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# V. BICYCLE AND PEDESTRIAN SAFETY

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## Bicycling and Walking Safely in Connecticut

Bicycle and pedestrian safety is an important topic in Connecticut. A recent heightened awareness of safety issues, coupled with the growth of bicycling and walking activity, has led to recent enactments of new legislation related to safety. In 2008, legislation was passed, the so-called “3-foot passing law,” requiring that motorists overtaking a cyclist on a public roadway must allow a minimum of three feet of separation between the cyclist and the overtaking vehicle. As this Plan is being developed there are an additional number of new potential regulations related to safety currently being considered by the Connecticut legislature.

The public perception of pedestrian and bicycle safety can have either a positive or a negative effect on those currently considering undertaking such activity. News of injuries and even deaths of bicyclists and pedestrians can establish perceptions that such activities may not be safe, and seriously discourage the public from engaging in these activities. To address the issue of safety, CTDOT has included safety in the vision, goals, and action strategies of this Plan update. The vision of the Plan is “to encourage and promote bicycling and walking throughout Connecticut by providing for the safe, convenient, and enjoyable use of these modes of transportation. Further, any person will be able to walk, bicycle, or use other types of nonmotorized transportation modes safely and conveniently throughout the State.” Specifically, Goal Four addresses bicycle and pedestrian safety and outlines action strategies to improve them through better monitoring of crash data and mitigation of crashes. Better understanding of the causes of crashes leads to more effective design countermeasures to improve bicycle and pedestrian safety. Improving

safety will ultimately encourage more people to walk and bicycle as a means of transportation

CTDOT’s *Highway Safety Plan* reports that there were 4,784 pedestrian fatalities and 770 bicycle fatalities in 2006 in the United States. This is 11.2 percent and 1.8 percent of the total highway fatalities respectively. While the percentage of pedestrian fatalities has steadily decreased from 19.8 percent in the 1960s, the percentage of bicycle fatalities has been consistently between one and two percent since 1960. In Connecticut, there were five bicyclist fatalities (0.6 percent of national bicycle total) and 38 pedestrian fatalities (0.7 percent of the national pedestrian total) in 2005.

## Crash Data

This section includes information on motor vehicle crashes that involve pedestrians and bicyclists for years 2005 through 2007. CTDOT collects and monitors crash data on an annual basis for all roadway classes (Interstate, U.S. Route, State Highway, and local owned and maintained).

While crash data is an important tool for researching problem areas, there are limitations to the data that one should consider. Only crashes that are reported to the police are included in this data. Typically, only crashes involving motor vehicles, and those having fatalities, injuries, or property damage, are reported. Crashes involving bicycles-only or bicycles and pedestrians, as well as those that do not have fatalities, injuries, or property damage, are not typically reported to the police. The police are responsible for filing the crash reports, which are then entered into the statewide crash database. Another limitation of the data is that property damage only crashes on local roads are not reported for years 2005 and 2006. Year 2007 was the first reporting year

for crashes on local roads that involved property damage only.

### Crashes Involving Pedestrians

There were 79,563 crashes reported on all roadways in Connecticut in 2005. Of these, 1,096 (1.4 percent) crashes involved pedestrians. The statewide total crash number dropped to 71,724 in 2006, with 1,066 (1.5 percent) of the crashes involving pedestrians. In 2007, there were 112,785 crashes reported statewide, and 1,275 (1.1 percent) of the crashes involved pedestrians. Table 11 displays statewide pedestrian crash totals by crash type.

In Connecticut, approximately two to four percent of crashes that involve pedestrians result in

fatalities. Approximately 90 to 95 percent of all crashes that involve pedestrians result in injuries, most often to the pedestrian.

The largest percentage of pedestrian crashes for all years occurred on local roads (60 percent and greater). The smallest percentage of crashes for all years occurred on Interstate highways (less than 2.2 percent). Table 12 displays pedestrian crash totals by road class for the 2005 – 2007 three-year period.

Figure 3 displays pedestrian crash locations on Interstates, U.S. Routes, and state roads (local road crashes not included) for years 2005 and 2006. Figure 4 displays concentrations of the pedestrian crashes for years 2005 and 2006. Pedestrian crashes are disproportionately high in the

**Table 11: Statewide Pedestrian Crash Totals by Crash Type**

	2005	2005 (%)	2006	2006 (%)	2007	2007 (%)
Fatal Crashes Involving Pedestrians	35	3.2%	38	3.6%	30	2.4%
Injury Crashes Involving Pedestrians	1,041	95.0%	1,008	94.6%	1,164	91.3%
Property Damage Only Crashes Involving Pedestrians	20	1.8%	20	1.9%	81	6.4%
<b>Total:</b>	<b>1,096</b>		<b>1,066</b>		<b>1,275</b>	

**Table 12: Statewide Pedestrian Crash Totals by Road Class**

	2005	2005 (%)	2006	2006 (%)	2007	2007 (%)
Interstate	23	2.1%	16	1.5%	20	1.6%
U.S. Route	99	9.0%	131	12.3%	141	11.1%
State Route	282	25.7%	279	26.2%	280	22.0%
Local Road	692	63.1%	640	60.0%	834	65.4%
<b>Total:</b>	<b>1,096</b>		<b>1,066</b>		<b>1,275</b>	

more urbanized areas of the state where large numbers of users (pedestrians, bicyclists, and motorists) are all utilizing the same facilities. The cities of Bridgeport, Hartford, New Haven, Stamford, and Waterbury have the highest number of pedestrian crashes (more than 70 in any one year of the 2005-2007 period). Almost 45 percent of all crashes that involve pedestrians occurred in these five cities over the three year period.

Suburban areas in Connecticut receive the next greatest proportion of crashes. The towns of Bristol, Danbury, East Hartford, Greenwich, Hamden, Meriden, Middletown, Milford, New Britain, New London, Norwalk, Norwich, West Hartford, and West Haven have all had a minimum of 20 crashes in any one year of the 2005-2007 period. Twenty-nine percent of all crashes occurred in these 14 towns over the three-year period. Appendix H presents a town by town summary of pedestrian crashes for years 2005-2007.

### **Crashes Involving Bicyclists**

There were 79,563 crashes reported on all roadways in Connecticut in 2005. Of these, 692 (0.9 percent) crashes involved bicyclists. The statewide total crash number dropped to 71,724 in 2006, with 645 (0.9 percent) of the crashes involving bicyclists. In 2007, there were 112,785 crashes reported statewide, and 829 (0.7 percent) of the crashes involved bicyclists. Table 13 displays statewide bicycle crash totals by crash type.

In Connecticut, crashes that involve bicyclists are fatal in less than one percent of instances. Approximately 80 to 93 percent of all crashes that involve bicyclists result in injuries, often to the bicyclist.

The largest percentage of bicycle crashes for all years occurred on local roads (52 percent and greater). The smallest percentage of crashes for all years occurred on Interstate highways (less than one percent), where bicyclists are legally not allowed. Table 14 displays bicycle crash to-

tals by road class for the 2005 – 2007 three-year period.

The age of the bicycle crash victims is reported for crashes. In the 2005-2007 three year period, the largest percentage of victims were age 10-19 years. The second highest percentage of victims was aged 20-29. In all three years, 83 – 85 percent of the bicyclists involved in crashes were male. Figure 5 displays bicycle crash age information.

Like pedestrian occurrences, bicycle crashes are disproportionately high in the more urbanized areas of the state where large numbers of users (pedestrians, bicyclists, and motorists) are all utilizing the same facilities. Typically, the most populated and urbanized towns have the highest number of bicycle crashes. The cities of Bridgeport, Hartford, and New Haven have the highest number of bicycle crashes (more than 50 in any one year of the 2005-2007 period). Twenty four percent of all crashes that involve bicyclists occurred in these three cities over the three year period.

Other urban and suburban areas in Connecticut that had the next greatest proportion of crashes include Bristol, Danbury, Manchester, Meriden, New Britain, Norwalk, Stamford, Waterbury, and West Haven. These municipalities have all had a minimum of 20 crashes in any single year of the 2005-2007 period. Almost 27 percent of all crashes occurred in these 9 municipalities over the three-year period. Appendix I presents a town by town summary of bicycle crashes for years 2005-2007.

### **Education Programs**

Education programs assist in the development of knowledge and skills related to the travel needs of bicyclists and pedestrians. Many people are unaware of their rights and responsibilities as bicyclists, pedestrians, equestrians, and motorists sharing the same roadways. There are a number of education programs established in Connecticut to promote the safety of bicyclists and pedestri-



Figure 3: Crashes that Involve Pedestrians on State Highways (2005-2006)

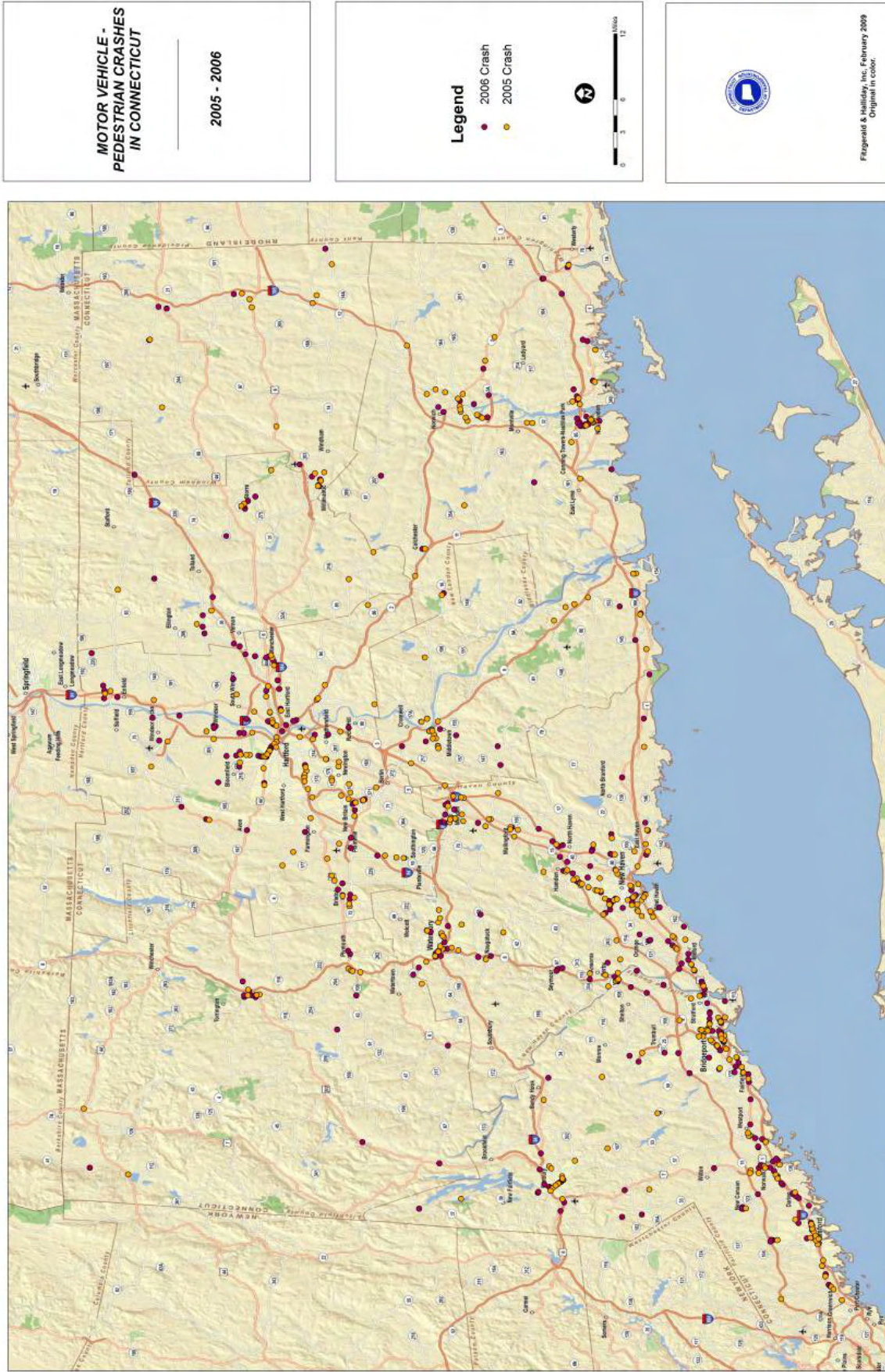
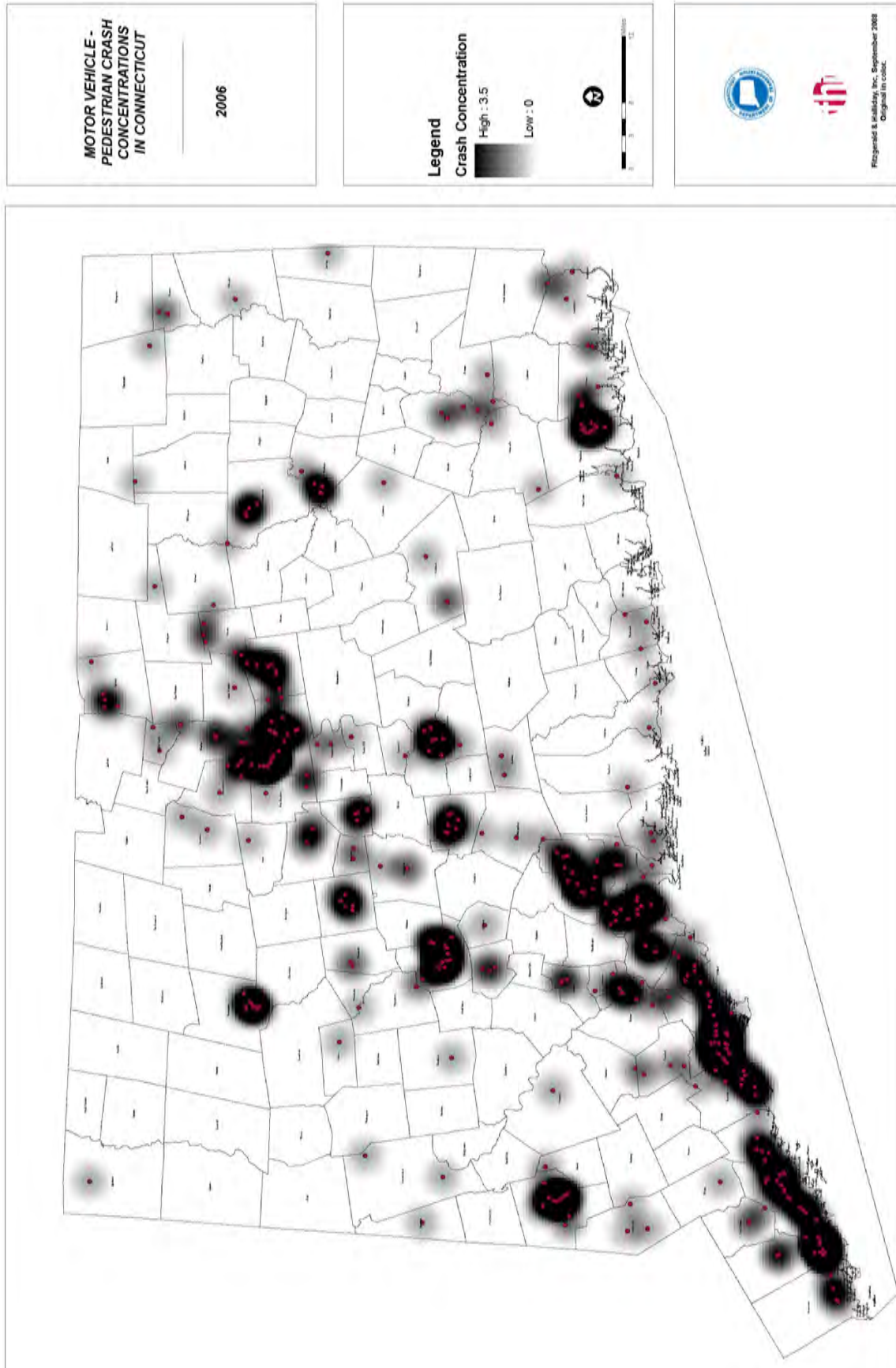


Figure 4: Concentrations Crashes that Involve Pedestrians on State Highways (2005-2006)



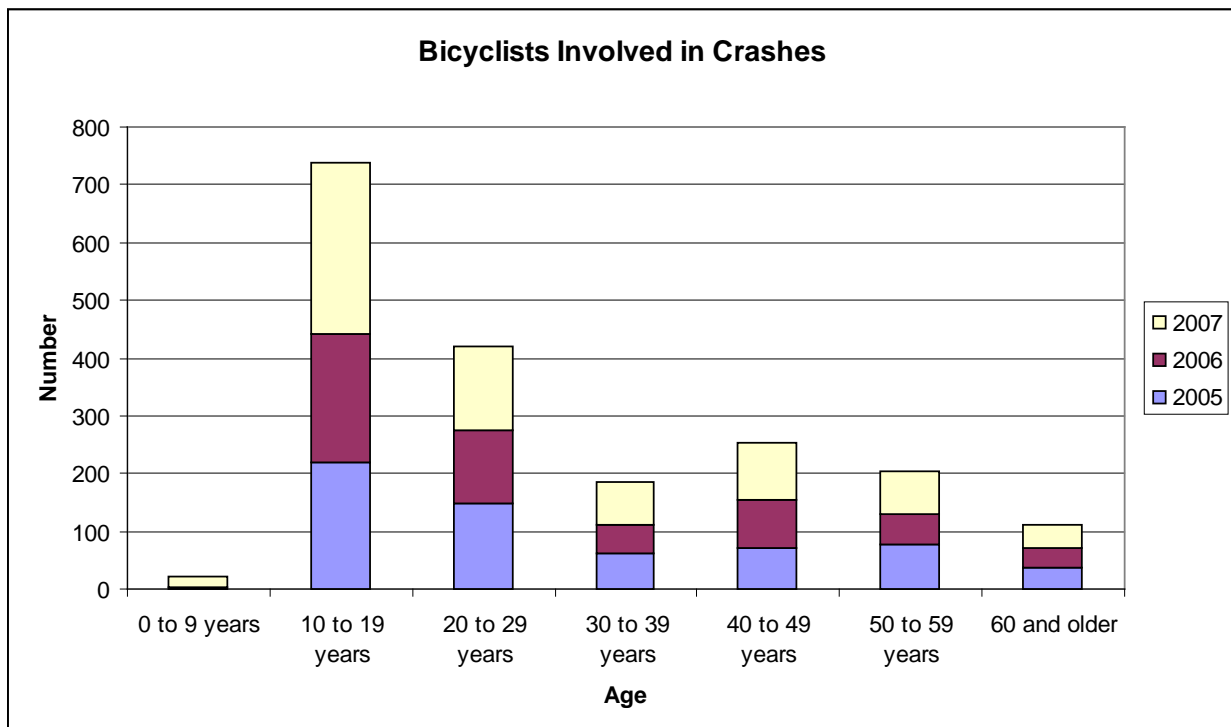
**Table 13: Statewide Bicycle Crash Totals by Crash Type**

	2005	2005 (%)	2006	2006 (%)	2007	2007 (%)
Fatal Crashes Involving Bicyclists	3	0.4%	5	0.8%	5	0.6%
Injury Crashes Involving Bicyclists	645	93.2%	580	89.9%	662	79.9%
Property Damage Only Crashes Involving Bicyclists	44	6.4%	60	9.3%	162	19.5%
<b>Total:</b>	<b>692</b>		<b>645</b>		<b>829</b>	

**Table 14: Statewide Bicycle Crash Totals by Road Class**

	2005	2005 (%)	2006	2006 (%)	2007	2007 (%)
Interstate	4	0.6%	4	0.6%	6	0.7%
U.S. Route	79	11.4%	91	14.1%	95	11.5%
State Route	219	31.6%	213	33.0%	227	27.4%
Local Road	390	56.4%	337	52.2%	501	60.4%
<b>Total:</b>	<b>692</b>		<b>645</b>		<b>829</b>	

**Figure 5: Statewide Crash by Bicyclists Age**





ans. Several existing education programs are described below:

### **Safe Routes to Schools (SRTS)**

SRTS, discussed in Chapter Four, is a federal program that promotes walking and bicycling to school for students in kindergarten through eighth grade. In Connecticut, the SRTS program is administered by CTDOT and provides funding for education, as well as encouragement, engineering, enforcement, and evaluation activities. Examples of education activities that can be supported with SRTS funds include:

- Teaching children about pedestrian, bicycle, and personal safety.
- Educating children and parents about the health and environmental benefits of walking to school.
- Educating drivers about safe drop off and pick up practices.
- Educating neighbors about safe walking and biking environments.
- Creating awareness of the benefits and goals of SRTS.

Municipalities and schools are selected through a competitive process to receive SRTS funds.

### **Safety Awareness Campaign**

The *2009 Master Transportation Plan*, developed by CTDOT, outlines a pilot safety awareness campaign initiative. This campaign was launched in May - July 2009 and emphasizes the need for motorists, bicyclists, pedestrians and equestrians to share transportation facilities safely and is one of the measures required by the 3-foot passing law passed in 2008. The chief components of the safety awareness campaign pilot include bus-mounted sign boards and radio announcements focusing on a "sharetheroadct" web site for related information.

### **CT Technology Transfer Center Training**

In the spring of 2008, the CT Technology Transfer Center, with funding from FHWA and CTDOT, conducted a series of three trainings workshops across the state covering topics relating to designing bicycle and pedestrian facilities in Connecticut. The two-day course was held in Norwalk, Farmington, and Storrs. Advance notice and an invitation to register were e-mailed to municipal engineers and planning, RPO staff, and CTDOT design and planning staff. Ninety-two attendees participated in the trainings, with the largest percentage, 53 percent of the participants, from local and regional governments. The next largest percentage of attendees (38 percent) was from CTDOT.

The design workshop training syllabus included the following topics:

- Bicyclist and pedestrian user characteristics
- Engineering tools for intersection and sidewalk design as well as multi use paths
- Design standards including access for different physical abilities (ADA and seniors)

The training contained real life national, regional, and state examples to attach meaning and enhance the learning of the participants. Countermeasures to address problem areas were interconnected with the broader issues of connectivity, livability, and municipal policies and risk management considerations. There was also a discussion on funding opportunities and their corresponding requirements.

The workshops provided an opportunity for different segments of the transportation community to come together in a collaborative environment and learn about common challenges faced by planners and engineers addressing the issues relating to designing these facilities

## **CT Department of Motor Vehicles**

In 2008, the *Connecticut's Drivers Manual* was revised to include expanded language to educate motorists on sharing the road safely with bicyclists and pedestrians. This new language was spearheaded by the Bicycle and Pedestrian Stakeholders Group that convened as part of the *Strategic Highway Plan*. The language states the following:

*“Under Connecticut law, a bicycle is considered a vehicle with the same rights and responsibilities as cars and other vehicles on the road. Drivers should expect to see bicyclists on the road, riding with traffic. A bicyclist may use the left lane when turning.*

*When a road is too narrow for cars and bikes to ride side-by-side, the bicyclist will “take the travel lane” which means riding in or near the center of the lane. A major problem for drivers is the ability to see bicyclists, especially at night. Sometimes they may be in the blind spot of your vehicle. When you approach a bicyclist, keep on the lookout and slow down. Learn to recognize situations and obstacles which may be hazardous to cyclists, such as potholes, drain grates and narrow bridges or roadways. Give them adequate space to maneuver. To avoid conflict, drivers of motor vehicles need to know the rules:*

- *Do not drive or park in a bicycle lane. You may cross a bicycle lane, such as when turning or when entering or leaving an alley, private road, or driveway.*
- *Fines are doubled for failure to yield right-of-way to a bicyclist.*
- *You must yield to bicyclists in a bicycle lane or on a sidewalk, before you turn across the lane or sidewalk.*
- *Do not crowd bicyclists. Wait for a clear stretch of road before passing a bicyclist who is moving slower than your motor vehicle in a lane too narrow to share. Remember, the bicycle is a slow-moving vehicle and this may require you to slow down. The greater the speed difference between you and a bicyclist, the more room you should allow when passing.*
- *Do not honk at a bicyclist, unless you have good cause to warn the rider. The loud noise could startle the rider. There may be a good reason for the bicyclist to be riding in the travel lane, such as roadway hazards not visible to motorists.*
- *When turning left at an intersection, yield to oncoming bicyclists just as you would yield to oncoming motorists.*
- *Do not pass bicycles if you will be making a right turn. Always assume bicyclists are traveling through unless they signal otherwise. Children on bicycles are often unpredictable – they cannot see things out of the corner of their eyes as well as adults, so they may not see you even when they glance back before pulling out in front of you. They also have trouble judging the speed and distance of oncoming vehicles. They believe adults will look out for them, and lack a sense of danger.”*

This recently added language to the Connecticut Driver's Manual is beneficial to bicyclists and especially aimed at educating and instilling safe habits in new drivers who may have limited experience at sharing the road with non-motorized vehicles.

### **Central Connecticut Bicycle Alliance**

In 2008, CCBA and CRCOG collaborated with REI of West Hartford to provide League of American Bicyclists League Certified Instructors (LCI) training and certification to 14 students. CCBA and



REI subsidized the training and certification of the instructors with the intent to establish a formal bicycle education program in Central Connecticut that will be administered by CCBA. Beginning in 2009, the 14 newly certified LCIs will begin providing bicycle education classes to employees, commuters, students, and other interested bicyclists. Such classes include traffic safety, commuting, and children's biking safety. This League of American Bicyclists program is the only comprehensive bicycle program operating in the United States. In addition, many states and locales have adopted this program as the foundation of their bicycle education.

## Recommendations

The following recommendations are selected implementation options from Chapter III. These implementation options are specific courses of action that CTDOT and others can take to achieve safer bicycle and pedestrian travel. All of the goals in the Plan have implementation options that are policy and practice related. However, Goals 4 and 5 have the largest concentration of safety related implementation options.

Any number and /or combination of the listed implementation options could be utilized. This list is not all inclusive, as other mechanisms not listed may be used to achieve safer bicycle and pedestrian travel, and thus move towards the overall vision of the Plan. Some recommended implementation options include:

1. Complete an annual review and audit of pedestrian and bicycle accident safety issues – CTDOT should review the accident reports filed by the responding police departments for accuracy and completeness, particularly as they relate to the causes of crashes. This can be done as part of the *Strategic Highway Safety Plan* development. In addition, a list of the most common bicycle and pedestrian crash locations should be assembled. Causes of the
- crashes should be analyzed using appropriate software, such as the PBCAT model, and the most effective countermeasures to mitigate the causes at those locations considered. Additional detail is available from FHWA's Bike-Safe website <http://www.bicyclinginfo.org/bikesafe/> and PedSafe website <http://www.walkinginfo.org/pedsafe/> and handbooks. South Central Connecticut Regional Council of Governments (SCRCOG) completed such an analysis in their 2007 *Bicycle and Pedestrian Plan*.
2. Work with State and Municipal Police to improve and enhance accident reporting information – After completing the annual review, CTDOT should coordinate with the State and Municipal Police to determine ways to improve the accuracy and completeness of the reporting of bicycle and pedestrian crashes.
3. Research the obtaining of non motor vehicle-related crash information from such sources as hospitals and clinics – CTDOT should first research if hospital emergency rooms and clinic identify visits as being bicycle or pedestrian crash related. A 1999 FHWA research effort showed that, overall, 70 percent of the reported bicycle injury events and 64 percent of the reported pedestrian injury events did not involve a motor vehicle. In addition, 31 percent of the bicyclists and 53 percent of the pedestrians were injured in non-roadway locations. For pedestrian only events, 24% occurred in roadways, 51% on sidewalks, and 14% in parking lots. Parking lots were especially hazardous to pedestrians in icy weather conditions. For bicyclist-only events, 54% occurred in roadways, 21% on sidewalks, 9% on trails or other off-road paths, and only 2%

- in parking lots. In contrast, 88% of pedestrian-motor vehicle and 92% of bicycle-motor vehicle events occurred in the roadway. Further development of an accident database could help to identify and focus safety improvement needs on the state's roadways.
4. Utilize the design toolbox, located in Appendix E - CTDOT should review the design toolbox in Appendix F and assess if strategies in the toolbox could be applicable to projects in Connecticut.
  5. Develop a "Share the Road" campaign and safety information - This campaign, which began in May 2009, aims to develop and provide educational materials for motorists, bicyclists, equestrians and walkers. Its purpose is to 1) improve their understanding of the rules of the road and applicable traffic, bicycle, equestrian and pedestrian laws, 2) improve driver awareness of bicyclists, equestrians and pedestrians, and 3) encourage pedestrians to use available pedestrian safety devices and features (e.g. control signals, crosswalks). This media campaign could include such things as radio and television ads, signage, and printed handouts (e.g. bumper stickers, pens, etc).
  6. Coordinate with CT DMV on educational material related to bicycle and pedestrian awareness - Including bicycle and pedestrian safety information in the CT Drivers Manual is a monumental first step of coordination between the two agencies. The next step would be to get CT DMV on board with CTDOT education effort. For example, CT DMV could assist in the distribution of Share the Road campaign paraphernalia. In addition, every driver license test could include one bicycle or pedestrian question.
  7. Educate bicyclists and pedestrians on reporting of all crashes, and their locations and causes - During the outreach process, the study team learned that it would be beneficial if all bicycle and pedestrian crashes (not just ones that involve motor vehicles) were reported and kept in a central database. This could allow CTDOT to design the most effective countermeasures at the most needed locations to improve safety. One way to educate cyclists to do this could be through advertising and media. For example, future versions of the Statewide Bicycle Map could promote the "Report an Issue" website, where bicyclists and pedestrians can report these crashes.
  8. Developing a "Report and Issue" page on the bicycle and pedestrian website - This page would be a location where bicyclists and pedestrians could report crashes that do not involve motor vehicles as well as other unsafe biking and walking locations.
  9. Coordinate with CTDOT Maintenance staff - Working with the Division of Maintenance would be to insure that lane striping guidelines are consistently applied to provide cyclists, where possible, with adequate room outside the travel lane.
  10. Review AASHTO standards and innovative approaches - CTDOT should consider implementing best practices and innovative approaches, many of which were identified in the benchmarking component of this Plan update. CTDOT should conduct a detailed review of standards as well as other state and town innovative strategies and best practices. Program administrators of

those strategies should be contacted with questions on implementation.

11. Coordinate further with CTDOT Design staff - One reason to do this could be to provide training on bicycle and pedestrian Plan updates and protocol. This can also be accomplished through the design review checklist process, described in next recommendation. Bicycle and pedestrian design continue to evolve, and CTDOT design staff should stay on top of new developments.
12. Update and clarify the design review checklist to ensure the CTDOT Bicycle and Pedestrian coordinator is involved in process – Project preliminary engineering could be more effective if the Bicycle and Pedestrian Coordinator was involved in reviewing designs for roadway design features to create more pedestrian and bicycle-friendly facilities that minimize vehicle, bicycle, and pedestrian conflicts.
13. Coordinating with advocacy groups and law enforcement to promote and enforce safe practices – CTDOT should continue to coordinate with advocacy groups and law enforcement to assist in promoting safe practices. For example, other organizations will often willingly provide handouts or other information for the Share the Road campaign or the Bicycle and Pedestrian website, including the “Report an Issue” page.
14. Coordinate with CCBA and CT League of American Bicyclist LCIs to assist in or expand their bicycle education efforts – CTDOT should support the educational programs of CCBA and the League of American Bicyclists. The Department’s website should be used to advertise class schedules and availability.

### Education Campaign: Street Smarts, New Haven, CT

Street Smarts, an intermodal community education campaign, was initiated by the City of New Haven in the summer of 2008. It is a major civic effort to reduce the number and severity of road crashes in New Haven through a direct appeal to all users of an intermodal environment of motorists, pedestrians, and cyclists. An organized community-wide campaign kick-off event occurred on October 19, 2008 at Edgewood Park. New Haven Mayor John DeStefano, Jr. and community leaders attended the kick-off event. Activities at the event included:

- **Music by the Shellye Vaslauskas Experience**
- **Performance by the Connecticut Roller Girls**
- **Bicycle safety instruction**
- **Sidewalk chalk drawing**
- **Free bicycle helmets for kids from Yale-New Haven Hospital Trauma Injury Prevention**
- **Plenty of giveaways!**

An advisory committee was formed after the kick off event and includes representatives from:

- **Yale University**
- **Yale New Haven Hospital**
- **Yale Medical School Traffic Safety Committee**
- **Downtown/Wooster Sq. Management Team**
- **City of New Haven**
- **New Haven Board of Aldermen**
- **New Haven Safe Streets Coalition**
- **Elm City Cycling**

In addition, a public relations firm was employed and design assistance was funded by Yale University. Fund raising continues. Major financial partners include:

- **City of New Haven**
- **Yale University**
- **New Haven Parking Authority**
- **William Graustein**

**Street Smarts go beyond simply obeying the traffic regulations or driving below the speed limit. Street Smarts call for attentiveness at all times, patience with others, and a willingness to share the road. Drivers are encouraged to sign the "smart driver" pledge. Materials for distribution include water bottles, car magnets, tri-folds, and other materials with the clearly identifiable Street Smarts logo.**

As of 2009, the Street Smarts campaign is ongoing with early positive feedback. Approximately 1 million impressions realized to date through media, direct outreach, and commitments to the New Haven "smart driver" program. For more information on this campaign, please contact Jim Travers, City of New Haven at (203) 946-8077.

