Publicity Given To Fortunate Result in Rollover But Nothing Said About Freshly Graded Soft Shoulder That Might Have Caused Crash

Posting Date: 18-July 2013

On the afternoon of July 17, 2013, a 2005 Kia SUV was northbound on Perth Road 23 just south of Mitchell, Ontario when the vehicle reportedly "…flipped end over end and landed in a wheat field" (Stratford Beacon Herald newspaper).

The publicity focused on the fortunate result that both occupants of the vehicle "…basically walked away from it" quoting OPP Constable Kees Wijnands. Constable Wijnands was then quoted as saying it was a "beautiful example" of automotive safety technology at work.

Well thankfully, the automotive technology did its job, but that is not the real story. Nothing was mentioned about what caused the collision and the 58-year-old female driver was charged with "careless driving". But based on what? Simply because the vehicle rolled over in a field? Why did the vehicle enter into a state of loss-of-control? Surely the police experts should have an opinion. Well, we examined the site this afternoon and we came to a different conclusion.

From the moment we parked our vehicle on the shoulder next to the location where the vehicle left the roadway we could tell from the marks left by the tires of our vehicle on the gravel shoulder that the news article and police were not telling the full story.

The photo below was taken from several hundred metres south of where the Kia rolled over. This northerly view of the east shoulder shows only one prominent tire mark in the gravel which is from the left side tires of our vehicle as we drove along it searching for the location where the vehicle rolled over.

View, looking north, along the east shoulder of Perth Road 23 (Same travel direction as the Kia) from several hundred metres south of the location where the Kia left the road surface and rolled over.

In fact, you can see our parked vehicle in the background and the point where the Kia exited the pavement is just in front of our parked vehicle. If you had studied any of our discussions about tire marks left on freshly graded gravel shoulders then you would immediately recognize what we recognized based on the visibility of the marks produced by the tires of our vehicle as we rode slowly along this shoulder. But let's look further…

If the previous photo was not obvious enough for you then the following photo should be even more revealing. Look how visible the tire mark is produced by the left side tires of our vehicle as we slowly rode along the shoulder searching for the collision evidence.

View, looking further northward along the east gravel shoulder toward the location where the Kia left the roadway.

Let us ask this question: If this shoulder had been left alone for six months or a year, through the cold of our Canadian winter, etc., and if you drove your vehicle onto to this shoulder after that length of time, would you expect to see such visible tire marks?

Having conducted extensive observations of tire marks on freshly graded shoulders our response is definitive: NO. A typical gravel shoulder that has been undisturbed will be hard-packed over that length of time and tire marks will not be that visible. This gravel shoulder was freshly graded, probably within a day or two of the collision date. But let us move on…

Interestingly, as we approached closer to the area of the Kia's roadway departure there was an obvious braking skid mark from a tandem-axled truck in the northbound lane as shown in the photo below.

View, looking north, showing a set of truck skid marks in the northbound lane of Perth Road 23.

Although we have seen a great deal of physical evidence over the years we are not magicians and there is no way for us to know whether these tire marks have anything to do with the collision events. For example, the Kia could have been passing the TT and it could have lost control during that process causing the truck driver to apply hard braking. There is no way for us to know this without having some kind of knowledge of what drivers and/or witnesses observed at the time of the collision. We can form some opinion however when there is some observable evidence on the collision site but that does not take place until very shortly before the Kia exited the roadway.

View, looking north along Perth Road 23 at a point just south of the parked position of our vehicle and just south of the yaw marks produced by the Kia as it rotated counter-clockwise off the east (right) side of the road.

The earliest evidence produced by the Kia was in the form of yaw marks which began to be visible just north of the parked position of our parked vehicle, as shown in the above photo. The photo below shows a closer view of the beginning of those yaw marks in the northbound lane.

View, looking north in the northbound lane of Perth Road 23 showing the beginning of the yaw marks caused by the Kia rotated counter-clockwise and into the east (right) roadside.

The presence of these yaw marks and the vehicle's travel into the field where it rolled over is of less interest to us than the fact that the gravel shoulder was freshly graded and therefore its character could have played a role in causing this vehicle's loss of control. So let us leave the collision evidence for the time being and focus on those tire marks left by our vehicle as we travelled forward while we initially searched for the location where the vehicle left the roadway.

In the photo below it can be seen how we had been travelling forward along the shoulder and, upon discovering the loss-of-control tire marks of the Kia, we stopped our vehicle, placed it in the reverse gear, and backed-up our vehicle a few metres. Look how clear the tire marks are which show that motion.

View, looking along side of the parked position of our vehicle toward the tire marks produced by that vehicle as it moved forward and then was reversed backward to its parked position.

The photo below is another view of the tire mark produced by the left side tires of our vehicle at a location just in front of the final stopped position of our vehicle. Look how clearly the tire mark is visible showing that motion of moving forward, stopping, and then backing up on the gravel.

View of tire mark just in front of our parked vehicle showing how the vehicle had rolled forward to halt and then was reversed on a slightly altered path before coming to a final halt behind the camera.

Is this the kind of imprinting you could expect from a gravel shoulder that has been hardened by months of environmental conditions? And look again in the photo below which is looking back at our parked car and our tire mark visible in the foreground.

View, looking southward, showing the tire mark produced by our vehicle as it was backed into its parked position on the east gravel shoulder.

And again below, a closer view of the change in the path of our vehicle as it was being reversed, revealed by the details exhibited in the visible tire mark.

View of details visible in the tire mark of our vehicle's reversing into its parked position. This is a classic indicator that the gravel shoulder was soft and freshly graded.

You can clearly see our tire mark in the distant background behind our vehicle and also the change in direction in the foreground. This evidence is classic of a soft shoulder condition created by fresh grading of the shoulder.

So where is the important news informing the public that this shoulder was soft and could be dangerous if travelled at highway speed?

Even more misleading is the title of the newspaper article claiming the vehicle "…flips end over end two and a half times…". That is totally false. Not only is it that end-to-end "flips" almost never occur, but the physical evidence at the site clearly showed that the vehicle rolled from side-to-side, like almost all roll-overs do. So who gave this mis-leading information? Did the news journalist just make that up? Possible, but we doubt it. Why are police providing such false and mis-leading information?

The caption leading to the news article in the London Free Press is entitled "Couple lucky to survive rollover". No, another sensationalization. Yes, every rollover has an element of unpredictability, but to conjure up the story that this was some kind of high speed rollover that was more severe than most is completely misleading and is damming of the evidence provided by both the police and news media. This was a "soft" rollover (barrel roll) at moderate speed. Nowhere is it indicative that the vehicle was travelling at high speed.

More importantly the police and news media have a responsibility to inform the public of true dangers that exist on the roadway. Absolutely nothing was posted on the roadside informing the driver of this vehicle that the gravel shoulder was freshly graded, soft and dangerous to enter at highway speed. The Manual of Uniform Traffic Control Devices (MUTCD) is the standard followed throughout North America to ensure that all traffic signage is consistent. In that manual it clearly identifies a "Soft Shoulders" sign (Wa-29) which should be erected under the following conditions:

"*The 'Soft Shoulders' sign shall be used where soft shoulders present a hazard to vehicles that may leave the pavement.*

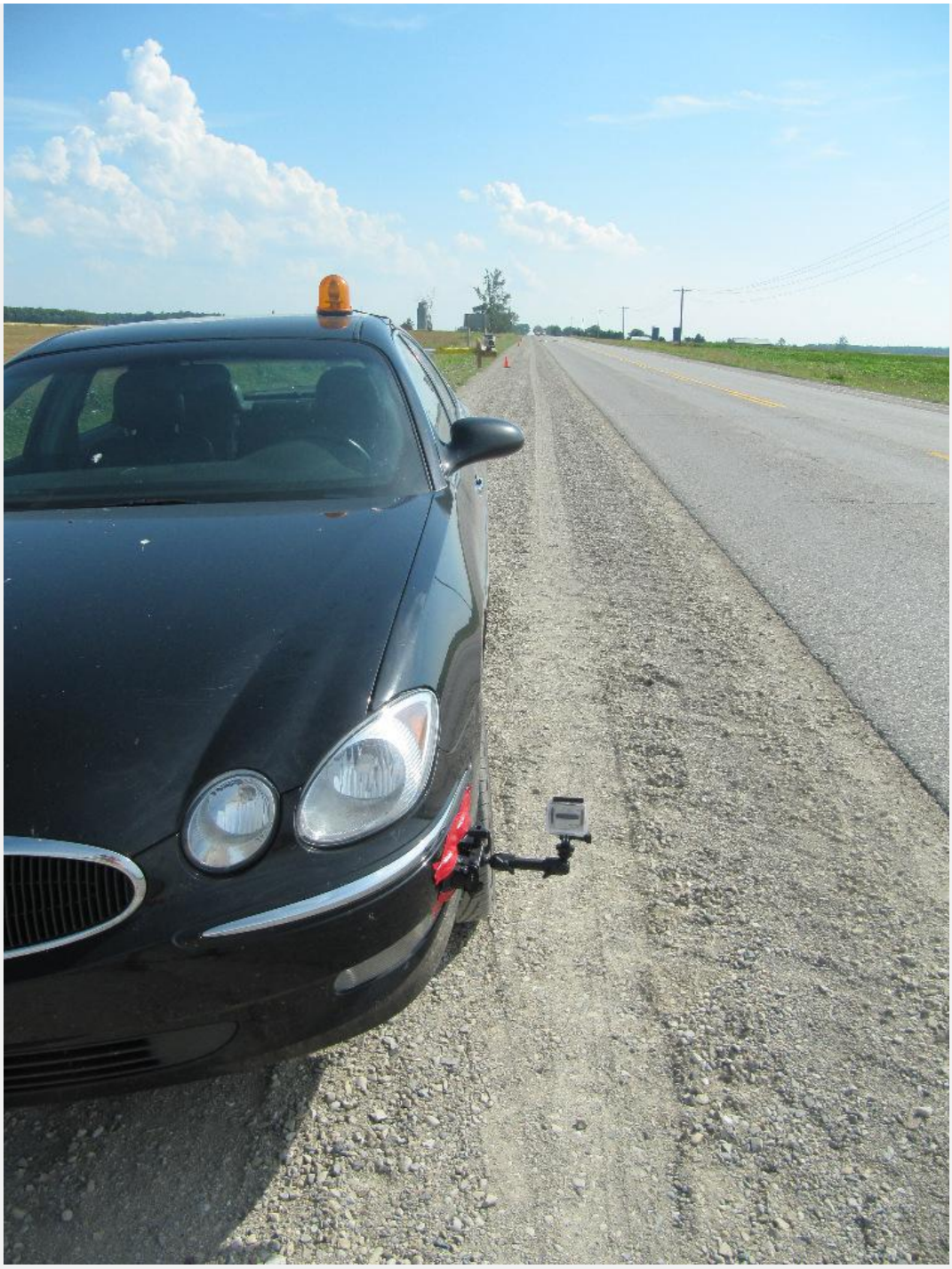
This sign should be erected at regular intervals (about 300m apart over short stretches and 900m apart on long sections) and beyond major intersections. The sign is intended for temporary application only, and shall only be in place as long as the soft shoulder condition exists. It should be removed after the shoulders have become thoroughly compacted."

Where were the police when it was required to determine whether this sign should have been posted? Where were the police in informing the news media that the public should be especially aware that travelling along this stretch of highway could be especially dangerous if a vehicle should stray off the paved road? Where were the police in requesting that a “Soft Shoulders” sign should be erected immediately along this stretch of road? If it was deemed that the sign was not needed where is the testing the police performed to determine so? What investigation did police perform by simply calling the local roads authority and determining when this shoulder was graded?

In addition to our observations at the site we decided to set up our vehicle for testing of the safety of the shoulder. In our traditional way we set up a number of video cameras on our test vehicle. For example, cameras were set up showing the right and left tires. The photo below shows a camera pointing to the right front tire.

View of GoPro camera pointing at the right front tire of our vehicle in preparation for testing.

The photo below shows a similar camera pointing backwards toward the left front tire.



View of GoPro camera pointing backwards at left front tire of our test vehicle.

We also attached a camera to a bike rack behind the vehicle to show a forward view of the vehicle's left side as shown in the photo below.

View of GoPro camera anchored laterally from a bike rack and the back of our test vehicle to point forward showing the left side of our test vehicle.

We also attached a camera in the foot-well area of our vehicle pointing at the brake and accelerator pedals so that we could document the application of these pedals during the testing, as shown in the photo below.

View of GoPro camera pointing to the brake and accelerator pedals with flashlights anchored in the area to brighten the view in this otherwise dark area.

We also attached a camera pointing at the speedometer/tachometer to show its condition during the testing, as shown below.

View of GoPro camera pointing at the speedometer/tachometer of our test vehicle.

We also attached a camera to the centre dash area, pointing forward through the windshield (not shown here).

Finally, we had a camera pointing at the “Gyro” app displayed on our iPhone as shown in the photo below.

View of GoPro pointing at the “Gyro” app displayed on our iPhone.

You might recall from our previous articles that the Gyro app provides a running display of six parameters:

1. Angle of the test vehicle along the X-axis indicating the vehicle’s pitch.
2. Angle of the test vehicle along the Y-Axis indicating the vehicle’s roll.
3. Angle of the test vehicle around its Z-axis indicating the vehicle’s yaw.
4., 5. and 6. Rates of change in the above three parameters in degrees per second.

So this app provided a fairly detailed description of what is happening to the vehicle body as it travels over the gravel shoulder in question.

We then began performing testing by first travelling northbound fully in the northbound lane of Perth Road 23 so we could demonstrate what the reactions of the vehicle would be. We then commenced a variety of tests at various speeds by dropping our right side

wheels over the asphalt edge and by travelling partly and fully on the loose gravel shoulder. The details of this testing are too lengthy but these may be reviewed in a separate article in the Articles page of this website.

But the bottom line is that our exit onto the shoulder at 80 km/h proved dangerous. So much so that we immediately had to abort the test by lightly applying our brake, without any steering inputs, and gently reducing speed to a reasonably safe speed. Even at 70 km/h we were able to complete our test but still found it precarious and it required our full attention to maintain vehicle control. Finally, at 60 km/h, we could maintain control but this would be the maximum speed that could properly be maintained but still requiring our full attention not to induce any significant steering inputs.

So this shoulder was a danger to any driver who might wander onto it at highway speed. The fact that that more loss-of-control events did not occur here was just a roll of the dice. The fact that the couple who "walked away" from this collision were lucky is also likely due to the fact that the driver was likely not travelling at an abnormally high speed and that is evidenced by the distance the vehicle travelled after it exited the road and the moderate extent of damage visible to the vehicle perimeter. The police and the roadway authority are to blame for this event, not the driver. Police should be making certain that, when shoulders are being graded, there are warning signs posted to inform drivers of the danger posed by soft shoulders. Road authorities should also be posting these temporary signs but are not doing so.

And when news reporters come to interview investigating police it is absolutely unacceptable that police should not inform them of the soft shoulder so that the public can be warned of that danger.

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