

Yielding More and Stopping Less can Save Time and Fuel

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[This proposal was initially offered to the Traffic Safety Committee of the Town of Los Altos Hills in October 2015 and was informally endorsed by them, but after repeated reviews without taking any action, on January 12, 2016 I asked them to forward it for review by the Town Council so that work could proceed on planning and redoing a few intersections. However, at the illegal instigation of a Councilmember, they did nothing and the Committee was then illegally suspended so as to block any reconsideration of it, so this matter may end up in court.]

From the beginning of road building about 10,000 years ago through the 1950s most road intersections had no signage. Travelers in various parts of the world developed conventions for road sharing such as which side of the road to use and how to decide who had priority at an intersection.

America settled on travelling to the right and, when two vehicles come to an intersection at right angles the one on the right has priority. If multiple vehicles arrive concurrently some negotiation is necessary and is often settled by the wave of a hand. This scheme worked quite well for centuries, even after motor vehicles began appearing around the beginning of the 20th Century. Traffic signage and signals began appearing in big cities but not in residential areas or in small towns and it took a while for them to get standardized. For example, Los Angeles had no traffic lights going into the 1940s but instead used mechanical semaphores with red and green paddles similar to what railroads used. Stop signs came to be favored over yield signs based on the popular belief that they were safer even though there was no supporting evidence.

As time went on and more fender-benders began happening, many people thought something should be done about it and stop signs began to appear everywhere, even

in cases where the accident was caused by a stupid driver rather than an intersection design problem. Since its inception in 1956 the Town of Los Altos Hills has generally followed the policy of adding stop signs wherever accidents occur regardless of what caused the accident.

Eventually four-way stop signs began showing up, which maximize vehicle delays even in cases where there is just one vehicle approaching a given intersection. In residential neighborhoods today, we are likely to encounter that kind of intersection frequently and are legally required to make a full stop each time even though that wastes time and fuel. Similarly, we often have to stop at a red light even when there is little or no cross traffic and may have to sit there for a minute or two. However, it now appears possible to avoid some of that wastage by returning to the past and using advancing technology to help enforce traffic regulations.

Following the adoption of a new highway program initiated by the Eisenhower Administration in the late 1950s, freeways and high speed toll roads began appearing all over the country and around the same time some bicyclist came up with the idea that painting a line on the pavement so as to create a bike lane made it safer for cyclists, even though that “safety” was only imaginary. That idea was supported by many cyclists who were afraid of riding in traffic even though that was generally a safe thing to do. In reality adding bike lanes sometimes increases the likelihood of accidents.

Stepping Back. We recommend that ways be found to encourage more yielding than stopping, so as to improve travel efficiency without sacrificing safety. Specifically, criteria should be developed for where to put each kind of intersection and the town should then start applying those criteria to new intersections while incrementally converting old ones and adjusting the criteria as we learn how well they work. Also, the few bike lanes in Los Altos Hills should be abandoned and viewed just as fog lines.

Sign-Free Intersections. Many residential

intersections have been sign-free from the beginning and should be kept that way. For example, most town roads end in cul-de-sacs generally need no signage where they connect to other such roads. In cases where stop signs have been added inappropriately they should be removed.



Yield Intersections. In cases where side roads meet main roads, we should put Yield signs on the side roads and signs on the main road indicating that vehicles there have the right-of-way. That might be indicated by a sign with a green arrow pointing upward, meaning “Go”.



Stop Intersections. It may be necessary to retain stop signs in some places, but we should avoid using three- or four-way stop signs anywhere. In general, they should be converted either to Sign-Free or Yield intersections.

Roundabouts. Our town currently has no roundabouts, but they have been shown to work well elsewhere. Compared to traffic lights, roundabouts may require a bit more land but otherwise their construction cost is about the same and they have the advantages of lower accident rates, lower maintenance costs and the ability to continue functioning through power outages.

One lane roundabouts can work well but using two lanes, as currently proposed in the official plans for the future I-280/Page Mill interchange, would be unsafe for both

pedestrians and cyclists. Fortunately, the County Roads and Airports people have informally agreed to provide ways for cyclists and pedestrians to bypass the proposed traffic circle by using a shared side-path.

Red-Yellow-Green Traffic Signals.

Conventional traffic lights can continue to be used where needed, though we currently have only four in our town, all on El Monte Road, with two more planned on Page Mill Expressway near I-280.

Green-Amber Traffic Signals. We suggest considering a new kind of traffic signal with just two kinds of lights: Green and Amber, the latter meaning “Yield”. This addition will require negotiations with other governmental agencies, so it cannot be done immediately. Under this scheme, green lights would still indicate right-of-way priority and changing the direction of traffic would be done by switching from green to amber then, a few seconds later, changing amber lights in the other direction to green. This will allow cross traffic to proceed if there is little traffic in the green direction.

Enforcement. Enforcing yield laws is actually not much different from enforcing stop laws in that both are judgment calls:

- Did the driver actually stop at the stop sign?
- Did the driver actually yield to oncoming vehicles at the yield point?

It appears that advancing technology can be used to assist police in making these determinations. Something that could be done almost immediately would be to provide police with a couple of video cameras that can be positioned to view an intersection from different viewpoints and be linked by radio to a display in the police car that shows what is going on so that officers who see an apparent violation can push a button to mark the recording while the officer pulls out and cites the offender, then can bring the recording to court if needed. An alternative would be to use a camera-carrying drone to overlook the intersection.

Robocop. An even more efficient scheme

would be to have a computerized vehicle tracking system automatically track all vehicles going through a given intersection and, based on vehicle locations and speeds, automatically identify offenders and notify the officer while providing snapshots of offending vehicles. It appears that a new kind of digital visual image processing called “neuromorphic engineering” will soon greatly facilitate this kind of machine perception [1].

Given that self-driving vehicles already have to do the kind of visual perception needed for this enforcement task, it appears likely that the least expensive way to create this kind of Robocop will be to purchase such vehicles for police use and do some minor reprogramming of their visual tracking system.

Conclusion. We recommend proceeding promptly with the development of initial criteria for using the various kinds of intersections in the Town of Los Altos Hills. Looking ahead, it appears that the forthcoming use of self-driving vehicles by both service providers and the general public will make yielding work even better. If our town does this, we expect it will spread across the country like a lot of things that start here.

Reference

[1] C. Posch, R. Benosman & R. Etienne-Cummings, “Giving Machines Humanlike Eyes,” IEEE Spectrum North American, 2015.12, pp.45-49.