Stephanie Fairweather Identified as Woman Fatally Injured on Third Line East of Iona Road

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The London Free Press has now identified Stephanie Fairweather as the 32-year-old female driver of a Ford Focus that was fatally injured Thursday (December 2, 2010) as a result of a collision with a group of trees. My comments from December 3rd, 2010 follow:

It is reported that she was westbound on Third Line "...when the vehicle left the roadway on the south side, striking trees and coming to rest in two pieces" (OPP Constable Michelle Murphy). While all collisions have an element of uncertainty and uniqueness, after having reviewed the evidence at the collision site it leaves my mind with considerable confusion. The following photos were taken between 1130 and 1300 hours today, December 3rd, 2010.

First, the photo below is a view looking west along Third Line from about 300 metres east of the location where the Focus left the roadway.

In the far distance you should be able to see my car, parked on the south side of the road, across from the final rest position of the front half of the Focus. Closer to the camera you should be able to see a large tree on the north roadside. A limb had fallen from this large tree and this limb was found lying near the north edge of the road. This limb is located about 235 metres east of the location where the Focus left the road surface. This is the only evidence I could find on the road that could remotely be associated with any obstruction or roadway defect which could be related to this collision. The photo below shows a view of the broken limb on the north roadside.

Note that the limb in on the roadside and not on the road so there is no evidence that it ever was on the road surface. The only other issue is that the limb is broken into several pieces and if it had been struck then we could expect it to become broken. But then someone would have to remove the limb from the road to hide its contribution and that seems a bit farfetched to me. Certainly I did not observe any tiny contaminants of wood on the road surface to suggest that the wood was ever on the road. I just mention it because it literally is the only thing in the vicinity that I can see as having an effect on a westbound vehicle's motion. Note that the roadway is straight and level and, considering it is a very low volume road, it is in relatively good condition.

As we travel further west toward the area of impact the photo below is a view looking west from about 125 metres east of where the Focus left the roadway.

Now you should clearly be able to see my car parked on the south roadside, next to where the front portion of the Focus came to rest. Closer to the foreground you should be able to see the stump of a tree on the north roadside. This stump is located about 108 metres east of the point where the Focus left the roadway. I mention the stump because the angle of the tire marks of the Focus I am about to show you line up with this stump. So if we are going to search for a location on the road from which the Focus began to leave the roadway then the vicinity of the stump is a good place to start.

You will have noticed the markings in the westbound lane in the foreground of the above photo and I'm sure you are already wondering if these have something to do with the collision. They don't have anything to do with this collision. Someone has laid a "cross" monument at the base of the stump and I suspect it has nothing to do with the present collision. My best guess is that there was a previous collision at this site where perhaps someone was fatally injured. The marks in the westbound lane are something similar to what would be caused by towing personnel: often caused by a larger than average tow truck. This is consistent with the aging of the marks. It is rather coincidental if a previous fatal collision occurred within a 100 metres of the present one because this is a very low volume road. So I would be interested to know if my assumption is correct.

I looked very closely at the surface of the road in the vicinity of this stump and progressing westerly toward the beginning of the tire marks. Initially I was puzzled to see some fresh scratches in the pavement near the roadway centre-line. But I soon discovered it was the old nemesis of accident reconstructionists at work again - the tow

truck operators who continually produce confusing evidence over top of the what I need to see. Evidently, upon towing the vehicle parts from the scene they came to scrape the road surface. I know this because I traced the marks back the other evidence of towing actions.

Next we begin to get close to the collision evidence. The photo below is looking westerly and you might begin to see the tire marks of the Focus on the south roadside as they travel toward a group of trees in the background.

Assuming you have looked at other collision scenarios in my previous articles you will know that I write a lot about yaw marks and what they look like. Yaw marks are almost always visible at the location of a loss-of-control collision. They are called yaw marks because they refer to the manner of rotation of the body (vehicle) that caused them. Yaw is the rotation that occurs about the vertical axis of a vehicle.

I can see some of you scratching your heads. So, imagine I take a utility pole and drive it downward through the roof of a car and this utility pole is now standing up vertically within vehicle. Now imagine if I rotate the car around the utility pole. That is yaw. The rotation around the vertical axis (the utility pole) is what almost always occurs before a vehicle crashes in a loss-of-control collision. For various reasons the tire marks that result from this yaw rotation are not always visible or are only visible for partial distances. I'm not going to get into a deep discussion of this but you should be able to look at the tire marks on the south side of the road and you should look perplexed

because the tire marks do not look like your regular, curved yaw marks. They appear to be quite straight. Certainly I was scratching my head when I first saw them.

The photo below shows another view of those tire marks near the beginning of where they travel off the road surface.

These marks are essentially parallel to each other. I know the marks in the above photo appear to converge but that is simply because they are entering the small ditch and this distorts their view. Believe me when you are looking at them at the site they look very parallel to each other. But that is not what is supposed to happen. Yaw marks are supposed to be curved and do a lot of converging and diverging.

The photo below shows the tire marks as they pass through the small ditch and toward the area of initial impact with the small trees in the background.

If you can follow the path of the tire marks you should be able to recognize that they look very parallel.

Before continuing this discussion of the tire marks let me continue further west and show you the area of initial impact with the three small trees in the photo below.

Upon striking these trees the vehicle separated into two pieces. One piece remained close to these trees while another portion travelled through them and ended up at another group of trees about 30 metres west of this location.

The photo below is a view of the second group of trees where the remaining portion of the vehicle came to rest. This location is adjacent to the parked position of my car. Note that there are some minor markings to the trees at this location but nothing compared to the large damage at the initial area of impact.

Returning to the issue of the tire marks I took some measurements of the lateral distance between them at two locations. The first measurement location is shown in the photo below. It was taken near the beginning of the visible tire marks. You can see my tape measure placed perpendicular to the marks.

The measured distance was 148 centimetres. And I took a second measurement further to the west as shown in the photo below.

The measurement at the second location was also 148 centimetres. Thus this confirmed what I had observed from looking at the tire marks. They were essentially parallel in the distance that they were visible. The distance from where the tire marks first appeared on the south roadside to the initial impact with the trees was about 67 metres. The distance inboard from the road edge to the first tree was about 5.9 metres. This results in an approximate departure angle of about 5 degrees. Fairly shallow but somewhat outside the range of 1 to 4 degrees that might suggest a sleeping or incapacitated driver.

Yet, if you recall my article on the apparently incapacitated driver of a few days ago (Nov 29th, fatally injured Blenheim driver strikes tree), that vehicle departed the roadway at an angle of 10 to 11 degrees. Sharply different from the 1 to 4 degrees that we often associate with sleeping or incapacitated drivers. Yet clearly that driver demonstrated no evidence of braking or willful attempts to return to the road.

So what happened in the present collision?

I did a quick scan of the track width dimensions of typical Ford Focus and the data indicates widths of about 146 to 148. This is essentially no different from the width of 148 centimetres that I measured between the tire tracks in the field. So was this Focus travelling off the road and leading with its front end and not sliding sideways? It is difficult for me to tell since I do not have access to the vehicle or any reasonable photos of it.

The only available photo is what is contained in the London Free Press article and this appears to show the rear portion of the Focus jammed against the first set of trees. But it is so greatly deformed that I would be almost guessing to suggest it struck the trees with its driver's side. Yet all the logical evidence would support that it struck the trees initially with its driver's side, even though the evidence from the tire marks does not support that conclusion.

Frankly I have investigated a number of fatal collisions resulting in their separation into two halves. I cannot recall an instance where a vehicle's initial impact was at its front end. All the collisions I investigated involved impacts to the vehicle's side. Typically these separations would occur either at the junction of the B-pillar or at the A-pillar. I have not seen any other alternatives. But if the vehicle struck the trees with its side why would there be such unusual evidence in the tire marks? I can somewhat answer my own question.

Recall what I said before that, when vehicles travel very quickly they cannot change their lateral position very much in a given distance as compared to when they are moving at a slower speed. The same applies to the yaw rate. Two vehicles may have the same yaw rate but when one is travelling two times faster than the other then the amount of rotation in the fast moving vehicle will to half of the slower one in a given distance. Am I confusing you? Let me try again.

Because the faster moving vehicle is going faster it covers more distance in the time that it rotates the same amount. Therefore in the given distance it appears to be rotating slower because the amount that it rotates in the given distance is less. So when I am looking at the tire marks there could actually be yaw taking place but it's just that there is too short of a distance in which to perceive that the rotation is occurring. Same thing for the curvature of the yaw marks. The faster a vehicle is travelling the shallower is the curvature of the yaw marks. So at the accident site I may be looking at tire marks which appear to be fairly straight without being able to conduct a detailed enough study that would take away the influences of things like the small ditch.

The bottom line is that there appears to be considerable speed involved in this collision. Not to say that this is what caused the collision. No different than, just because there was an elevated alcohol level in a driver's blood does not mean that the collision was caused by the driver's impairment and you can simply walk away without further investigation. That is not how we conduct a scientific study.

At this stage I cannot say what caused this collision. There were no visible tire marks on the road and that sometimes makes me suspicious of the road surface condition. If it is not obvious, it is difficult to produce visible tire marks on a road surface that is wet or icy so whenever there are no visible tire marks on a hard-surfaced road you should investigate the road surface condition. In addition, the fact that the Focus slid off the road leading with its driver's side is a further indication that the road surface could have been a factor. In a normal and typical scenario the Focus should have rotated counter-clockwise and led into impact with its right side. Instead it has demonstrated little evidence of lateral motion within the roadway before exiting as evidenced by the fact that no other tire marks were created in the earth shoulders. Thus the rotation occurred within the confines of the paved road and this suggests there was a slippery road surface.

The police have the best opportunity to determine what factors contributed or caused this collision because they would have seen all the available evidence including the damage to the vehicle as well as other associated facts such as the driver's whereabouts prior to the collision, what may have been contained in the vehicle interior and many other facts. Certainly I would hope someone would take the vehicle for a thorough mechanical examination.

I will be watchful for further developments.

UPDATE: December 7, 2010

Well, I am still waiting. Where is the response from the police investigation? If they have communicated privately to the family about the circumstances that caused this collision then that is fine, we do not need to go there. A simple note in the news media that the family wishes the matter to be held private is all that is needed. But the family should know. They deserve to know. Leaving this as just some kind of statistic does not sit well with me.