# Was Speed The Primary Factor That Led To The Fatal Injuries of Matthew Hartle?

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Matthew Hartle, 25, of Roseville, Ontario (west of Cambridge) died as a result of a collision that reportedly occurred shortly after midnight on Tuesday, May 15, 2012. He was driving his 2012 Mitsubishi eastbound on Alps Road on the southern outskirts of Cambridge, Ontario, Canada, when his vehicle went out of control and struck a tree. Police reportedly concluded that speed was a factor in this collision. In fact, our examination of the accident site indicates that the issue of speed is not quite what the report suggests, and that roadway factors also likely contributed to the cause of the crash.

Let us first examine the roadway on approach to the accident site. On the following page is a view, looking east along Alps Road, from about a kilometre west of the area of impact. The accident occurred beyond the sag in the road and just beyond the upslope that is visible in the distant background.

You should recognize, that, although the road contains this sag it is generally straight. A typical driver travelling this route would interpret it as a typical rural road where the maximum speed would be similar to the 80 km/h maximum that is posted for most rural roads in Southern Ontario.

Also there are warning signs posted on the roadside such as shown in the bottom photo on the following page. Such a warning sign is common on many rural roads but is does not

provide any particular warning that a driver should be travelling substantially slower than one would normally travel on a rural road.

Unbenownst to most drivers, the purpose of a reduced maximum speed is because there are features of a road that may be difficult to detect that require a lower posted speed. Many times drivers drive much faster than the posted speed because they believe that the posted maximum is unnecessary and too stringent.

At the present site the sag exists because when the area was first settled the road followed the natural slopes and valleys of the countryside. This sag contains steep grades which reduce visibility distances and therefore a reduced speed is posted. But the reduced speed is not required because the driver would have difficulty maintaining control of a vehicle travelling in a straight line. In fact, if there were no visibility issues the road should have allowed a driver to travel at extreme speeds, provided that the vehicle could travel along a generally straight line.

But the visibility issue causes the roadway authority to post a reduced maximum speed of 60 km/h as shown in the top photo on the following page.

The impact of the tree occurred just beyond the upgrade that you see in the background of the bottom photo on the following page. So one would think that the regulatory sign would have been sufficient warning for a driver to follow that advice. But that is rarely the case. It is human nature for a large number of us to ignore advice and laws if we do not understand the meaning or reasoning for them. This was confirmed to us, once again, while standing at this site just beyond the hillcrest and watching the speed of vehicles passing us. Rarely did any vehicle travel below the speed limit even though we had our vehicle on the roadside with our flashing yellow beacon and orange cones laid out along the road edge.


We have been witness to the occasional sarcastic remark that, if drivers do not follow the rules of the road then they deserve what they get. But that kind of ignorance fails to prevent the speeding, fails to reduce the high medical bills that our society pays and insults the hardship faced by the families of the deceased. The only true solution is to attempt to correctly diagnose the problem and consider a reasoned solution.

At the present site, an eastbound driver exiting the sag now begins to see less distance of roadway ahead and cannot judge what danger may lie there, as shown in the two photos on the following page. Yet the roadway ahead appears to be straight and there are no warning signs to tell the driver otherwise.

In fact we can look at the above photos and even at the photos at the crest of hill and we would believe that there was nothing to be concerned about.  Because the two photos above were taken from a camera mounted in the centre of our test vehicle, a 2007 Buick Allure. And the photo below was also taken from that  same camera location and we have now come to the crest of the hill.  Can you honestly say, upon first viewing of the photo below, that you recognize a dangerous situation? And what would a typical driver detect, travelling through this site, at an "incredibly high" speed of just 80 km/h or even 90 km/h?

We venture to say that there is nothing in the above photo that would attract a typical driver's attention and that the reader would also not detect a problem.

We can also say that this site did not attract the attention of the investigating police, nor the persons responsible for the maintenance of the road. Because the police never mentioned a problem with the road and news media (Kitchener Record newspaper) only spelt out in large letters *"North Dumfries Fatal Drives Home Anti-Speeding Message"* and described how *"Ontario police chiefs came to town Tuesday to stress that excessive speed kills. They raised their alarm hours after a driver ran off the road in North Dumfries, hit a tree and died. Waterloo Regional Police believe speed was a factor"*.

Interestingly, it would appear that road maintenance personnel were likely out at the site around the time of the crash because we could see the fresh grading of the south shoulder on the upgrade of the sag, on approach to the accident site, as shown in the photo on the following page. This photo shows the typical signs of fresh grading of the gravel of the shoulder and the tire marks from the grader in the freshly turned gravel. This south shoulder is the one of interest because, in a loss-of-control collision, it is this shoulder that a vehicle typical enters before a driver loses directional control of a vehicle. Furthermore, the north shoulder was not graded, as demonstrated in the photo on Page 9. So why would maintenance personnel be present at the site of this collision shortly before or after the collision, and grading this south shoulder? Interestingly, they did not re-grade the shoulder all the way up the slope. The regrading stopped just west of the hillcrest. But we will see shortly that there is other evidence on the south shoulder at the hillcrest that is of particular significance to the cause of this accident.

But before discussing that evidence we want to show you the collision evidence on the hillcrest and the impact site.

The view in the photo below is looking eastward from the south shoulder on Alps Road at the top of the hillcrest. So the sag is behind the camera. As per typical procedure you will note below that we parked our vehicle on the south shoulder with cones surrounding it to warn drivers of our presence. The impacted tree is located on the left (north) side of the road beyond our parked car in the distant background. If you look closely you may see some persons at the tree examining it.

As we zoom in with our cameras lens we can see the view below which shows the persons (two cyclists) at the impacted tree while  our row of cones is visible on the right edge of our photo. This is a very compressed and distorted view of the length of the road.

When we uncompress the view it shows up as per the photo on Page 12. The Hartle Mitsubishi travelled onto the right gravel shoulder and produced some typical yaw marks before it crashed into the tree on the opposite side of the road. The last cone (most easterly) is in view in the photo and it represents the point at which the yaw marks exited the south shoulder and began coming back on the road surface as the vehicle travelled toward the tree.  If you look very closely you might be able to

detect those yaw marks on the gravel of the shoulder but that would be quite difficult.

Instead, we can stand just west of that cone and see the eastbound view as shown on the following page. From this position you should clearly be able to see the curving yaw marks on the pavement as they exit from the south shoulder. The view of the tire marks is somewhat complicated by the curving shadows caused from the power lines that exist on the south side of the road. In the background you should be able to see two trees on the north roadside with some bark that is missing on them and these were the trees that were struck by the subject vehicle.

As we move over to the area of impact we can see the trees that were struck as shown below. You can also see the tire marks in the grass on the north roadside produced by the vehicle as it approached the point of impact

After glancing off the first tree the vehicle also struck a second tree and then spun away back onto the road surface where it came to rest. The top photo on the following page shows the oil stain produced as the vehicle left the tree impacts and came to rest on the roadway. The bottom photo on the following page shows a view looking westward from the area of impact back toward the direction from which the vehicle came.

Now let us return to the issue of what caused this crash. Obviously we have no information to go on except for the markings and evidence we see at the site. The police have several advantages including being able to examine the damage on the vehicle and possibly evaluating any witness information. However certain evidence cannot be disputed.

For example, vehicles travelling at very high speed cannot change their travel direction within a specified distance as readily as a vehicle travelling at low speed. So, in the case of yaw marks or the manner in which a vehicle travels from one side of the road to another, a vehicle travelling very quickly will need a much longer distance in which to move laterally across the road. And this is also evidenced in the curvature of the yaw marks that are generated. In a scenario where we are officially retained we would normally measure the character of the yaw marks in detail and determine whether a speed estimate can be developed from those marks. But aside from that, simply looking at the curvature of the yaw marks and the distance travelled by the vehicles tells us, generally, whether we are dealing with a high speed scenario. And we can say from the yaw marks we observed that the vehicle was not travelling at what we would call a high speed for a rural roadway.

Now, the police may claim that the vehicle was travelling well above the posted speed of 60 km/h and therefore the reasoning for their statement that speed was a factor in this collision. But that kind of comment conjures up the suggestion that this vehicle was travelling at very high speed and this is why it left the roadway and crashed. But this is not the case. The police have not properly identified why the vehicle left the road, or at least the official news agencies have not provided that information if indeed it was provided by the police. Here is

where we return to the roadway to demonstrate that speed is not really the primary factor in why this vehicle lost control and why the crash occurred.

Below is a photo of the south shoulder looking westbound or back toward the direction from which the vehicle came. The closed cone to the camera is where the vehicle's tires returned to the roadway after travelling a distance on the gravel shoulder.

You can also see our vehicle parked on the shoulder in the background with three other cones surrounding it. Now for some distances...

The distance from the first tree impact to the cone in the above photo is about 61 metres and the distance from that tree to the front end of our parked car is about 87 metres. Certainly the vehicle was on this south shoulder for the distance between the cone and the front end of my vehicle. Where it actually entered the shoulder is uncertain because that marking was already destroyed by the time we arrived. But based on our experience the entry onto the south shoulder was somewhere west of our parked car. You might want to study the shoulder in the area so we have provided two additional photos on Page 19 and 20, showing the area near our parked car and the character of the south shoulder in that vicinity. The photo on Page 19 is looking westward while that on Page 20 is looking eastward.

A curious fact is that in the short distance just west of our parked vehicle we observed that there was a significant edge drop off. In other words, the surface of the gravel shoulder dropped down with respect to the edge of the pavement. For example we measured out equal distances of 10 metres beginning at the 100 metre mark and took some measurements of the edge drop off through to 170 metres. Those edge drop offs are noted in the table on Page 21.

What you should observe is that, in the vicinity of 110 to 130 metres the edge drop off is most prominent and then is slowly diminishes toward the west. Although the measurements do not indicate it, we also observed that the edge drop off diminished as we progressed eastward from the 100 metre location.

## Edge Drop-Offs Along South Shoulder

100 metres = 1.00 inch
110 metres = 1.50 inch
120 metres = 1.50 inch
130 metres = 1.50 inch
140 metres = 1.00 inch
150 metres = 0.75 inch
160 metres = 0.50 inch
170 metres = 0.25 inch

What this evidence indicates is that, for some reason, vehicles are travelling off the paved surface of the road and their travel reach an apex in around 110 to 130 metres, or at approximately 120 metres. Looking at the numbers, the vehicles must start entering the shoulder at approximately 170 metres or about 50 metres from the apex and likely leave that shoulder about 50 metres east of 120 metres, or at about 70 metres. Note that the 70 metres is very close to the 61 metres that we measured as the point where our vehicle exited the south shoulder.

Now, why would vehicles be exiting the paved surface at this point in the road? Did we not just look at the photos earlier and determine that the roadway is straight and there does not appear to be any reason why this would happen? Let's take another look at those photos.

The photo on the following page is looking westward along the south shoulder back toward the sag in the road, west of where the vehicle collided with the trees. Unlike the previous photos however we have zoomed in with our camera lens thus shrinking the length of the road. Do you see anything different now?

Look at the vehicle in the background approaching the sag in the road and then match up the south edge of the road as it approaches the camera. Notice that you do not see the bottom of the sag so the vehicle will disappear for a period of time before emerging again on the near side of the sag. How do you think the vehicle will be oriented with respect to the south road edge as it comes out of the sag. When the camera cannot see the vehicle it also means that the eastbound driver will not see the camera, or more importantly, the driver will not see the road surface.

The obvious fact you should see in the above photo is that the south pavement edge just west of our parked vehicle is not in line with the roadway further in the sag. And the eastbound driver cannot see that the south edge of the pavement has moved to the north or into the driver's lane so if the driver is travelling straight ahead it is more likely that the vehicles right side wheels will travel off the paved surface of the road and onto the south shoulder. And this is exemplified by the edge drop off that we measured - precisely where the road edge deviates.

Let's take a couple more looks at this road edge with the camera lens zoomed in like we showed above. This time we present two photos below taken looking in an easterly direction along the south road edge. Is it not obvious that the roadway is not straight and that this deviation would not be visible until an eastbound driver crests the sag? But there is no warning of this deviation. To some degree speed is a relevant issue in our case, but is speed the only issue? Matthew Hartle's vehicle entered the south shoulder because the road way deviated at a point when he could not see its change in direction and there was no warning of that deviation.

Where is the large news media article that says "North Dumfries Fatal Drives Home The 'Make Our Roads Safe' Message"?

We are quick to criticize persons for speeding and we should not change that because, without doubt, travelling too quickly is a leading cause of many collisions. We continually talk about abstaining from drinking alcohol when driving. That is an equally important thing to emphasize. And we should continually reinforce that drivers must pay attention to their driving task, not to their telephones, not to conducting personal grooming, eating or whatever.

But, there is an equally important factor that we must emphasize: Roadway problems also cause accidents. Roadway problems are being hidden by the official agencies who have a monopoly on attending to a crash site and documenting the evidence that exists. This is sometimes done on purpose but it is also done because those official personnel who are given the monopoly to document roadway problems are not given any meaningful training for them to understand when a roadway problem exists. This should not be happening and it should not be tolerated.

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