



NEW YORK STATE PEDESTRIAN SAFETY ACTION PLAN

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Department of
Transportation

Governor's Traffic
Safety Committee

Department of
Health

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EXECUTIVE SUMMARY

BACKGROUND

Strategic Highway Safety Plan

As required by federal surface transportation legislation, every state has developed a Strategic Highway Safety Plan (SHSP). The Safety Vision as described in New York's SHSP is *"New York's safety community will continue to work to ensure that its customers - those who live, work and travel in New York State - have a safe, efficient, balanced and environmentally sound transportation system, and that safety is appropriately considered in all education, enforcement, engineering and emergency response activities in New York State in order to reduce fatal and injury crashes"*.

Improving pedestrian safety is one of seven emphasis areas identified in New York's SHSP and is the focus of this action plan. Recommendations in this plan will be included as strategies in an updated SHSP.

Purpose

The purpose of this Pedestrian Safety Action Plan is to identify the current safety conditions and to recommend a distinct set of engineering, education, and enforcement countermeasures that can be accomplished over the next 5 years to improve pedestrian safety.

Funding available to accomplish the objectives outlined in the plan will include Highway Safety Improvement Program (HSIP) funds as well as other state and federal funding sources. Full implementation of the Pedestrian Safety Action Plan is contingent upon anticipated funding remaining available through the duration of the program.

Focus State

The Federal Highway Administration's (FHWA) safety office has been working aggressively to reduce pedestrian deaths by focusing on and providing additional resources to cities and states with the highest pedestrian fatalities and/or fatality rates. New York State was identified as a pedestrian focus state and New York City as a pedestrian focus city. FHWA supported development of the plan through direct involvement and by providing

The plan identifies current safety conditions and recommends a set of education, engineering and enforcement countermeasures to improve pedestrian safety.

consulting services from Vanasse Hangen Brustlin, Inc. (VHB). VHB is headquartered in Watertown, Massachusetts with New York offices in Albany, Hauppauge, White Plains and New York City. In addition to FHWA, this plan was developed by New York State Department of Transportation (NYSDOT), Governor's Traffic Safety Committee (GTSC), Department of Health (DOH), Department of Motor Vehicles (DMV), local governments and several Metropolitan Planning Organizations, with the advisement and technical support of VHB.

Scope

Complete Streets and the Americans with Disabilities Act

Walking is the most fundamental form of transportation used by everyone, people of all ages and physical abilities. This Pedestrian Safety Action Plan is part of New York State's broad effort to improve traffic safety. It supports the State's Complete Streets Law and is consistent with the Americans with Disabilities Act Transition Plan.

Governor Andrew M. Cuomo signed the Complete Streets Law on August 15, 2011, requiring state, county and local agencies to consider the safety and convenience of all users when developing transportation projects that receive state and federal funding and are subject to NYSDOT oversight.

Complete Streets features enhance safety, mobility and accessibility while promoting a cleaner environment. They help encourage people to be active, improving their health and reducing traffic congestion and air pollution in the process. The NYSDOT incorporates Complete Streets considerations into everything it does.

Statewide Pedestrian Program

New York State promotes pedestrian safety across the state through funding, training and technical support. This Pedestrian Safety Action Plan focuses on strategies and projects that improve pedestrian safety outside of the five boroughs of New York City, which has a targeted safety initiative.

Focus Communities

The plan recommends statewide improvements in urban areas at uncontrolled crosswalks and signalized intersections. In addition, since nearly 50% of all pedestrian crashes outside of New York City occur in 20 areas identified in Table 4 (page 18) as Focus Communities, these communities will be given extra attention in order to improve pedestrian safety as follows:

- ❖ **Engineering:** Provide funding to local municipalities via a pedestrian safety project solicitation with priority given to projects in the focus areas.

- ❖ Education and Public Awareness: In the short term, include a statewide awareness campaign via TV, radio and social media. In the long term, provide targeted messaging in the focus communities.
- ❖ Enforcement: Focus outreach, enforcement training and enforcement details in the focus communities.

Coordination

The successful implementation of the strategies described in this plan will require cooperation, communication and coordination amongst many safety partners, including but not limited to the 3 key agencies (NYSDOT, DOH and GTSC), metropolitan planning organizations, traffic safety boards, bicycle/pedestrian coordinators, local municipalities, and police agencies.

Statewide Pedestrian Safety Goals

- ❖ Reduce pedestrian fatalities by 20% from 335¹ in 2013 to 268 in 2021.
- ❖ Reduce pedestrian injuries by 10% from 16,278² in 2013 to 14,650 in 2021.

While the findings and recommendations contained in this plan focus on areas outside New York City, the safety goals are statewide in scope and include outcomes resulting from this plan, as well as ongoing efforts in New York City and other municipalities.

KEY FINDINGS

- ❖ More than 300 pedestrians are killed and 15,000 injured each year in New York State (including NYC) due to being hit by motor vehicles.
- ❖ The pedestrian fatality trend statewide (including NYC) was relatively flat over the 10 year period between 2004 and 2013. The average number of pedestrian fatalities during those years was 306 per year.
- ❖ Pedestrians comprise more than 25% of the fatalities due to motor vehicle crashes in New York State (including NYC).

¹ Source: FARS – Fatality Analysis Reporting System

² Source: NYS Department of Motor Vehicles (NYSDMV) and the Institute of Traffic Safety Management (ITSMR)

The findings below include pedestrian crashes that occurred between 2009 and 2013 outside of NYC.

- ❖ More than 23,700 pedestrians were hit by motor vehicles; 48% of the crashes occurred at an intersection; 47% were not at an intersection and 5% were unknown.
- ❖ 3% (719) of the pedestrian crashes resulted in a fatality; 32% (7,522) resulted in a serious injury; and 52% (12,459) were identified as a possible injury in police crash reports.
- ❖ 48% (11,364) of the pedestrian crashes occurred in the 20 focus communities identified in Table 4.
- ❖ 88% (20,897) of the pedestrian crashes occurred on roads in an urban area. A map of urban areas and focus communities is shown in Figure 5.
- ❖ Pedestrian crashes on state roads are generally more severe than pedestrian crashes on local roads. Pedestrian crashes away from an intersection are generally more severe than those occurring at an intersection.
- ❖ 24% of the pedestrian crashes were on state roads; however state owned roads comprise only 14% of the public road mileage in New York State.
- ❖ 76% (16,551) of the pedestrian crashes were on locally owned roads.
- ❖ 62% of the urban crashes occurred when a pedestrian was crossing the road while 12% occurred when a pedestrian was walking along the road. The remaining 26% were unknown or in various miscellaneous categories.
- ❖ 69% of the urban crossing crashes occurred at intersection or mid-block locations where there was no traffic signal.
- ❖ The most frequent actions taken by drivers prior to hitting a pedestrian were driving straight ahead (48%), making a left hand turn (30%), making a right hand turn (10%), backing up (3%) and starting in traffic (3%).
- ❖ 61% of the contributing factors were related to the driver, while 37% were related to the pedestrian.
 - When contributing factors were noted for the driver, the top 2 were driver inattention and failure to yield.

- When contributing factors were noted for the pedestrian, the top 3 were pedestrian error, pedestrian failed to yield, and alcohol impairment.

RECOMMENDED ACTIONS

The intent of the Engineering, Education and Enforcement recommendations below are to improve pedestrian safety on both state and locally owned roads. The plan recommends that the improvements begin on roads owned by the state during the first year of the program and expand to the local municipalities in subsequent years via a “safety project solicitation”. Beginning on state roads will provide the opportunity to test implementation strategies and develop best practices that can be shared with both state and local partners. It is recognized that this Pedestrian Safety Action Plan only addresses a portion of the pedestrian crashes and potential for pedestrian safety improvement. As actions are implemented, the plan will be monitored, evaluated for success, and enhanced accordingly in order to continue to increase pedestrian safety in subsequent years.

ENGINEERING

- ❖ Implement engineering countermeasures that improve pedestrian safety in urban areas. A map of urban areas and focus communities is shown in Figure 5.
 - Launch a systemic safety program that improves safety for pedestrians at uncontrolled marked pedestrian crosswalks on state roads in an urban area. Uncontrolled locations include sites where there is a marked mid-block crosswalk, as well as intersection locations with a marked crosswalk across the through street where the side street is controlled and the through street is not. Implement improvements by 2021.
 - Study 50% of the Signalized Intersections on state roads in an urban area and recommend countermeasures to improve safety for both pedestrians and vehicles by 2018. Implement safety recommendations as indicated by the studies by 2021.
 - Launch a “safety project solicitation” that provides Highway Safety Improvement Program (HSIP) funding for municipalities to implement a systemic safety program on locally owned roads. All locally owned roads in an urban area will be

eligible; however, priority will be given to the focus communities identified in Table 4.

- Expand NYSDOT's existing Pedestrian Safety Corridor Program by identifying and implementing pedestrian safety improvements in 5 additional corridors over the next 5 years.
- ❖ Emphasize locations with high numbers of pedestrian crashes in the New York State Department of Transportation's Annual Regional Work Program.

EDUCATION AND ENFORCEMENT

- ❖ Raise both driver and pedestrian awareness of the pedestrian safety issue and promote behavior change in order to reduce pedestrian injuries and fatalities statewide.
- ❖ Conduct a statewide Public Information and Education Campaign.
- ❖ Increase knowledge among law enforcement regarding pedestrian safety and increase enforcement through targeted "Operation SEE! BE SEEN!" pedestrian safety mobilization efforts.
- ❖ Conduct dedicated enforcement details to address pedestrian safety.

DATA AND DATA SYSTEMS

- ❖ Enhance the data and processes in New York State's information systems to include the following: 1) enhanced intersection data; 2) available transit data; 3) a process to analyze all public roads in order to identify local locations with a high number of pedestrian crashes and corridors with a potential for crash reduction; 4) a linear referencing system that includes local roads; and 5) additional traffic counts on local roads.
- ❖ Introduce a pilot pedestrian counting program to investigate best practices and determine pedestrian volumes and exposure.
- ❖ Develop a pedestrian safety web page available to the public that contains information pertinent to pedestrian safety, as well as dash boards showing pedestrian crash trends.

I. INTRODUCTION

TRENDS AND COSTS

Pedestrian safety is an issue that affects everyone; regardless of gender, age, or socioeconomic status. The analysis of police crash reports shows that almost 20,000 pedestrians were killed, injured or possibly injured due to being hit by a motor vehicle between 2009 and 2013 in New York State (outside of New York City). The economic cost that results from these crashes was estimated to be approximately \$5.82 billion over the five-year period or \$1.16 billion annually. Fatal pedestrian crashes account for three percent of the pedestrian crashes and 77 percent of the total cost³.

Table 1. Pedestrian Crashes by Severity and Year

Year	K (Fatal)	A (Incapacitating Injury)	B (Non- Incapacitating Injury)	C (Possible Injury)	PDO (Property Damage Only)	Total
2009	139	680	927	2447	591	4784
2010	142	688	872	2565	523	4790
2011	137	694	825	2585	646	4887
2012	164	682	812	2505	646	4809
2013	137	575	767	2357	616	4452
Total	719	3319	4203	12459	3022	23722

Table 1 above includes the distribution of pedestrian crashes by severity for the analysis period.

³ These numbers were calculated based on the comparison between the KABCO scale which is used by law enforcement to classify injuries and the Abbreviated Injury Scale (AIS) Levels with weight values for the respective crash types for each scale.

Figure 1 below shows the number of pedestrian crashes outside NYC from 2009-2013.

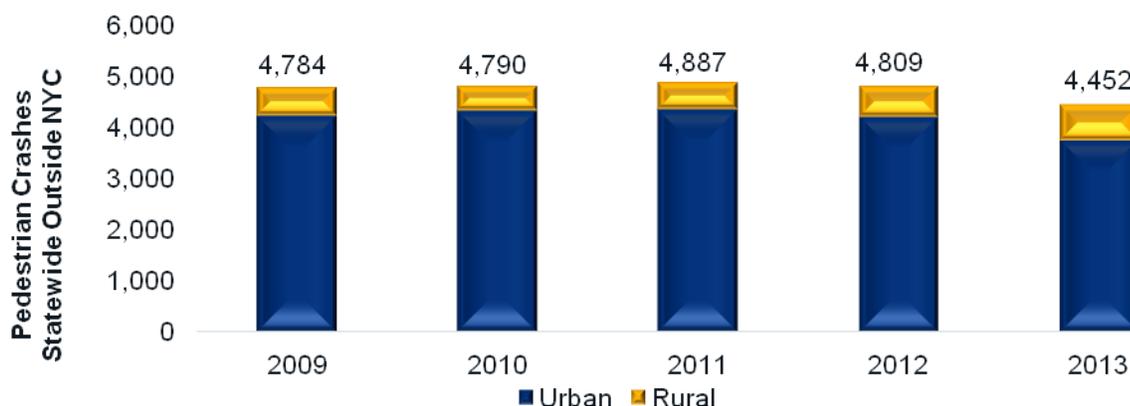


Figure 1. Pedestrian Crash Trends by Area Type

PURPOSE AND OBJECTIVES

The purpose of this New York State Pedestrian Safety Action Plan is to utilize available data to evaluate pedestrian crash patterns and develop a statewide approach that improves safety and complements on-going initiatives in NYC and other areas of the state. By effectively using data to identify the problem areas and risk factors, funding can be focused on the areas and strategies with the greatest potential to reduce fatal and serious injuries to pedestrians.

Addressing pedestrian safety requires a comprehensive approach. Therefore, the plan outlines a coordinated application of countermeasures consisting of 3 of the 4 E's of safety (engineering, enforcement and education) over a 5 year period. The 4th "E" - emergency response plays a critical role in reducing death and disability in the post-crash phase. Emergency response will be addressed in an update of the Strategic Highway Safety Plan in 2017.

Specific objectives of the plan include the following:

- ❖ Identify risk factors present for pedestrians on state and locally owned roads.
- ❖ Identify counties and municipalities, as well as specific locations and corridors where there is a potential to reduce pedestrian crashes.
- ❖ Identify a toolbox of countermeasures.
- ❖ Identify appropriate performance metrics in order to monitor progress, evaluate effectiveness and adjust approaches accordingly.

STUDY METHODOLOGY

New York State Department of Transportation uses a statistical method to identify high accident locations (HALs) on state highways as part of an annual network screening process. To augment the HAL analysis, and with a focus on pedestrian crashes, the Pedestrian Safety Action Plan study included a systemic analysis of the crash data. A systemic approach identifies locations where risk is greatest, regardless of crash frequency.

SYSTEMIC APPROACH

A systemic approach proactively addresses widespread safety issues and minimizes crash potential by implementing low cost countermeasures throughout the roadway network. A systemic improvement is one that is widely implemented based on high-risk roadway features that are correlated with crash types rather than crash frequency. The systemic problem identification entails a system-wide crash analysis that targets specific crash characteristics at the system level. Applying the systemic approach may help address crash types that have not been identified through the network screening process.

FHWA's Systemic Safety Project Selection Tool (FHWA-SA-13-019) provided the framework for the systemic planning component of this plan. A link to the Systemic Safety Project Selection Tool can be found in Appendix F: Helpful Links.

Identifying risk factors associated with pedestrian crashes began with a system-wide review of crash data. Data was extracted from NYSDOT's crash data systems in an ArcGIS format. The data included a five-year sample (2009-2013) of pedestrian crashes for urban and rural locations (outside New York City) on state and locally owned roadways. Pedestrian crashes were summarized based on intersection types (intersection/non-intersection), location types (urban/rural), ownership (state/local), traffic control types (signalized/non-signalized), and other characteristics. The crash, vehicle and apparent factor tables from the Safety Information Management System (SIMS) were joined to inventory data in the Roadway Inventory System (RIS) to further examine potential contributing factors for all involved vehicle types.

While the crash data were helpful in describing general statistics and trends in pedestrian crashes some of the critical elements that describe risk were incomplete or not available. For example, factors such as pedestrian signing, pavement markings, presence of transit, etc. were not described in the crash data, but were considered critical to describing conditions that affect risk. Other elements such as speed were only partially available. For that reason, the project team selected a random sample of

100 pedestrian crash locations and identified additional risk factors by reviewing roadway characteristics using Google Earth.

Results of the systemic data analysis and the random sample analysis can be found in Section II and Section III, respectively. Information related to countermeasures can be found in Section IV.

WORKSHOPS

Two workshops were held to review data analysis results, share ideas and solicit expertise and feedback. The first workshop was held in September 2014 and focused on both vehicle and pedestrian safety at intersections. The second workshop was held in January 2015 and included discussions on engineering, education and enforcement strategies to improve the safety of pedestrians. The workshops included participants from Federal Highway Administration (FHWA), New York State Department of Transportation (NYSDOT), Governor's Traffic Safety Committee (GTSC), Department of Health (DOH), Metropolitan Planning Organizations (MPO's), Department of Motor Vehicles (DMV), Department of State, as well as Albany, Schenectady and Saratoga counties. Workshop participants recommended practical countermeasures that could be implemented at specific locations with a potential crash issue, as well as those that were appropriate to deploy systemically. Feedback received during both workshops was used to develop the plan.

II. FINDINGS – SYSTEMIC DATA ANALYSIS OF PEDESTRIAN CRASHES IN NEW YORK STATE

WHERE: STATEWIDE

During the 5 year period from 2009 to 2013 there were 23,722 pedestrian crashes in New York State outside NYC. Thirty-five percent of the crashes resulted in a severe or moderate injury or fatality (Type K-A-B) and 52% of the crashes resulted in a possible injury (Type C). In addition, there were on average over 3,000

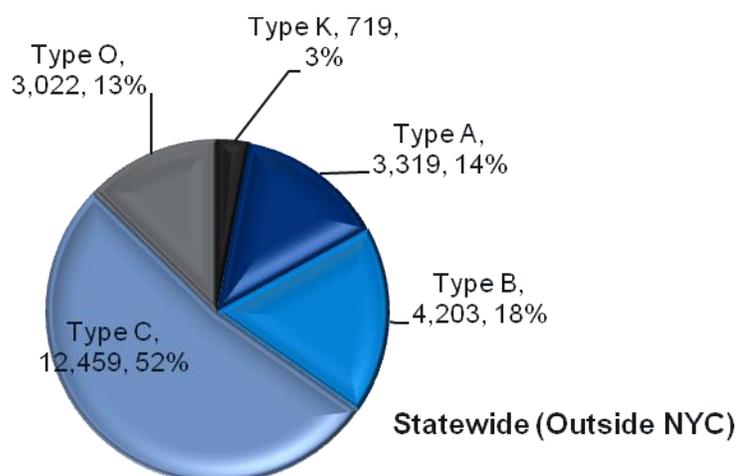


Figure 2. Pedestrian Crash Severity (2009-2013)

hospitalizations and 12,000 visits to the emergency department each year, resulting in over \$197 million in medical costs. Table 2 below contains a list of severity codes.

Table 2. Crash Severity Codes

Severity Codes	Severity Description
K	Fatality
A	Severe injuries including skull fractures, internal injuries, broken or distorted limbs, unconsciousness, severe lacerations, and unable to leave the scene without assistance.
B	Moderate injuries include visible injuries such as a "lump" on the head, abrasions, and minor lacerations.
C	Slight injuries include hysteria, nausea, momentary unconsciousness, and complaint of pain without visible signs of injury.
O	Property Damage Only, without visible signs of injury or complaint of pain

The vast majority of fatal, injury and possible injury crashes occurred in urban areas while property damage only crashes were more evenly split between urban and rural areas as shown in the figure below.

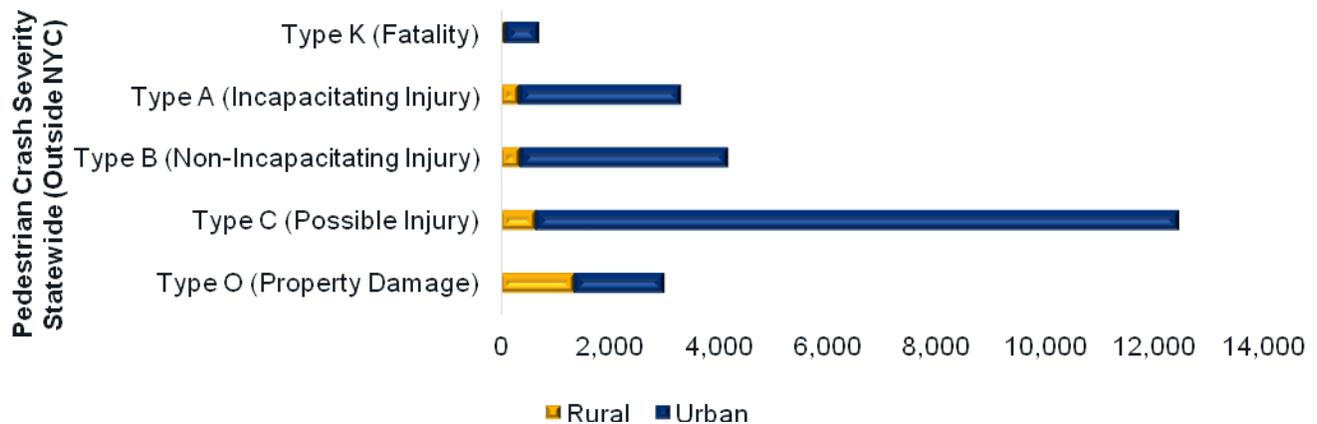


Figure 3. Pedestrian Crash Severity by Area Type (2009-2013)

A map of all of the pedestrian crashes in the state, outside New York City, can be found in Figure 4. Maps showing the urban areas as well as the 20 counties and municipalities with the highest crash frequency outside of New York City can be found in Figure 5.

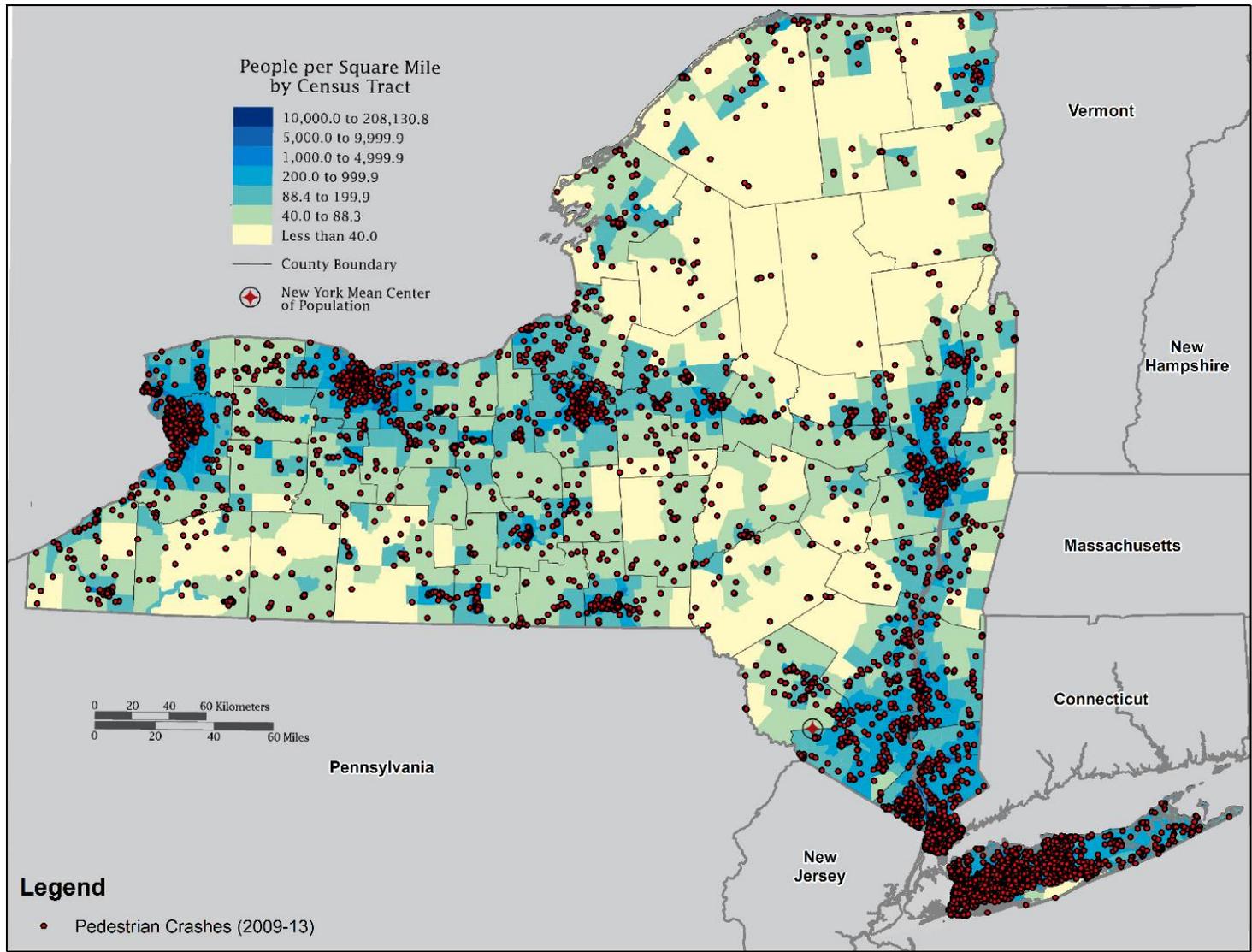
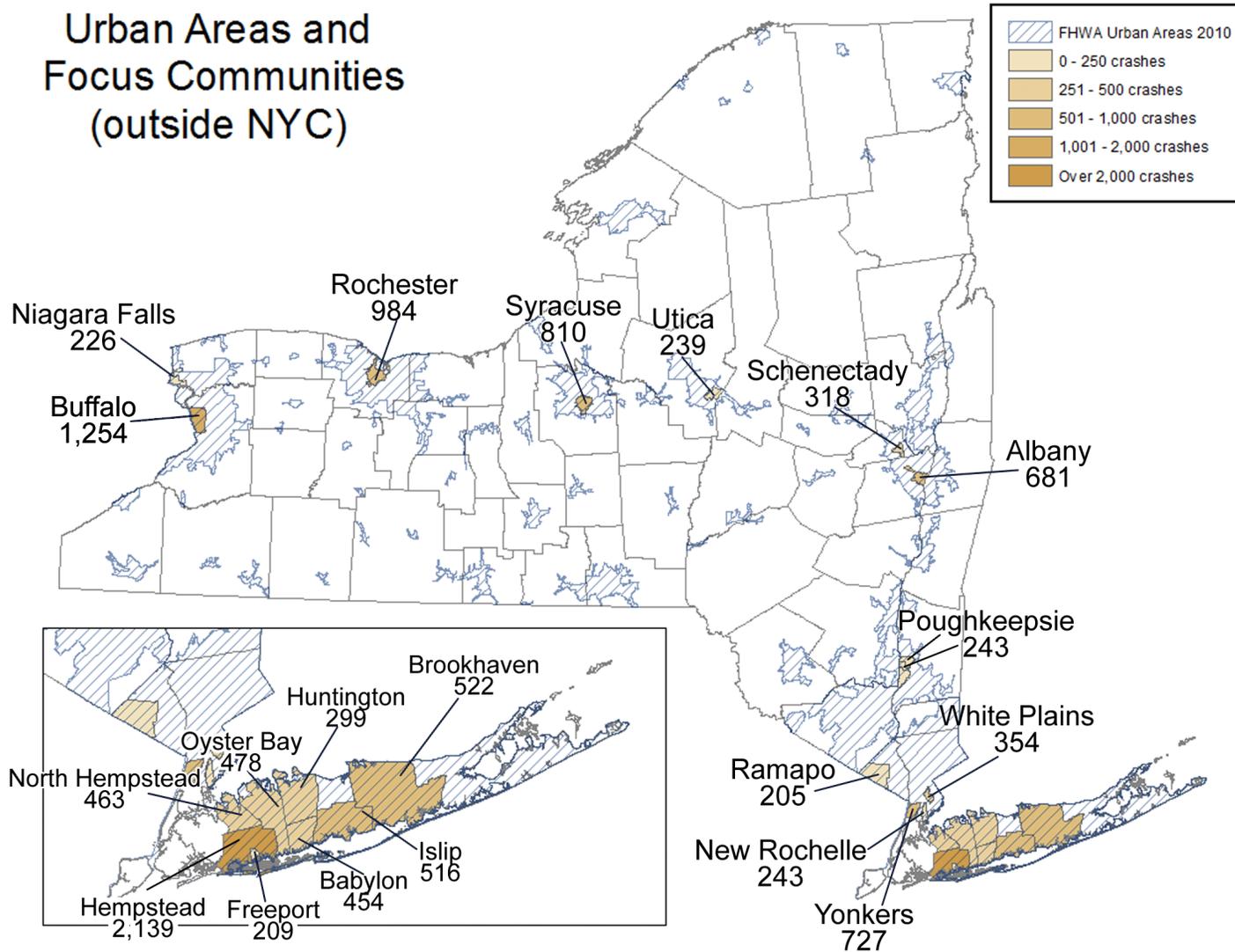


Figure 4. Pedestrian Crashes by Area Type and Population (2009-2013) Outside of New York City

WHERE: URBAN AREAS, COUNTIES AND FOCUS COMMUNITIES

Urban Areas and Focus Communities (outside NYC)



Focus Counties (outside NYC) for Pedestrian Crashes

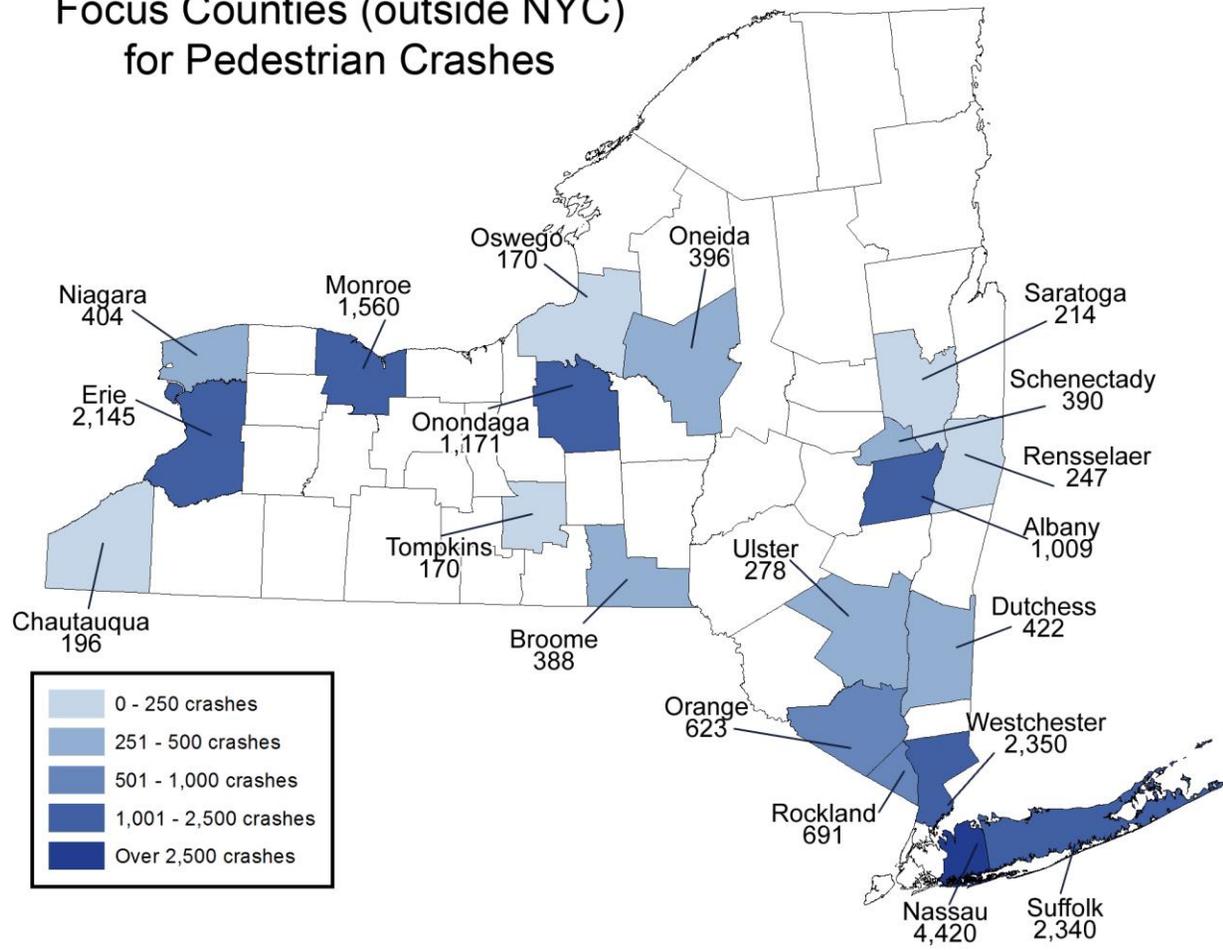


Figure 5. Urban Areas, Focus Communities and Counties

Counties and communities ranked by the number of pedestrian crashes is shown in **Table 3** and Table 4.

Table 3. Focus Counties

Rank	County (by # crashes)	Crashes
1	Nassau	4,420
2	Westchester	2,350
3	Suffolk	2,340
4	Erie	2,145
5	Monroe	1,560
6	Onondaga	1,171
7	Albany	1,009
8	Rockland	691
9	Orange	623
10	Dutchess	422
11	Niagara	404
12	Oneida	396
13	Schenectady	390
14	Broome	388
15	Ulster	278
16	Rensselaer	247
17	Saratoga	214
18	Chautauqua	196
19	Oswego	170
19	Tompkins	170

Table 4. Focus Communities

Rank	City/Town/Village (by # crashes)	County	Crashes
1	Hempstead	Nassau	2,139
2	Buffalo	Erie	1,254
3	Rochester	Monroe	984
4	Syracuse	Onondaga	810
5	Yonkers	Westchester	727
6	Albany	Albany	681
7	Brookhaven	Suffolk	522
8	Islip	Suffolk	516
9	Oyster Bay	Nassau	478
10	N. Hempstead	Nassau	463
11	Babylon	Suffolk	454
12	White Plains	Westchester	354
13	Schenectady	Schenectady	318
14	Huntington	Suffolk	299
15	New Rochelle	Westchester	243
16	Poughkeepsie	Dutchess	243
17	Utica	Oneida	239
18	Niagara Falls	Niagara	226
19	Freeport	Nassau	209
20	Ramapo	Rockland	205

WHERE: URBAN

The census definition of “urbanized area” as well as “urban clusters” was used to define urban areas during the data analysis process. Using this definition, some of the lower population areas included Red Hook (1,961 people), Canajoharie (2,229 people), and Attica (2,547 people). Some of the higher population urban areas include Buffalo (261,310 people), Rochester (210,565 people), and Syracuse (145,170 people). Urban area maps can be found in Figure 5 and the Functional Classification and National Highway System Viewer. See the Appendix F: Helpful Links section for more information.

The majority of the pedestrian crashes throughout the state were located in urban areas (88 percent) as shown in Figure 6. Between 2009 and 2013, the number of pedestrian crashes peaked in 2011 with

The majority of the pedestrian crashes throughout the state were located in urban areas.

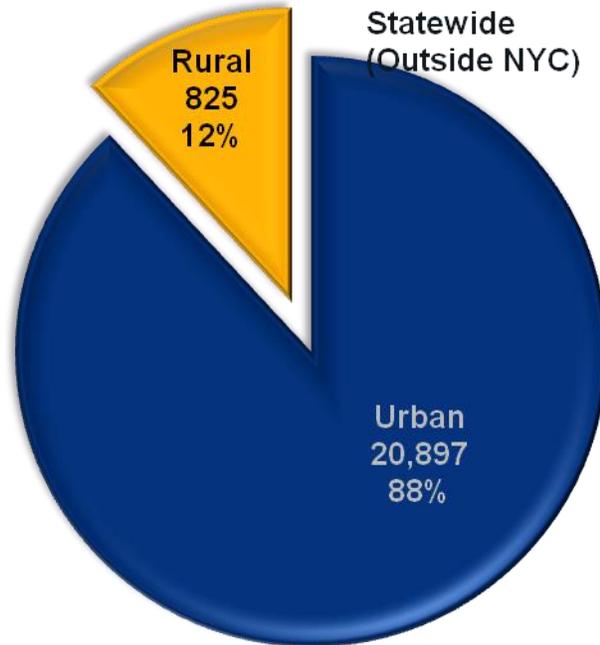


Figure 6. Pedestrian Crashes by Rural vs. Urban (2009-2013)

4,887 crashes although during this period the crashes per year were fairly consistent, with an average of 4,744 crashes per year. Approximately 76% of the pedestrian crashes statewide occurred on locally owned roads and 24% occurred on state owned roads, as shown in Figure 7. However, 85% of the public road mileage in New York State is locally owned while 14% is owned by the state. This suggests that pedestrian crashes are over represented on state owned roads.

The majority of pedestrian crashes occurred in urban areas regardless of ownership as shown in the figure below.

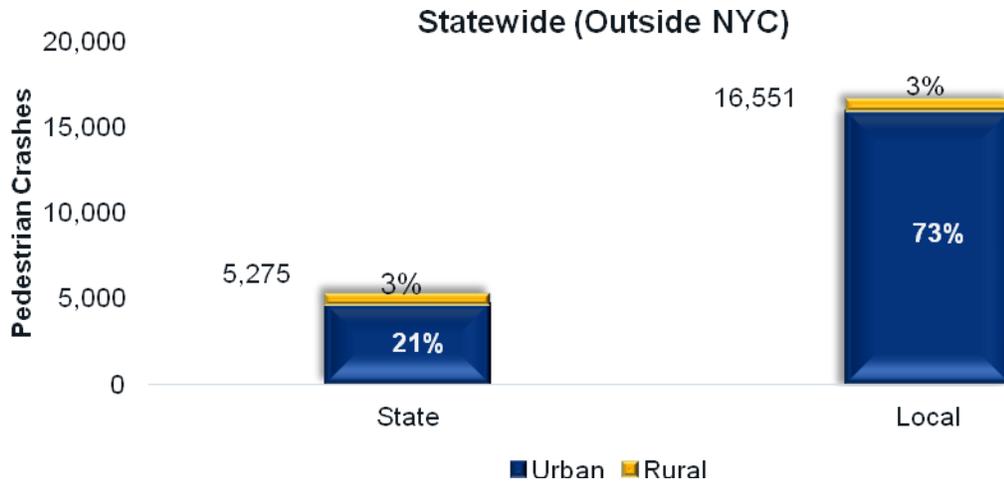


Figure 7. Pedestrian Crashes by Roadway Ownership (2009-2013)

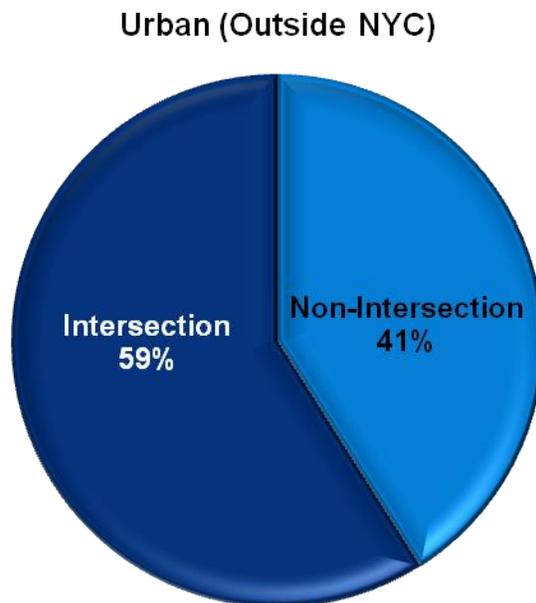


Figure 8. Pedestrian Crashes by Location (2009-2013)

Pedestrian crashes in the urban and rural areas of New York State outside of NYC were a nearly even split between intersections (48%) and non-intersections (47%). Figure 8 shows that pedestrian crashes in urban areas outside NYC were more prevalent at intersection locations (59%) although many occurred at non-intersection locations as well (41%). Figure 9 illustrates that most of the crashes in urban areas resulted in a fatality, injury or possible injury (92 percent). Figure 10 illustrates the total number of signalized and non-signalized urban locations with pedestrian crashes as well as the number of signalized/non-signalized urban locations with pedestrian crashes that resulted in a fatality or injury (Type K-A-B). Non-signalized locations include both intersection and mid-block locations.

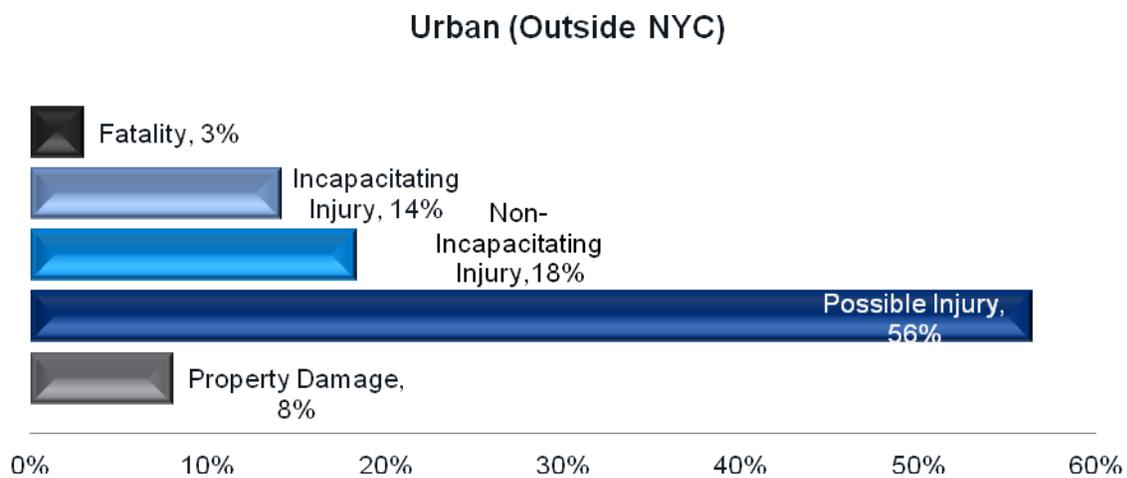


Figure 9. Pedestrian Crash Severity (2009-2013)

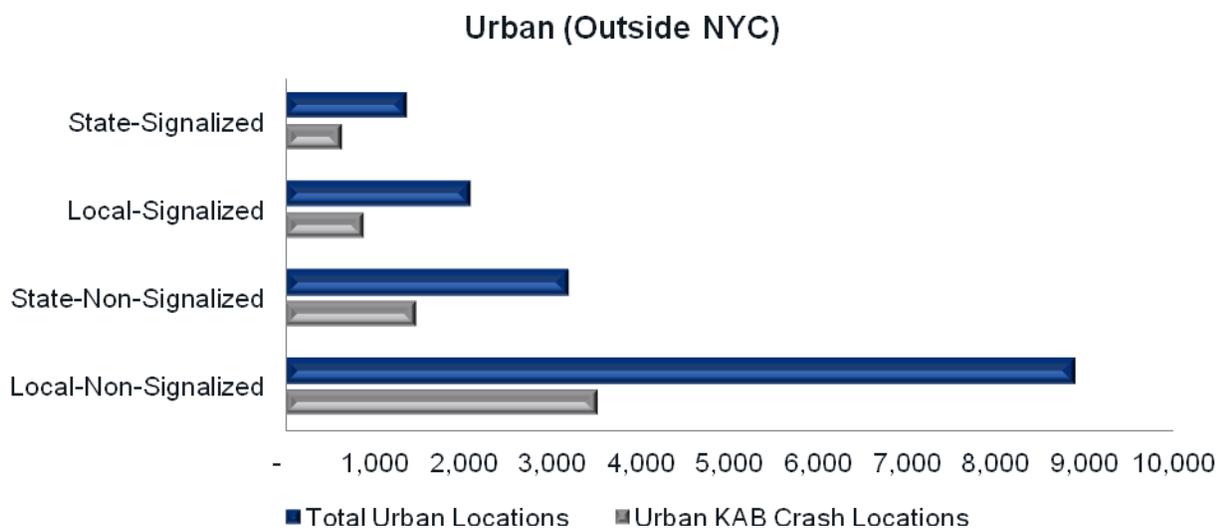


Figure 10. Crashes at Signalized vs. Non-Signalized Locations (2009-2013)

WHEN

The majority of crashes occurred during “light” conditions as shown. This corresponds with the time of day as shown in Figure 12.

Pedestrian Crashes peaked at 5pm.

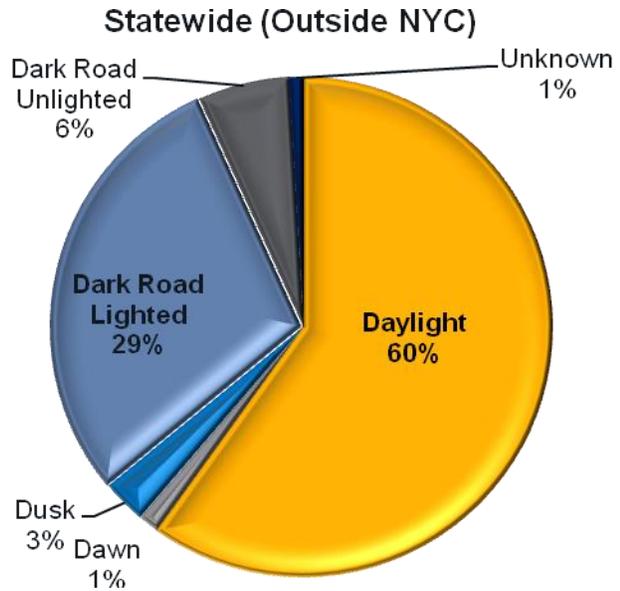


Figure 11. Pedestrian Crashes by Light Conditions (2009-2013)

Most of the crashes occurred in the afternoon and evening hours, peaking at 5:00 PM.

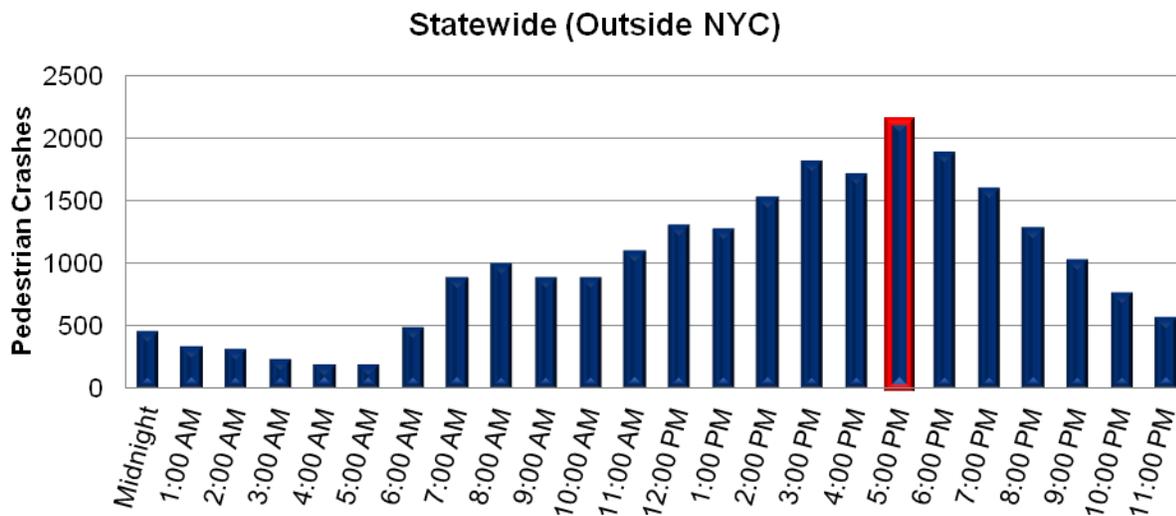


Figure 12. Pedestrian Crashes by Type of Day (2009-2013)

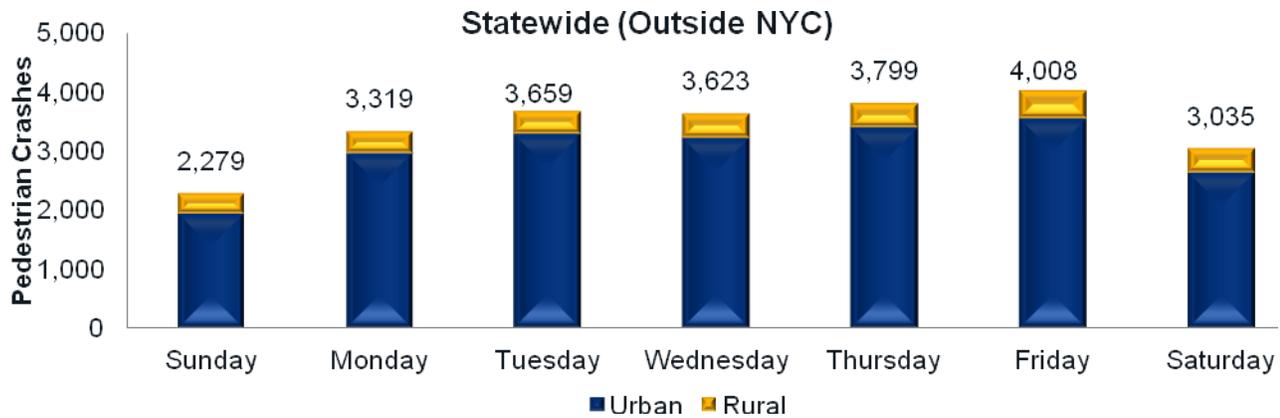


Figure 13. Pedestrian Crashes by Day of the Week (2009-2013)

Figure 13 shows pedestrian crashes by day of the week. Crashes are at their lowest level on Sundays and steadily increase throughout the week, peaking on Fridays.

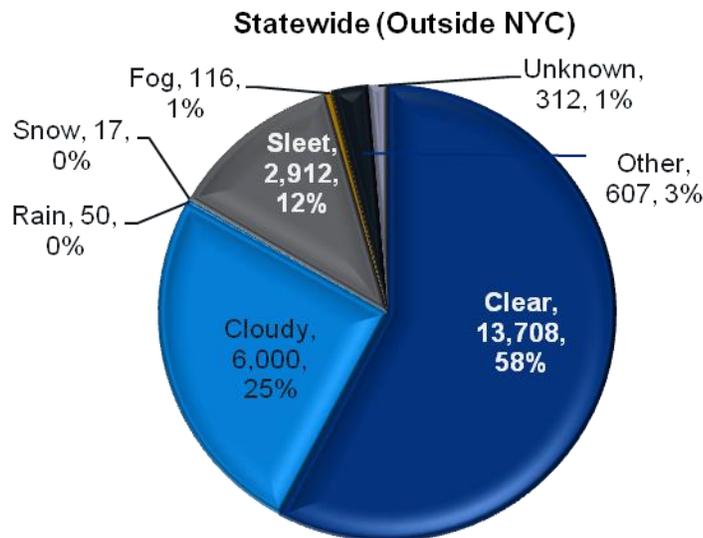


Figure 14. Pedestrian Crashes by Weather Conditions 2009-2013

As shown in Figure 14, most of the crashes occurred during clear or cloudy conditions (83 percent) although 12 percent occurred during sleet conditions.

Pedestrian crashes vary throughout the year, ranging from a low of 1,677 crashes in April to a high of 2,367 crashes in November. The number of pedestrian crashes by

month is shown in Figure 15.

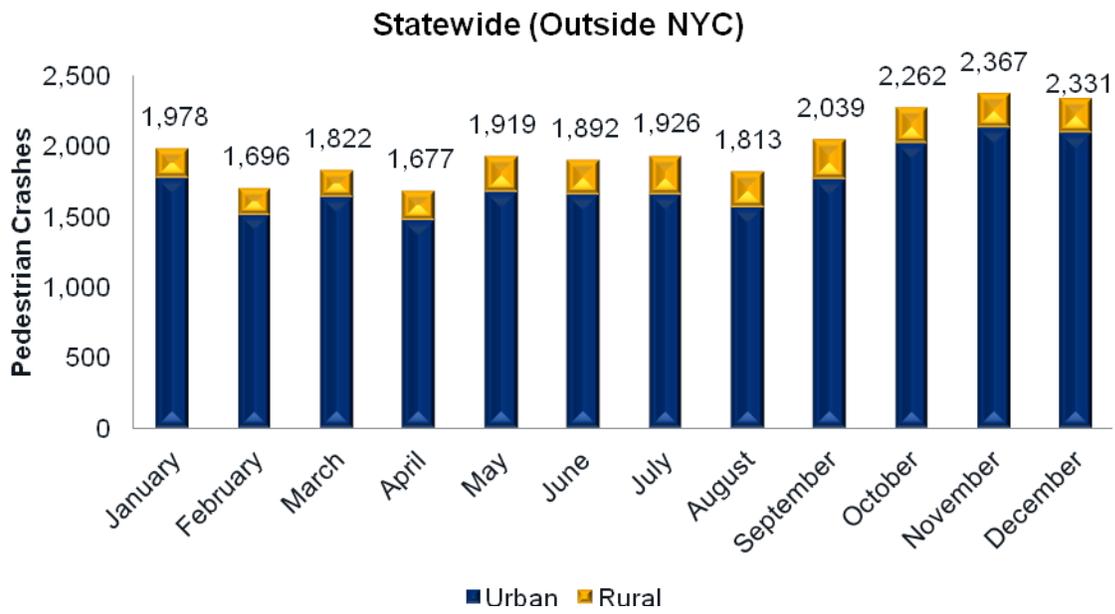


Figure 15. Pedestrian Crashes by Month (2009-2013)

HOW

As shown in Figure 16, fifty-five percent of the fatal and injury (Type K-A-B) pedestrian crashes in urban areas occurred when pedestrians were crossing the roadway. Eleven percent of the fatal and injury crashes (Type K-A-B) occurred when pedestrians were walking along the highway.

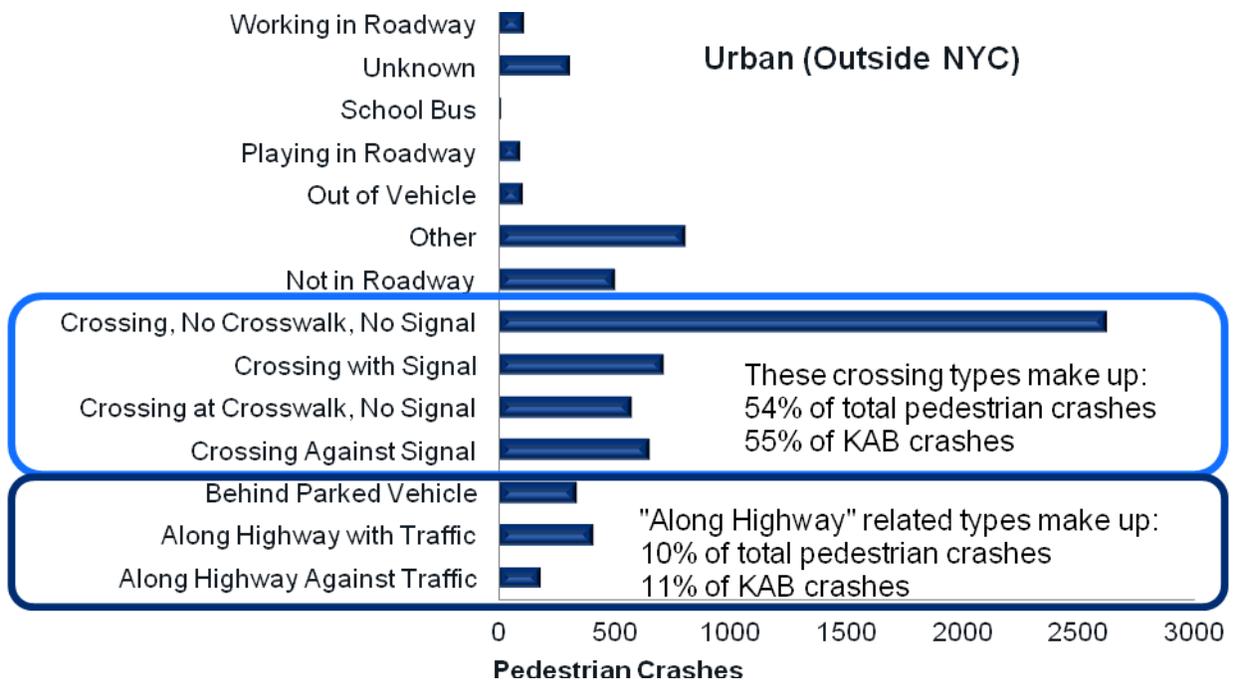


Figure 16. KAB Pedestrian Crashes Action Types (2009-2013)

One or more contributing factors can be recorded on a police report at the time of a crash. Contributing factors can be attributed to a driver or a pedestrian and can help provide insight into the possible events related to a crash, as well as identify unknowns for further investigation. For example, the top three apparent factors noted in crash reports for

The majority of the pedestrian crashes occurred when pedestrians were crossing the road.

drivers were: 1) inattention, 2) failure to yield, and 3) other. The “other” category offers limited, if any, information on the driver’s behavior during the time of the crash. Further investigation into the 20 percent of “other” driver contributing factors would help to

further understand the factors surrounding the crash. The top three contributing factors noted in crash reports for pedestrians were: 1) pedestrian error, 2) failure to yield, and 3) inattention. Similar to the “other” driver contributing factor, it is unknown what constitutes “pedestrian error” and may be worth additional investigation. A comparison of driver and pedestrian contributing factors is shown in Figure 17. The vast majority of crashes involve motorists and pedestrians who live in New York State.

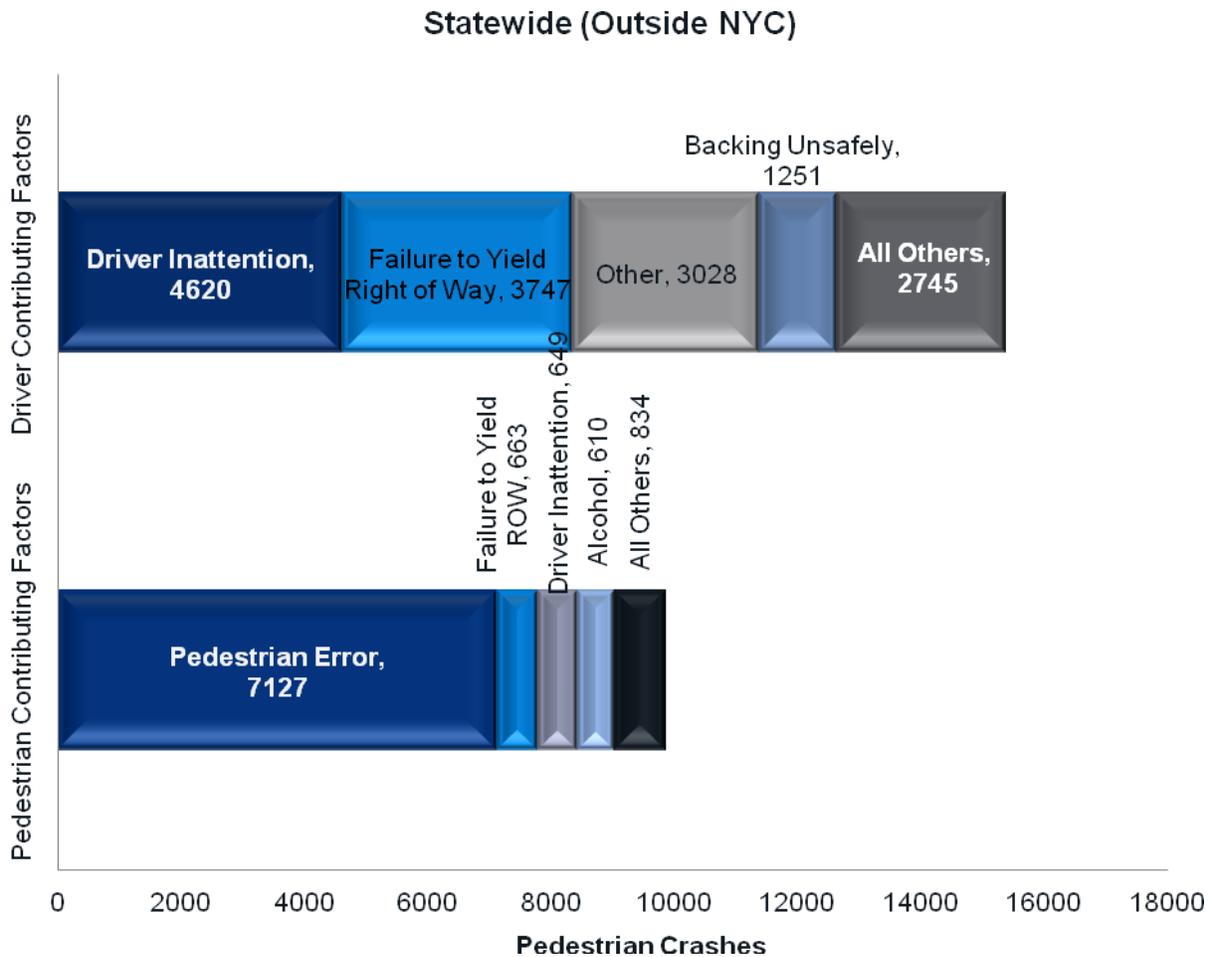


Figure 17. Apparent Factors for Pedestrian Crashes (2009-2013)

WHO

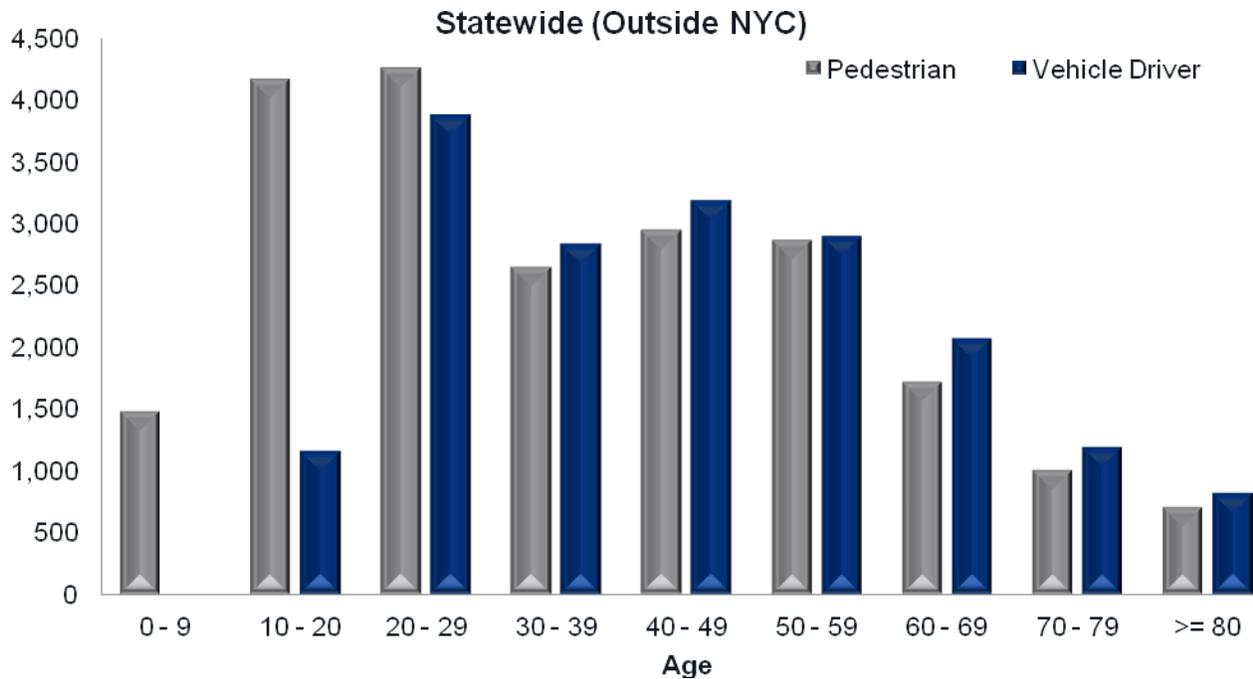


Figure 18. Age of Pedestrians and Drivers Involved (2009-2013)

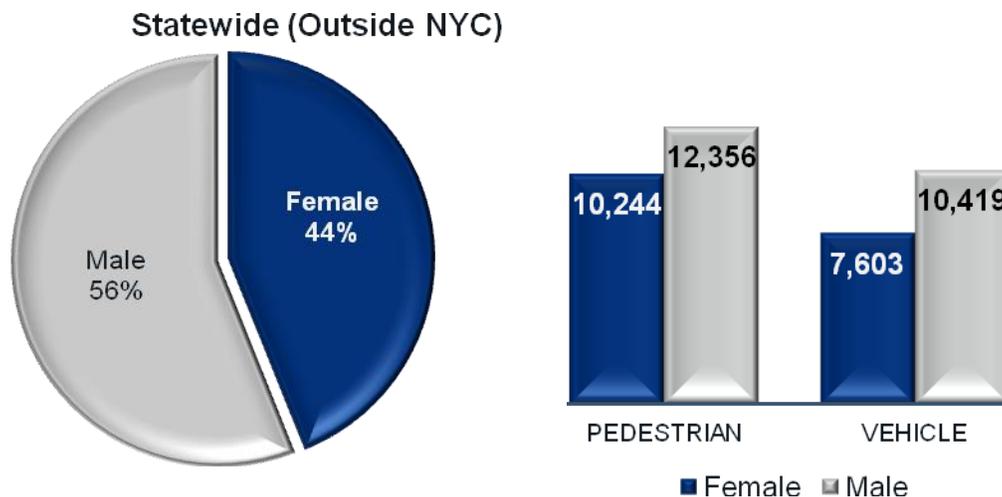


Figure 19. Pedestrian and Driver Gender (2009-2013)

As shown above, pedestrians between the ages of 10 and 29 were involved in more crashes than any other age group (39%). Drivers between the ages of 20 and 29 were

Most pedestrians involved in crashes were between the ages of 10 and 29 years old.

involved in the highest number of pedestrian crashes (22 percent). It should be noted that while the number of drivers involved in pedestrian crashes appears to be on the lower end for the 10-20 age group, many individuals are too young to drive. Male pedestrians and drivers were involved in slightly more pedestrian crashes than females. Overall males were involved in 56 percent of the crashes – comprising

58 percent of vehicle drivers and 55 percent of the pedestrians. Cars, vans and pickups were the vehicle type most often involved in pedestrian crashes. The proportion of vehicle types involved in pedestrian crashes is shown in Figure 20. A comparison of the driver’s license registrations is shown in Figure 21.

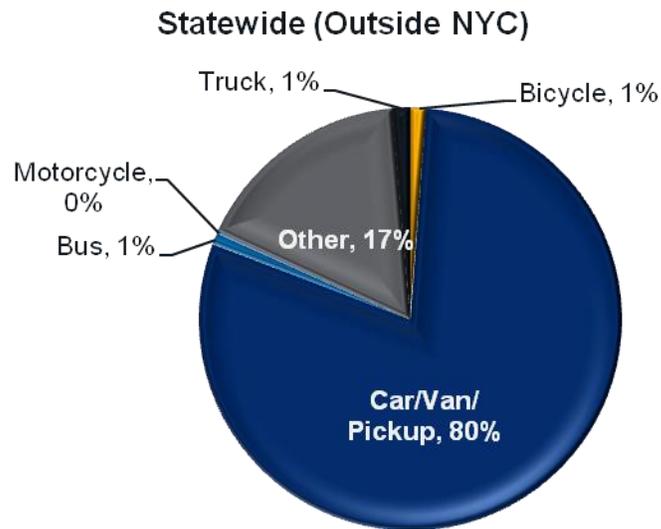


Figure 20. Vehicles Involved in Pedestrian Crashes (2009-2013)

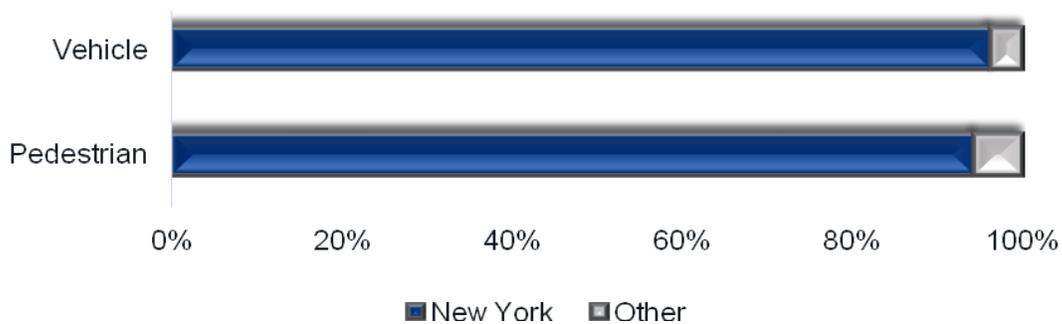


Figure 21. Drivers License Registration (2009-2013)

III. FINDINGS – ASSESSING RISK FACTORS

In order to gather information on risk factors that were not readily available in the crash data a random sample of 100 pedestrian crash locations was reviewed using aerial mapping and Google Street View. This sample was conducted on the four crossing pedestrian action crash type categories described in Figure 16 (e.g., “crossing, no crosswalk, no signal”, and “crossing with signal”) and the number of sites reviewed for each category was weighted according to the number of fatal and injury crashes (type K-A-B). The following data was collected for each location:

- Pedestrian markings
- Crosswalk style – standard, continental, ladder
- Pedestrian warning signs
- Median refuge
- Traffic Signal
- Pedestrian signal
- Street lighting
- Number of travel lanes at crosswalk
- Travel distance (feet) at crosswalk
- Lack of crossing opportunity, i.e., presence of nearest marked crosswalk or signalized intersection within 600’ of the sample location.
- Presence of transit modes

The information collected from the random sample was used to assess risk factors and potential countermeasures that could be applied to address those factors. The number of crashes associated with each risk factor was estimated by assuming that the characteristics of the sample were consistent with the overall urban roadway network. The benefit cost (BC) ratio was then determined to derive the list of countermeasures that could be applied on a systemic level. Countermeasures that were low-cost and highly effective received the highest BC ratio. Results of the systemic data analysis and the random sample review, as well as practical experience, NYSDOT policies and practices and the BC ratio were all considered when developing the systemic countermeasures in this plan.

ACTION PLAN

A BALANCED APPROACH TO PEDESTRIAN SAFETY

Data analysis revealed that pedestrian crashes include multiple contributing factors. Therefore, the plan identifies a multi-faceted approach that includes Engineering, Education, and Enforcement (3 E's of safety) countermeasures to improve safety for pedestrians on both state and local roads. Engineering recommendations approach the safety problem from the roadway and vehicle perspectives, while education and law enforcement recommendations focus on road user behavior and prevention. Emergency response is the 4th E of Safety and will be addressed in an update of the Strategic Highway Safety Plan. The table below includes the major recommendations and the analysis findings that support the approach.

Finding	Recommendation
Pedestrian crashes are widely dispersed but predominately urban.	Focus program in urban areas.
The majority of pedestrian crashes occur on local roads; however the state system is over-represented in crashes to centerline miles.	Begin implementation on the state system. Include a local project solicitation in subsequent years.
There is a nearly even split between pedestrian crashes at intersection and non-intersection locations outside NYC. The majority of pedestrian crashes occur when pedestrians are crossing the road.	The systemic component of the plan includes engineering improvements to signalized intersections, intersections with an uncontrolled marked pedestrian crosswalk and midblock crosswalks.
Pedestrian crashes occur at random locations. More than 50% of the crashes occur at locations where there is no marked crosswalk and no signal.	Education and Enforcement elements that address decisions and behaviors of both pedestrians and drivers can help address some of the randomness of pedestrian crashes.
More than 50% of the urban crashes occur in 20 municipalities.	Prioritize Engineering, Education and Enforcement implementations accordingly.
The most frequent behavioral factors include inattention, failure to yield, alcohol and pedestrian error.	Include Education and Enforcement elements that address decisions and behaviors of both pedestrians and drivers.

ENGINEERING ACTION PLAN

Coordinating Agency: New York State Department of Transportation

ENGINEERING OBJECTIVE 1

Take proactive steps to reduce crash potential and address target crash types.

Strategy

Launch a systemic safety program that implements the following countermeasure packages at uncontrolled marked pedestrian crosswalks on state roads in an urban area. Uncontrolled marked pedestrian crosswalks include locations where there is a marked mid-block crosswalk, as well as intersection locations with a marked crosswalk across the through street where the side street is controlled and the through street is not.

- ❖ Implement a basic sign and pavement marking treatment package by 2019. The basic package includes high-visibility crosswalks, double posted Pedestrian Crossing (W11-2) signs with a fluorescent yellow-green background, advance pedestrian crossing signs, retroreflective sign posts, and a yield line with a Yield Here to Pedestrian (R1-5) sign at midblock locations.
 - Although the basic treatment package should be implemented at most uncontrolled marked pedestrian crosswalks, engineering judgment will need to be exercised when determining whether a countermeasure is appropriate at a particular location. Additional information on the uncontrolled crosswalk packages can be found in Appendix A: Systemic Countermeasure Packages.
- ❖ Implement an enhanced treatment package at an estimated 20% of the eligible locations by 2021. Enhanced treatments include yield lines, raised pedestrian refuge areas, signalization options and parking restrictions. Sites should be prioritized based upon number of lanes, speed limit, annualized average of the daily traffic volume (AADT), pedestrian exposure, pedestrian generators, and crash history.

Strategy

Study 50% of the signalized intersections on state roads in an urban area by 2018 and recommend countermeasures to improve safety for both pedestrians and vehicles.

- ❖ Safety improvements considered should include those listed in Appendix B: Signalized Intersection Improvements. Countermeasures include, but are not

limited to, high-visibility crosswalks, signal re-timing, backplates with retro reflective borders, pedestrian count down signals, additional warning and regulatory signs, left turn phasing, leading pedestrian intervals, accessible pedestrian signals, and no turn on red signs.

- ❖ Create a study work product format that can be used as direct input to a construction contract.
- ❖ Implement safety recommendations as indicated in the intersection studies by 2021.

Strategy

Create a multi-region consultant contract that can be used for a variety of traffic engineering and safety needs including design services to complete the work required to meet the goals and objectives described in the Pedestrian and Intersection Safety Action Plans.

Performance Measures

- ❖ Number of uncontrolled marked pedestrian crosswalks treated with a basic package.
- ❖ Number of uncontrolled marked pedestrian crosswalks treated with an enhanced treatment.
- ❖ Number of signalized intersections studied by region.
- ❖ Number of signalized intersection improvements by type by region.
- ❖ Number of pedestrian crashes in urban areas (before and after).
- ❖ Number of pedestrian fatalities and serious injuries in urban areas (before and after).

ENGINEERING OBJECTIVE 2

Encourage local municipalities to implement systemic approaches to improve pedestrian safety.

Strategy

Launch a “safety project solicitation” that provides Highway Safety Improvement Program (HSIP) funding for municipalities to implement a systemic safety program on locally owned roads. Priority will be given to the focus communities identified in **Table 4**. Countermeasures include, but are not limited to:

- ❖ High-visibility crosswalks
- ❖ Pedestrian warning and regulatory signs
- ❖ In-street pedestrian crossing signs (with local sponsor)
- ❖ Pedestrian signals with pedestrian countdown timers
- ❖ Accessible pedestrian signals
- ❖ Signal retiming
- ❖ Intersection illumination (with local agreement for maintenance and utility costs)

Strategy

Work through the Metropolitan Planning Organizations to provide guidance and support to local municipalities in the areas of pedestrian safety planning and implementation. Support could include the following:

- ❖ Data packages that include, but are not limited to, pedestrian crash data on state and local roads, crash density maps, risk factors etc.
- ❖ Pedestrian safety assessments.
- ❖ Review of pedestrian generators, lane use and infrastructure inventories.
- ❖ Technical guidance and engineering support.
- ❖ Interpretation of standards.
- ❖ Best practices.
- ❖ Training and webinars.

Performance Measures

- ❖ Number of local projects that receive funding for systemic pedestrian safety improvements.
- ❖ Amount of HSIP funding obligated by local municipalities for pedestrian safety improvements.
- ❖ Number of municipalities that received assistance as well as type of assistance. For example, the number of trainings and webinars or data packages provided.

- ❖ Number of pedestrian fatalities and serious injuries in urban areas on local roads (before and after).

ENGINEERING OBJECTIVE 3

Improve pedestrian safety along corridors at locations exhibiting a high number of pedestrian crashes and a potential for pedestrian safety improvement.

Strategy

Expand the existing pedestrian safety corridor program.

- ❖ Identify and implement pedestrian safety countermeasures in at least 5 corridors over the next 5 years. Countermeasures could include, but are not limited to, the following:
 - Pedestrian packages found in Appendix A: Systemic Countermeasure Packages.
 - Traffic calming measures - See the NYSDOT Highway Design Manual, Chapter 25 and Appendix E: Traffic Calming.
 - Road diets.
 - Sidewalk improvements.
 - Raised pedestrian refuge medians, curb extensions and corner islands.
 - Properly located bus stops.
 - Intersection illumination - assumes local agreement for maintenance and utility costs.
 - Signal installations and enhancements.
- ❖ Suggested areas include one location in the Hudson Valley and Long Island plus one location in the Western, Central and Capital regions of the state. The focus counties and communities identified in **Table 3** and **Table 4** will be used to focus analysis efforts in identifying the corridors with the greatest potential for crash reduction.
- ❖ Develop a Pedestrian Safety Corridor Evaluation Guide. The guide will identify a process that can be followed to improve pedestrian safety along a corridor.

Additional information on the Pedestrian Safety Corridor Guide can be found in Appendix D: Pedestrian Corridor Safety Guide.

Performance Measures

- ❖ Number of pedestrian corridors where pedestrian safety improvements are implemented.
- ❖ Funding obligated for pedestrian corridor safety improvements.
- ❖ Corridor crash rates (before and after).

ENGINEERING OBJECTIVE 4

Improve safety for pedestrians at locations with a higher than expected number of pedestrian crashes.

Strategy

Add the Pedestrian Priority Investigation Locations (PILs) to the annual NYSDOT Regional Work Program. Pedestrian PILs are locations where the percentage of pedestrian crashes is higher than expected. They are identified every year via an automated procedure that runs in the Safety Information Management System (SIMS). Adding the Pedestrian PILs to the regional work program ensures that a safety investigation will be conducted on a portion of the Pedestrian PILs annually.

Performance Measures

- ❖ Number of safety investigations performed on Pedestrian PILs.

PUBLIC INFORMATION AND EDUCATION ACTION PLAN

Coordinating Agency: New York State Department of Health

Engineering can improve the transportation environment; making the system safer for pedestrians and motorists alike. However, education and enforcement are critical in addition to engineering to guide pedestrians and drivers to make safer decisions; enforce vehicle and traffic laws affecting pedestrian safety and prevent pedestrian injuries and deaths. Responsibility for addressing pedestrian safety issues is shared among several state and local agencies/organizations in New York. Effective solutions to these issues will require collaborative efforts among those agencies responsible for engineering, education and enforcement. One of the challenges in this program area is that persons of all ages, from young children to older adults, are part of the at-risk group. Public information and education (PI&E) programs and other strategies to reduce deaths and injuries among pedestrians must be integrated to address all pedestrians. Equally important is the need to continue efforts to raise awareness and educate motorists on how to safely share the road with pedestrians. This includes educating motorists, pedestrians, and law enforcement on New York State's Vehicle and Traffic Laws.

OBJECTIVE

Raise awareness among drivers and pedestrians of the pedestrian safety issue and promote behavior change in order to reduce pedestrian injuries and fatalities statewide.

Strategy

Develop consistent pedestrian safety outreach materials.

- ❖ Create public service announcements for TV and radio as well as messaging for social media.
- ❖ Create print materials for distribution by federal, state and local partners.
- ❖ Develop a toolkit that provides information and resources for use by groups such as schools, community organizations, judges, prosecutors and local leaders.
- ❖ Provide multi-lingual materials as needed.

Strategy

Conduct statewide and targeted awareness campaigns.

- ❖ Deliver media marketing outreach
 - Short term: Include a statewide campaign via TV, radio and social media.

- Long term: Provide targeted messaging to the focus communities identified in **Table 4**.
- Engage and utilize local partners such as the county Traffic Safety Boards (TSB), local health departments and other partner organizations to deliver the education campaign.
- Use multi-media outlets such as:
 - TV – broadcast and cable
 - Radio
 - Billboards
 - Social Media
 - Partner agency websites

Strategy

Provide technical support for traffic safety partners and monitor the program.

- ❖ Identify state and local champions, including the MPO's, to serve as liaisons between local safety partners and the statewide Pedestrian Safety Action Plan (PSAP) team.
- ❖ Provide training to partner organizations, such as public health, traffic safety, law enforcement, planners, judges and magistrates, school personnel, senior citizens and faith-based organizations, regarding pedestrian safety education program development and delivery.
- ❖ Provide mechanisms for technical assistance and distribution of educational materials and resources.
- ❖ Establish a method to track partnership development and progress.

Performance Measures

- ❖ Number of impressions for media outreach (TV, radio, billboards, social media).
- ❖ Number of trainings delivered and number of individuals trained by group (judges, prosecutors, community groups, etc.)
- ❖ Number of printed materials created and distributed.
- ❖ Number of times the pedestrian safety toolkit is accessed.

ENFORCEMENT ACTION PLAN

Coordinating Agency: Governor's Traffic Safety Committee (GTSC)

ENFORCEMENT OBJECTIVE

Increase knowledge among law enforcement regarding pedestrian safety and increase enforcement through targeted "Operation SEE! BE SEEN!" pedestrian safety mobilization efforts.

Strategy

Encourage law enforcement to emphasize pedestrian safety.

- ❖ Utilize GTSC's network (Highway Safety Program Representatives and Law Enforcement Liaisons) to encourage police agencies to apply for police traffic service grants in the high pedestrian crash areas.

Strategy

Train state, county and local law enforcement to understand their role pertaining to pedestrian safety enforcement in the focus communities.

- ❖ Provide "Pedestrian Safety for Law Enforcement" training in the focus communities.
- ❖ Provide tools and facilitate communication at the local level to ensure judicial systems are aware of the issue and support enforcement activities.

Strategy

Encourage law enforcement agencies to conduct intensive street level outreach and enforcement details during an "Operation SEE! BE SEEN!" pedestrian safety awareness week.

- ❖ Focus outreach and enforcement details in the focus communities while encouraging all law enforcement agencies to participate utilizing GTSC police traffic services grant funding.
- ❖ Distribute educational tools specific to vehicle and traffic laws that impact pedestrian safety.
- ❖ Utilize the GTSC law enforcement liaisons to track law enforcement agency participation and citations issued.

Performance Measures

- ❖ Number of law enforcement trainings conducted
- ❖ Number of law enforcement officials/officers trained
- ❖ Number of driver citations and warnings issued during mobilization
- ❖ Number of pedestrian citations and warnings issued during mobilization

DATA AND DATA SYSTEMS ACTION PLAN

Coordinating Agency: New York State Department of Transportation

SYSTEMS OBJECTIVE 1

Increase NYSDOT's ability to identify pedestrian crash risk factors by enhancing crash data systems.

Strategy

Enhance the data and processes in New York State's Accident Location Information System (ALIS) to include the following:

- ❖ Identify, collect and store information on each intersection in the state so the data can be used for enhanced safety analysis and the identification of intersection risk factors.
- ❖ Add available transit layers for enhanced safety analysis.
- ❖ Add a process that includes crash analysis on all public roads in order to identify locations with high numbers of pedestrian crashes and pedestrian corridors with a potential for crash reduction.
- ❖ Review a subset of crash reports in order to identify patterns where the written descriptions in the crash reports do not match what has been coded in the Accident Location Information System (ALIS). Specific areas of interest include, but are not limited to, location information and vehicle and pedestrian contributing factors.

Strategy

Track program performance to determine countermeasure effectiveness

- ❖ Establish a procedure to track locations that receive systemic pedestrian treatments.
- ❖ Track before and after crash frequency at treated locations to assess program effectiveness.
- ❖ Develop a pedestrian safety web page available to the public that contains information pertinent to pedestrian safety, as well as dash boards showing pedestrian crash trends and performance measures.

Strategy

- ❖ Develop a pilot pedestrian counting program to determine pedestrian volumes and exposure rates. Guidance from the following publications should be used:
 - NCHRP Report 797 - Guidebook on Pedestrian and Bicycle Volume Data Collection and NCHRP Report 770 – Estimating Bicycling and Walking for Planning and Project Development: A Guidebook. See links in Appendix F: Helpful Links for more information.

Performance Measures

- ❖ Number of intersections added to ALIS.
- ❖ Number of transit layers added to ALIS.
- ❖ Number of pilot locations counted.

SYSTEMS OBJECTIVE 2

Enhance the ability to perform crash analysis on the local road system.

Strategy

Continue efforts to create a linear referencing system (LRS) that includes all locally owned public roads.

Strategy

Continue efforts to take additional traffic counts on local roads. Local counts will provide the ability to calculate vehicle miles of travel (VMT) and crash rates on local roads and streets in a similar manner as is currently done for state roads.

Performance Measure

- ❖ Number of traffic counts taken on locally owned roads.

SUPPORTING NYSDOT POLICY AND LEGISLATION

POLICY AND LEGISLATION OBJECTIVE

Ensure relevant NYSDOT policy and guidance is consistent with and supports the objectives and strategies of the Pedestrian Safety Action Plan.

Strategy

Review and if warranted; update or finalize policy or legislation on the following:

- ❖ Raised pedestrian median refuges & corner islands.
- ❖ In-street pedestrian crossing signs.
- ❖ Pedestrian lighting design.
- ❖ High-visibility crosswalks at signalized intersections.
- ❖ Uncontrolled pedestrian crosswalks.
- ❖ Pavement markings in advance of a marked crosswalk at uncontrolled locations.
- ❖ Leading pedestrian intervals at traffic signals.
- ❖ Flashing yellow arrows at traffic signals.
- ❖ Rectangular Rapid Flashing Beacons (RRFB) and High-intensity Activated CrossWalk beacons (HAWK).
- ❖ Accessible Pedestrian Signals.
- ❖ Complete Streets guidance and checklist.
- ❖ Chapter 18 of the NYSDOT Highway Design Manual.

In addition:

- ❖ Develop a tool that calculates standard amber and red clearance intervals that are consistent with the most recent guidelines.
- ❖ Consider adding marked midblock crosswalks to the current law that disallows parking within 20' of a crosswalk at an intersection.

IV. GLOSSARY

Term	Definition
3 E's of Safety	Engineering, Education, and Enforcement
4 E's of Safety	Engineering, Education, Enforcement, and Emergency Response
Abbreviated Injury Scale (AIS)	An integer scale developed by the Association for the Advancement of Automotive Medicine to rate the severity of individual injuries.
Accessible Pedestrian Signal (APS)	A device that communicates information about pedestrian signal timing in a non-visual format.
Advance Yield Line	A pavement marking placed before a crosswalk to encourage drivers to yield in advance of a crosswalk.
Americans with Disabilities Act (ADA)	Civil rights legislation that prohibits discrimination and guarantees that people with disabilities have the same opportunities as everyone else to participate in the mainstream of American life -- to enjoy employment opportunities, to purchase goods and services, and to participate in State and local government programs and services.
Annual Average Daily Traffic (AADT)	An estimated average of the daily traffic volume on a route segment at a particular count station location.
ArcGIS	ArcGIS is a geographic information system (GIS) for working with maps and geographic information.
Association for the Advancement of Automotive Medicine	The Association for the Advancement of Automotive Medicine (AAAM) is a professional multidisciplinary organization dedicated entirely to motor vehicle crash injury prevention and control.
Backplates with Retroreflective Borders	A thin strip of material that extends outward from and parallel to a signal face on all sides of a signal housing to provide a background for improved visibility of the signal indications.
Benefit Cost (BC) Ratio	A Benefit Cost ratio reveals the most economically efficient investment alternative.
Contributing Factor	Contributing factors can be attributed to a driver or a pedestrian and can help provide insights into the possible events related to a crash as well as identify unknowns for further investigation.
Controlled Intersections	Controlled intersections have traffic lights, yield signs or stop signs to control traffic.
Corner Island	A small section of pavement or sidewalk where pedestrians can stop before finishing crossing a road.

Term	Definition
Corridor	The path that a highway follows.
Corridor Approach	The plan for a specified length of highway.
Countermeasure	A strategy designed to address a specific safety problem defined by crash data.
Crash Severity Codes	<ul style="list-style-type: none"> • K - Fatality • A - Severe injuries including skull fractures, internal injuries, broken or distorted limbs, unconsciousness, severe lacerations, and unable to leave the scene without assistance. • B - Moderate injuries include visible injuries such as a "lump" on the head, abrasions, and minor lacerations. • C - Slight injuries include hysteria, nausea, momentary unconsciousness, and complaint of pain without visible signs of injury. • O - Property Damage Only, without visible signs of injury or complaint of pain
Crosswalk	The portion of the roadway where pedestrians are permitted to cross the street; may be marked or unmarked.
Curb Extension	A section of sidewalk extending into the roadway at an intersection or midblock crossing that reduces the crossing width for pedestrians and may help reduce traffic speeds.
Double Posted Pedestrian Warning Signs	Pedestrian signs that are posted on the right and left sides of the road.
Engineering Instruction	Engineering Instructions define engineering policy and standards.
Fatality Analysis Reporting System (FARS)	FARS is a nationwide census providing NHTSA, Congress and the American public yearly data regarding fatal injuries suffered in motor vehicle traffic crashes.
Federal Highway Administration (FHWA)	An agency within the U.S. Department of Transportation (U.S. DOT) responsible for the administration of the nation's Federal-Aid highway funds.
Systemic Safety	A systemic approach to safety looks at risk across an entire roadway system rather than at specific locations.
Flashing Yellow Arrow	The flashing yellow arrow signal indication may be displayed to indicate a left turn may proceed with caution after yielding to oncoming traffic.
Functional Classification	Functional classification is the process by which roads, streets, and highways are grouped into classes according to the character of service they provide.
Google Earth	Google Earth is an application that provides the ability to view satellite imagery, maps, terrain, and 3D buildings.
Google StreetView	Google Maps with Street View provides the ability to view 360-degree, panoramic, and street-level imagery.

Term	Definition
Governor's Traffic Safety Committee (GTSC)	Governor's Traffic Safety Committee (GTSC) awards federal highway safety grant funds to local, state and not-for-profit agencies for projects to improve highway safety and reduce deaths and serious injuries due to crashes.
High Crash Location (HALs)	Segments with crash rates that exceed the mean rate for a similar type of facility to an extent that suggests a factor other than chance may be contributing to the crashes.
High Visibility Crosswalks	High visibility crosswalks consist of three major styles: continental, ladder, or bar pair. High visibility crosswalks have been shown to increase motorist yielding at uncontrolled pedestrian crosswalks.
High-Intensity Activated Crosswalk Beacon (HAWK)	A High-intensity crosswalk beacon is a traffic control device used to stop road traffic and allow pedestrians to cross safely. The signal is dark until activated by a pedestrian who wants to cross.
Highway Design Manual (HDM)	The HDM provides design criteria, requirements, and guidance on highway design methods and policies.
Highway Safety Improvement Program (HSIP)	A core federal-aid highway program with the primary purpose of achieving a significant reduction in fatalities and serious injuries on all public roads.
Highway Safety Manual (HSM)	The HSM provides tools to conduct quantitative safety analyses, allowing for safety to be quantitatively evaluated alongside other transportation performance measures such as traffic operations, environmental impacts, and construction costs.
Horizontal Curves	Horizontal curves are those that change the alignment or direction of the road.
Humps/tables	Speed humps are vertical traffic calming measures. They are paved (usually asphalt) and approximately three to four inches high at their center.
Institute of Transportation Engineers (ITE)	The Institute of Transportation Engineers is an international educational and scientific association of transportation professionals who are responsible for meeting mobility and safety needs.
ITSMR	Affiliated with the University at Albany's Rockefeller College of Public Affairs and Policy, the Institute for Traffic Safety Management and Research (ITSMR) is a non-profit organization dedicated to improving highway safety.
KABCO Scale	The "KABCO" injury scale can be used for establishing crash costs. This scale was developed by the National Safety Council (NSC) and is frequently used by law enforcement for classifying injuries: K – Fatal; A – Incapacitating injury; B – Non-incapacitating injury; C – Possible injury; and O – No injury.
Land Use	The physical characteristics of the land surface and the human activities associated with the land surface.

Term	Definition
Leading Pedestrian Intervals (LPI)	LPIs give the pedestrian the WALK signal before the motorists are allowed to proceed through the intersection.
Left Turn Phasing	The type of left-turn traffic signal phasing utilized at a particular intersection.
Linear Referencing System (LRS)	Linear referencing is an intuitive way to associate multiple sets of attributes to portions of linear features.
Mainline	The primary road at an intersection.
Manual on Uniform Traffic Control Devices (MUTCD)	The MUTCD, which has been administered by the FHWA since 1971, is a compilation of national standards for all traffic control devices, including road markings, highway signs, and traffic signals.
Marked Crosswalk	Marked crosswalks are painted pedestrian crossings that specify proper locations for pedestrians to cross the street.
Mast Arm	A type of traffic signal pole.
Median Refuge	Raised pavement between opposing lanes of traffic that allow pedestrians to cross one direction at a time.
Metropolitan Planning Organization (MPO)	The organization designated by the governor as responsible, together with the state, for transportation planning in an urbanized area.
Mid-block Crossing	A marked pedestrian crossing point positioned within a block rather than at an intersection.
Municipality	A city, town, village or county.
MV 104	The NYSDMV form used to report a motor vehicle incident or crash.
New York State's Accident Location Information System (ALIS)	A GIS web based accident location analysis tool that allows for geographic based crash analysis.
Pavement Marking	Pavement markings are used to convey messages to roadway users. They indicate which part of the road to use, provide information about conditions ahead, and indicate where passing is allowed.
Pedestrian Countdown Signals (also called Pedestrian Countdown Timers)	A signal that displays the number of seconds left to cross before the DON'T WALK or upraised hand is displayed.
Pedestrian Counting Program	A pedestrian counting program estimates the number of pedestrians that use a particular facility. Reliable count data is necessary for measuring trends in facility use and for putting crash

Term	Definition
	data in context. Pedestrian counts can be collected manually or through the use of automatic counters.
Pedestrian Generators	Areas where pedestrians originate, such as schools, park entrances, libraries, parking lots, etc.
Pedestrian Push Button	Pedestrian push buttons are electronic buttons used by pedestrians to activate pedestrian signals at an intersection or mid-block crossing.
Pedestrian Safety Assessments	Pedestrian safety assessments can be used to assess the safety of pedestrian facilities.
Pedestrian Safety Corridor Program	A program to improve pedestrian safety along a length of road or a corridor.
Pedestrian Signal	Signals that control the flow of pedestrian traffic and provide sufficient time for safe and efficient pedestrian crossings.
Pedestrian Priority Investigation Locations (PILs)	Locations where the percentage of pedestrian crashes is higher than expected.
Raised Crosswalks	Raised pedestrian crosswalks are crosswalks constructed above the elevation of the street. They are intended to reduce vehicle speeds and increase pedestrian visibility at the crosswalk.
Rectangular Rapid Flashing Beacon (RRFB)	Rectangular Rapid Flash Beacons (RRFBs) are used to supplement pedestrian warning signs at uncontrolled intersections or mid-block marked pedestrian crosswalks. RRFBs include flashing lights that alert motorists that pedestrians are using the crosswalk. Studies have shown that RRFBs significantly increase driver yielding behavior.
Regional Work Program	This program contains the locations for which the NYSDOT region will conduct and prepare a safety investigation.
Regulatory Signs	Regulatory signs are used to inform road users of traffic laws or regulations and indicate the applicability of the legal requirements.
Retroreflective Sign Posts	A strip of retroreflective material on sign posts that draws attention to the sign during nighttime conditions.
Road Diet	A road diet, also called a lane reduction or road rechannelization, reduces the number of travel lanes and/or effective width of the road in order to improve safety and/or reclaim space for other uses such as bike lanes, pedestrian refuge islands, bus lanes and parking.
ROW	Right of Way
Safety Information Management System (SIMS)	A repository of historical accident information that includes accident characteristics, location information and scanned images of the accident reports.
SEQRA	New York's State Environmental Quality Review Act

Term	Definition
Signal Re-timing	Signal timing is the process of optimizing the operation of traffic signals.
Signalized Intersection	An intersection where traffic movements are controlled by a traffic signal.
Span Wire Analysis Program	A program used to determine the structural capacity of tethered and non-tethered span wire traffic signal poles.
Strategic Highway Safety Plan (SHSP)	The SHSP is a state's comprehensive transportation safety plan.
Systemic Approach	A systemic approach looks at risk across an entire roadway system.
Traffic	From NYSV&T Law: Section 152. Pedestrians, ridden or herded animals, vehicles, bicycles, and other conveyances either singly or together while using any highway for purposes of travel.
Traffic Calming	The deliberate slowing of traffic by installing measures such as speed humps, traffic circles, curb extensions, and center islands.
Traffic Control Devices	A sign, signal, marking, or other device placed on or adjacent to a street or highway by authority of a public body or official having jurisdiction to regulate, warn, or guide traffic.
Traffic Counts	A record of traffic that pass a given checkpoint during a given time period.
Traffic Engineering Directive (TED) Traffic Safety & Mobility Instruction (TSMI)	Engineering and/or Operational policy and guidance.
Uncontrolled marked pedestrian crosswalk	Uncontrolled marked pedestrian crosswalks are crosswalks that exist at locations where there is no signal, stop sign or yield sign.
Urban Areas	As defined by the census; an urban area will comprise a densely settled core of census tracts and/or census blocks that meet minimum population density requirements, along with adjacent territory containing non-residential urban land uses as well as territory with low population density included to link outlying densely settled territory with the densely settled core.
Vehicle Miles of Travel (VMT)	A measure of miles traveled by vehicles in a specified area during a specific time period.
Vertical Curves	Vertical curves are those that change the slope of the road.

V. APPENDICES

APPENDIX A: SYSTEMIC COUNTERMEASURE PACKAGES – CROSSWALKS AT UNCONTROLLED LOCATIONS

Basic and enhanced treatments are provided for uncontrolled marked pedestrian crosswalks. The basic treatment packages require minimal analysis and are applicable to and should be implemented at most eligible sites. However, it is recognized that every site is different; pedestrian safety improvements must be evaluated on a case-by-case basis and engineering judgment will be used at each site to determine which countermeasures are appropriate. Enhanced treatments require additional site by site analysis and should be implemented based upon a safety engineering evaluation, identified community need and department guidance.

UNCONTROLLED MARKED PEDESTRIAN CROSSWALKS

For the purposes of this plan, uncontrolled marked pedestrian crosswalks include locations where there is a marked mid-block crosswalk or an intersection with a marked crosswalk across the through street where the side street is controlled and the through street is not.

Systemic treatment packages have been created for crosswalks at uncontrolled crossings on state roads in urban areas. All treatment packages include the following countermeasures:

- High-visibility crosswalks.
- Pedestrian warning signs with a fluorescent yellow – green background.
- Retroreflective sign posts. The retroreflective sign posts are required to be the same color as the background color of the sign (fluorescent yellow – green for warning signs and white for regulatory signs). See the MUTCD section 2A.21.

Guidance

Guidance for the implementation of countermeasures is found in the following documents:

- Manual on Uniform Traffic Control Devices (MUTCD)
- New York State Supplement to the MUTCD
- NYSDOT Traffic Safety & Mobility Instructions (TSMI)
- NYSDOT Engineering Instructions (EI), Bulletins (EB) and Directives (ED)
- NYSDOT Traffic Engineering Directive (TED)

- NYSDOT Highway Design Manual

Treatment Packages – Uncontrolled Locations

See Appendix C: PSAP/Highway Design Manual Exhibit 18-19 Cross Reference for a cross reference between the countermeasure packages below and Exhibit 18-19 of the Highway Design Manual.

1. For Posted Speed Limit 30 and 35 mph		
Number of Lanes	Basic Treatment	Enhanced Treatment
2	<p>Basic Treatment Package B</p> <ul style="list-style-type: none"> • High-visibility crosswalk • Retroreflective sign posts (for pedestrian signs at crosswalk and in advance of crosswalk) <p><u>At crosswalk</u></p> <ul style="list-style-type: none"> • Double posted (back to back) fluorescent yellow-green Pedestrian Crossing signs (W11-2) or School signs (S1-1). Pedestrian on sign should always face the crosswalk. • Fluorescent yellow-green diagonal downward pointing arrow plaque (W16-7P) <p><u>In advance of crosswalk.</u></p> <ul style="list-style-type: none"> • Fluorescent yellow-green Pedestrian Crossing sign (W11-2) or School sign (S1-1). • Fluorescent yellow-green ahead plaque (W16-9P) <p>See Table NY2C-4. Guidelines for Advance Placement of Warning Signs in the NYS Supplement to the MUTCD for</p>	<ul style="list-style-type: none"> • Advance yield line (sharks teeth) with “Yield Here to Pedestrian” sign (R1-5) – midblock only • Restrict parking – midblock locations • In-street Pedestrian Crossings signs (R1-6) - up to and including 30 mph only • Rectangular Rapid Flashing Beacon (RRFB) - (Solar Powered)

1. For Posted Speed Limit 30 and 35 mph

Number of Lanes	Basic Treatment	Enhanced Treatment
	guidance on advance posting distances.	
3 or more	<p>Basic Treatment Package B</p> <ul style="list-style-type: none"> • High-visibility crosswalk • Retroreflective sign posts (for pedestrian signs at crosswalk and in advance of crosswalk) <p><u>At crosswalk</u></p> <ul style="list-style-type: none"> • Double posted (back to back) fluorescent yellow-green Pedestrian Crossing signs (W11-2) or School signs (S1-1). Pedestrian on sign should always face the crosswalk. • Fluorescent yellow-green diagonal downward pointing arrow plaque (W16-7P) <p><u>In advance of crosswalk</u></p> <ul style="list-style-type: none"> • Fluorescent yellow-green Pedestrian Crossing sign (W11-2) or School sign (S1-1). • Fluorescent yellow-green ahead plaque (W16-9P) <p>See Table NY2C-4. Guidelines for Advance Placement of Warning Signs in the NYS Supplement to the MUTCD for guidance on advance posting distances.</p>	<ul style="list-style-type: none"> • Advance yield line (sharks teeth) with “Yield Here to Pedestrian” sign (R1-5) – midblock only • Restrict parking – midblock locations • In-street Pedestrian Crossings signs (R1-6) - up to and including 30 mph only • Rectangular Rapid Flashing Beacon (RRFB) - (Solar Powered) • Raised pedestrian median refuge and/or corner island and/or curb extension • Signalize the Crossing <ul style="list-style-type: none"> ○ If a 2 stage crossing can be implemented consider High-Intensity Activated crossWalk beacon (HAWK) ○ If a 2 stage crossing is not possible and a crash history exists consider a 3 Color Traffic Signal

2. For Posted Speed Limits 40 and 45 mph

Number of Lanes	Basic Treatment	Enhanced Treatment
2	<p>Basic Treatment Package C</p> <ul style="list-style-type: none"> • High-visibility crosswalk • Retroreflective sign posts (for pedestrian signs at crosswalk and in advance of crosswalk) <p><u>At crosswalk</u></p> <ul style="list-style-type: none"> • Double posted (back to back) fluorescent yellow-green Pedestrian Crossing signs (W11-2) or School signs (S1-1). Pedestrian on sign should always face the crosswalk. • Fluorescent yellow-green diagonal downward pointing arrow plaque (W16-7P) <p><u>In advance of crosswalk</u></p> <ul style="list-style-type: none"> • Fluorescent yellow-green Pedestrian Crossing sign (W11-2) or School sign (S1-1). • Fluorescent yellow-green ahead plaque (W16-9P) • Advance yield line (sharks teeth) – midblock only • Yield Here to Pedestrian sign (R1-5) – midblock only <p>See Table NY2C-4. Guidelines for Advance Placement of Warning Signs in the NYS Supplement to the MUTCD for guidance on advance posting</p>	<ul style="list-style-type: none"> • Rectangular Rapid Flashing Beacon (RRFB) - (Solar Powered) • Restrict parking – midblock locations

2. For Posted Speed Limits 40 and 45 mph

Number of Lanes	Basic Treatment	Enhanced Treatment
	distances.	
3 or more	<p>Basic Treatment Package C</p> <ul style="list-style-type: none"> • High-visibility crosswalk <p>Retroreflective sign posts (for pedestrian signs at crosswalk and in advance of crosswalk)</p> <p><u>At crosswalk</u></p> <ul style="list-style-type: none"> • Double posted (back to back) fluorescent yellow-green Pedestrian Crossing signs (W11-2) or School signs (S1-1). Pedestrian on sign should always face the crosswalk. • Fluorescent yellow-green diagonal downward pointing arrow plaque (W16-7P) <p><u>In advance of crosswalk</u></p> <ul style="list-style-type: none"> • Fluorescent yellow-green Pedestrian Crossing sign (W11-2) or School sign (S1-1). • Fluorescent yellow-green ahead plaque (W16-9P) • Advance yield line (sharks teeth) – midblock only • Yield Here to Pedestrian sign (R1-5) – midblock only • Restrict Parking between 	<ul style="list-style-type: none"> • Rectangular Rapid Flashing Beacon (RRFB) - (Solar Powered) • Raised pedestrian median refuge and/or corner island and/or curb extension • Signalize the Crossing <ul style="list-style-type: none"> ○ If a 2 stage crossing can be implemented consider High-Intensity Activated crossWalk beacon (HAWK) ○ If a 2 stage crossing is not possible and a crash history exists consider a 3 Color Traffic Signal

2. For Posted Speed Limits 40 and 45 mph

Number of Lanes	Basic Treatment	Enhanced Treatment
	<p>yield line and crosswalk</p> <p>See Table NY2C-4. Guidelines for Advance Placement of Warning Signs in the NYS Supplement to the MUTCD for guidance on advance posting distances.</p>	

3. For Posted Speed Limits 50 mph and above

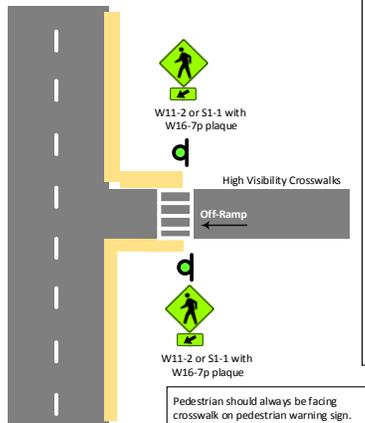
Number of Lanes	Basic Treatment	Enhanced Treatment
All	Implement measures to reduce operational speeds and consider enhanced treatments	<ul style="list-style-type: none"> • Signs and marking upgrades consistent with basic packages with raised medians for pedestrian refuge and/or corner islands and/or curb extensions • Signalize the Crossing <ul style="list-style-type: none"> ○ If a 2 stage crossing can be implemented consider High-Intensity Activated crossWalk beacon (HAWK) ○ If a 2 stage crossing is not possible and a crash history exists consider a 3 Color Traffic Signal • Restrict parking

4. For Uncontrolled crosswalks on on-ramps or off-ramps

Number of Lanes	Basic Treatment	Enhanced Treatment
All	<p>Basic Treatment Package A</p> <ul style="list-style-type: none"> • High-visibility crosswalk • Retroreflective sign posts <p><u>At crosswalk</u></p> <ul style="list-style-type: none"> • Double posted fluorescent yellow-green Pedestrian Crossing signs (W11-2) or School signs (S1-1). Pedestrian on sign should always face the crosswalk. • Fluorescent yellow-green diagonal downward pointing arrow plaque (W16-7P) 	<p><u>In advance of crosswalk</u></p> <ul style="list-style-type: none"> • Advance yield line (sharks teeth) • Yield Here to Pedestrian sign (R1-5) <p><u>Additional advance warning signs. Posting distance as determined by NYS Supplement Table NY2C-4.</u></p> <ul style="list-style-type: none"> • Fluorescent yellow-green Pedestrian Crossing sign (W11-2) • Fluorescent yellow-green ahead plaque (W16-9P)

Systemic Improvements on Roads in Urban Areas

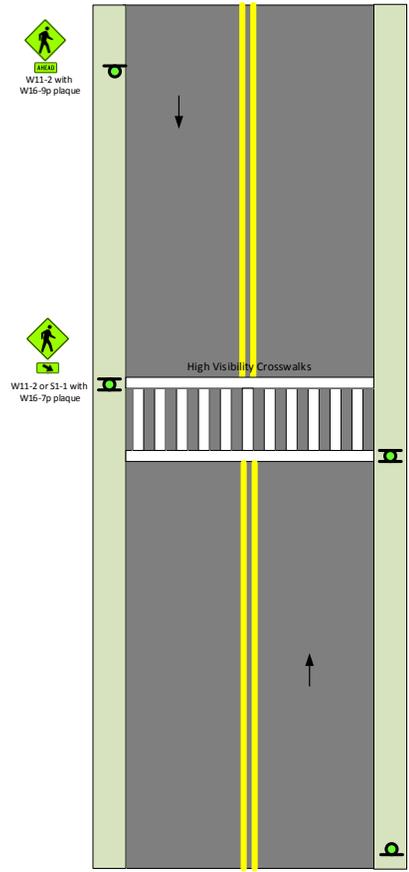
Uncontrolled Crosswalk (on-ramp or off-ramp)
Basic Package A



- Enhanced Treatments**
Enhanced treatments require a site by site analysis. Countermeasures selected depend on number of lanes, speed, AADT, pedestrian volumes and crash experience.
- Advance yield line (sharks teeth) with "Yield Here to Pedestrian" sign (R1-5)
- Advance warning signs. Posting distance as determined by NYS Supplement Table NY2C-4**
- Fluorescent yellow-green Pedestrian Crossing sign (W11-2)
 - Fluorescent yellow-green ahead plaque (W16-9P)
- Guidance**
- Office Traffic Safety and Mobility policies and guidance
 - Highway Design Manual

Pedestrian should always be facing crosswalk on pedestrian warning sign.

Mid-block crosswalks (speed limit 30-35 mph)
Basic Package B

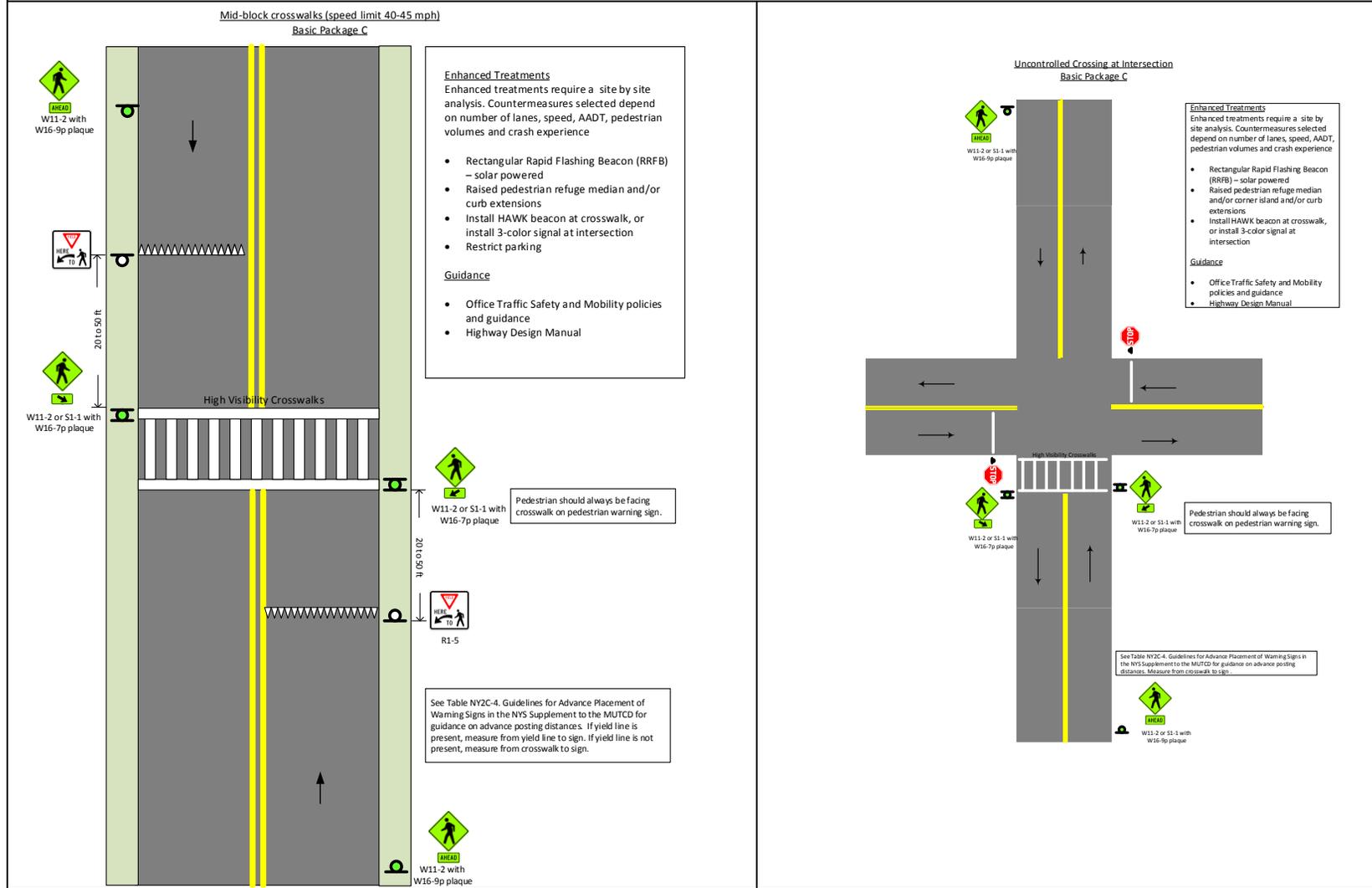


- Enhanced Treatments**
Enhanced treatments require a site by site analysis. Countermeasures selected depend on number of lanes, speed, AADT, pedestrian volumes and crash experience
- Advance yield line (sharks teeth) with "Yield Here to Pedestrian" sign (R1-5)
 - Rectangular Rapid Flashing Beacon (RRFB) – solar powered
 - Raised pedestrian refuge median and/or curb extensions
 - Install HAWK beacon at crosswalk or 3-color signal at intersection
 - Restrict parking
- Guidance**
- Office Traffic Safety and Mobility policies and guidance
 - Highway Design Manual

Pedestrian should always be facing crosswalk on pedestrian warning sign.

See Table NY2C-4. Guidelines for Advance Placement of Warning Signs in the NYS Supplement to the MUTCD for guidance on advance posting distances. If yield line is present, measure from yield line to sign. If yield line is not present, measure from crosswalk to sign.

Systemic Improvements on Roads in Urban Areas



APPENDIX B: SIGNALIZED INTERSECTION IMPROVEMENTS

The improvements below include countermeasures to improve safety for all roadway users. It is assumed that a study is conducted at each intersection location and appropriate countermeasures recommended based upon the outcome of the study. See TSMI 15-01: Applicability of American and Disability Act (ADA) Guidelines on Traffic Signals for policy regarding how ADA applies to traffic signal pedestrian facilities at signalized intersections.

Treatments for Consideration – Signalized Intersections

Signalized Intersections – Low Cost Improvements	Implementation Goal
Re-time traffic signals for proper amber and red clearance intervals and proper pedestrian clearance time/intervals.	All urban signalized intersections studied or 50% of urban signalized intersections on state roads.
Re-time traffic signals for better coordination	Based upon study recommendations.
Install backplates with retroreflective borders	All urban signalized intersections studied where a structural analysis indicates load capacity is adequate for backplates.
Upgrade existing pedestrian signals to include countdown pedestrian indications at remaining eligible locations.	All urban signalized intersections studied with a pedestrian signal.
Upgrade existing marked crosswalks to high-visibility Add high-visibility crosswalks at unmarked signalized intersections	All urban signalized intersections studied or 50% of urban signalized intersections on state roads. High-visibility crosswalks shall be used at crosswalks traversing the “mainline” (state highway) and cross streets or commercial driveways of at least three lanes.
Restrict Parking at Intersection	Consider restricting parking within 20’ of an intersection at locations where it is explicitly allowed.
Evaluate left-turn phasing. Consider protected/permitted left turn phasing and protected only left turn phasing. Consider upgrading permitted phasing from green ball to flashing yellow arrow.	Based upon study recommendations.
APS (Accessible Pedestrian Signal)	Based upon study recommendations. Consider at key pedestrian generators such as schools, malls and transit hubs
LPI (Leading Pedestrian Interval) + Overhead blank-out “No turn on Red” + Accessible Pedestrian Signal	Based upon study recommendations Consider at locations where there is a history of pedestrians being hit by turning vehicles.
Install a new pedestrian signal	Based upon study recommendations. Consider when crossing distance > 40’ or > 3 lanes or crossing a state highway. Include countdown, latching pushbuttons and APS.
Add advance cross street name signs	Based upon study recommendations.

Add Signal Ahead Sign	Based on study recommendations.
Turning vehicle yield to Pedestrian Sign (R10-15)	Based upon study recommendations.
Add no turn on red signs (standard or blank-out) with optional plaques (R10-11, R10-30, NYR7-4P, NYR7-5P)	Based upon study recommendations. Evaluate if existing no turn on red are overhead; Install No Turn on Red (NTOR) where warranted
Move regulatory signs overhead.	Regulatory signs are located according to the MUTCD.

APPENDIX C: PSAP/HIGHWAY DESIGN MANUAL EXHIBIT 18-19 CROSS REFERENCE

Treatment Packages at Uncontrolled Crosswalks																				
No. of Lanes and Median Type	Vehicle AADT < 9000					Vehicle AADT > 9000 to 12,000					Vehicle AADT > 12,000 to 15,000					Vehicle AADT > 15,000				
	Speed Limit																			
	30 mph	35 mph	40 mph	45 mph	>= 50 mph	30 mph	35 mph	40 mph	45 mph	>= 50 mph	30 mph	35 mph	40 mph	45 mph	>= 50 mph	30 mph	35 mph	40 mph	45 mph	>= 50 mph
	< 50 km/h	57 km/h	65 km/h	72 km/h	80 km/h	< 50 km/h	57 km/h	65 km/h	72 km/h	80 km/h	< 50 km/h	57 km/h	65 km/h	72 km/h	80 km/h	< 50 km/h	57 km/h	65 km/h	72 km/h	80 km/h
2 lanes			*	**	**			*	**	**			**	**	**		*	**	**	**
3 lanes			*	**	**		*	*	**	**	*	*	**	**	**	*	**	**	**	**
4 or more lanes with raised median			*	**	**		*	**	**	**	*	*	**	**	**	**	**	**	**	**
4 or more lanes without raised median		*	**	**	**	*	*	**	**	**	**	**	**	**	**	**	**	**	**	**
Install Basic Treatment Package B					*Consider Enhanced Treatments as per Appendix A															
Install Basic Treatment Package C					**Enhanced Treatments should be used as per Appendix A															
Consider measures to reduce operational speeds					If a speed reduction is not feasible, then Basic Treatment Package C and evaluate for Enhanced treatments															

APPENDIX D: PEDESTRIAN CORRIDOR SAFETY GUIDE

NYSDOT will develop Pedestrian Safety Corridor Evaluation Guidelines to reduce the frequency and severity of pedestrian crashes in corridors and develop safe and more walkable environments. The Guidelines are intended to help the Department and local governments move beyond treatments designed to address individual crash locations to a more systemic treatment of the transportation system as a whole. The corridor approach aims to bring about improvements that will begin to change the transportation landscape providing safer streets for all users.

The plan is to utilize the Guidelines to conduct at least five corridor evaluations in the next five years. NYSDOT will look more closely at high crash locations, crash frequencies and crash rates along corridors to identify those that would benefit from a more comprehensive implementation of safety treatments throughout. Subject to data analysis results, suggested areas include Long Island, Hudson Valley, Western and Central New York as well as the Capital Region.

The evaluation process will empower federal, state, and local stakeholders to take leadership roles by involving a broad audience to evaluate needs and identify measures to improve safety. The guidelines identify steps from start to finish involving data, engineering, enforcement, and education. The pedestrian safety corridor evaluation works best and provides the most value when all steps and all stakeholders are involved, but is flexible enough to be partially used, depending on local conditions and resources. There are five steps to the pedestrian safety corridor evaluation:

- 1. Form a Diverse Team** - Assemble a team that represents the diverse perspectives of engineering, enforcement, and education stakeholders in the community. Team members could include representatives of the Department of Transportation, Local Department of Public Works, Local Planning Department, County Traffic Safety Board, Local Health Department, Law Enforcement, Governor's Traffic Safety Committee, Metropolitan Planning Organization, Local Transit Authority, and Local Schools or Universities. Other local partners such as Business Improvement Districts, Chambers of Commerce and large employers should also be included as appropriate.
- 2. Review Data & Perform Analysis** - Gather and carefully review readily available data including the "MV-104 Report of a Motor Vehicle Accident" and develop a plan to collect any additional data before detailed analysis begins. Team members will provide vital, local insight that will help analysts better understand conditions when collecting and analyzing crash, transportation and land use data. Pedestrian related crash history data including date, location, time of day, accident type, severity, traffic control, light condition, road character, surface condition, weather, contributing

factors, vehicle travel directions, etc will be collected. In addition, traffic & pedestrian data including demographics, pedestrian travel, traffic & pedestrian volumes, travel speeds, bus/ transit ridership and land use will be obtained for the analysis.

3. **Perform Field Inventories & Studies** -The team will review results of crash analysis, transportation data and land use data and perform a corridor walk-through or road safety audit. Team members will be familiar with locations, potential causes, local conditions, and efforts that may have previously been applied to reduce pedestrian crashes or plans that present opportunities to do so. This effort will involve developing a field inventory to assess existing features including, at a minimum, roadway geometry (vertical and horizontal curves), pavement markings, number and type of travel lanes, driveways, traffic control devices and pedestrian signs, parking restrictions, bus stop locations, traffic and pedestrian signals (including pedestrian signal size and type), pedestrian pushbuttons and whether they are accessible and operational, sidewalks, crosswalks, pedestrian ramps and whether they are accessible, roadway and pedestrian lighting, roadside features, etc.
4. **Develop Recommendations as a Team** - Reviewing the information, analysis and results from the previous steps, develop a list of short and long term actions that will provide a comprehensive 3-E approach to improve pedestrian safety. An incremental approach is encouraged to be able to implement simple/short term improvements first, while more complex improvements are being developed. Enforcement and education campaigns and programs will compliment proposed engineering solutions. This will result in a multi-dimensional discussion of immediate, short-term and long-term improvements separated into engineering, enforcement and education focuses.
5. **Implementation Plan** - The plan will identify focus areas and corridor-wide elements that could be addressed to improve pedestrian safety. The elements will be organized into easy, medium or difficult problems to solve, and corresponding immediate, short and long terms solutions to address those problems. Immediate-action improvements are likely those that can be implemented through Work Orders or requirement contracts. Short-term improvements may require design efforts and use local maintenance forces to implement, but without major capital improvement costs, right-of-way takings and/or environmental impact studies. Identify and summarize long-term improvements. These may require design efforts with capital improvement cost, right-of-way considerations and/SEQRA processing. Street connectivity, curb extensions, pedestrian refuge islands, zoning ordinance reform are examples of some improvements that might be more long term in nature depending on the status of the evaluation process. Enforcement and education will play a role in all immediate, short and long terms solutions.

APPENDIX E: TRAFFIC CALMING

The New York State Department of Transportation's policy is to consider the application of traffic calming, as appropriate, on State highways and Department administered or financed projects, in accordance with the guidelines and requirements contained within HDM Chapter 25⁴.

In general, the Department, in collaboration with the affected locality and within the framework of this policy, will consider traffic calming measures as a tool to address congestion, safety, and quality of life issues in response to one or more of the following:

- ❖ A community, corridor or area where a traffic calming plan has been completed, or agreed upon, by a neighborhood group, the municipality or the county.
- ❖ A project is scheduled for a village/main street, school zone or other subarea and scoping indicates that inclusion of traffic calming would satisfy identified subarea needs, such as an identified crash pattern whose severity could reasonably be expected to be reduced by the application of traffic calming.
- ❖ Community requests for speed limit modifications, traffic control devices, safety improvements or other concerns are not satisfied by more traditional measures and/or enforcement. The community must, however, be aware that traffic calming does not replace their obligation to provide normal law enforcement.⁵

Chapter 25 of the HDM provides a list of traffic calming project objectives. Among them are the following which are consistent with this Pedestrian Safety Action Plan's goals.

- ❖ Improve driver behavior to be more considerate of other users of the street or road.
- ❖ Increase the level of respect for non-motorized street users.
- ❖ Create a feeling of safety for all street users.
- ❖ Improve safety and convenience for road users, including residents, motorists, bicyclists, pedestrians, transit riders, and people with disabilities.
- ❖ Reduce number and/or severity of crashes.
- ❖ Achieve an overall improvement in the environment.
- ❖ Promote and support the use of transportation alternatives to the single occupant vehicle.
- ❖ Achieve an overall improvement of the community's quality of life.

⁴ NYSDOT Highway Design Manual
(https://www.dot.ny.gov/divisions/engineering/design/dqab/hdm/hdm-repository/chapt_25.pdf) p.25-2

⁵ Ibid., p. 25.3

APPENDIX F: HELPFUL LINKS

Department of Justice/Department of Transportation Joint Technical Assistance on the Title II of the Americans with Disabilities Act Requirements - <http://www.ada.gov/doj-fhwa-ta.htm>

FHWA Bike Ped- http://safety.fhwa.dot.gov/ped_bike

Highway Design Manual Chapter 18: Exhibit 18-19 –
<https://www.dot.ny.gov/divisions/engineering/design/dqab/hdm>

Highway Safety Manual: <http://www.highwaysafetymanual.org/>

Highway Safety Strategic Plan - <http://www.safeny.ny.gov/HSSP/HSSP-2015.pdf>

How to Develop a Pedestrian Safety Action Plan -
http://safety.fhwa.dot.gov/ped_bike/ped_focus/docs/fhwasa0512.pdf

Manual on Uniform Traffic Control Devices -
<http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/mutcd09r1r2editionhl.pdf>

NCHRP Report 797, Guidebook on Pedestrian and Bicycle Volume Data Collection -
http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_797.pdf

NCHRP Report 770, Estimating Bicycling and Walking for Planning and Project Development: A Guidebook -
http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_770.pdf

New York City Vision Zero - <http://www1.nyc.gov/nyc-resources/service/3860/nyc-vision-zero-action-plan>

New York City DOT Vision Zero Borough Pedestrian Safety Action Plans -
<http://www.nyc.gov/html/dot/html/pedestrians/ped-safety-action-plan.shtml>

NYS Department of Transportation Functional Classification and National Highway System Viewer – <https://www.dot.ny.gov/gisapps/functional-class-maps>

NYS Department of Transportation – Intersection Safety Action Plan

NYS Department of Transportation – Pedestrian Safety Corridor Evaluation Guide

NYS DOT Implementation of the Smart Growth Public Infrastructure Policy Act (SGPIPA) - <https://www.dot.ny.gov/programs/smart-planning/smartgrowth-law>

NYS DOT Complete Streets - <https://www.dot.ny.gov/programs/completestreets>

NHTSA “Everyone is a Pedestrian” - <http://www.nhtsa.gov/Pedestrians>

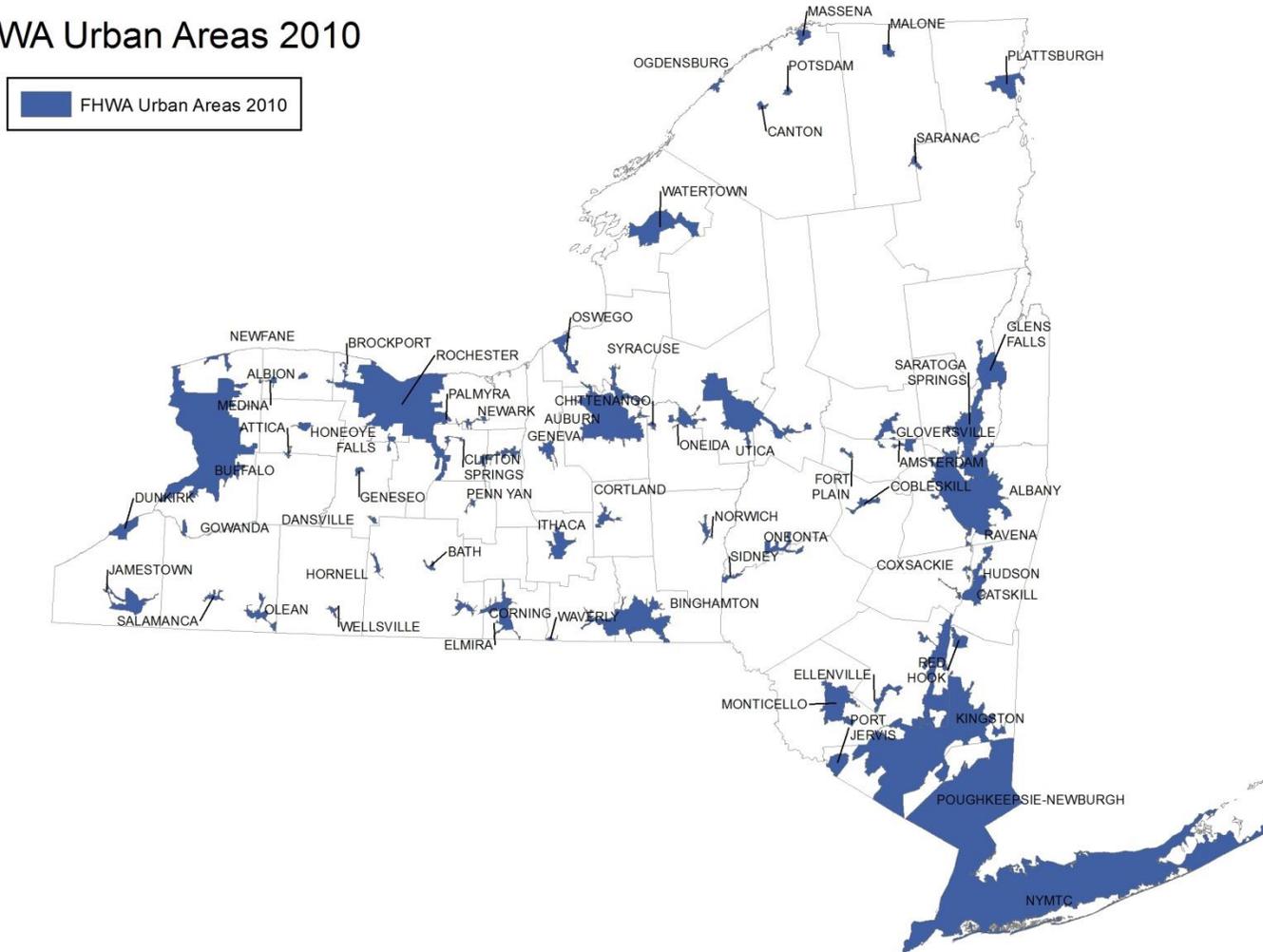
Pedsafe - [http://w ww.pedbikesafe.org/](http://www.pedbikesafe.org/)

Strategic Highway Safety Plan -
<https://www.dot.ny.gov/divisions/operating/osss/highway/strategic-plan>

Systemic Safety Project Selection Tool -
<http://safety.fhwa.dot.gov/systemic/fhwasa13019/>

APPENDIX G: URBAN AREA MAP

FHWA Urban Areas 2010



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