



MUNICIPAL IMPLEMENTATION TOOL #32

OCTOBER 2018



INTRODUCTION

This brochure is one in a series of Municipal Implementation Tools (MITs) available to local governments and planning partners to assist in implementing the region's long-range plan, *Connections 2045*. Prepared and adopted by the Delaware Valley Regional Planning Commission (DVRPC), in collaboration with regional stakeholders, the long-range plan provides a sustainable land use and transportation vision for the region's growth and development through the year 2045. *Connections 2045* establishes five key principles that are essential to realizing a sustainable future:

- Sustain the environment.
- Develop livable communities.
- Expand the economy.
- Advance equity and foster diversity.
- Create an integrated, multimodal transportation network.

Municipal governments have the primary authority and responsibility to implement these policies. The series is designed to introduce local officials and citizens to planning techniques that may be useful in their communities. Each covers a different topic and provides an overview of the use of the tool, the benefits, and best practices from within the Greater Philadelphia region. For additional information about *Connections 2045,* please visit

<u>www.dvrpc.org/Connections2045</u>. To download additional brochures, visit <u>www.dvrpc.org/MIT</u>.

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Speeding—driving too fast for conditions, racing, or exceeding the posted speed limit—contributes to approximately a third of all traffic fatalities in the United States, which is about the same proportion as alcohol impairment.





Source: 2007-2016 Fatality Analysis Reporting System (FARS) Data

Figure 1 shows the trend of speeding-related traffic fatalities compared with alcohol-impaired and all traffic fatalities in the United States from 2007 to 2016. Although speeding-related traffic fatalities declined along with overall traffic fatalities during this time, in recent years both have been on the rise. Between 2015 and 2016, speeding-related traffic fatalities increased 4 percent while overall traffic fatalities increased 5.6 percent. Although these increases are influenced by a 2.2 percent increase in vehicle miles traveled (VMT), **speeding remains the most common contributing factor to traffic fatalities besides alcohol-impaired driving**.

SPEEDING IN THE REGION

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Speeding is of particular concern in Pennsylvania, which had the fourth-most speeding-related traffic fatalities in the United States in 2016, as well as the seventh-highest percentage of total traffic fatalities that were speeding related. Pennsylvania had five times the number of speeding-related fatalities that New Jersey had in 2016, and Pennsylvania's percentage of speeding-related fatalities was twice as large as New Jersey's (see Figure 2).

Troublingly, the number of speeding-related fatalities increased slightly in New Jersey between 2015 and 2016. In both states, however, speeding-related fatalities made up a slightly smaller percentage of traffic fatalities in 2016 than in 2015, although more years of data are needed before a trend can be established.

Figure 2: Speeding-Related Traffic Fatalities as a Percentage of Total Traffic Fatalities by State in 2016



Source: 2016 FARS Data

The Greater Philadelphia region is made up of five counties in Pennsylvania (Bucks, Chester, Delaware, Montgomery, and Philadelphia) and four counties in New Jersey (Burlington, Camden, Gloucester, and Mercer). In these nine counties, 28 percent of traffic fatalities in 2016 were speeding related, which is an improvement from earlier years; 36 percent in 2015 were speeding related. Within the Greater Philadelphia region, Chester County in Pennsylvania had the highest percentage of speeding-related fatalities at 54 percent, while Camden County in New Jersey had the lowest at 15 percent (see Figure 3).

Figure 3: Speeding-Related Traffic Fatalities as a Percentage of Total Traffic Fatalities by County in 2016



Percentage of Total Traffic Fatalities

Source: 2016 FARS Data

SPEEDING IN THE REGION

Crash rates are often a more useful metric for determining the relative incidence of crashes than the absolute number of traffic fatalities or the percentages of total traffic fatalities. By normalizing these crashes by annual average daily traffic (AADT), a commonly used measure of traffic volume, the difference in traffic volume between different areas can be accounted for, which is important because AADT accounts for exposure, or the risk of being in a crash. As AADT increases, so do traffic fatalities and serious injuries.

Chester and Bucks counties have not only the highest percentages of speeding-related fatalities in the region but also the highest speeding-related fatality rates (see Figure 4). There is variation in the fatality rate between municipalities within these counties, however.



Figure 4: Speeding-Related Traffic Fatalities on Non-Interstate Roads per 10,000 Annual AADT by Municipality, 2012–2016

Sources: Pennsylvania Department of Transportation and New Jersey Department of Transportation, 2012–2016

CONTRIBUTING FACTORS



A car passes through an intersection, entering the crosswalk. (Getty Images/Hans-Martens)

Crash Severity: Speeding-related crashes are typically lethal compared to lower-speed crashes. Speeding not only increases your chances of being involved in a crash, but it also increases the likelihood that a crash will be fatal or cause serious injury. As vehicle speed increases, so does stopping distance and the time needed to stop. These increases reduce a driver's ability to react to changing conditions on the road, increasing the probability of a collision. Additionally, the higher the speed prior to a crash, the bigger the velocity change upon impact, which is the largest determinant in the severity of a crash. **Studies consistently show that a 5 percent increase in average speed increases traffic fatalities by 20 percent overall.**

Increased speed worsens crash severity even more dramatically for pedestrians in crashes. A study by the AAA Foundation for Traffic Safety found that a pedestrian hit at a speed of 23 miles per hour (mph) has a 90 percent chance of surviving; when speed is increased to 58 mph, a pedestrian has only a 10 percent chance of surviving (see Figure 5).





Source: Tefft, 2011 (AAA Foundation for Traffic Safety)

Aggressive Driving: Speeding is just one of a set of behaviors known as aggressive driving. Aggressive driving also includes a number of dangerous and often illegal behaviors, such as running a stop sign or red light, or passing in a no-passing zone. Researchers at the AAA Foundation for Traffic Safety found that 56 percent of fatal crashes between 2003 and 2007 were caused by at least one of these actions. New Jersey uses this definition for aggressive driving, while Pennsylvania defines aggressive driving as performing at least two of these actions. As a result, the number of crashes, injuries, and fatalities attributed to aggressive driving is higher in New Jersey than in Pennsylvania.

Perception: According to a 2015 AAA Foundation for Traffic Safety Culture Index poll, speeding and aggressive driving are viewed by 90 percent of drivers as dangerous, yet 51 percent of respondents admitted to engaging in it within the past month. The reasons drivers

speed are varied and complex; for example, some drivers may speed if they are in a hurry, or if they are unaware of the posted speed limit or their operating speed. Others simply love the thrill of driving fast.



A radar speed indicator sign in a neighborhood warns a driver that they are speeding. (Getty Images/Willowpix)

Other Factors: Using data from the 2015 FARS, which is the largest and most recent dataset available, it becomes readily apparent that several factors correlate with speeding-related traffic fatalities: demographic characteristics; alcohol consumption; lack of restraint use; location; road type; road condition/weather; and time of day, month, and year. Knowing what correlates with speeding-related traffic fatalities helps law enforcement, government agencies, roadway owners, and advocacy groups make intelligent decisions to reduce speeding and prevent speeding-related traffic crashes.

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Gender and Age

Gender and age are the strongest predictors of speeding-related traffic fatalities. The percentage of fatal crashes that involve speed decreases with age for both genders, and this percentage is highest in the 15–24 age group for both men and women. Male drivers in this age group represent the overall highest number of fatal crashes for all age groups. In fact, **speeding-related traffic crashes among male drivers are more common than among female drivers across all age groups** (see Figure 6).

Figure 6: Percentage of Fatal Crashes in the United States Involving Speeding Drivers by Age and Gender in 2015



Source: 2015 FARS Data

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Impairment

Alcohol-impaired driving is more common in speeding-related traffic fatalities than in traffic fatalities in which speed did not play a role. In 2015, 40 percent of speeding drivers involved in fatal crashes in the United States had blood alcohol concentrations above .08, while only 17 percent of non-speeding drivers involved in fatal crashes had been drinking.

Seat Belt Use

Speeding drivers are also more likely to be unrestrained, which contributes to the severity of speeding-related crashes. In 2015, nearly half of speeding drivers involved in fatal crashes in the United States were unbelted, compared to 24 percent of non-speeding drivers.



A roadside sign reminds motorists to use their seat belts. (Getty Images/Willowpix)

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Road Location and Type

Drivers are more likely to speed in rural areas than in urban areas. From 2006 to 2015, **the rate of U.S. speeding-related fatalities in rural areas was more than twice that in urban areas** over the same period (see Figure 7).

Figure 7: U.S. Speeding-Related Fatalities on Rural and Urban Roads per 100 Million VMT



Source: Insurance Institute for Highway Safety, 2006–2015

Drivers are also more likely to speed on certain road types than others. The majority of speeding-related fatalities in the United States occurred on arterials, which include interstates,

freeways/expressways, principal arterials, and minor arterials (see Figure 8). Examples of arterials in the region are the Schuylkill Expressway and NJ 73. The high rate of speeding-related fatalities on arterials may be caused by the fact that **both the design speed and the posted speed limit of arterials are often higher than on collector and local roads, and higher speeds are associated with increased severity of crashes.**

Figure 8: Speeding-Related Fatalities in the United States in 2015 by Roadway Class



Source: 2015 FARS Data

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CONTRIBUTING FACTORS

Weather Conditions

A driver can be considered to be speeding even when driving below the posted limit. For example, in the event of inclement weather, drivers are advised to reduce their speed to less than the posted speed limit: a precaution which promotes safety. Non-compliance could be interpreted as driving too fast for conditions: a crash-prone practice. In the United States, **speeding-related traffic fatalities are more likely to occur on roads with ice, frost, snow, or slush than on dry roads**, which may explain why speeding-related traffic fatalities in the United States are most common in February.



Cars and trucks traveling in adverse weather and road conditions. (Getty Images/Maren Winter)

Time of Day

In the United States, **speeding drivers were more likely to be involved in a fatal crash at night or on the weekend** and less likely to be involved in a fatal crash in the daytime or on weekdays.

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There are three common strategies to combat speeding: **engineering**, **education**, **and enforcement**.

Engineering: The engineering approach aims to design or redesign roads and intersections in ways that ensure a lower average speed or that discourage speeding. Studies have shown that lane narrowing, in combination with other traffic-calming measures such as installing roundabouts, force drivers to slow down to the appropriate speed. Road diets, which may or may not include lane narrowing, reconfigure roads by removing travel lanes and using the newly available space for other uses, such as parking, bike lanes, or center turn lanes. Road diets also reduce speeds, resulting in up to 47 percent fewer crashes, and have been implemented throughout the region since the early 2000s to great success, including in Philadelphia, Coatesville, and Pottstown in Pennsylvania; and Ewing Township, and Haddon Heights, Mt. Ephraim, and Woodbury boroughs in New Jersey.



This section of Garrett Road in Upper Darby, Pennsylvania, seen looking north from Sherbrook Boulevard, was reduced from four lanes to three, based on a design developed through DVRPC's Transportation and Community Development Initiative. The first photo was taken in May 2017, while the second was taken in June 2018 after the road diet. (Traffic Planning and Design, Inc./Randy Waltermyer)

SPEED REDUCTION STRATEGIES

<u>Complete Streets</u>: Lane narrowing, roundabouts, and road diets are just a few of the features of **Complete Streets**, a road design policy tool that aims to provide equity to all road users, especially vulnerable ones such as pedestrians and bicyclists, instead of prioritizing private vehicles. As of 2016, **31 municipalities in the DVRPC region have Complete Streets policies**, including the cities of Philadelphia, Trenton, and Camden (see Figure 9).

Figure 9: Municipalities in the DVRPC Region with Complete Streets Policies



Source: National Complete Streets Coalition, 2018

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Variable speed limits: Many speed limits are determined based on the **85th percentile speed**, which is the speed at which 85 percent of vehicles travel. However, if most drivers are moving at or above the posted speed limit, the 85th percentile speed is likely to be higher than the posted speed limit, resulting in continual increases in the speed limit.

Prior to 1995, there was a national speed limit of 55 mph. Since then, maximum speed limits in 16 states have increased to 75 mph or higher. Pennsylvania's maximum speed limit increased from 65 to 70 mph in 2016, while New Jersey's is still 65 mph.

Given rapidly rising speed limits, **variable speed limits** are an important tool that can change the speed limit according to traffic, weather, or road conditions, and have been used successfully in other countries, such as Germany.



Variable speed limits on the Autobahn in Germany allow the speed limit to be lowered during construction. (Getty Images/KenWiedemann)

SPEED REDUCTION STRATEGIES

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<u>In-vehicle technologies</u>: As vehicles become increasingly semiautomated, technological improvements can help reduce speeding.

One such technology is **intelligent speed adaptation**, which alerts drivers when they exceed the speed limit and can even electronically limit the speed of a vehicle, making it impossible for drivers to speed. Recent studies have shown that such technologies are moderately successful in decreasing the incidence of speeding, especially among "chronic speeders" (drivers with at least three speeding violations).

Another emerging in-vehicle technology that can help prevent fatalities in the event a driver speeds is **pedestrian monitoring**. Sensors on the front of the vehicle warn the driver if a pedestrian is in the path of the vehicle; if there is no response from the driver, the vehicle will brake automatically, bringing the vehicle to a complete stop. Similar technology can also detect if the vehicle is too close to the vehicle in front of it and alert the driver to slow down.

Unfortunately, these technologies will take some time to phase in as the vehicle fleet turns over, and there is little that municipalities can do to speed this transition. Municipalities should, however, be aware of the benefits of these emerging technologies and prepare for their impacts.

Education: The second approach—education—attempts to inform drivers about traffic safety and the ramifications of speeding. Despite its significant share of all traffic fatalities, awareness campaigns targeted toward speeding are less common than alcohol-impaired driving or seat belt use education campaigns. Trial campaigns to reduce speeding have had mixed results across the United States and usually did not have a lasting impact. Research is needed to understand which crash safety campaigns have been successful and how they can be adapted to address speeding.

Enforcement: The enforcement approach seeks to increase compliance with existing speeding laws. Often this entails raising the financial penalties for speeding, but more recently, data-driven forms of enforcement such as high-visibility enforcement (HVE) and automated speed enforcement (ASE) have proven more effective. HVE concentrates law enforcement resources in areas where crashes are most common, deterring those drivers who would otherwise speed. ASE, on the other hand, uses mounted cameras to detect and identify speeding vehicles, which frees up law enforcement resources and results in a higher rate of compliance from those who are aware that they are being monitored. ASE has been found to reduce average speeds by up to 15 percent, with a resulting decrease in crashes of up to 49 percent. In Pennsylvania, Senate Bill 172 recently authorized the use of ASE in work zones as well as along Roosevelt Boulevard in Philadelphia. Unfortunately, ASE is prohibited in New Jersey, which complicates the implementation of ASE in the DVRPC region.



A police officer pulls over a speeding driver. (Getty Images/kali9)

CONCLUSION

Ultimately, **none of these approaches alone can reduce traffic crashes and fatalities resulting from speeding**. What will work best is a combination of engineering, education, and enforcement strategies.

For example, in 2014, New York City adopted its **Vision Zero Action Plan**, with the goal of cutting traffic fatalities in half by 2025. That same year, the city lowered its citywide speed limit from 30 mph to 25 mph (engineering) and, at the same time, expanded its speed camera program to deter motorists from breaking the new law (enforcement). In addition, the plan called for the deployment of "street teams" to educate the public about the Vision Zero effort prior to beginning the enforcement campaigns (education).

New York City's Vision Zero program has been very successful in part due to this **multipronged approach**; the city's traffic fatalities have decreased by 28 percent over the past four years, even while nationally, traffic fatalities increased by 15 percent. Pedestrian fatalities in New York City have declined even more dramatically, by 45 percent.

Philadelphia, which has more than twice the number of traffic deaths per capita than New York City, adopted Vision Zero in 2016. Twenty-one percent of serious crashes that occurred on Philadelphia's local roads between 2012 and 2016 were speeding related.

As such, reckless/careless driving is one of the **"Safety Six,"** which are six types of traffic violations on which the Philadelphia Police Department will focus their traffic safety enforcement efforts in order to reduce the number of serious crashes in the City of Philadelphia.

The Speeding and Traffic Safety MIT was developed with the **Regional Safety Task Force (RSTF).** The RSTF is a multi-disciplinary team of transportation safety professionals and stakeholders that promotes transportation safety in the Delaware Valley and offers guidance for DVRPC's efforts. The goal of the RSTF is to reduce roadway crashes and eliminate serious injuries and fatalities from crashes in the region. Established in 2005, the task force seeks to build and maintain effective partnerships to improve safety for all users of the regional transportation system. The RSTF meets quarterly focusing on one of the American Association of State Highway Transportation Officials' (AASHTO) safety emphasis areas through presentations by practitioners and subject matter experts. Each meeting also includes small group discussions targeted at identifying action items that help improve safety on that meeting's topic. For more information on the RSTF, please visit https://www.dvrpc.org/Committees/RSTF.

Another product of the RSTF is **the Transportation Safety Analysis and Plan (TSAP).** The TSAP presents data trends and analysis at the regional, county, and municipal levels, combined with recommended improvement strategies and existing programs designed to improve safety for each AASHTO safety emphasis area. The fifth edition of the TSAP is due to be released in late 2018 (see Figure 10). The 2018 TSAP presents an expanded list of 13 safety emphasis areas, and includes a deeper look at eight factors that collectively contribute to 93 percent of the killed and severe injury (KSI) crashes that occur in the region each year. One of those eight critical factors is aggressive driving, a set of dangerous and illegal driving behaviors which includes speeding (see page 8). The 2018 TSAP will be available as a free download from DVRPC's products web page.



Figure 10: 2018 Transportation Safety Analysis Plan

TRANSPORTATION SAFETY ANALYSIS AND PLAN

An Analysis of Crash Data and Recommended Safety Strategies for Greater Philadelphia

NOVEMBER 2018 | Fifth Edition

A product of the



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Source: DVRPC

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ABOUT DVRPC

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The Delaware Valley Regional Planning Commission is the federally designated Metropolitan Planning Organization for a diverse nine-county region in two states: Bucks, Chester, Delaware, Montgomery, and Philadelphia in Pennsylvania; and Burlington, Camden, Gloucester, and Mercer in New Jersey.

DVRPC's vision for the Greater Philadelphia Region is a prosperous, innovative, equitable, resilient, and sustainable region that increases mobility choices by investing in a safe and modern transportation system; that protects and preserves our natural resources while creating healthy communities; and that fosters greater opportunities for all.

DVRPC's mission is to achieve this vision by convening the widest array of partners to inform and facilitate data-driven decision-making. We are engaged across the region, and strive to be leaders and innovators, exploring new ideas and creating best practices.

DVRPC fully complies with Title VI of the Civil Rights Act of 1964 and related nondiscrimination statutes in all activities. For more information, visit www.dvrpc.org/GetInvolved/TitleVI.

The authors are solely responsible for the findings and conclusions herein, which may not represent the official views or policies of the funding agencies.



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