

Intersection Control Starts with...No Control

We overuse traffic signals, Stop signs, and Yield signs. There, we said it.

Oh, we understand how it happens. There's a minority (but substantial number) of drivers who drive...well, let's just say it, they drive like jerks. Big, dumb stupid-head jerks. We like to always imagine it's those darned kids, but the reality is that some of those jerks have been driving for 20, 30 years or more and look a lot like us. It takes just a couple of these scofflaws in the neighborhood for a couple of the regular attendees at the council meeting to (loudly, insistently) call for a Stop sign, an All-Way Stop condition, or a traffic signal, even if warrants don't substantiate them. Because law enforcement can't be everywhere at once (and let's face it, the aforementioned jerks will respond only to law enforcement), elected officials feel stuck.



When it comes to managing intersections, we have several tools that we should use collaboratively. The first of these is the Delaware Code, specifically the Rules of the Road in [Title 21](#). Most readers of this article are licensed drivers in Delaware and hence, know precisely what the right-of-way section of the Code says. But, in a nutshell, there are a handful of simple rules:

- You can't enter an intersection if there is insufficient room on the other side to be clear of the intersection (don't block the box).
- If there is already a vehicle in the intersection, you have to yield to it.
- If two vehicles approach/enter the intersection from different legs at approximately the same time, the one on the left yields to the one on the right (hence, the name, right-of-way).
- A left turning driver yields to a vehicle approaching on a through movement.
- Oh, and you can't drive on sidewalks.

Pretty straightforward. Now granted, at higher speeds, at intersections of roadways with unbalanced traffic loads, in areas of high pedestrian and bike traffic, and intersections with limited sight distances, the motorists will need some assistance beyond just the Rules of the Road.

That brings us to our next resource, the Delaware Manual on Uniform Traffic Control Devices ([MUTCD](#)). Sections 2B.04 through 2B.09 are of principal interest and again, we will leave you to read those brief sections in their entirety, particularly the guidance for use of stop, yield, or no control.

Nowhere does the MUTCD say that all intersections require control. In fact, Section 2B.04 establishes minimum criteria that should trigger the use of either a Yield or Stop condition and Section 2B.06 encourages consideration of a Yield condition where a full stop is



not necessary. Engineering judgement can be used to apply controls when those criteria aren't met, and there is additional guidance to consider pedestrian and bike volumes, crash histories, sight distances, and so on. The MUTCD supports a thought process that first imagines no control and builds up as warranted.

Taking the concept to its most extreme, consider your driveway. It is unlikely that there is a Stop sign (or even a Yield sign) at the end of your driveway. You know that the connecting road contains far greater traffic than your driveway and at higher speeds (at least we hope so) and so it is the major street. As such, you need no sign to tell you that you must at least yield as you approach the roadway and, depending upon conditions, even come to a full stop before proceeding.

Now let's say you live on a cul-de-sac street with only 3-5 homes (very fancy) and the entrance of this short street has good sight distances along the major street in intersects. Is a Stop sign warranted? Possibly not. Failing that, is a Yield sign needed? Perhaps. It is possible that no sign is needed at all. No offense, but your street is a glorified driveway and if you think a sign is going to be difference between whether drivers navigate the intersection correctly, your vehicles should probably stay in your garages.



Stay with us; this is a thought process. We didn't mean to insult your street. It's an adorable street, seriously. Don't be so sensitive.

A reasonable question might be, what's the harm in putting a Stop sign at the end of your short street? That's where a whole collection of research and guidance documents dealing with human factors in engineering (and other such titles), too numerous to mention, come into play. Good drivers and bad alike (along with good and bad pedestrians and bicyclists alike) are, as the psychologist say, funny things. Free will (ever present when law enforcement or our parents aren't around) can override what the sign at the end of the street says. If, even as prudent drivers, we believe a full stop condition is not warranted because there is plenty of sight distance on the lightly traveled street, some of us would be guilty at times of a rolling stop (or a "California stop;" how'd they get tagged with that one?), which often looks a lot like yielding. If that's the way a prudent driver navigates the intersection, the MUTCD guides us to scratch our heads for a moment and consider if a Yield sign or even no control is more appropriate.

But we avoided the "what's the harm" question you say? Oh, you caught that.

It comes back to the human factors research. As engineers and other managers of roadway systems, we are not in the business of manufacturing citable driving infractions for no reason. Fundamental in the MUTCD (Section 1A.02) is guidance we should have on a poster in our office. It says that, "to be effective, a traffic control device should meet five basic requirements: fulfill a need; command attention; convey a clear, simple meaning; command respect from road users; and give adequate time for proper response." When we stray from these, we lose credibility with roadway users, we can create confusion upon those sorting out right-of-way, and we can even see a lack of compliance with traffic control devices beyond that intersection. So, it's subtle and it's big picture, but we have to look at the whole network and ensure the

best overall safety for all road users. Those five basic requirements can help us shape our approach to road network safety.

But let's move on to the more common intersection of two real streets (again, no offense to your cul-de-sac; seriously). Even here, a no control option can apply. But realistically, that's unlikely unless the traffic loads are remarkably low. But our thought process can still serve us well. Pause for just a moment and ask, could we do no control? Probably not; fair enough. But next, could we address control with a yield condition? And if it has to be a stop condition, is it two-way stop control or All-Way? How do we navigate that?

The MUTCD walks you through the guidance in a somewhat step-wise approach and we won't repeat it here, since to summarize it would be to lose some of the nuances that should be carefully considered with each intersection. But there are some basic tenants that run through it, in addition to considering lesser control first.



- Yield or Stop signs should not be used for speed control (Section 2B.04). Why is that? Because it doesn't work. Research has demonstrated that drivers that don't recognize the need for a stop condition will resort to rolling stops and/or seek to "make up the time" between stops out of frustration. The additional result can be lessened peripheral vision for the risks beyond the travel lane and lessened reaction time when someone enters the street or opens a car door, for example.
- Is intersection control not needed all the time? Examples of this are intersections impacted by seasonal or annual events. For example, the flower mart at the church (or the county fair or a block party, etc.) interrupts normal flow for a couple days per year. These are temporary conditions and should be addressed with temporary traffic control (MUTCD Part 6), flaggers, and possibly law enforcement personnel.
- If yield works, don't immediately jump to a stop condition. That horse has been sufficiently beaten above.
- In most cases, the roadway carrying the lowest volume of traffic should be controlled.
- Multi-way stop control should be based on an engineering study, considering crash history, volumes on each leg, left-turn conflicts, pedestrian and bicycle volumes, and sight distances.

Speaking of sight distances, yet another essential tool is AASHTO's A Policy on Geometric Design of Highways and Streets (aka, The Green Book), particularly Chapter 9. Here, the step-wise approach to consider no control all the way up through minor control to all-way control to signalization is presented, along with quantified minimum sight distance needs, as established by research, for driver reaction time and braking time.

So, is it easy to say no when the community demands an All-Way Stop condition with no engineering basis for it? If you think it is, you have a spine of steel or you've never been in public service. But, we owe our elected officials the best technical advice we can provide so that they have a fighting chance of making a correct decision because in the absence of it, all they have is the (often emotional) view of the public. The anecdotal observations of the

community residents is indeed relevant, but it is often exaggerated and should be put into context of whatever data we can gather as well as what research has shown us to be the most effective measures, including traffic control devices.

The conversation with the community should be transparent, but it should begin with whatever data can be gathered and it should include local law enforcement personnel so that a realistic program of enforcement can be counted on. Such a conversation has a better chance of being based upon data and sound engineering, possibly avoiding a more knee-jerk reaction that doesn't address the problem or even makes it worse.



The Delaware T²/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.