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1 Cor. 10:31
…whatever you do,
do it all for the glory of God.

Neighborhood Traffic Calming
Part 3 – Solutions

by
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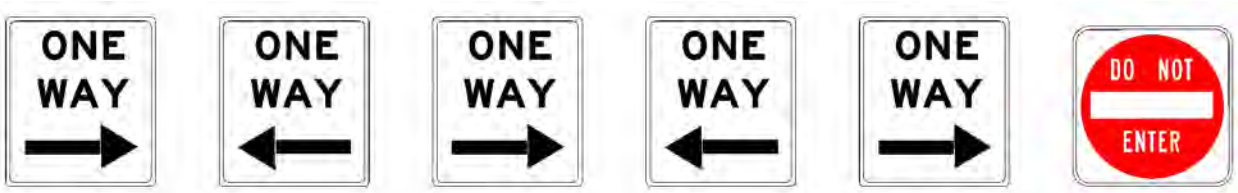
It is extremely tempting to jump to this step of the process thinking that the problem is obvious. Don't do it! Be sure to go through the steps of gathering the complaints, contacting your local government, hiring a professional traffic engineer if one is not provided by the government, and formally defining the problem. Specific solutions should be tailored to specific problems. Installing the wrong solution can create more problems than doing nothing.

Cut-Through Traffic

Cut-through traffic solutions involve making the neighborhood streets less attractive to through traffic. The downside is that they typically have negative impacts on the neighbors at the same time. The cut-through traffic problem needs to be weighed against the negative impacts on the neighbors.

The most obvious way of making the neighborhood streets less attractive is to eliminate the through route with a street closure. This is a pretty dramatic approach, but it is very effective. With street closures, it may not be necessary to close the street to all traffic, just motor vehicles. Sidewalk or multi-use paths can remain open by simply making the opening too small for motorized vehicles. Half a street can also be closed by making a portion one-way, and removing the remaining pavement or installing curbing that leaves only 5 feet open for a bicycle path.



Alternating one-way patterns on a street can leave it open to local traffic while making it unattractive to through traffic. By alternating the direction of the one-way restriction every block, streets will lose their ability to function for through traffic by forcing a turn at the end of every block.

Diverters are physical barriers that force turns at intersection. They can be in the form of a median in the middle of the cross street or a diagonal diverter that causes an intersection to turn into a pair of turns. Like the street closure, it can remain open to pedestrians and bicycles. Diverters can function as speed calming since they require vehicles to make low speed turns.

Turn restrictions are a form of diverter where turns are necessary for the cut-through route. Signs and pavement markings are typically ineffective without constant enforcement unless there is some kind of physical change to the intersection making the turn difficult. A typical radius for a local street may be 20 feet, but if the turn is prohibited the radius can be reduced to practically zero.

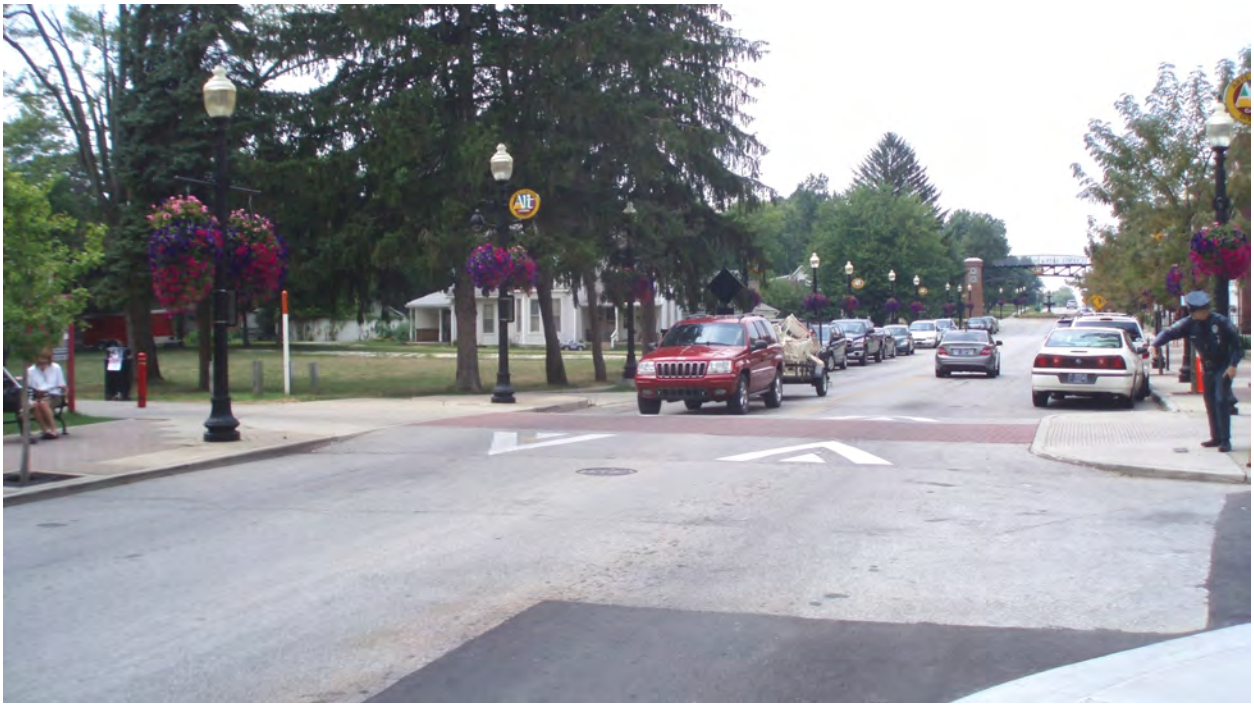
Gated neighborhoods are another way to stop through traffic, but offer significant problems with access cards, gate maintenance, visitors and service vehicles. They may also have legal implications that should be investigated. Most traffic calming for cut-through traffic works by making the trip less attractive, not impossible.

Speed Control

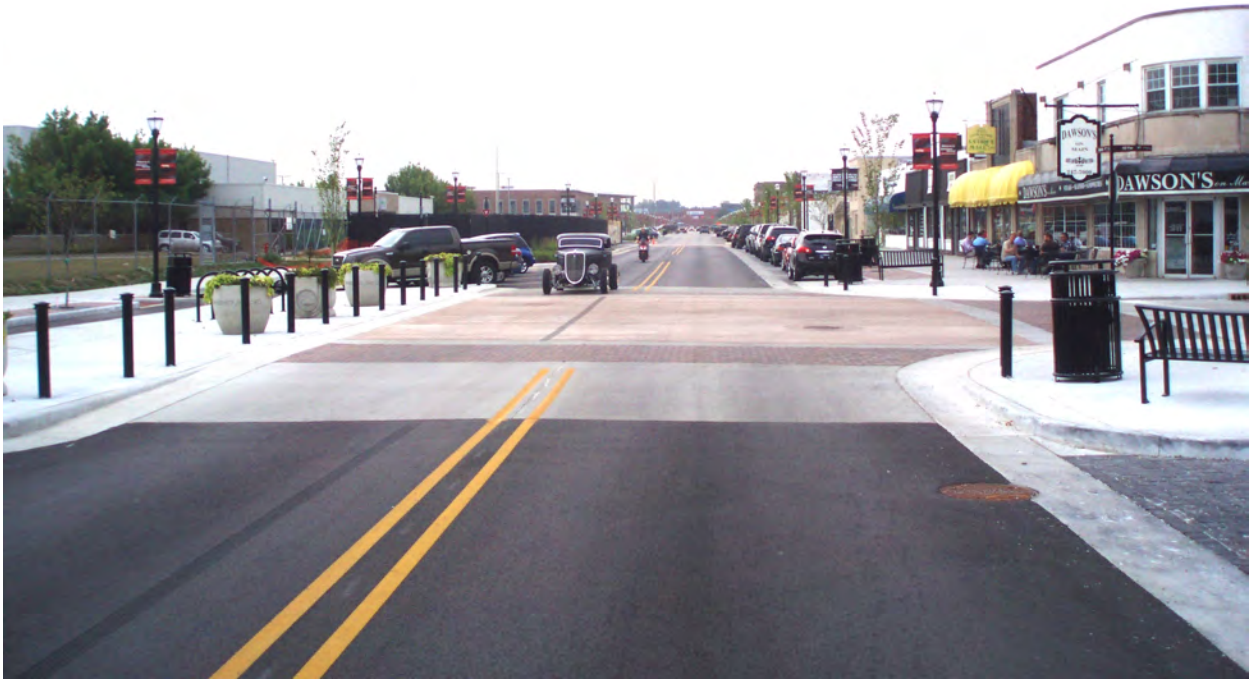
Speed solutions involve making the high speed travel uncomfortable typically through horizontal or vertical deflection, or through psychological methods.

Speed humps are some of the most common traffic calming devices around. Speed humps are different than speed bumps. Speed humps are typically 12-14 feet long by 3 ½ inches high where as speed bumps are typically 2 feet long by 4 inches high. Speed bumps because of their short length can be absorbed by the vehicles suspension at higher speeds, but tend to jolt the driver at lower speeds. Speed bumps are only comfortable at less than 5 MPH. The extra length of a speed hump smoothes out the ride for low speeds, but forces the entire vehicle, and therefore the driver, to feel the hump at higher speeds. Speed humps are not without their drawbacks. The first couple of drawbacks that are typically mentioned

are that they impede emergency vehicles and snow removal. These can be over come with some design features, such as variation called speed lumps that have a portion in each lane that is not elevated. The spacing is designed so that fire trucks can straddle the centerline with their wheel paths in traveling through the voids, but narrower cars can't avoid hitting the raised portion. Speed humps have been used in many snowy areas. There are also speed humps that are removable so that they are only there three seasons of the year. Other drawbacks include additional noise created by trucks crossing them.

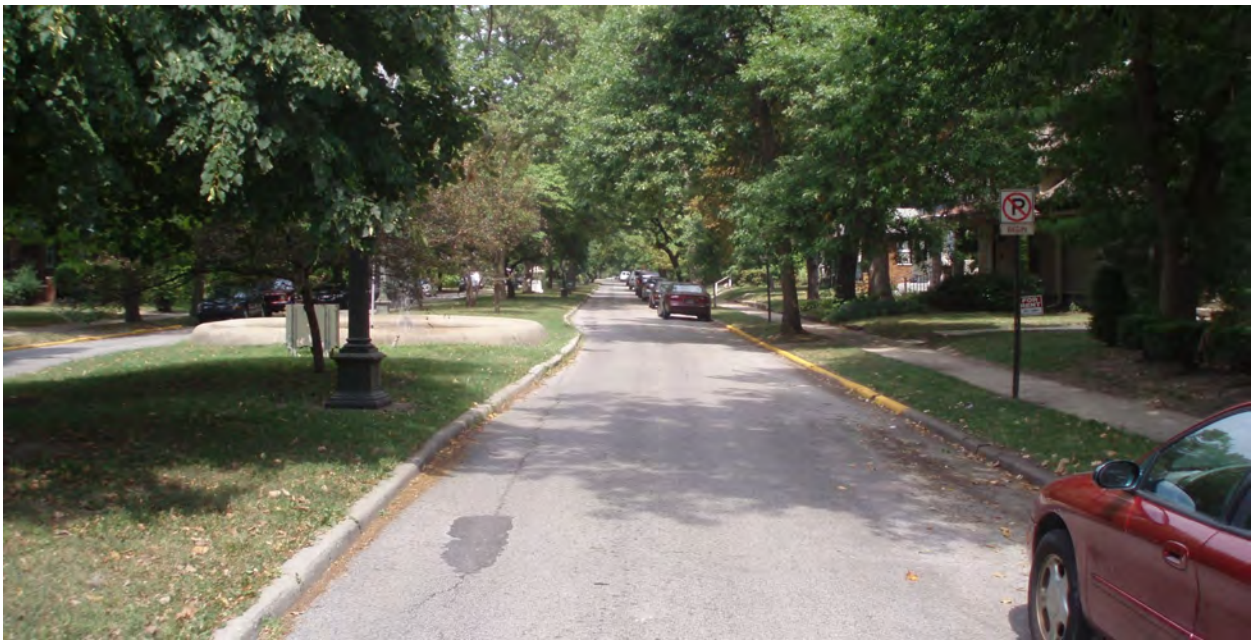


Speed tables are a variation of speed humps with a flat section in the middle to lengthen the speed table. These are better accepted by emergency vehicles, but due to their size, they are more expensive. Speed tables can operate as a mid-block raised crosswalk.

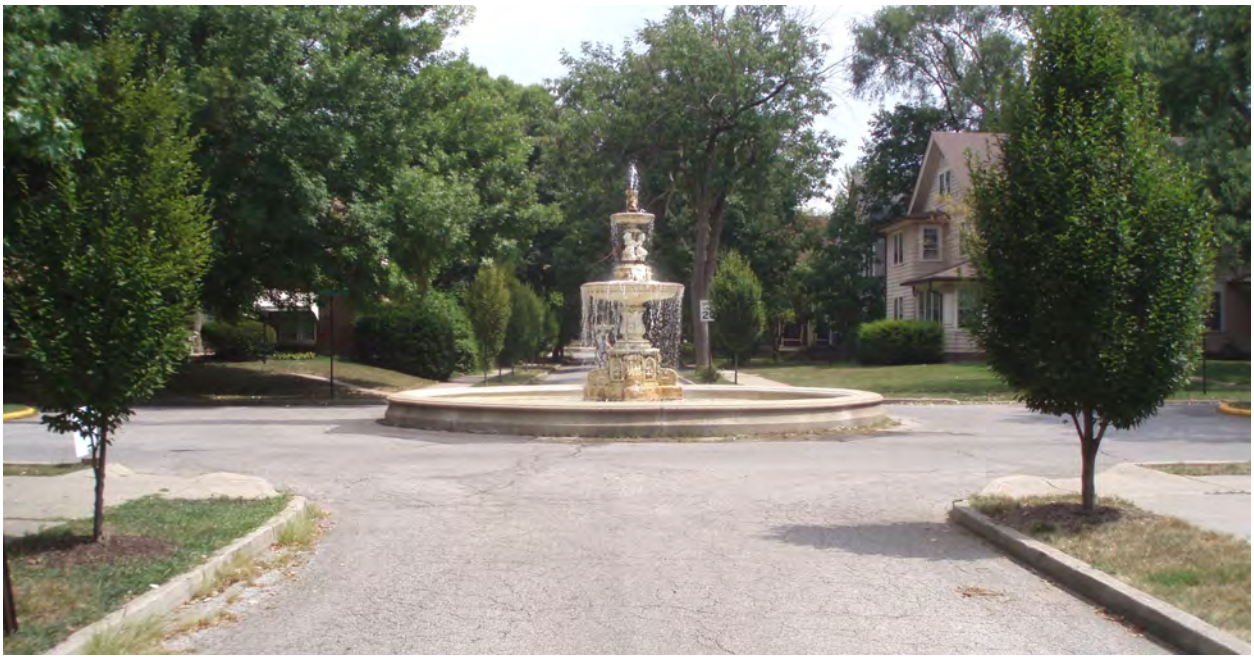


Raised intersections are basically speed tables in the middle of intersection. They have the advantage of impacting two streets with one speed table, and focusing the driver's attention on the intersection where there are more conflict points with pedestrians, bicycles and other vehicles. Important design considerations of vertical deflection are drainage, pedestrians and non-motorized vehicles such as bicycles and wheel chairs.

Horizontal deflection works by making the vehicle leave the high speed path. The lateral forces on the driver are uncomfortable so they slow down. Care must be taken to be sure that the deflection is sufficient to get the desired result without unknowingly making travel by larger vehicles impossible without leaving the road. While the bulk of vehicles in a neighborhood will be cars and light duty trucks, semis still need access such as moving vans, construction vehicles and the like. It is very important to check the design of horizontal deflection based traffic calming for fire truck paths.

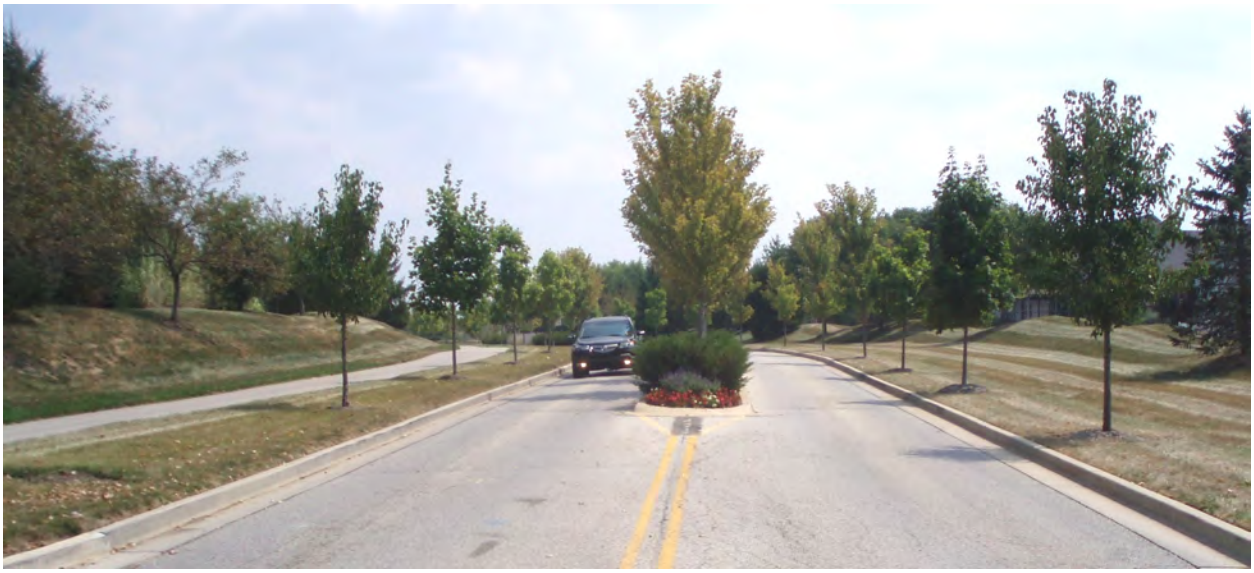


The easiest form of horizontal deflection to think of is the chicane that makes the vehicle turn to one side and then back. These however are not very effective on their own unless there are medians or oncoming traffic preventing vehicles from using the opposing lane. The easiest form of chicane to make is created by allowing on-street parking on narrow roads and alternating the side on which parking is allowed. If the roads are too wide or if on-street parking is rare, there won't be any deflection to slow traffic.



Neighborhood traffic circles work by placing a circular island in the middle of the intersection so that through traffic must jog to the right. They are similar to roundabouts in that they both have round center islands, but traffic circles are much smaller, the center island may be mountable to address large vehicles, and there are typically no splitter islands on the approaches. They are still controlled as all-way yield on the approaches like roundabouts. Installing all-way stop control at a traffic circle is redundant as it eliminates the need for the horizontal deflection to control speeds, assuming everyone stops for the stop signs. Due to the yield control, it is important to provide clear sight lines on the approaches. Sight lines

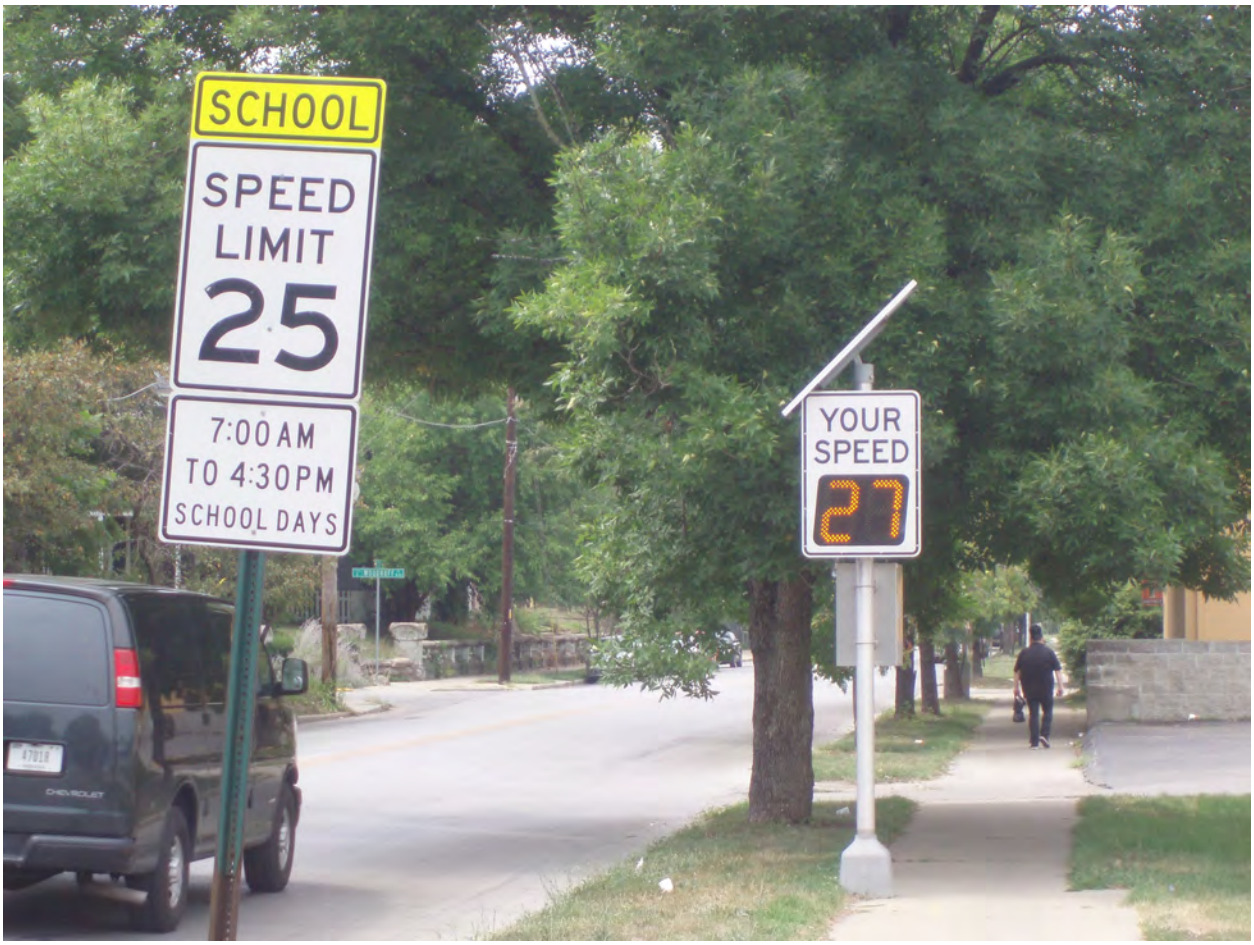
don't need to be appropriate for the posted speed limit since the traffic circle will be designed to slow vehicles on the approach, but visibility is needed for a 15 – 20 MPH approach speed on all approaches.



Narrowings work psychologically on the driver. They can be accomplished by bringing the curbs in, by installing a median, or by landscaping the adjacent grass areas. As with horizontal deflections it is important to consider fire and other trucks that need access to the neighborhood. In a fire emergency, it is important that one fire truck can park in the narrowing while another can pass by, and some fire trucks are 10 feet wide excluding the mirrors.

Bulb-outs are where the roadway is narrowed at an intersection by bringing the curbs in at the crosswalks equal to the parking lanes. This helps pedestrians see oncoming traffic, the motorist see the pedestrians before they enter the crosswalk and keeps parked cars from parking too close to the intersection.

Like vertical deflections, it is important to consider drainage and other modes of transportation in the design of horizontal deflections.



Signage and pavement markings can be helpful, but rarely accomplish the full desired effect by themselves. Speed feedback signs are more effective at reducing speeds to the speed limit than a simple speed limit sign. Speed limit signs tend to become invisible to the regular driver who determines their vehicle speed based on their own judgment rather than a sign, unless there is some sort of enforcement. Good traffic calming elements are self enforcing rather than relying on the driver's good will or police enforcement. Warning signs rarely reduce speeds without an associate impediment to the driver, such as a slow speed turn or speed hump.

Some times the best solution may be to incorporate two techniques together, such as providing a narrowing at a speed hump. Horizontal deflections may not work without a median if volumes are already low.

Speed solutions tend to work only around where they are installed, so they need to be installed periodically to drop speeds throughout the neighborhood. For a desired 20 MPH speed, they should be installed about every 250 feet along the road. As the desired speed increases, so does the distance between them. Conversely, spacing them too far apart will not provide the desired results.

Crash Problems

Solutions to crash problems depend on the specific patterns involved, but many can relate to excessive speeds and sight distance problems. Addressing the causes usually will cure a crash problem, but sometimes that may not be possible so other improvements may be needed, such as an all-way stop when it is impossible to provide adequate sight distance. Random accidents are very hard to solve since they typically will be based on driver error, and the only sure way would be to eliminate the driver. Even this would not stop mechanical breakdowns within the car that can cause crashes, such as brake failures or stuck accelerators. In any event, we have gone outside the scope of traffic calming.

Area Wide Plan

Solutions should be part of an area-wide traffic calming plan. Diverting cut-through traffic from one neighborhood street to another does not solve the problem. Speed lowering techniques tend to only work near the calming element, so they need to be repeated at regular intervals to calm traffic throughout the neighborhood. A good traffic engineer should provide an overall plan and not just spot solutions.

At this point, one of the drawbacks to any traffic calming element is the cost. Local governments may have funds for some traffic calming, but rarely have the ability to fund all desired improvements. The federal government is still working on the next transportation bill, but given the national budget constrains, little if any federal funding is expected for traffic calming. Different elements have associated costs, but in general the neighborhood should be thinking in terms of tens of thousands of dollars for an effective treatment plan. Construction costs tend to vary by location and time due to varying design requirements, materials, labor, and even the price of oil and the economy. The traffic engineer can better address costs once they have a good handle on the problems and potential solutions.

More information on traffic calming can be found on the Institute of Transportation Engineers' website at: http://www.ite.org/traffic/index.asp

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