

Dr. Shaughnessy Collision Site - Additional Line of Sight Testing on Jan 13, 2011

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I was informed by a neighbour of the accident site at the intersection of Oxford County Road 55 and Muir Road (Oxford County Road 130) that a rollover collision occurred on January 12th, 2011 and so I attended the site to investigate further. It turned out that the event was fairly minor, was a simple loss of control into a ditch and was likely not related to the line-of-sight deficiencies that I reported in my original article regarding the Saughnessy collision in early November, 2010.

However, since I was already there I decided to conduct a further analysis of the line of sight at the intersection. Recall in my original article that I never performed any formal test of the line of sight but I simply looked at it and indicated there was probably a problem. Well on January 13th I actually performed a formal test as follows.

I set-up cones along the south shoulder of County Road 55 at 25 metre intervals commencing at 150 metres west of the intersection and progressing up to a location 275 metres west. I also parked my vehicle on the same shoulder at the 200 metre cone. Next I took my video camera (my still camera had already lost battery power from previous photos) and I documented what could be seen by a southbound driver on County Road 130 (also known as Muir Road and County Road 22).

In order to establish the driver's eye position I used a distance of 2 metres north of the southbound traffic stop bar. This is because a southbound vehicle must bring its front end up to the stop bar when coming to a stop and the typical distance from the front end of a passenger car to a driver's eyes is about 2 metres. I also positioned myself about 1 metre west of the centre-line of County Road 130. Again, the rationale is that a passenger car travelling along a 3.5 metre wide lane will cause the driver's position to be in the neighbourhood of 1.0 metres from the roadway centre-line. And finally, I selected two vertical heights for my testing. Under the first condition I simply stood up while videotaping. This resulted in the video camera being about 170 centimetres above the ground. In the second condition I knelt down with one knee on the road surface and I know from previous testing that this results in a camera height of 120 centimetres above the ground.

The following photos will show the line of sight from each of these conditions.

First, the photo below shows the situation from 2 metres north and at the 170 centimetre height. You should be looking just to the left of the wall of the church to see if you can see any orange cones or my car. I think you will agree that none are visible.



What should be interesting to you however is that a snowbank is visible just the left of the wall of the church. I can tell you that the amount of snow on the ground is not excessive and there was much more snow in the area in the past month. So the snowbank is often taller than what you see in the above photo.

What you also may not realize is that the snow bank is actually not at the edge of the road. It is located on private property which is several metres north of the road edge. There is a wide, paved shoulder on this north side of the road that has been plowed clear by about 3 to 4 metres. So the snow bank is actually quite distant from the road edge. But it appears to be close from this viewing angle because of the way that County Road 55 curves to the right in the background - and this makes the line-of-sight issue even more important. The snow bank is actually created by the owner of a wide, paved driveway. As the owner clears his driveway he pushes the snow over to the east and thus the snow bank that is created, but not along the edge of County Road 55. So what is happening during winter conditions is that this snow bank is blocking the line of sight even more than the wall of the church. Let's look at some other views.

Below is the same viewing position as the previous photo but the view is zoomed in and I have dropped down to the 120 centimetre height. The view looks a little fuzzy because it is exported from the video and therefore the zoomed view has a low resolution. But surely you should see no sign of my parked car or any of my cones.



We can get you to appreciate this further by showing you at what point the cones, and my vehicle are actually visible. To do this I needed to stand on top of the traffic stop bar as shown in the photo below.



Again, the exported frame from my video is somewhat fuzzy. The view in the above photo is at a 170 centimetre height at the stop bar. Now you should be able to see my vehicle on the shoulder. You should also be able to see the 175-metre-cone and the 200-metre-cone (next to the vehicle).

But where is the 150-metre-cone in the above photo? Well, it is behind the snow bank. Invisible. Much like any eastbound car would be. Remember that this is from a height of 170 centimetres. You need some background to appreciate this significance. Road design standards use a height of only 105 centimetres as the bench mark for all their visibility testing. Why? Because that takes into account the eye height of a driver sitting in the lowest car - a Corvette perhaps, or something similar. The testing I'm giving you at 120 centimetres is more like the eye height of an average passenger car driver. And the 170 centimetre height that I am showing you in the above photo is actually slightly higher than almost all Pick-up trucks and Vans. So if something cannot be seen from a height of 170 centimetres you are really taking in a large part of the driving population that will not be able to see beyond the noted snow bank.

As an example, the photo below shows two westbound vehicles passing the snow bank and my camera is still at the 170 centimetre height. Note how the leading vehicle is almost invisible as only its roof can be seen above the snow bank.



But remember that the above photo shows what can be seen from a height of 170 centimetres, not from the typical driver's eye height of 120 centimetres. Clearly we have a problem.

It means that, in winter time, an eastbound vehicle travelling along Oxford County Road 55 will be blocked from view even though a southbound driver has pulled the front end of his car or light truck about 2 metres past the traffic stop bar. And that line of sight likely means that the eastbound vehicle could easily be invisible to a southbound driver until it is in the range of perhaps 130 metres or less from the intersection, depending on the height of the snowbank.

Take this scenario. Let us say the eastbound vehicle becomes visible at 125 metres from the intersection. At 90 km/h (25 metres per second) this eastbound vehicle reaches the intersection in about 5 seconds. Can a southbound driver commence his passage through the intersection and clear it in five seconds? I already know that answer but let's look at a couple of observations anyway. Below is a photo of a large truck hauling some heavy equipment on a trailer as it makes its crossing of County Road 55.



I have not examined the video in detail but it took about 11 seconds for this truck to complete its crossing. Do we have a problem. Yes, but the truck driver's eyes are a lot higher off the ground. So maybe it's not exactly comparable. But let me say that in the short time I was at the site, I made only three observations of southbound vehicles and 2 of those observations involved large trucks with trailers. The other large truck was hauling a standard semi-trailer and it also took about 12 seconds to make its crossing.

But let me show you my third observation below - a typical SUV.



Just to show you that all problems are not related to roads, as this gentleman crossed my viewing point I could see he was looking down at a cell phone or blackberry in his lap. Scary, when you consider he is attempting to cross this intersection. Anyway, without any detailed analysis I estimated that it took this SUV just over 5 seconds to clear the intersection.

Now let's go back to what I calculated previously. If our eastbound vehicle is only visible for 5 seconds and this southbound driver needs over 5 seconds to clear the intersection, don't we think there is a problem?

But there is more. The time estimate I gave you for the southbound driver was only for the vehicle motion. It does not include the delay required to scan the intersection before pulling out. Standard guidelines typically use a 2 second delay for such a scan. Add that 2 seconds to the previous 5 and you get a total of 7 seconds to clear the intersection. And we all know that in an 80 km/h zone there are persons who drive at speeds higher than 90 km/h.

My documentations at numerous sites using video camera technology indicates that often 20 percent of the driving population travels above 100 km/h in an 80 km/h zone. Now, some of you would say, ah, let the speeder kill himself if he wants to, he deserves it. Thankfully, many judges do not believe one should pay with his or her life for making this error in judgment. When an official study is performed the distribution of vehicle

speeds is determined through standard tube-counting devices. Thus a municipality can see from this operating speed just how many drivers will be exposed to a life-threatening condition. Many judges in Ontario do not look kindly upon municipalities that ignore life-threatening conditions and in many instances will find a municipality partially liable even though a driver may have been speeding. It all depends on the details.

So, in summary, I indicated at the outset when discussing the collision that claimed the life of Dr. Shaughnessy, that I have no information as to what caused that collision. But the motion of his vehicle was unusual. It is not likely that the motion of his vehicle onto the south shoulder was caused by the right curve in the road because that motion occurred too early into the curve. Some have speculated various causes. I know that the location where Shaughnessy's vehicle travelled to the left and off the roadway was in the vicinity where the intersection could have been a factor. Interference by a southbound vehicle on the cross-road (Muir Road - County Road 130) would cause the Shaughnessy vehicle to travel to the left in the manner that it did. The location of the vehicle's exit from the road is consistent with such a happening. It is not consistent for example, with an alcohol-impaired driver who is deceived by the geometry of the curve and for that reason is involved in a head-on collision. The results from that set of circumstances typically result in a different pre-impact travel of the alcohol-impaired driver. What we see in the Shaughnessy collision is a relatively unique, pre-impact motion as I discussed in the opening of my original article in November.

But nothing is sacred in the probabilities of collision causation and everything that is supposed to occur based on probability can be proven to be wrong in any individual collision. But at the same time, I have said numerous times that collisions occur in similar patterns and with similar results. If you take the time to study them and categorize them you can be better off than doing nothing. And in many instances the results to the analyst are far better than nothing.