

What Caused an OPP Police Cruiser Impact With a Tree on the Exit Ramp From Highway 401 Near Ingersoll Ontario - Part 1 of 2

Posting Date: 24-Dec 2013

This article is Part 1 of two articles discussing our evaluation of a collision involving an OPP cruiser collision that occurred on the westbound off ramp of Highway 401 at Plank Line, on the outskirts of Ingersoll, Ontario on December 18, 2013. This article will focus on a review of the physical evidence. The follow-up article, Part 2, will discuss some of the testing that was performed to provide further information about the collision.

1.0 Background

News media in Southern Ontario reported the following collision involving an Ontario Provincial Police cruiser that reportedly occurred on the afternoon of December 18, 2013.

"Police seeking vehicle that fled scene of crash involving police cruiser near Ingersoll

Sentinel-Review Staff

Wednesday, December 18, 2013 5:09:44 EST PM

An OPP officer suffered minor injuries after crashing into a tree on a ramp on Highway 401 near Ingersoll Wednesday afternoon.

The collision occurred at 1:55 p.m. on the westbound off ramp at Plank Line. The officer was exiting the highway when they spotted a vehicle parked on the north shoulder of the off ramp.

The vehicle suddenly pulled off the shoulder and onto the roadway directly in the path of the fully marked OPP cruiser, police said, causing the officer to drive their vehicle into a north ditch and strick a tree to avoid a collision.

The other vehicle, described as a white Ford Fusion, did not remain or return to the scene.

OPP are looking for any witnesses who have not yet spoken to police and may have information about this incident, or may be able to help identify the driver involved to contact them at 1-888-310-1122."

This article was taken from the Woodstock Sentinel Review newspaper, of Woodstock, Ontario. The typographical errors in the article are printed as they occurred in the original article.

One reader of the article sent his comment where he reported that he drove past the site shortly after the collision and he gave this account:

"I actually took that off-ramp just after it happened (only one other cop car there at that point). When i saw it, the first thing I thought was "how fast was he going to get that far up the other side of the ditch". With the stop sign within ~50m, one would think his speed would be very slow at that point - if driving with care. And damage/injury it wasn't "hitting a tree", it was the impact of hitting the other side of the ditch and traveling uphill towards the Elmhurst. just my take on it. maybe it happened, maybe it didn't. one thing for sure, the cops would never believe that story if i told it."

2.0 Review of Physical Evidence

Figures 1 and 2 provide general views, looking east, from the overpass of Plane Line, toward the westbound exit ramp where the reported collision occurred.

Generally, an exit ramp involves lower speeds of traffic although that may vary depending on whether the incident was closer to the point of entrance into the ramp or if it occurred further toward the stop sign at Plank Line. A vehicle that is stopped on the side of such a ramp does not enter into the path of another vehicle "instantly". It usually takes several seconds for that to occur. Additionally, the fact that contact did not occur between the reported Ford Fusion and the police cruiser indicated that the police officer was able to take evasive action that successfully prevented that contact. If that contact was avoided, did the police officer steer to the left and past the Fusion before moving back to the right and crashing into the north ditch? Or did the police officer steer to the right of the intruding Fusion and therefore move directly into the north shoulder?

Certainly, if the officer steered left, there would have been a considerable distance of travel by the cruiser to get past the accelerating Fusion before the cruiser exited the north roadside. This would involve a long period of deceleration even before the cruiser exited the paved ramp. So the speed of the cruiser would have been in question.

If the officer steered to the right then the cruiser would exit the ramp road in a shorter time and distance. This would mean that the Ford Fusion would have been parked only a short distance from where the cruiser exited the ramp road.

Even if the officer steered to the right its takes a considerable time and distance before the angle of the cruiser is changed and during that time and distance we should expect substantial deceleration, even if it is not at a maximum level. So the facts, whatever they were, left us with an uncomfortable degree of suspicion.

As is typical, no additional evidence was provided by news media. As is typical, we decided to attend the accident site and examine the evidence for ourselves.



Figure 1: View, taken from the Plank Line overpass of Highway 401, looking east at the westbound exit ramp where the collision occurred with the OPP cruiser.



Figure 2: View, looking east, showing a closer view of the westbound exit ramp from Highway 401 to Plank Line.

We examined the site on the morning of December 19, 2013. Figures 1 and 2 were taken upon our first arrival and before we actually walked to the area where the collision evidence was located.

Upon approaching the site eastbound along the ramp from its intersection with Plank Line it was not long before we located the fresh evidence of a tree impact along the north side of the ramp, as shown in Figures 3 through 6. These figures show the ramp from opposite to the cruiser's travel direction so that readers can appreciate how close the impact location was to Plank Line and how it would be reasonable for vehicles to be travelling at a relatively slow speed in comparison to the speeds that would be expected when the vehicles first enter the ramp from the high speed highway.

Figures 7 and 8 show the view as we walked along the north side of the ramp and toward the area of the tree impact. Figures 9 and 10 show the physical evidence as we approach the area of impact. It can be noted how there is an upslope in the ramp on approach to the impact and there is an additional upslope of the ditch to the impact at the tree. These facts are of concern when we consider the speed that the cruiser must have possessed when it travelled through this area.



Figure 3: View, looking east, along the ramp from just east of its intersection with Plank Line.



Figure 4: View, looking east, toward the area of the cruiser's impact with the tree.



Figure 5: View, looking east, toward the area of the cruiser's impact with the tree.



Figure 6: View, looking east, toward the area of the cruiser's impact with the tree.



Figure 7: View, looking east, while walking along the north side of the ramp toward the area of impact.



Figure 8: View, looking east, showing the area of the physical evidence of the collision on the north side of the ramp.



Figure 9; View, looking northeast toward the physical evidence of the impact on the north side of the ramp.



Figure 10: View, looking northeast toward the area of impact on the north side of the ramp.

In Figure 11 we progress past the area of impact, so the view is now from the east and looking west, or in the direction that the police cruiser was travelling. We now see the tire marks of the cruiser in the snow as it exited the paved ramp in the foreground, proceeded up the upslope of the roadside and collided with a tree and other objects in the background.

We will examine the details of this evidence at the area of impact shortly. However we want to take you to the east along the ramp to show how the police cruiser approached the area where these events occurred.

Figure 12 shows a view of the ramp taken from a location shortly after vehicles have left the fast speeds of Highway 401 which can be seen on the left edge of the view. It can be seen that, as vehicles pass through the ramp they negotiate a right curve and then, the far distance, the ramp curves back to the left in the area where the police cruiser left the north roadside. High speeds of vehicles would be expected in the foreground of Figure 12 but note the long distance that a vehicle must travel before it reaches the area of the left curve. Drivers should be decelerating during this long distance such their speed should be much slower by the time they reach that left curve.



Figure 11: View, looking west, from the location where the police cruiser travelled off the paved ramp and onto the north roadside where it collided with a tree and other objects in the background.



Figure 12: View, looking east, along the westbound exit ramp of Highway 401, showing how the ramp curves to the right and then back to the left in the far background.



Figure 13: As drivers travel around the right curve of the ramp there is a location where they are unable to see the right (north) shoulder of the ramp because there are two large, blue signs on the north road side.

Figure 13 demonstrates that, as drivers travel through the ramp there is a location where they are unable to see the north shoulder because there are two, large, blue signs on the north roadside that block the drivers' view of that shoulder. With respect to the cruiser collision, it is possible that the Ford Fusion was located on the north shoulder in the vicinity where its presence was blocked from view by the signs. This would mean that the police officer might not have been able to see the Ford Fusion for a brief period but it also demonstrates that the driver of the Ford Fusion was also not able to see the cruiser's approach. Figure 14 shows another example of that short-term view obstruction.

One must also consider the view point of the Ford Fusion driver who is seated in the vehicle and possibly looking in his/her mirrors before entering the ramp. Given where the cruiser left the road, the Ford Fusion would likely be located in the straight section of the ramp between the two curves. In this location the Fusion driver would not be able to see the cruiser's approach via the driver's exterior mirror while that cruiser was still in the right curve because obviously, the cruiser would be to the "right" of the Fusion. A better view might be obtained from the rear view mirror but even then the view of the cruiser while it was in the right curve would not be ideal.



Figure 14: View, looking west along the ramp showing that the two, large, blue signs on the north roadside could produce a temporary view obstruction of a vehicle parked on the north shoulder of the ramp.

Thus the speed at which the cruiser approached the Fusion from the rear would be an important issue because the faster that the cruiser travelled the less time the Fusion driver would have to see the cruiser in the remaining portion of the ramp that is straight after the right curve.

Figure 15 shows that, as we move further west, past the two large blue signs, there is the short distance of straight ramp before it bends back to the left, which is where the cruiser left the paved surface. One can imagine, for example, that the Ford Fusion might have been on the north shoulder in the vicinity of the vehicle that is shown in Figure 15, or perhaps slightly further west of that location.

Figure 16 provides another view of the ramp in its straight section before it curves to the left. If the Ford Fusion existed then we do not believe that it would have been stopped further east (i.e. closer to the camera) than the white directional sign on the right (north) roadside that is presently closest to the camera. It would more likely be closer to the yellow sign further to the west. This is our judgment considering that the cruiser left the roadway just before the green directional sign in the distant background. So the Fusion would be parked in the vicinity of where the ramp began its left curve.



Figure 15: View, looking west, near the end of the right curve of the ramp, showing the short section of the ramp that is straight before it curves back to the left.



Figure 16: View, looking west, along the straight section of the ramp. If the Fusion existed then our best estimate is that it was parked near the vicinity of the yellow sign located on the north roadside.

Figures 17 and 18 show the north roadside just east of that yellow sign. There is evidence there of some fresh disturbance of the snow, from at least one vehicle, but it would be difficult to say whether some of these marks could be related to the mystery vehicle. This would be speculative, since there are numerous such marks further to the west likely from various emergency vehicles that would have parked there after the collision. Figure 19 shows another view of those fresh marks from just past the anchor post of that yellow sign. In Figure 20 we turn around to face east, from the location of that anchor post, and show the characteristics of those fresh tire marks in the snow.

Whether the Ford Fusion existed or not, there is nothing in the evidence near this yellow sign that would confirm its existence. There is no deposit any black tire rubber that might confirm the rapid acceleration of such a vehicle.

Given that the collision occurred about 19 hours before this photo was taken it is possible that the edge of the snow might have been further into the shoulder and perhaps the right side tires of that Fusion might have been on that snow. This would cause the Fusion to accelerate slower from its rest position, depending on the specific circumstances. In all, there is no clear evidence of the existence of this mystery vehicle.



Figure 17: View, looking west, at the north roadside just east of the yellow sign where we expect that the Fusion was parked on the paved shoulder.



Figure 18: View looking at some fresh snow disturbance in the vicinity of the anchorage post of the yellow sign where we estimate that the Fusion was parked before it accelerated onto the ramp.



Figure 19: View of the fresh tire marks in the snow that exist just west of the anchor post of the yellow sign.



Figure 20: View, looking east, of the fresh tire marks just east of the anchorage post of the yellow sign.

As we move further west along the north shoulder we can see other tire marks in the edge of the snow such as those shown in Figure 21, just east of the white parking sign.



Figure 21: View, looking west, at the north roadside, where other fresh tire marks exist just east of a white parking signs.

Figure 22 provides a close view of the east end of those tire marks. They indicate the presence of more than one vehicle or that the same vehicle was on the shoulder more than once. But certainly there is nothing about these marks that could lead us to the conclusion that they came from the mystery Fusion vehicle.

Figure 23 shows that tire marks exist from this white parking sign all the way to the point where the cruiser left the paved road surface and we would expect that many emergency vehicles would be located here. Again, there is nothing in this evidence that can be used to confirm the presence of the Ford Fusion.

Now that we have reviewed the evidence travelling westward along the path of the police cruiser we can come back to the location where the cruiser left the pavement and study how it travelled through its impacts and to its final rest position.



Figure 22: View of the east end of the fresh tire marks that exist near the white parking sign.

Figure 24 shows that the evidence of the cruiser's entrance into the ditch is located on the right and the marks created during pulling the cruiser back toward the road after the collision are on the left.



Figure 23: View, looking west, toward the white parking sign and the evidence of numerous tire marks leading to the location where the police cruiser left the paved ramp.



Figure 24: View, looking toward the north ditch at the location where the cruiser exited the paved surface.

The extent of the deceleration of the cruiser though the snow can be appreciated by the fact that its undercarriage was in contact with the deep snow as evidenced in Figure 25. We must also consider that it would take more speed for it to travel up the embankment in the background than if it was travelling over level ground.

Figures 26, 27 and 28 show that, along its travel path, the cruiser also knocked down an "OPP" sign that was thrown up the embankment.

Figure 29 provides an overall view of the path of the cruiser as it travelled up the embankment with a view of the ramp road in the background and the markings in the snow that showed how the cruiser plowed through it.

While the official story given to the news media was that the cruiser collided with a tree, Figure 30 shows that the tree that was struck was only grazed and that the cruiser continued to travel into the brush where it struck a number of saplings and a fence.



Figure 25: View of marks in the snow showing how the cruiser plowed through the deep snow such that the marks from its undercarriage can also be seen in the snow.



Figure 26: View of the anchor post to the "OPP" sign that was knocked over.



Figure 27: View of "OPP" sign that was knocked down and thrown up the slope.



Figure 28: View of "OPP" sign that was knocked over by the cruiser as it travelled through the embankment.



Figure 29: Overall view, looking from the stop of the embankment, at the path taken by the cruiser as it left the ramp road and plowed through the deep snow.



Figure 30: View, looking at the tree that was grazed by the cruiser before it carried on to make other impacts in the vicinity.

An important point about any collision is that a single, significant impact can be deadly if all the vehicle's speed and kinetic energy is lost by way of that impact. This is so because many of the things that vehicles strike will cause the vehicle to slow down in an extreme hurry. For example, a 50 km/h frontal impact into an immovable barrier is often completed in a little more than 1/10th of second (or slightly more than 100 milliseconds). When a collision is of short duration the acceleration pulse must be high and thus this is the deadly aspect of a collision which causes injury. It is far more beneficial to the vehicle occupant when that time of deceleration is stretched out from the 100 milliseconds to 200 or even 300 milliseconds. When you double the time you halve the acceleration and the potential for injury diminishes greatly.

So, in the present instance, it was sheer luck that the police cruiser only grazed the large tree shown in Figure 30 because, if there had been a central impact, the tree was not going to move, and the cruiser was definitely going to stop in a very quick hurry. It was clear from the remainder of the evidence that the cruiser still had a substantial amount of speed left over after it mounted the top of the embankment so that a central impact with the tree would have been a major problem because of its severity.

Instead, there was evidence how the cruiser's speed was lost through a long collision pulse and this added length to the deceleration time gave the officer a lower level of

deceleration and less potential for injury even though a substantial amount of speed was lost.

In cases where a vehicle sustains several impacts through a prolonged time of deceleration it is important to study the evidence within the areas of direct contact to determine the sequence of these impacts. In the present case we are not involved in an official investigation and the police cruiser is not available for us to examine. However some information can be obtained by studying the remains of damaged parts lying on the ground.

For example, we found a couple of pieces of debris near the tree impact, as shown in Figure 31. Even if you do not study damaged parts for a living it is not difficult to look at these parts and determine that they came from either the left or right front corner of the cruiser, as they are from the signal light of the vehicle. Looking at the markings on such debris can provide further clues about the type of vehicle involved. So in Figure 32 we can see that on the back of the silver piece of debris shown in Figure 31 there are some markings that indicate that the part came from a Ford Crown Victoria, which is the standard vehicle that has been used by police forces in North America in recent years.

In another area of that debris we see a label as shown in Figure 33. Part of the writing on this label indicates "RH 2011". This may indicate the year in which the part was made and that it was made for the right hand side of the vehicle. It is possible that this Crown Victoria was a 2011 model year or later and that the right front portion of the vehicle was damaged in the area of the base of the tree. This cannot be believed with certainty without having an intimate understanding of the markings, however this understanding is consistent with what we would expect from examining the evidence.



Figure 31: View of signal light debris from the cruiser lying near the base of the struck tree.



Figure 32: View of markings on the back of the debris indicating the involved vehicle was a Ford Crown Victoria.

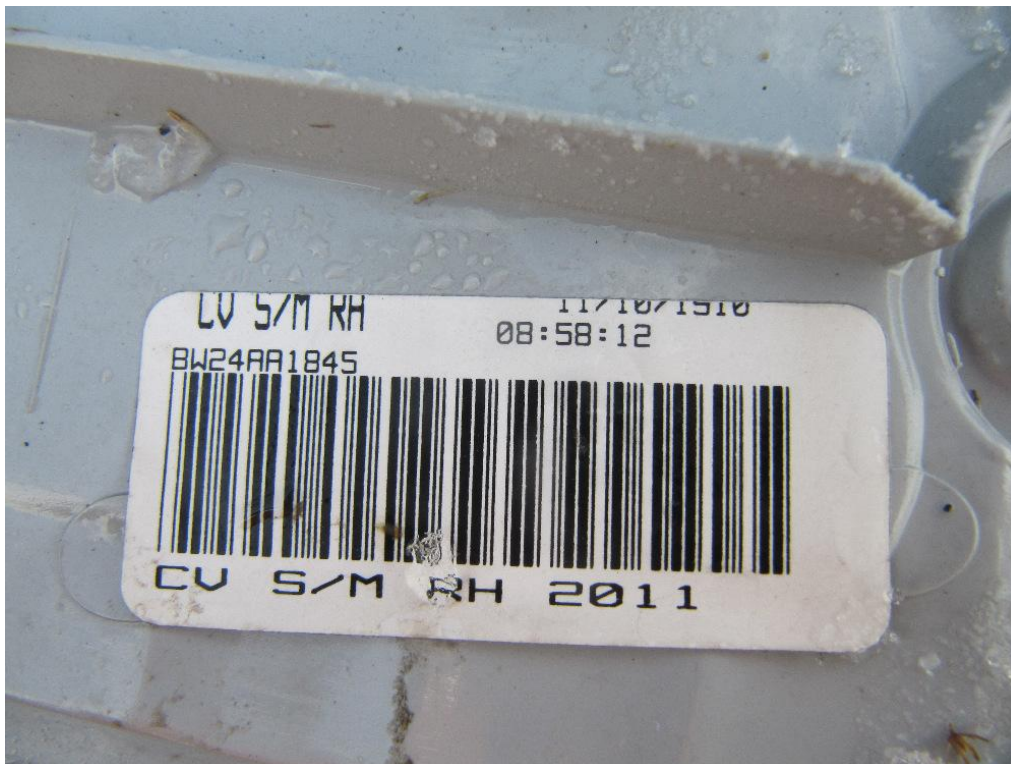


Figure 33: View of label on the back of the debris indicating "RH 2011".



Figure 34: View, looking backwards from the tree impact toward the north roadside and onwards to the ramp road in the background.

We saw the tire marks in the snow as the cruiser plowed through the snow of the north embankment and the lateral distance between those tire marks indicated that the width was too narrow to be the Crown Vic's wheelbase, and that these were the marks from the right and left sides of the vehicle, so that the vehicle was plowing into the snowy embankment leading with its front end. Taking into account the upslope of the embankment and the angle of the cruiser, it would be reasonable that the right front of the cruiser would make contact with the rising ground or that this could also be the portion of the vehicle that made the grazing contact with the tree.

Knowing that the cruiser was likely plowing into the snowy embankment with its front end says something important about the vehicle's position and the events leading up to its exit from the paved ramp road. For example, in a very large number of loss-of-control collisions, many of which we have described in articles on this website, the vehicle's state of loss-of-control is demonstrated by "yaw" marks that may exist for a long distance before an eventual impact. These yaw marks indicate that the vehicle is rotating about its vertical axis. Colloquially we hear terms such as "fish-tailing" when we hear persons talking about the motion of such a loss-of-control vehicle. But the straightness of the tire marks in the north, snowy embankment does not lead us to the belief that there was any substantial rotation of the vehicle. The evidence gives the impression that the cruiser simply drove straight into the embankment, whether due to the driver's steering or otherwise. Such knowledge can be used to study any information that the driver or witnesses might provide about how the event unfolded.

Returning to the evidence around the tree impact, there was a considerable amount of damage visible to the various saplings and brush at the line of a wire fence, just to the west of the impacted tree. Figure 35 provides a general view of that damage.

Figure 36 provides a further indication of the damage to the saplings just west of the tree. If one looks closely you might see that the wire fence was pushed against the trunk of the tree in the centre of the view and the this caused markings on the trunk in the areas of the wire contact.

Figure 37 provides a view of the damage at the final rest position of the cruiser. What may be difficult to detect is that there is metal anchor post from the fence that is somewhat hidden by the other narrow, vertical objects in its vicinity and this metal post shows an extreme bend in it. Figure 38 provides a closer view of that metal post.

Our point is that the various saplings and underbrush, including the wire fence, acted as a "catcher's mitt" in capturing the vehicle and bringing it to a stop over a relatively prolonged time and distance which was beneficial to the officer's health. This action is not much different than the action of a guardrail or other barrier system on the roadside that is made to collapse its anchorages and deflect to bring a vehicle to a gradual stop. There was considerable energy lost during this action and there was considerable speed lost by the cruiser during this action but the acceleration pulse would have exhibited generally lowered levels of deceleration due to that extended time and distance of deceleration.



Figure 35: View of the general damage exhibited by the various saplings and brush just to the west of the impacted tree.



Figure 36: View of the damage to a sampling located just west of the struck tree and the evidence that the wire of the fence was compressed against the trunk of the tree in the centre of the view.



Figure 37: Vie of the damage evident near the final rest position of the police cruiser.



Figure 38: Closer view of the bent, metal, anchor post the wire fence at the final rest position of the police cruiser.

This completes our review of the physical evidence. In Part 2 of this two-part series of articles to discuss some testing that was conducted on the ramp road to provide further clues as to how this collision might have taken place.

Gorski Consulting
London, Ontario, Canada

*Copyright © Gorski Consulting,
All rights reserved*