., high volumes, heavy truck activity); 3) Human factors (e.g., driving under the influence, misjudgment, speeding, aggressive or inexperienced driving, illness, unlicensed driver); 4) Equipment (e.g., faulty vehicles, over or under loaded larger vehicles.). Crashes usually involve several of these factors.

In past years, the city has ranked the top crash locations based upon data from the New York State Department of Transportation (NYSDOT). The Department uses the NYSDOT Crash Database to locate high crash locations as this database is the most complete and accurate source of crash information. **From 2002 to the present, NYSDOT has only provided reportable crash data.**

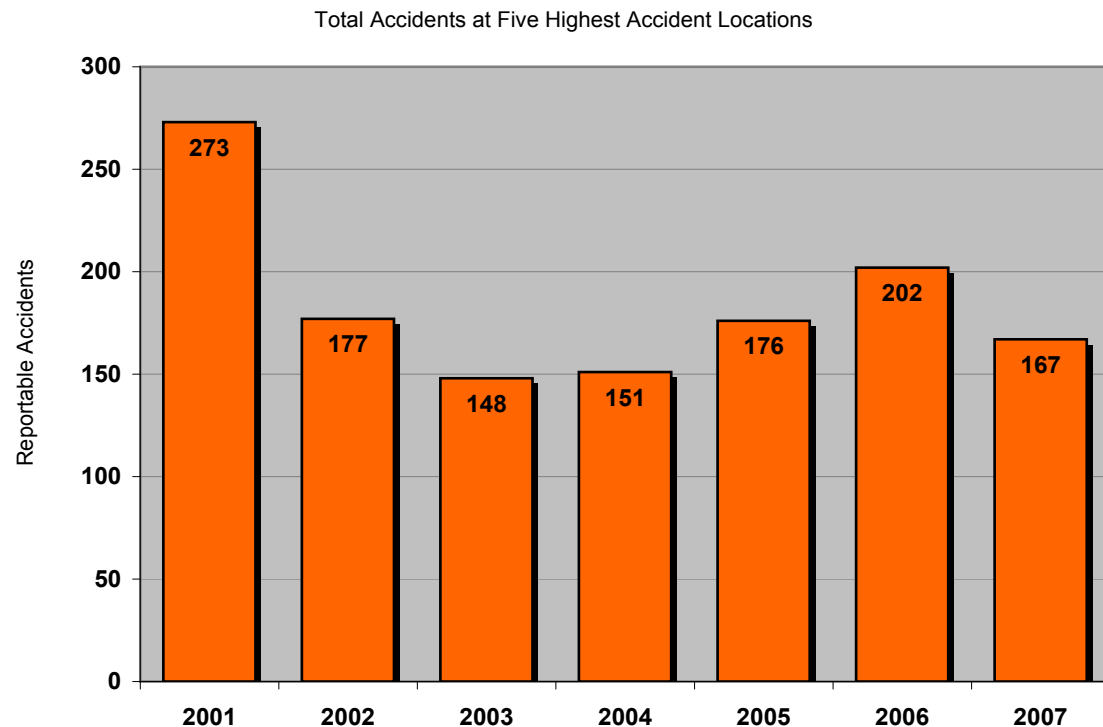
## Identifying Locations for Improvement

Many of the high crash locations throughout the city have benefited from the implementation of engineering improvements. More recently, the Department's focus has been directed toward addressing corridors and intersections where available data and trends indicate that crashes are occurring more frequently. These locations may be identified through the Department's own review of crash data, as well as suggestions from elected officials, the Police Department and the community. **This year, the Department initiated a comprehensive study of traffic fatality and severe injury crash locations to further identify intersections that may benefit from additional safety improvements.**

Annually, most of the high crash locations have progressively experienced a decline in the total number of crashes. This trend is similar to the overall decline in fatalities, severe injuries and crashes occurring citywide.

This downward trend is confirmed when looking at the sum of reportable crashes per year at the five highest crash intersections in the City. As indicated by the overall decline of 39% since 2001, crashes at each of the top five high crash intersections each year have declined. An even more striking trend is the decline at the highest ranked location each year. The top ranked location had the fewest reportable crashes to date (32) in 2003, a 55% decline from 2001. Although the number of crashes has increased slightly since 2003, the number one ranked location in 2007 still exhibited a 42% decline (to 41 from 71 in 2001).

The range between the top twenty reportable crash locations from year to year has also been shrinking. In 1996 the highest ranked location, the intersection of Kings Highway, Linden Boulevard and Remsen Avenue, experienced 81 reportable crashes, while the eight-way tie for twentieth location experienced 33 reportable crashes. This represents a range of 48 crashes. Since then, the range between the top location and the twentieth has become progressively smaller. By 2007, the range between the top ranked (Queens Boulevard and 65th Place with 41 reportable crashes) and the

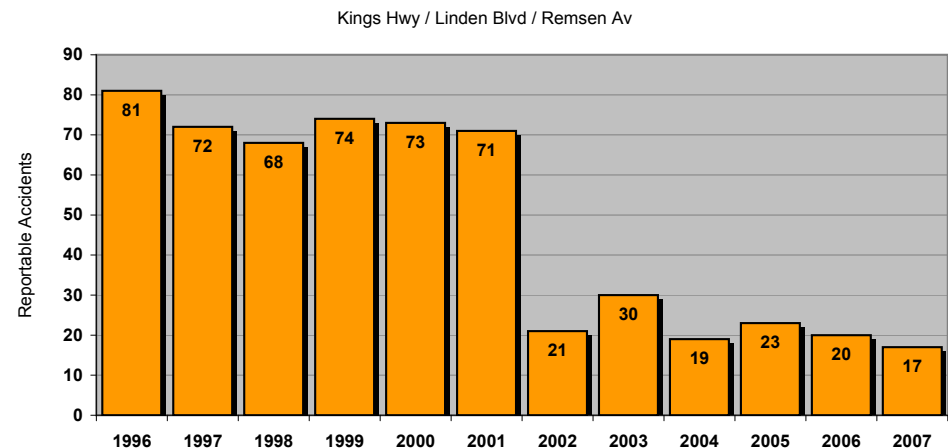


four-way tie for twentieth ranked location (which only reported 21 crashes) shrank to only 20. Given the smaller range, and the significantly lower crash numbers, even if a location is highly ranked in 2007, the annual crash experience at these locations is frequently lower than those in any preceding year. Cumulatively, these account for a significant reduction in total crashes at these locations.

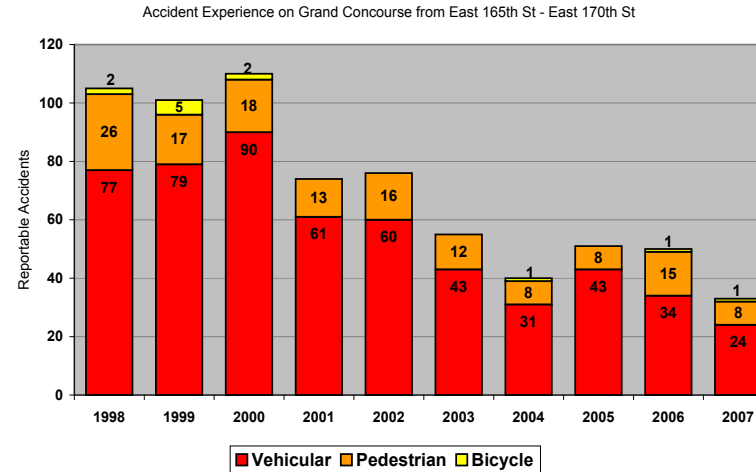
While there are numerous locations throughout the city that are indicative of these trends, there are some notable locations that have experienced a dramatic decline in their crash experience that can be directly related to the implementation of safety improvements and the declining overall trends.

One such location is Kings Highway at the Linden Boulevard and Remsen Avenue intersection. This is a multi-legged, complex intersection that experienced a high number of crashes before improvements were implemented in 2000 and 2001. **For the six years before improvements were implemented, this intersection experienced an average of 73 reportable crashes per year. Data from the six year period after improvements were implemented, 2002 through 2007, show that the average number of crashes per year declined substantially to 22, a 70% decline.**

Some of the improvements that were implemented at this intersection involved signal timing changes, installation of oversized street name signs, new curbside regulations and modifications to bus stops. **In 2008, the eastbound Linden Boulevard corridor approaching the intersection was designed with a “road diet”, calming traffic with a reduction in the number of travel lanes.**



Another location that has shown considerable improvement in safety over the past few years is the Grand Concourse corridor. Beginning with improvements implemented in 1992, the Grand Concourse represented the first corridor-wide safety initiative the Department undertook to improve both pedestrian and vehicular safety along an entire corridor. This approach and several of the treatments that were implemented served as a model for other corridors in the city, most notably Queens Boulevard.



Beginning in 1993 and coinciding with improvements made on the Concourse, annual fatalities (both vehicular and pedestrian) began to drop significantly. In 1993, total fatalities decreased 60% (to six from 15 in 1992) and pedestrian fatalities decreased 50% (to five from 10 in 1992). This downward trend in fatalities has continued each year. In 2003, there was only one pedestrian fatality on the corridor. Although fatalities increased slightly to three in 2004, they declined back to one in 2005 and 2006. **A comparison of average number of fatalities per year for the corridor between the ten years prior to 1993, as compared to the years since (15), indicates that fatalities have declined by 77% (42 Fatalities/31 Pedestrians between 1993-2007 vs. 120 fatalities/100 pedestrians between 1983 and 1992).**

Some of the initial treatments that were implemented on the Concourse included the installation of nearly 3,800 linear feet of pedestrian fencing at high pedestrian volume locations to discourage midblock crossings, the modification of traffic signal timing (to a 120 from a 90 second cycle length) to provide increased time for pedestrians to cross the Concourse, the installation of pedestrian signals at 25 intersections, the installation of red light cameras and the simplification of advance and exit directional signage for motorists travelling between the service and main roadways.

Over the next decade, the Department continually monitored and implemented improvements to enhance these earlier efforts. These treatments included numerous improvements to signage, markings and signals along the entire Concourse. Initiatives such as oversized street name signs, improved lane assignment treatments for turning movements, and additional signal improvements provided for a safer pedestrian and vehicular environment.

In 1998, the Department focused its efforts on improving pedestrian safety at specific locations along the Grand Concourse. This included a targeted Pedestrian Safety Demonstration Project between East 165<sup>th</sup> and 170<sup>th</sup> Streets and at two high crash locations, East 170<sup>th</sup> Street and East 183<sup>rd</sup> Street. **In 2007, pedestrian safety improvements were also made at the intersection of Grand Concourse and East 167th Street.**

At both East 170<sup>th</sup> and East 183<sup>rd</sup> Streets, the Department implemented treatments to improve pedestrian safety. These treatments included high visibility crosswalks at all legs, larger red signal lenses and the installation of additional pedestrian signage. At East 170<sup>th</sup> Street, dual left turn signal phases were installed, and at East 183<sup>rd</sup> Street we increased the all red interval to ensure that left turning vehicles cleared the intersection. These improvements dramatically reduced the incidence of pedestrian crashes. **At East 170<sup>th</sup> Street, pedestrian crashes have decreased significantly by 63% (to three in 2007 from eight in 1999). At East 183<sup>rd</sup> Street, pedestrian crashes also decreased significantly by 70% (to three in 2007 from ten in 1997).**



Example of innovative treatment used as part of the Pedestrian Safety Demonstration Project

The Pedestrian Safety Demonstration Project between East 165<sup>th</sup> and East 170<sup>th</sup> Streets was a more ambitious endeavor. This project narrowed the service roads in each direction to one moving lane by widening the medians from 10 to 18 feet through the use of planters and the installation of a bicycle lane. Additional motorist advisory signage and roadway markings were also installed. **Along this segment of the Grand Concourse, pedestrian crashes decreased by 69% (to eight in 2007 from 26 in 1998).**

# LOCATIONS DISCUSSED IN THIS REPORT

At each location selected for study, an extensive historical crash review is conducted to ascertain whether any particular type of crash was being repeated or if any other patterns existed. In addition, an on-site investigation is conducted involving various disciplines within the Department. Based upon the investigation, the Department develops sets of mitigation measures to address the noted issues and conditions at each respective location. These may include immediate measures that can be implemented in the near term such as the replacement of missing, defaced or outdated signage or the installation of new or improved signage, street lighting upgrades that require minimal repair work or bulb replacement, improved signal timing, phasing or displays, and the refurbishment or addition of roadway markings. At certain locations, recommendations may involve longer term efforts that usually involve roadway reconfiguration or capital work. However, at many of these locations, the Department tries to utilize shorter-term, temporary measures until the projects can be completed through capital work.

This report describes, in detail, the work undertaken at specific locations or corridors. In many cases, improvements have been implemented over the course of several years, and the Department continues to monitor and improve these locations accordingly.