



What is Traffic Calming?

The Institute of Transportation Engineers (ITE) defines traffic calming as “the combination of measures that reduce the negative effects of motor vehicle use, alter driver behavior, and improve conditions for non-motorized street users.” That is a mouthful, but it identifies three inter-related challenges which are the topic of many lifetimes of practice and study.

Reducing the negative effects of motor vehicle use is a broad topic. According to the National Highway Traffic Safety Administration (NHTSA) in 2020, speeding and aggressive driving were contributing factors in 29 percent of all traffic fatalities. It is not surprising then that most public works professionals use measures to increase road safety and reduce vehicle speed.

This toolbox is an introduction for those just starting out in traffic calming and a handy reference guide for the experienced professional to the many tools available.

This toolbox is not meant to provide a master key to altering human behaviors, but the tools and publications referenced in this toolbox can help redirect some of the more dangerous ones. Traffic calming tools address challenges in two or more pillars of the interdependent Safe System Approach, and as such, small investments in calming can result in a compounding positive return in improved safety of the entire transportation system.

This toolbox brings together some of the most current research in driver behavior and innovations to help designers calm traffic. It will not allow a designer to drive the vehicle for another human but instead carefully identify the behavior(s) that should be encouraged or corrected. As such, the designer can choose countermeasures from the resources included at the end of the toolbox that are best suited to figuratively, or even literally, encourage the driver into making safer decisions.

Keys to traffic calming project success

There are many different approaches to traffic calming, varying from simple and relatively inexpensive improvements such as signs, pavement markings, or vertical pavement modifications to full reconstruction. It is important to remember that every small traffic calming improvement incrementally advances the goal of zero fatalities and serious injuries.

Get the public involved early in planning stages of traffic calming.

Design professionals may not fully understand the needs of the public they serve. Their expertise is most often in engineering and safety, so it's not surprising that sometimes those are the primary or even the only factors considered. Sharing information about a design with the people that will use it, early in the process, should be more than just a checkbox in the project timeline. It is an opportunity to make the design work better for everyone. The public can provide critical context the designer may lack or overlook. Listening critically to constituents and making a sincere effort to address their concerns and empathize with them is a powerful tool for building public trust and earning buy-in for a traffic calming project. That said, some traffic calming tools, though highly effective, do not enjoy widespread public acceptance. There should be public engagement before selecting a tool. Designers should not allow negative public perception to override a decision to use an appropriate traffic calming solution. Instead, a wise public works professional will recognize different perspectives as an opportunity to focus on outreach and education. The designer should be able to clearly demonstrate the benefits and costs of a chosen tool over an alternate. If not, a different tool should be considered and analyzed.



Image: <https://www.transportation.gov/NRSS/SafeSystem>

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Define goals and opportunities beyond the primary purpose of the improvement

When planning traffic calming measures, it's essential to consider additional goals and opportunities that extend beyond the immediate need for safety improvements. These considerations can enhance the overall effectiveness and benefits of the project.

Goals

- Reduce vehicle crashes at a spot location.
- Decrease lane departure errors that lead to crashes into roadside obstacles or oncoming traffic.
- Improve air and water quality through minor changes to corridor designs.
- Proactively find ways to provide separation or otherwise prevent fatal crashes between motorized and non-motorized system users.

Opportunities

- Address the impact of a new housing development generating significant turning traffic onto a high-speed roadway, necessitating the need for vehicles to slow down to increase gaps.
- Consider the concerns about physical ailments and global economic impacts during the design process.

Multiple deficiencies can be resolved, or additional benefits reaped, with limited or no increase in cost if secondary and tertiary challenges are included in the initial analysis. Roundabouts, for example, are known for reducing vehicle speeds, intersection backups, and fatal and injury crashes significantly. They also reduce emissions by improving level of service and enhance non-motorized user access by providing pedestrian refuge areas within the medians and splitter islands.

Choose potential tools or countermeasures

Once primary and other goals or opportunities for improvement have been identified and exhausted, use sound engineering judgment to select appropriate tools and/or best practices to implement (see Traffic Calming Resources section at the end of this toolbox). Both regulatory and guidance signs are essential elements of any design. Ensure all signage and markings and vertical pavement improvements meet the latest *Manual on Uniform Traffic Control Devices* (MUTCD) requirements and as much of its guidance as possible, especially near a new traffic calming countermeasure (<https://mutcd.fhwa.dot.gov/>). A consistent message allows drivers to react more predictably and help reduce crashes but can also be a bit stifling. Traffic calming is not for the faint of heart, since many people only want to travel as fast as possible!

Traffic calming countermeasures fall into three basic categories:

• Technology

Technology now provides designers with interactive guidance tools for all system users. Examples include dynamic message signs, speed awareness signs, pedestrian activated flashers at mid-block crosswalks, and traffic actuated lighting on or in the margins of signs. These tools activate only when needed or in use, drawing additional attention. Unlike traditional signing, they do not fade into the background "noise" for regular users of a road segment, which improves their effectiveness.

• Horizontal deflection

A wise engineer once said, "people may ignore traffic laws, but they cannot ignore the laws of physics." A driver's perception of their ability to maintain control or avoid collision at a given speed is related to the physical geometry of their environment and other objects within it. For that reason, changing the physical geometry of the environment is a powerful tool available to the designer to limit traffic speeds. Inducing horizontal deflection in the design forces a driver to reduce speed as they navigate a constructed obstacle. Physically constricting or creating the optical equivalent of a narrowing corridor also tends to reduce traffic speeds. Examples of using horizontal deflection to reduce speed include roundabouts, narrower painted lane lines or medians, raised medians, pedestrian islands, and bike lanes.

• Vertical deflection or changes

Vertical deflection over a short span reduces traffic speed. Examples include speed humps, speed tables, or speed cushions or raised crosswalks. These tools are often used with crosswalks or in pedestrian areas to help improve conditions for non-motorized users. Although vertical deflection countermeasures work best in lower speed corridors, center or edge-line rumble strips can help reduce lane departures by providing tactile and audible driver feedback on high-speed facilities.

A "road diet" or "complete streets" approach to traffic calming often combines several of the available tools to improve safety and multimodal use within a travel corridor or community. A "road diet" often leads to fewer lanes which the community may not perceive as a positive outcome. There are too many countermeasures to list, so the designer is encouraged to use the links available in this document to find a more expansive list of tools and best practices available.



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Evaluate the improvements and iterate

After traffic calming improvements are made, follow up to determine if the solution is working. When the improvement is working as intended, share data on the reduction in conflicts, crashes, speeds, or injuries with the public including impacts to improving the level of service. This may mean running counts of crashes for shorter time periods than normally used (i.e. three years minimum). That will help build trust and consensus for additional improvements going forward.

Additional benefits of traffic calming

Slowing speeds can lead to reduced greenhouse gas emissions and air pollution. Studies have shown that driving at higher speeds can burn more fuel than driving the same distance at lower speeds. This is because air resistance increases exponentially at higher speeds, reducing a vehicle's fuel efficiency and generating more pollution per mile. It's not only the maximum speed that counts. Reducing the act of acceleration and deceleration, one can reduce overall emissions. One approach to maintain flow is integrating traffic roundabouts rather than signal-controlled intersections.

Lower speed limits can also lead to indirect environmental benefits by encouraging active transportation options, such as walking and cycling and use of public transportation. Reduction of vehicle miles travelled is the most direct way to reduce emissions from vehicles.

Traffic calming designs often include road narrowing or road diets that provide opportunity to reconsider the use of the right-of-way (ROW) or existing hard surface treatments. Simple techniques such as removal of asphalt or concrete and reintroducing permeable soft scape can have significant benefits and can help meet stormwater management goals. Bumpouts (bulbouts) or roundabouts, for example, can be designed with the use of green infrastructure to capture and filter water and provide space for plants and trees to grow.

Summary

When considering a traffic calming project there are many aspects to consider. Remember to contact your [Local Technical Assistance Program \(LTAP\)](#) to see if they have resources to share on this topic. You should also consult state and local standard specifications. In the end, the biggest challenge is simply trying something new and different.

Traffic Calming Resources

Complete Streets in FHWA

<https://highways.dot.gov/complete-streets>

Institute of Transportation Engineers Traffic Calming Measures

<https://www.ite.org/technical-resources/traffic-calming/traffic-calming-measures/>

MUTCD, 11th Edition

<https://mutcd.fhwa.dot.gov>

NACTO Complete Streets Resources

<https://nacto.org/references/a-hrefhttpwww/>

Proven Safety Countermeasures

<https://highways.dot.gov/safety/proven-safety-countermeasures>

Road to Zero Fatalities

zerofatalities.com

<https://highways.dot.gov/safety/zero-deaths/safe-system-approach-toward-zero-traffic-deaths>

Safer Speeds

<https://www.transportation.gov/NRSS/SaferSpeeds>

Safe System Approach

<https://www.transportation.gov/NRSS/SafeSystem>

