Bumps, Humps, and Something More Intelligent?

Speeding and reckless driving, particularly through our residential and business areas, is something most of us naturally find threatening. Frankly, drivers who disregard speed limits are likely to ignore other rules of the road, such as those dealing with yielding to pedestrians. And just as naturally, many of us will latch onto what appear to be easy fixes. In this case, speed bumps and unwarranted all-way Stop conditions are the common go-to fixes, but both of these can result in unintended consequences. We will focus on speed bumps in this issue.

Simply put, speed bumps are rarely a good idea and can be counterproductive. Because they are so aggressive, the most insolent drivers in our community (and yes, many times we find that the most egregious violators live just down the street…maybe, even in our own house) will look to "make up time" between them with even more reckless behavior and their field of attention can focus down to the road so narrowly that they may be less likely to see the person, animal, or errant soccer ball entering the roadway. If there is any kind of nearby alternative route, the erratic behavior often just moves there with the self-involved drivers that were the problem on the first street. Emergency response vehicles can be hampered in their response time and in the case of heavier vehicles, their tighter suspension can even be damaged. Oh, and if you are a snow plow operator, you are not a fan either. In short, they don't work well with our worst offenders, and they can actually worsen safety instead of lessening it.

An alternative, appropriate for some streets, is the speed hump. What's the difference? Well, we'll skip the snarky response that it's an "h" instead of a "b" because we're more mature than that. Neener, neener. No, but seriously…

Whereas a speed bump is often parabolic in shape, as much as six inches high, and only one to two feet long, a speed hump is a shallower, elongated mound, typically no more than three inches high and usually 12-14 feet in length. A speed bump tends to bring most vehicles to a stop or nearly so, whereas a speed hump is designed to provide a comfortable ride at speeds in the 20-25 mph range, but increasingly reduced comfort thereafter.

The Delaware Traffic Calming Design Manual is a good reference for the use of speed humps, including location, design, and use of multiple humps. The Manual is also transparent that emergency response time can still be affected, snow plowing operations can be impacted, erratic behavior can still occur between humps, traffic may move to a nearby route, and motorcycles may successfully bypass them altogether. It turns out there is simply no alternative, for the ill-mannered scofflaws in our community, to a uniformed law enforcement officer with a ticket book and a multi-colored light bar.

An example of the effects of placement can be seen in this video and the same creator shows an example where multiple sets are placed far closer than they should to be effective.

The research is varied on the crash effects of speed humps, but the Crash Modification Factors Clearinghouse (an excellent place to geek out on safety on a Saturday evening by the

fireplace) lists 40-50% reduction in injury crashes, under the circumstances researched by Elvik and Va.

A new entrant that is getting some buzz is the intelligent speed bump (and other such names). The idea is that at design speed, the driver passes it with little discomfort, but above that speed, the fluid reacts in a manner that becomes turbulent and even jarring. There is a lot we need to yet discover about these non-Newtonian fluid based devices, but they are intriguing. It stands to reason that there are durability questions about the membrane (and is some neighborhood ruffian just going to take a box cutter to it one evening?). We have questions about the fluids themselves and whether we want them running down the gutter and then into the stream. And, we wonder how well they will work to influence driver behavior. We will just have to keep our eye on that one for now.

A similar approach that was in a research phase in Burkburnett, Texas but hasn't apparently found its way to market as yet is a retractable speed bump. Here, this designer uses an industrial railroad airbag to raise a 2" bump on a timer to manage speeds at the times of day most needed for pedestrian crossings and the like. Yet another approach includes road sensors that recognize a fast approaching driver and pops up the speed bump to give him or her a little attitude adjustment.

None of these have managed to go mainstream, at least not in the U.S., but there clearly is a lot of tinkering for a more balanced solution. Perhaps one or more of these will come our way, but in the meantime, our traditional methods should be thoughtfully deployed.

Presumably, we can agree that in all but the narrowest of circumstances, speed humps are a poor idea, but that speed humps do have their limited place. And the jury is still out on these intelligent entries. But the Traffic Calming Design Manual has more tools for us to consider as well and if reckless or erratic driving is a problem in your community, have a look at the rest of the toolbox, including raised crosswalks, chokers, chicanes, etc. The Institute of Transportation Engineers also provides a nice overview of speed management measures and the National Association of city Transportation Officials' Urban Bikeway Design Guide has a section on speed management with a popup figure that nicely illustrates speed lumps, bumps, chicanes, median islands, neighborhood traffic circles, pinch points, and neck downs. Taking a careful look at what the research shows as reasonable expectations for each of these tools and where they can be applied most effectively, will better ensure that we choose countermeasures with a reasonable likelihood of improving safety in our communities.

Meanwhile, here's one final look from the "right side driver" part of the world that gives the kid's perspective on speed bumps. There's a family dynamic going on there that bears some examination, but we're going to take a pass.

The Delaware T^2/LTAP Center's Municipal Engineering Circuit Rider is intended to provide technical assistance and training to local agencies, so if you have traffic safety questions or other transportation issues, contact Matt Carter at matheu@udel.edu or (302) 831-7236.