Vague Official Explanation For OPP Police Cruiser Rollover In Lambton County - A Review of the Physical Evidence

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The old adage "You can fool some of the people some of the time..." seems to apply in the most recent case of a police cruiser rollover in Lambton County Ontario. But the implications go beyond the simple fact that two OPP police officers reportedly sustained relatively minor injuries.

On Saturday, September 28, 2013 it was reported that an OPP police cruiser was involved in a rollover collision on Courtright Line in Lambton County Ontario. It might have been a non-event except for the fact that the official explanation of how it occurred left readers skeptical. For example the article in the Sarnia Observer newspaper gave the explanation this way:

"Around 9 p.m. the officers were responding to an impaired driver call in Oil City, but had to use an "evasive maneuver" to avoid a traffic situation they encountered en route on Courtright Line, near Gypsy Flats road, police said."

Rightly so, readers of this strange wording wrote:

"Evasive maneuver" to avoid a traffic situation. Could you be anymore vague? Sounds like their evasive maneuver wasn't executed very well."

And another comment:

"Vague? Clearly."

Other commenters were far less diplomatic and quite frankly rude, as expected. It is interesting to us how, when a person's identity cannot be tracked, their comments express the true line of their thinking and often that thinking is not as pretty as it would appear on the surface.

However the reason for the general negative tone can be understood as the official explanation for what occurred was rightly seen as an attempt to squirm around the issue so as not to explain what actually occurred. While we waited for a better explanation we suspected, from past experience, that one would never follow. Therefore, as per our usual actions in the past few years, we ventured out to the accident site to get a look at the physical evidence.

We approached the accident site on Sunday, September 29, 2013, shortly before noon or about 15 hours after the reported incident. There was no explanation available to determine which way the police cruiser had been travelling, only that the rollover occurred near the crossroad of Gypsy Flats Road. So as we approached that area we activated our dash-mounted video camera and began to document the facts.

Up to the location where we crossed Black Ash Road, Courtright Line was observed to be freshly paved and the gravel on both shoulders was also new as can be seen in Figure 1.

Figure 1 - Frame exported from our video while westbound on Courtright Line at intersection with Black Ash Road.

However, just beyond that intersection the new paving ended, as shown in Figure 2. As we crossed onto this older portion of pavement it became clear that there was a large difference in the road surface quality. There were significant lateral cracks in the pavement that were causing a loud "thump, thump, thump" as our vehicle crossed each of these. As an example, Figure 3 is a frame take from our video at approximately 150 metres prior to the location where we observed the loss-of-control tire marks of the police cruiser. It can be seen how the view is out of focus and this was caused by the vibration of our vehicle travelling over one of the noted lateral cracks. This is how the rest out video looked like as we passed through the accident site. There would be short periods where the video was clear and there were short bursts where the video went fuzzy as the vehicle was jolted by the interaction with the lateral cracks in the pavement.

At approximately 350 metres west of Black Ash Road we observed the first evidence of the police cruiser's loss-of-control tire marks at the location shown in Figure 4. Remember that Figure 4 is taken from our video and it is not as clear as the still photos of this location that we will be showing further in this article.

Upon locating the loss-of-control tire marks, we drove past them, turned around and came back to park on the south side of Courtright Line next to the cruiser's final rest position (FRP).

Figure 2: View of end of new paving of Courtright Line just west of Black Ash Road.

Figure 3: Out of focus view caused by the vibration of our vehicle travelling over one of the lateral cracks in the pavement.

Figure 4: View, looking west, from the beginning of the visible tire marks of the police cruiser.

Figure 5 shows our vehicle parked on the south shoulder of Courtright Line, facing eastbound with the debris of the cruiser's FRP lying in the grass of the ditch.

Figure 5: View, looking north, at our vehicle parked on the south shoulder of Courtright Line next to the final rest position of the police cruiser.

Examination of the evidence near the vehicle's FRP indicated that it had slid sideways, leading with its right side, over a small embankment . The distance between where the rollover commenced and the vehicle's FRP was quite short, in range of 10 metres. Generally, this was a low severity rollover because of this reduced speed.

News media reported that both officers were trapped in the vehicle and that is an important fact because, even though this was a low speed rollover the consequences could have been far worse. This is so because a driver who has lost control of a vehicle cannot dictate where that vehicle will travel and the cruiser could easily have rolled into the north ditch. The consequences of entering that north ditch could have been much worse because that ditch was much deeper, had steeper embankments, and most importantly, that ditch was filled with water.

For example, Figure 6 is a view looking east along the north ditch and our parked car can be seen at the extreme upper right of the photo. Comparing the size of our car to the embankment it can be seen that this drop was well over 10 feet and the embankment is steep.

Figure 6: Eastward view of depth of north ditch and steepness of its embankment, on the opposite side of where the police cruiser came to rest.

Furthermore, Figure 7 shows a culvert and that indicates the presence of water that is hidden by the tall grasses within the ditch.

Figure 7: Eastward view of north ditch and a source of standing water that is hidden by tall grasses.

A vehicle entering such a ditch would be difficult to find because of those weeds. However we had just demonstrated that, even a low speed rollover can entrap a vehicle's occupants.

There were two additional, fortunate circumstances in this case. One is that the entrapped police officers likely had body-mounted radios that would enable them to communicate their difficult situation. If this had been a typical passenger car it is not so certain that they would have a cell phone that would be so readily available. So it is quite possible that, without communication with the outside world, the occupants of a vehicle landing in the water of the north ditch could be there for quite some time before being noticed.

The second fortunate circumstance is that the water in this ditch was quite shallow. But that will not always be the case. It is not difficult to imagine that water levels in such ditches can fluctuate greatly. Even a depth of two feet of water can cause great difficulties when a vehicle comes to rest upside down, particularly if the occupants have been injured and/or disoriented. So, the notion that this rollover of the police cruiser was a non-event is very inaccurate. Given the right circumstances this could have led to the drowning of both police officers. Luck only goes around for so long and believing it will come around again is a dangerous supposition.

Having assessed the conditions near the cruiser's final rest position (FRP) we began to walk backwards (eastward) along the tire marks of the police cruiser to determine how and where it commenced its loss-of-control. Figure 8 shows an easterly view from the police cruiser's FRP toward the tire marks on the south embankment indicating the location where the cruiser left the roadway.

Figure 8: View, looking east, from the final rest position of the cruiser, toward the location where it left the roadway.

Figure 9, is an easterly view from the top of the south embankment showing the tire marks of the cruiser on the road surface as they come toward the camera and into the south ditch. Examining the relationship between the curved yaw marks one can get an appreciation of the angle of the cruiser as it exited the paved surface. Figure 10 takes us further to the east and we now have a clearer view of the yaw marks as they approach the south shoulder. We can clearly see that the cruiser was coming from the westbound lane across the eastbound lane and then down into the south ditch.

In Figure 11 we turn around to face westward and show the view of those yaw marks as they leave the westbound lane, cross the eastbound lane and travel into the south ditch. One can appreciate the distance involved by noting that our car is shown in the background and it is at the cruiser's FRP. The cruiser left the south pavement edge about 33 to 46 metres east of where it came to rest. In calculating a vehicle speed we would use a level of deceleration that takes into account the advanced stage of rotation and the fact that it made gouges in the earth during the rollover. A tumble number of 0.5 g or a value slightly less than that of 0.4 g would best approximate this level of deceleration over an average distance of about 40 metres. This would indicate that, as the vehicle was exiting the south asphalt edge, its speed would be in the general range of 67 km/h.

Figure 9: View, looking east, at the yaw marks of the cruiser coming toward the camera.

Figure 10: View, looking east, of yaw marks passing through the eastbound lane as they travel toward the south ditch behind the camera.

Figure 11: View, looking west, at the yaw marks travelling from the westbound lane, across the eastbound lane and into the south ditch.

As we move further to the east and look back toward the final rest position, Figure 12 shows us what was happening to the cruiser as it was in the westbound lane. We can see how the tire mark from its right rear tire comes very close to the north edge of the asphalt before it veers across the centreline. The apex of its curved tire mark at the north asphalt edge was about 88 metres east of the cruiser's FRP. However, when we turn around to face eastward Figure 13 shows that is becomes difficult to see the tire marks in the westbound lane, mostly due the position of the camera with respect to the position of the sun. Despite this difficulty we can state that we were capable of seeing those tire marks and we can indicate that, further to the east, the cruiser was positioned in the passing lane. Looking further to the east we could see where those yaw marks had crossed the centreline from the eastbound lane and that there were yaw marks further to the east in that eastbound lane. The location where those yaw marks crossed the centreline was about 105 metres east of the cruiser's FRP.

In Figure 14 we attempt to highlight the location of the yaw marks in the eastbound lane by placing two fingers of our left hand in the view at the general location of the two marks.

Figure 14 indicates that the cruiser was rotating clockwise as it was travelling toward the centre-line. Then, as the vehicle crossed that centre-line those yaw marks were not visible briefly because the rotation was transitioning from clockwise to counterclockwise as the vehicle moved into the westbound lane.

Figure 12: View, looking west, at the yaw marks in the westbound lane as they come close to the north asphalt edge.

Figure 13: View, looking east, from the location where the yaw marks came close to the north asphalt edge.

Figure 14: Westward view with investigator's fingers pointing out the two yaw marks in the eastbound lane indicating that the cruiser was rotating clockwise at this location.

The apex of the curvature of the yaw marks in the eastbound lane was about 187 metres east of the cruiser's FRP. In calculating a speed at this location we would use a deceleration rate in the range of 0.2 to 0.3 g over the distance between 40 and 187 metres or travel distance of 147 metres resulting in a speed loss of about 97 km/h. Combining this with the speed loss in the last 40 metres of travel (67 km/h) results in a speed of about 117 km/h in the general location shown in Figure 14.

So, at this point we know that the cruiser was rotating clockwise in the eastbound lane and it crossed the centre-line while it was transitioning to counter-clockwise rotation. It then rotated counter-clockwise in the westbound lane as it crossed back over the centre-line again while transitioning a second time from counter-clockwise to clockwise rotation while approaching the south ditch. However, there were more tire marks visible to the east of the location shown in Figure 14.

Figure 15 shows a westward view where the investigator's finger is pointing the area of the beginning of the visible yaw marks adjacent to the tree visible on the right (north) roadside. Again, the faintness of those tire marks makes it difficult to make them visible in Figure 15.

One way of making the tire marks more visible is to use a longer focal length or to "zoom in" as shown in Figure 16. This procedure compresses the objects in the distance and it compressed the dark tire marks into a small area of the view and thus making them stand out more from the rest of the road.

Figure 15: View, looking west, with investigator's finger pointing to the location where the cruiser's yaw marks first became visible in the westbound lane.

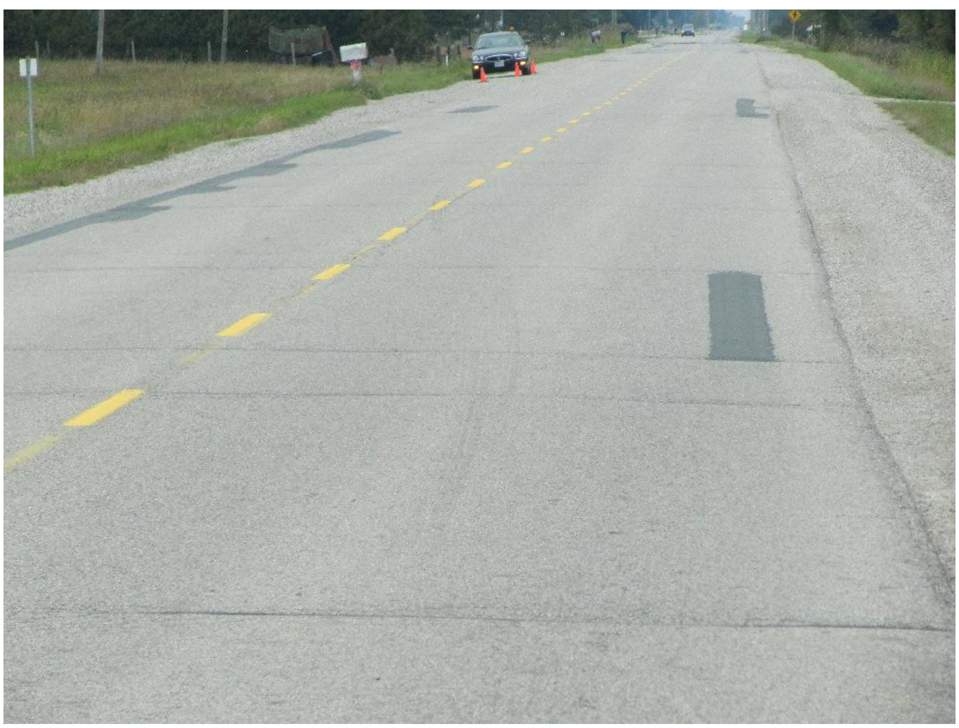

Figure 16: Westward view showing how a longer focal length (zooming in) causes the compression of the dark transfers from the tire marks and therefore makes them more visible.

By looking closely at Figure 16 one can detect the two faint yaw marks in the centre of the westbound lane, roughly in the middle of the Figure. We noted that those yaw marks began to be visible to us at a distance of about 218 metres east of the cruiser's FRP. Considering a speed at this location we can take the 178 metre distance between 40 and 218 metres and, using a deceleration rate of 0.25 g, estimate a speed loss of about 106 km/h. Combining that with the previously calculated speed loss of the last 40 metres (67 km/h) results in a cruiser speed of about 126 km/h at the beginning of the visible tire marks.

However that is still likely to be an underestimate of the speed of the cruiser as it approached the site. We say this because of the characteristics and location of the yaw marks where they first became visible. The first visible tire marks came from the right side tires of the cruiser and we measured that these marks were about 1.9 metres north of the roadway centre-line. A vehicle travelling normally along the this road would not have its right side tires in the middle of the lane like this. And the fact that these yaw marks are visible at this location indicates that, just before it produced those marks, it was coming from the centre of the road or perhaps even from the westbound lane and the yaw marks indicate that the driver was steering to the left to prevent the vehicle from continuing to travel, at a north-east angle, toward the north roadside. So there had to be something else going on just previous to the commencement of these marks which was not severe enough to generate visible tire marks but which likely involved a lateral motion of the cruiser on the road. This indicates to us that, if we had arrived at the site just after the collision we would likely have seen additional, faint tire marks in the westbound lane further to the east than the 218 metres. After 15 hours of delay, faint tire marks can become invisible and less faint marks can approach being invisible. So the speed estimate of 126 km/h is likely an underestimate and the true speed could be anything greater than 126 km/h.

On September 29th we conducted some testing on this roadway with multiple video cameras and an iPhone-based accelerometer. Our testing was done at an initial speed of 80 km/h to show that vibrations were experienced by our test vehicle as it passed from the newly paved road surface and onto the older surface where the crash occurred. The data clearly showed how our vehicle was being jostled, not only up and down, but there were forces causing a pitch/pole effect, as well as a yawing effect. Thus all three axis of the tri-axial accelerometer were affected by the interaction with the old road surface. We then repeated our tests at a speed of 110 km/h. Obviously the vibrations experienced by our vehicle increased along all three axes.

Figure 17 is a screenshot taken from the Adobe Premiere project that we created from our testing and it shows the views from five video cameras attached in our test vehicle. This instant in time is where we are accelerating westbound in preparation to conduct our test at 110 km/h. At the upper left you can see a view of the speedometer and it shows our vehicle travelling about 85 km/h at this precise instant but the vehicle is increasing speed to the target speed of 110 km/h.

Figure 17: View showing a westbound test just as the vehicle is approaching the older road surface which is located just west of the intersection of Black Ash Road.

At the bottom left of Figure 17 is a view from our camera that is anchored to the centre dash and pointing forward through the windshield. You can see that our vehicle is approaching the intersection of Black Ash Road and just beyond that intersection you can see how the new, black asphalt changes to the lighter colour of the old asphalt surface.

At the upper centre of Figure 17 is a view from a camera mounted to the left exterior of our test vehicle. At the upper right is a view from a camera mounted to the right exterior of our test vehicle.

At the bottom right is a view from a video camera pointing at the face of our iPhone that is displaying the data from the XSensor Pro app which is displaying the tri-axial accelerometer data. The yellow-green horizontal line is the lateral acceleration data that is also the data shown above the "Y" which is the lateral acceleration data. At the present instant the Y-acceleration is displayed as "-0.06" although the "6" is rather fuzzy and difficult to see.

The red horizontal line is the acceleration or deceleration level of the vehicle that might occur if one were to step on the accelerator pedal or the brake pedal. The "-0.22" indicates that, at this instant the vehicle is accelerating or increasing it velocity. There is nothing unusual about the negative value of this data point only that the iPhone was attached to the test vehicle in such an orientation that forward acceleration is displayed as a negative value.

The blue horizontal line indicated the vertical acceleration of the vehicle. If the vehicle was standing still the reading would indicate "-1.00" which is 1 g or the acceleration due to gravity. When the vehicle is being lifted toward the sky that negative value becomes greater as there is a higher vertical force that the vehicle is being subjected to. If the vehicle is falling toward the ground then the value becomes less of a negative value, or it tends toward "0.00". So the current value displayed on the iPhone of "-1.02" means that there is a very slight lifting of the vehicle's centre of gravity toward the sky.

Overall you should recognize that all three horizontal lines are relatively straight and do not show any great disturbances and this would be expected because in the short time before this instant the vehicle had been travelling along a new asphalt surface that was in very good condition and the road was straight and level.

Figure 18 shows us the status just after our vehicle has travelled onto the old pavement surface just west of the intersection of Black Ash Road. The view of the speedometer indicates that the vehicle has now increased in speed to just over 100 km/h and it is still accelerating toward the desired speed of 110 km/h. But note what has happened to the relatively straight horizontal lines that are now showing some large "spikes" of acceleration, particularly in the blue line which documents the vertical acceleration.

Figure 18: View of accelerations just after the test vehicle enters the old asphalt surface.

The most recent data on the horizontal lines is at the right end of the lines. Note that the actual numerical value of the X-axis acceleration is reading "-1.23 g" at this point so the vehicle is being lifted toward the sky. You can also observe a large spike in the blue line just shortly before this and our analysis of the video indicates that this spike occurred precisely when our vehicle crossed the junction between the new and old surfaces. So, as the vehicle crossed onto the old surface it was suddenly lifted up toward the sky, relatively speaking.

Figure 19 shows the status as the test vehicle is approaching the tree where the cruiser's yaw marks first became visible. Looking at the view of the speedometer one can note that the vehicle is travelling at approximately the desired speed of 110 km/h. The spikes in all three horizontal lines are significant. The value of the forward acceleration at this precise instant in time is "0.11" and this value is expected to fluctuate up and down. Similarly, the lateral acceleration is "-0.13" indicating that there is a substantial lateral force. The value for the vertical acceleration is "-1.40" which is a very high spike, but then, this is just a single data point and the individual values are expected to spike up and down. But it indicates that there are large spikes occurring in this vertical acceleration.

Figure 19: View of the test vehicle approaching the area where the first visible yaw marks of the cruiser were found.

There was no reason to attempt the test at the likely speed of the police cruiser as there could be a danger of losing directional control in the same fashion as that cruiser. However the increase in the magnitude of vibrations between 80 and 110 km/h would be carried on from 110 to 130 km/h. There is no physical evidence that can be used to indicate that the cruiser was travelling faster than 130 km/h, however the opposite is also true: there is no physical evidence that prevents one from concluding that the cruiser was travelling faster than 130 km/h. It is simply an unknown. But what is known is that the faster this cruiser was going the more difficulty the driver would have had with maintaining control of the cruiser on this type of aged road surface.

So what really happened? The official explanation stated that the officer who was driving " ...***had to use an "evasive maneuver" to avoid a traffic situation***". Does that mean that the officer encountered another vehicle on that road and he had to take evasive action to avoid colliding with it? Well, this highway is perfectly straight and level for a number of kilometres to the east and west of the accident site. The incident apparently occurred in darkness around 2100 hours and this highway should have had very little traffic on it at that hour. A driver travelling either east or west on that highway should easily have been able to detect a police cruiser from several kilometres away if the cruiser's emergency lights were activated. So there would be little excuse for a driver to interfere with the progress of the cruiser. So why was no one charged with some kind of traffic citation for failing to allow the cruiser to pass by? We do not believe that the cruiser was interfered with by such a vehicle. We do not believe that such a vehicle existed.

Another possibility is that a vehicle entered the highway from an adjacent driveway. However, the same issue applies: there should have been plenty of visibility in either direction to warn such a driver that the cruiser was coming and therefore a traffic citation should have been issued to such as driver - but there was no indication that such a citation was written. Additionally, the only driveway that exists was about 309 metres east of the FRP of the cruiser. Again we do not believe that such a vehicle existed. In fact, we believe there was no other vehicle that existed at the time of the cruiser's loss-of-control other than the cruiser itself.

We would be willing to consider that the driver of the cruiser encountered some animal that had entered the road. That is possible, but we saw no evidence on the road surface that any animal had been struck. And a police spokesperson could easily have indicated so rather than using this bazaar "traffic situation" description.

What we believe is that the loss-of-control of the police cruiser had nothing to do with another vehicle or animal. We also do not believe that the officer chose to conduct an evasive maneuver. Instead, what we believe is that the officer was travelling westbound extremely quickly on the newly paved surface east of the accident site. At about 450 metres east of the cruiser's rest position the newly paved surface ended and the cruiser entered onto the old surface which contained the significant lateral cracks that caused our vehicle to "thump, thump, thump" as we moved along it. At a speed of 130 km/h the cruiser would travel about 36 metres every second. The cruiser would travel the 200 metres distance between 450 and 250 metres east of its FRP in just a little over 5.5

seconds. It is during this 200 metres that the officer experienced his cruiser bouncing up and down, sideways due to interaction with the poor road surface. While attempting to deal with this problem the driver's actions caused the cruiser to begin yawing, initially into the westbound lane. The driver countered this motion by steering the vehicle back into the westbound lane and the loss-of-control began at this point where we saw the first yaw marks in the westbound lane at about 220 metres east of the cruiser's FRP. During this last 220 metres the physical evidence showed how the driver was attempting to gain control of the cruiser by steering right and left while the cruiser veered left and right from one lane to the other and the yawing became greater until the rotation passed beyond the breaking point and the vehicle rotated off to the south roadside.

There are many questions that have not been answered. Why was the cruiser travelling so quickly in response to a notice that someone located a drunk driver? Why did the police spokesperson cause persons' skepticism by failing to be straightforward with what actually occurred?

This event could easily have resulted in the death of both occupants of the cruiser if the vehicle had actually travelled into the north roadside instead of to the south. Not only because of the depth of that north ditch, or the potential presence of standing water and the possibility that the cruiser could have come to rest on its roof in that water. It could have been deadly because in that north ditch there was a large stone-framed culvert. If the cruiser had slid down that steep-sided ditch it would have exposed its roof to that stone-framed culvert. At the noted speed of about 67 km/h the roof would have been crushed to the level of the bottom of the seat cushions and there would be no chance of survival.

It is most likely that the auxiliary officer was not the one who was driving. So why would the full time officer subject the auxiliary officer to such a life-threatening incident? And having survived this potentially life-threatening incident what are the police teaching their auxiliary officers about taking responsibility for one 's actions? It's OK because we can simply provide a vague statement to the news media and no questions will be asked?

Additionally, the incident indicates that others could experience a loss-of-control at this site. If someone dies from entering the north ditch the news head-line will read "speed was a factor" in the fatal collision and the problem caused by the dramatic change in the road surface conditions will never be brought forward.

What will fellow officers learn from this incident? Will they recognize that familiarity breeds contempt? When they are told that they have received advanced training in emergency maneuvers do they really understand that they cannot foretell that a road surface might suddenly change from being exceptionally good to exceptionally bad and no advanced training can help you when your speed is too fast for the conditions?

All these opportunities to keep officers and the public safe are lost when the true reason why this event occurred is held back from public evaluation. And it only leads to the very cynical comments we read that followed the news media articles.

The public has to be accepting that police are only a segment of themselves who are sometimes capable of making an error in judgment. Public expectations of police are far too high. When a mistake is revealed the consequences of that revelation are far too high. Rather than being accepting and separating honest mistakes from habitual bad conduct we want to punish police for any sign of weakness. Police themselves are attempting to create a false image of themselves by hiding those times when they make understandable errors. But what would you expect when the consequences of admitting to an error are so harsh? This is an unhealthy climate that needs correction.

Gorski Consulting
London, Ontario, Canada