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MOTOR VEHICLE / PEDESTRIAN COLLISION ANALYSIS

RE: Dewar
Date of Incident: November 27, 2016

Prepared for:

Mr. Marc Kazimirski
KazLaw Injury Lawyers
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Intech File: 20G003
Date: July 28th 2020

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1.0 INTRODUCTION

This report was prepared on the instructions of Mr. Marc Kazimirski, of KazLaw Injury Lawyers. It is concerned with the motor vehicle incident of November 27th 2016, involving a 2009 Mazda 3 operated by Lindsay Finnigan (the Finnigan Mazda) and a pedestrian Mr. Garth Dewar.

In accordance with Mr. Kazimirski's instructions, the provided data were reviewed. The purpose of this assignment was to technically assess:

- The speed of the Finnigan Mazda.
- The relative pre-impact positions of the Finnigan Mazda and Mr. Dewar.
- The opportunity for the operator of the Finnigan Mazda to avoid impact.

2.0 QUALIFICATIONS AND CERTIFICATION

2.1 Qualifications

Amrit Toor, Ph.D., P.Eng., is the author and is responsible for the contents of this report. Dr. Toor's qualifications are summarized as follows:

- B.Sc. in Engineering with first class honors from Coventry University, Coventry, United Kingdom (1980).
- Ph.D. in Mechanical Engineering from Coventry University, Coventry, United Kingdom (1986).
- Registered Professional Engineer in the Province of British Columbia.
- Author and Reviewer of several peer reviewed publications in the field of Accident Reconstruction.
- Qualified and provided expert evidence as a Mechanical Engineer and Accident Reconstructionist in the Supreme Court of British Columbia, the Provincial Courts of British Columbia and Manitoba, and the Superior Court of Washington State.

A detailed copy of Dr. Toor's curriculum vitae, with professional affiliation, experience, and publications, is appended.

2.2 Certification

I, Amrit Toor, certify that I have read the Supreme Court Civil Rule 11-2 "Duty of Expert Witnesses" and I am aware of my duty under sub-rule 1. Specifically:

i.) I am aware that my duty as an expert witness is to assist the court and that I must not be an advocate for any party when giving my opinion to the court.
ii.) I have made every effort to ensure that this report conforms to that duty.
iii.) If I am called on to give oral or written testimony, I will give that testimony in conformity with that duty.

3.0 DATA PROVIDED

For the purpose of this report, the following data was provided:

- Vancouver Police Department file material for file #16-236387, including:
  - BC Motor Vehicle Traffic Collision Police Investigation Report (MV 6020).
  - General Occurrence Hardcopy.
  - Digital copies of 27 photographs of the incident scene and involved vehicle.

  - Not to Scale diagram.
  - Statement of Witness Raven Morris.
  - Officer's notes.
- Digital copies of 24 photographs of the damages sustained to the Finnigan Mazda.
- ICBC Damage Estimate Supplement #4 for the Finnigan Mazda.
- Google Map images.

Technical data that is utilized for analysis purposes is referenced with a description or endnote where required; thus, the research relied upon is referenced in this report where applicable.

4.0 FACTS AND ASSUMPTIONS

For the purpose of this report, the following were assumed:

1) The incident occurred:
   a) On November 27th 2016, at approximately 7:30 p.m.
   b) Within the 2100 block of Wall Street in Vancouver, BC.
2) Ms. Lindsay Finnigan was the operator of a 2009 Mazda 3 (the Finnigan Mazda).
3) Mr. Garth Dewar was the pedestrian impacted by the Finnigan Mazda.
4) At the time of the incident:
   a) The Finnigan Mazda was southbound on Wall Street, travelling near the middle of the road.
   b) Mr. Dewar was crossing Wall Street, from west to east.
   c) Mr. Dewar was 51 years old at the time of the incident; he had a mass of approximately 130 kg (280 to 290 lb) and was 178 cm (5' 10") tall.
   d) Mr. Dewar was walking from his apartment building at 2121 Wall Street to his parked vehicle, which was a 2008 Ford Escape, parked along the east-side curb of Wall Street.
   e) Mr. Dewar's walking followed a path at or near straight across the road.
   f) Ms. Finnigan first observed the pedestrian when he was in front of and to the right of the Finnigan Mazda.
   g) Mr. Dewar observed the Finnigan Mazda before crossing the road, but thought that the Finnigan Mazda would let him cross.
5) At the time of the incident, it was dark, raining, and the roads were wet.
6) The police scene photographs document:
   a) The post-impact rest position of the Finnigan Mazda.
   b) The blood deposits forward and to the left of the Finnigan Mazda, indicating Mr. Dewar's post-impact rest position.
7) The provided photographs document the damages sustained to the Finnigan Mazda.

5.0 INVESTIGATION

Neither the incident scene nor the Finnigan Mazda were examined by Intech Engineering. The following descriptions were ascertained from the provided data, including photographs. Additional details regarding the incident scene geometry were ascertained from aerial imagery and corresponding data from the City of Vancouver; Google Street View images were also used as a reference.

5.1 The Finnigan Mazda

The Finnigan Mazda was identified as a 2009 Mazda 3 four-door hatchback, with a vehicle identification number of JM1BK343691231789. The ICBC damage estimate indicates that the Finnigan Mazda was equipped with an anti-lock braking system (ABS). The damages sustained to the Finnigan Mazda are illustrated in Figure 1. The visible damages sustained to the Finnigan Mazda included:

- The front license plate was deformed rearward and the license plate frame was cracked along its right side.
- The front center emblem was broken and the grille was fractured.
- The leading edge of the hood was deformed near its centerline.
- The hood was scuffed and deformed downward.
- The windshield was fractured near its base, just to the left of its centerline.
- The left side mirror outer casing was detached and the mirror was fractured.

Figure 1: Finnigan Mazda damages.

5.2 The Incident Scene

The incident scene was identified as the 2100 block of Wall Street, in Vancouver, BC; this corresponds to Wall Street approximately half a block to the south of Eton Street. Wall Street is oriented predominantly in a north/south direction. Eton Street intersects Wall Street at an oblique angle, towards the east. The intersection of Wall Street and Eton Street has a traffic circle (roundabout). Parking is permitted on both the east and west-side curbs of Wall Street; with vehicles parked on both sides of the road, the road is sufficiently wide to allow opposing traffic flow. There is a slight downward grade for southbound traffic on Wall Street and overhead streetlamps at regular intervals.

There is an apartment building complex at 2121 Wall Street (Hampton Court), with the main entrance/exit approximately 40 meters to the south of Eton Street. The entrance/exit of Hampton Court has a concrete walkway from the entrance/exit region, to the curb edge of Wall Street. The entrance/exit region is shown in Figure 2 as depicted through a Google Street View image from May 2017.

Figure 3 are images from Google Street View from May 2017, depicting southbound views along Wall Street. Figure 4 illustrates the incident scene geometry, based on aerial imagery from the City of Vancouver; also shown in Figure 4 is an aerial image from 2013.

Figure 2: Google Street View image of the entrance/exit of 2121 Wall Street.

Figure 3: Google Street View images of southbound views along Wall Street.

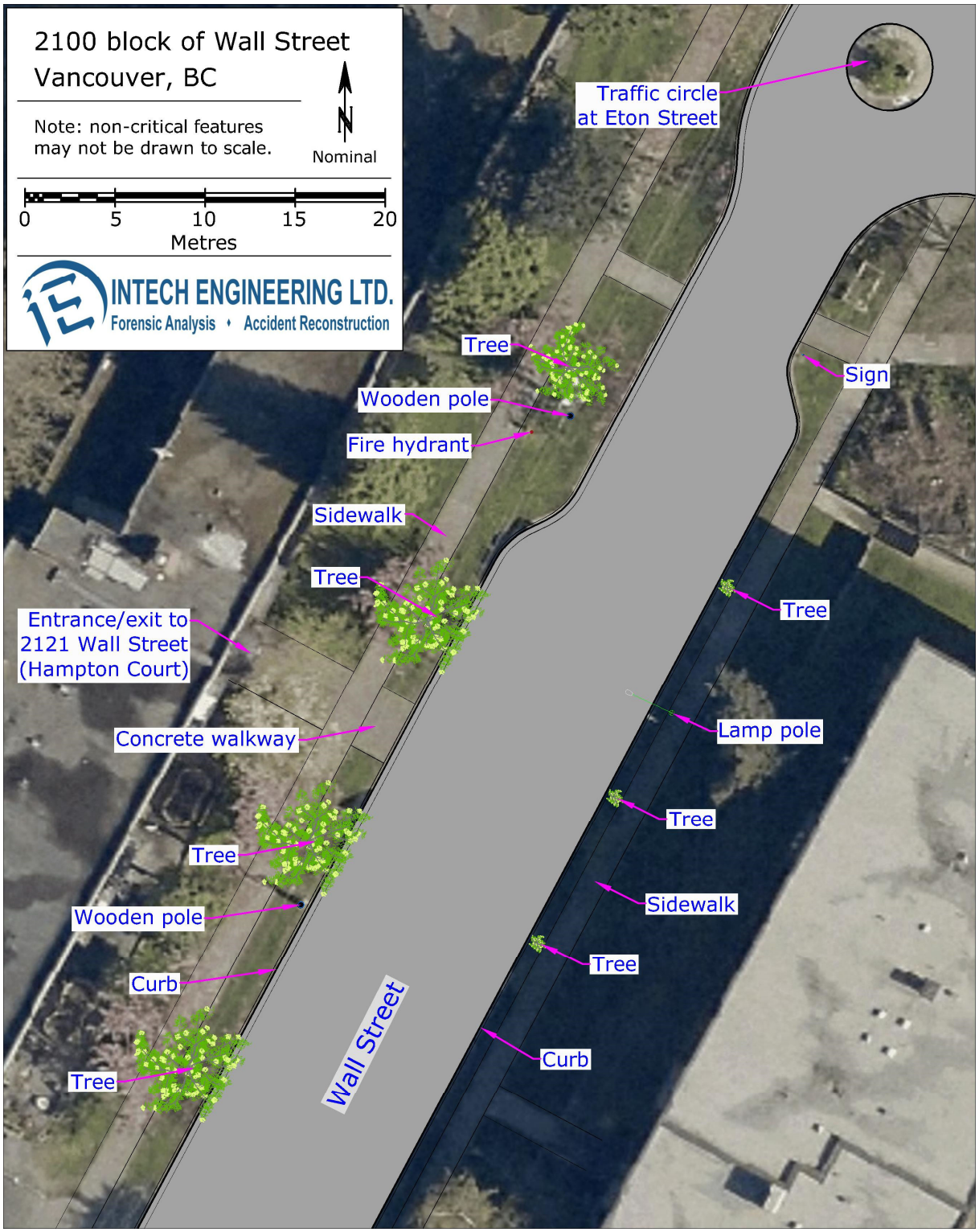


Figure 4: Incident scene geometry of 2100 block of Wall Street in Vancouver, BC.

5.3 Review of the Provided Police Data

The provided police data included photographs, notes and a sketch. The police data indicates that the incident occurred at approximately 7:30 p.m. on November 27th 2016. The police report further indicates that the road surface was wet asphalt and the posted speed limit was 30 km/h.

The police file described the following in the Occurrence Report:

- Upon arrival, PC 2877 RAJTSCHAN observed a male (who later identified as DEWAR, Garth) laying face down on the pavement, mid-block 2100 Wall St. Male was observed to be bleeding from the head. EHS was on scene and was attending to DEWAR.
- PC 2877 RAJTSCHAN then accompanied DEWAR to VGH, for medical treatment. DEWAR was observed to have a large laceration to his left forehead, facial bruising and facial abrasions. DEWAR complained of neck pain and an x-ray revealed a broken left fibula/tibia. DEWAR stated he exited his apartment at 2121 Wall St and crossed the road, as he was going to his vehicle. DEWAR saw a vehicle, but thought it saw him and would stop. DEWAR then recalled getting struck.
- On 2016-11-27 at approximately 2030 hours Cst 2524 THRING arrived on scene at the 2100 block of Wall St Vancouver, BC. Cst THRING observed the roadway blocked off by police vehicles on the south and north sides of the block with Vehicle #1 stopped facing south mid-block. Driver: FINNIGAN was no longer on scene and Pedestrian: DEWAR was on route to Vancouver General Hospital via BCAS. There was blood on the roadway at approximately 8-9 feet southeast from Vehicle #1. There was fresh damage to the front hood, windshield, and driver side mirror of Vehicle #1. There were no witnesses on scene and no roadway evidence present

The police scene photographs illustrate the Finnigan Mazda in its post-impact rest position, oriented in a predominantly southbound direction, but angled slightly to the south-east, and biased toward the northbound side of the road. To the south-east (forward and to the left) of the Finnigan Mazda rest position, is a region of red deposits, likely blood. The photographs also show parked cars along both the east and west-side curb edges of Wall Street. The left side mirror casing of the Finnigan Mazda is seen on the asphalt road surface, just forward and to the left of the Finnigan Mazda rest position. Also observed in the police scene photographs is a silver Ford Escape, parked along the east-side curb of Wall Street, to the south of the Finnigan Mazda rest position. Figure 5 illustrates eight of the police scene photographs.

As the police data did not include any scene measurements or scaled diagrams, the collision scene evidence was modelled based on the police photographs. Figure 6 provides a top view of the incident scene with the relative positions of the collision evidence and scene characteristics.

Figure 5: Police scene photographs.

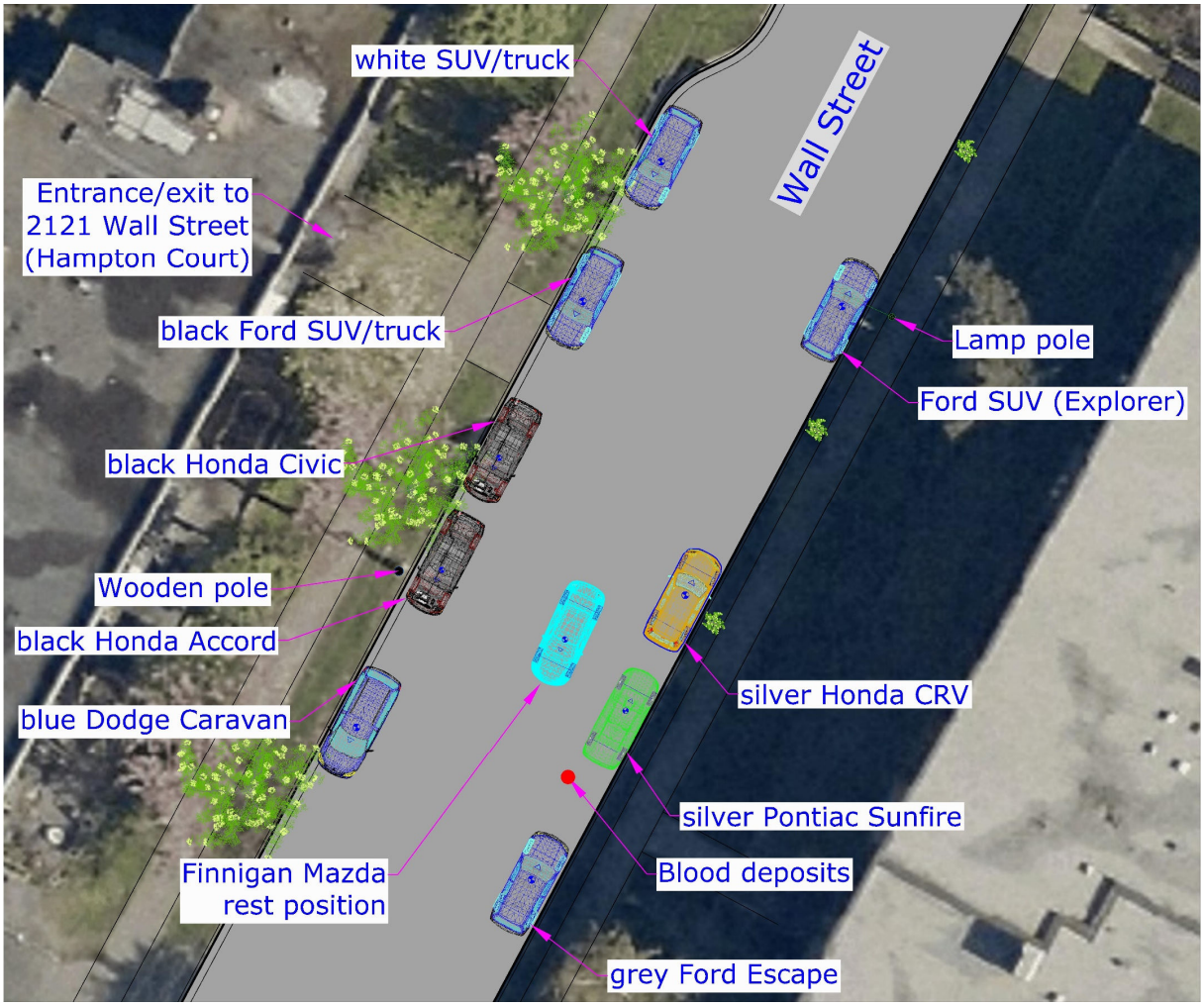


Figure 6: Incident scene as assessed from the police scene photographs.

5.4 Driver Perception Response Time

When confronted with hazardous objects or situations, a driver must first detect the object, identify it as a hazard, decide on an appropriate evasive action and then implement evasive action. This process of hazard identification and response has been the subject of several technical publications. The most cited publication is authored by Olson, et al [1]. Olson broke down the perception response process into four segments: detection, identification, decision and implementation. The first two steps are known collectively as perception and the last two steps are known collectively as response.

Research performed by Olson [2] evaluated that under normal daylight conditions, the 50th percentile non-alerted and alerted combined perception response time is about 1.1 seconds and about 0.7 seconds, respectively. Although the above values are based on technical research, it should be noted that the perception response time for a specific individual faced with a specific hazard situation cannot be technically determined.

Under less than ideal conditions, the perception time is prolonged. Night-time driving conditions present a less than ideal situation, as the human eye is not as sensitive to motion under low level lighting as it is under daylight conditions. Thus, a protracted perception response time of about 1.5 seconds would likely be more appropriate for a 50th percentile non-alerted operator in a night-time situation.

Atmospheric conditions, such as rain, can further influence the driver's perception response time. In order to maintain reasonable visibility, the wet windshield requires wiping. Even under the best of conditions, visibility is reduced when the windshield is wet. Other factors which may influence visibility are condition of the wipers, condition of the windshield, the speed of the vehicle and heaviness of the rain. Thus, to account for night-time and rainy conditions, a perception response time of about 2.0 seconds will be considered.

5.5 Roadway Coefficient of Friction and Deceleration

Based on the research published by Warner [3], the available wet road/tire coefficient of friction leads to an average emergency deceleration value of about 0.575g for vehicles travelling below 50 km/h and about 0.525g for vehicle speed greater than 50 km/h. In addition, there was a slight downward grade (about 1 to 2%) in the southbound direction. The downward grade would have effectively slightly decreased the available friction and the corresponding deceleration rate in the southbound direction.

In addition, the Finnigan Mazda was equipped with an anti-lock braking system (ABS). The primary function of ABS is to prevent wheels from fully locking and skidding during emergency braking. Typically, the static coefficient of friction (non-sliding) is higher than the kinetic coefficient of friction (skidding) between any two given materials. Thus, by preventing the brakes from fully locking the wheels, ABS improves the braking performance of a vehicle. Based on research [4] [5], vehicles equipped with anti-lock braking system (ABS) will generally decelerate at a rate about 13% greater than conventional braking systems with emergency brake application. Thus, the Finnigan Mazda would likely have been capable of decelerating at a rate of about 0.63g (range of about 0.49 to 0.77g) with emergency brake application.

6.0 ANALYSIS

6.1 Pedestrian Impact Dynamics

The pedestrian dynamics can be assessed by referencing the scene evidence and vehicle damage. In this collision, the impact dynamics can be generalized as a pedestrian impact with a “wrap projection trajectory” near the front center region of the Finnigan Mazda. This trajectory occurs when the center of mass of the pedestrian is above the upper edge of the impact area of the vehicle.

At initial contact, the pedestrian’s lower body would have been struck by the front bumper region. The pedestrian’s body then “wraps” around the vehicle profile while resulting in contact with the hood and the windshield. The impact forces delivered by the Finnigan Mazda to Mr. Dewar would have directed Mr. Dewar along the direction of travel of the Finnigan Mazda. For a short duration of time, Mr. Dewar would have interacted with the vehicle and would have been accelerated to a speed often referred to as the “pedestrian launch speed”.

In vehicle/pedestrian collisions, if the vehicle brakes are activated and the vehicle decelerates, then the pedestrian separates from the vehicle. If there is no effective braking, then the vehicle continues past the pedestrian after impact. The pedestrian launch speed is always less than the vehicle impact speed, especially if the vehicle brakes were not applied or if there was not full interaction between the pedestrian and vehicle such as during fender or roof vault scenarios. After the pedestrian and vehicle separate, the pedestrian is displaced toward the final rest position. The ratio of the pedestrian throw speed to the vehicle impact speed is termed the “projection efficiency”. The projection efficiency can vary depending on the pedestrian’s height and the height of the hood of the vehicle (i.e.: the vehicle geometry).

The pedestrian impact dynamics can be considered in three separate phases:

i.) Contact phase between the pedestrian and vehicle.
ii.) Launch phase when the pedestrian is airborne.
iii.) Ground contact phase when the pedestrian is sliding and/or tumbling.

Vehicle/pedestrian collisions have been the subject of several studies. The studies have taken both theoretical and empirical approaches in order to calculate the impact speed of the vehicles. In a 2003 study published by Toor and Araszewski [6], a comprehensive review of both methods was presented. When properly understood and knowledgeably applied, both approaches can yield a reliable estimate of the vehicle speed from a known pedestrian throw distance. As with any technical analysis, there are boundaries and limitations which must be observed when employing any particular methodology.

The Toor and Araszewski methodology has been validated by other independent researchers [7,8,9,10]. The vehicle speed can also be calculated if the braking distance and the deceleration rate are known. Typically, the most accurate analysis techniques for vehicle/pedestrian collisions reference the braking/skidding distance of the vehicle and the pedestrian throw distance; however, as documented in the 2002 study by Toor [11], the vehicle damages can also be used to gauge the vehicle impact speed.

6.2 Point of Impact and Rest Positions

There is no physical evidence on the road surface or documented in the scene photographs to define the specific point of impact; however, the provided assumptions allow the pedestrian crossing path and the point of impact to be assessed. The damage to the Finnigan Mazda indicates that at impact, Mr. Dewar was near the center of the vehicle. The post-impact rest position of the Finnigan Mazda was biased to the northbound side of the road, with the Finnigan Mazda at a slight angle to the south-east at its rest position. Assumptions #4 (b), (d), and (e) indicate that Mr. Dewar was walking from his apartment building and crossing from west to east. Based on the available evidence and provided assumptions, the point of impact was assessed as shown in Figure 7. It was also assumed that Mr. Dewar came to rest near the blood deposits photographed by the police and described in the police file.

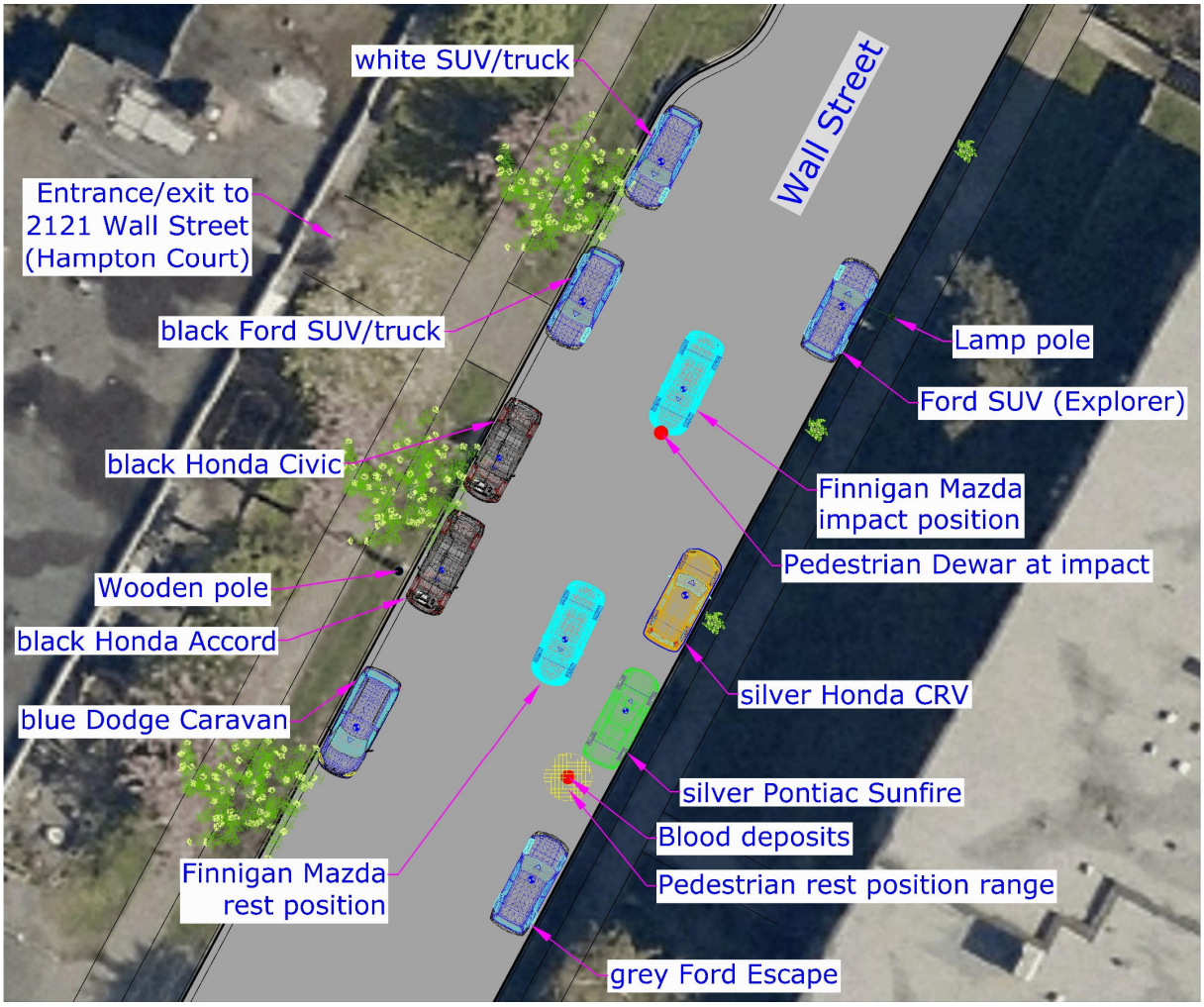


Figure 7: Assessed impact positions of the Finnigan Mazda and pedestrian.

6.3 Impact Speed of the Finnigan Mazda

The impact speed of the Finnigan Mazda can be calculated via analysis of the:

i.) Finnigan Mazda damages.
ii.) Pedestrian throw distance.
iii.) Finnigan Mazda travel from impact to rest by considering the distance travelled and deceleration rate.

6.3.1 Analysis of the Finnigan Mazda Damages

The Finnigan Mazda damages included bumper, grille, hood and windshield damages. The windshield damage was to the lower middle section of the front windshield. Referencing Expert Autostats [12], the front edge of the hood of the Finnigan Mazda was at an elevation of about 76 cm, while the top of the front bumper was at an elevation of 56 cm. Thus, the effective leading edge of the Finnigan Mazda was likely at an elevation of about 76 cm. Based on assumption #4, Mr. Dewar was about 1.78 meters (5'10") tall; this corresponds to his center of mass being at a height of about 100 cm [13]. Based on the data, Mr. Dewar's center of mass was about 44 cm above the front bumper elevation of the Finnigan Mazda.

The 2002 Toor study [11], provides an approximate guide to correlate the vehicle damage and the approximate range of impact speed. The damage sustained by the Finnigan Mazda correlates to a likely impact speed of about 40 to 50 km/h.

6.3.2 Analysis of the Pedestrian Throw Distance

From impact to rest, the pedestrian travelled a distance of about 15 meters (range of about 14 to 16 meters). The throw distance of the pedestrian is dependent on the vehicle impact speed and the interaction (projection efficiency) between the front of the vehicle and the pedestrian (i.e.: the height of the pedestrian's center of mass as compared to the leading edge height of the Finnigan Mazda).

Based on the pedestrian throw distance of 14 to 16 meters and a typical pedestrian "wrap projection" trajectory from Toor and Araszewski [6], the Finnigan Mazda impact speed with the pedestrian was calculated to be about 44 to 48 km/h.

6.3.3 Analysis of the Finnigan Mazda Post-Impact Travel

From impact to rest, the Finnigan Mazda travelled a distance of about 11.5 meters (range of 11 to 12 meters). With a constant average deceleration rate from impact to rest of 0.63g, yields that the impact speed of the Finnigan Mazda would have been about 42 to 44 km/h. For an impact speed of 44 to 48 km/h, yields that the Finnigan Mazda would have decelerated at a rate of about 0.63 to 0.68g. This calculated deceleration rate of the Finnigan Mazda is consistent with the assessed range of deceleration of the Finnigan Mazda based on the ABS and the slight downward grade near the incident scene.

6.3.4 Comparison of the Impact Speed Results

The analysis of the impact speed of the Finnigan Mazda using three separate techniques yielded consistent results, with the impact speed for the Finnigan Mazda calculated to be about 46 km/h.

6.4 Pre-Impact Speed and Positions of the Finnigan Mazda and Pedestrian Dewar

The analysis indicates that the Finnigan Mazda brakes were likely applied at impact; in addition, the Finnigan Mazda was likely biased toward the left (northbound) side of the road at impact. If the Finnigan Mazda was initially centered in the middle of the road (assumption #4a), then this indicates that the Finnigan Mazda likely applied some steer to the left prior to impact. If it is further assumed that the Finnigan Mazda steering and braking response was initiated simultaneously or nearly simultaneously, then the Finnigan Mazda brakes were likely applied prior to impact. The extent or length of pre-impact brake application by the Finnigan Mazda cannot be assessed from the available data; however, any pre-impact brake application would have increased the initial speed of the Finnigan Mazda. Thus, the approach speed of the Finnigan Mazda was likely greater than 46 km/h.

At impact, Mr. Dewar had crossed more than halfway across the road surface, corresponding to about 6.0 to 6.5 meters from the curb edge. For the first 1.6 to 2.0 meters from the curb edge, Mr. Dewar would have likely been between the parked cars. Mr. Dewar would have likely been unobstructed on the road surface for about 4 to 5 meters before impact.

As a reference to the crossing speeds [14], a typical crossing speed is about 5.8 km/h (range 5.4 to 6.1 km/h). Therefore, at typical walking speeds, Mr. Dewar would have likely been on the road surface and clear of the parked cars for about 2.8 seconds before impact (range of about 2.4 to 3.3 seconds).

Owing to the geometry of the traffic circle at Wall Street and Eton Street, it is likely that the Finnigan Mazda travelled through the traffic circle at a speed less than 46 km/h. Therefore, it is likely that the Finnigan Mazda accelerated after exiting the traffic circle and up to a speed of about 46 km/h or more. The speed of the Finnigan Mazda as it traversed the traffic circle and the acceleration phase is not known. However, it is likely that the speed at the traffic circle would have been lower than the calculated speed of 46 km/h and the speed at the end of the acceleration phase would have been higher than the calculated speed of 46 km/h. For the purposes of this report, an average speed of 46 km/h is likely to be a reasonable consideration.

At the average speed of 46 km/h, the Finnigan Mazda would have been about 36 meters north of the point of impact when Mr. Dewar cleared the parked cars adjacent to the curb. This would have positioned the Finnigan Mazda near the traffic circle at the intersection of Wall Street and Eton Street (with an average speed of 46 km/h considered). Assumption #4g indicates that Mr. Dewar observed the Finnigan Mazda, but thought it would let him cross. If Mr. Dewar observed the Finnigan Mazda as Mr. Dewar cleared the parked cars, then Mr. Dewar likely observed the Finnigan Mazda before or during its acceleration phase, i.e. when the Finnigan Mazda speed was likely less than 46 km/h. The approximate position of the Finnigan Mazda and the pedestrian Dewar as Mr. Dewar cleared the parked cars, is illustrated in Figure 8.

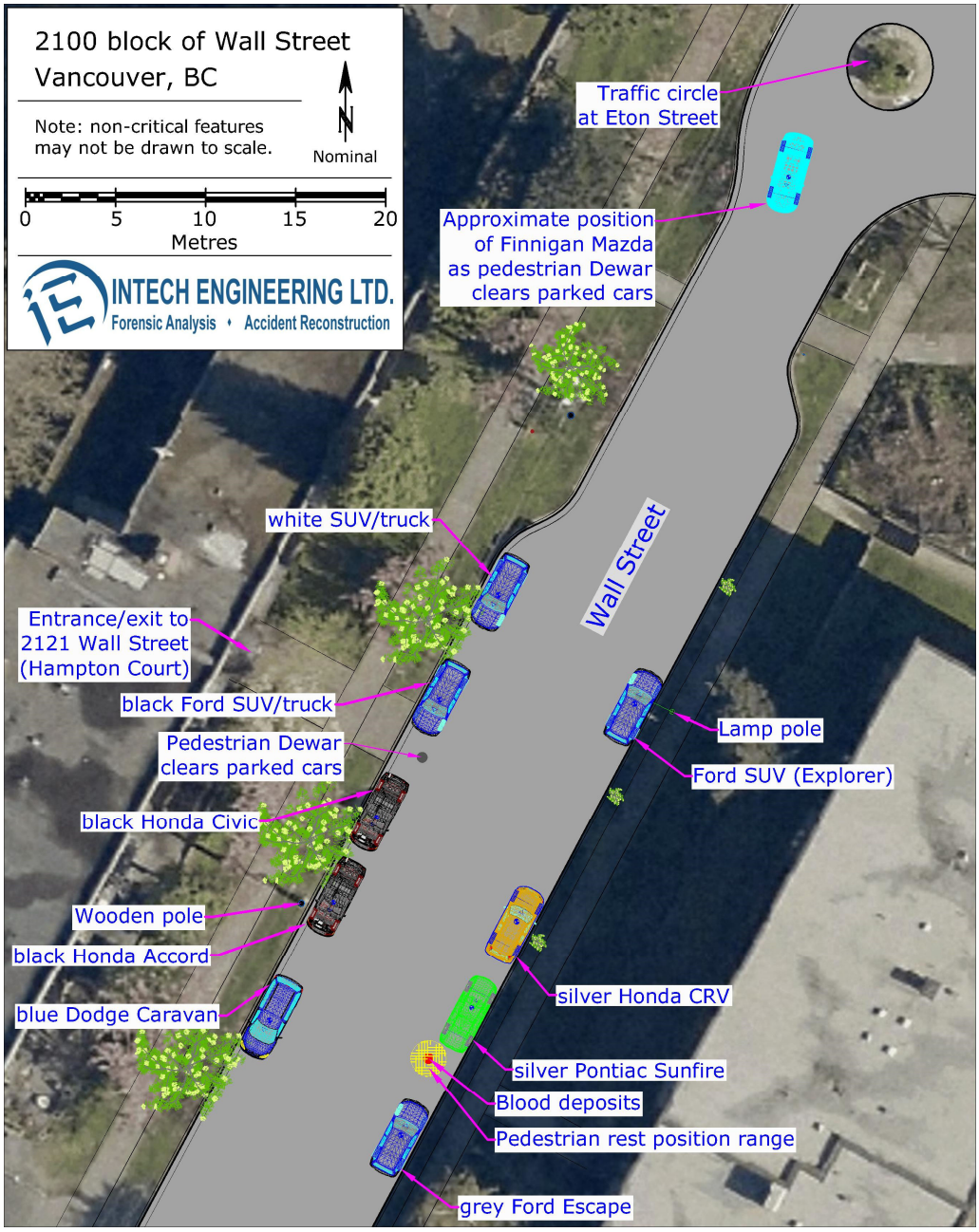


Figure 8: Assessed pre-impact positions of the Finnigan Mazda and pedestrian as the pedestrian cleared the parked cars.

6.5 The Opportunity for Ms. Finnigan to Avoid Impact

There are two general criteria which can be employed to assess a collision avoidance potential via the application of brakes. The first method is to stop before the point of impact, while the second is to delay the arrival at the point of impact to allow the hazard to pass in front without impact occurring. Details of this avoidance analysis methodology can be found in another study published by Toor and Araszewski [15] (Intech Engineering publication).

In order for Mr. Dewar to clear the path of the Finnigan Mazda, he would have needed to travel an additional distance of about 1.2 meters. At an average pedestrian crossing speed of 5.8 km/h, the additional distance to clear the path of the Finnigan Mazda would have taken an additional 0.8 seconds. Thus, if the Finnigan Mazda had delayed its arrival at the point of impact by a time of about 0.8 seconds, then the impact would have been avoided. Prior to impact, Mr. Dewar was on the road surface about 6.0 to 6.5 meters and travelled about 4.0 to 5.0 meters past the southbound parked vehicles. The later ("4.0 to 5.0" meters) location corresponds to a point when Mr. Dewar and Ms. Finnigan likely entered each other's unobstructed field of view.

At the walking speed of 5.8 km/h, Mr. Dewar would traverse the 6.0 to 6.5 meters in about 4 seconds and the 4.0 to 5.0 meters in about 2.8 seconds.

In order to avoid the collision, the Finnigan Mazda needed to delay its arrival at the point of impact by 0.8 seconds. Under identical circumstances, the impact likely would not have occurred if:

i.) The average speed of the Finnigan Mazda had been reduced to about 36 km/h or less while Mr. Dewar cleared the parked vehicles along the southbound curb (as Mr. Dewar and Ms. Finnigan likely entered each other's unobstructed field of view). The reduction in the speed would have adequately delayed the arrival of the Finnigan Mazda at the point of impact for Mr. Dewar to clear its path and the impact would have been avoided. In this scenario, no response by the operator of the Finnigan Mazda would have been required to avoid impact (i.e.: the operator of the Finnigan Mazda would not have needed to apply brakes to avoid impact if the speed was an average of 36 km/h or less).

Or

ii.) The Finnigan Mazda had been travelling at 44 km/h or less and Ms. Finnigan initiated detection and the perception response process when Mr. Dewar first cleared the parked vehicles along the southbound curb (as Mr. Dewar and Ms. Finnigan likely entered each other's unobstructed field of view) and then Ms. Finnigan applied the vehicle brakes, as occurred in this incident, then the impact likely would not have occurred. This slight reduction in speed, combined with earlier detection of Mr. Dewar and coupled with brake application, would have adequately delayed the arrival of the Finnigan Mazda at the point of impact for Mr. Dewar to clear its path and the impact would have been avoided.

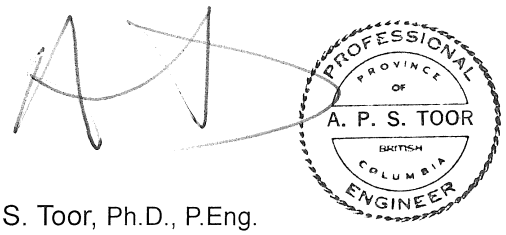
It is also noted that the collision took place at or near the road centerline. At that location, Mr. Dewar had already cleared the path of the southbound section of the road. If the Finnigan Mazda had travelled in the southbound section of the road, then it also would not have collided with Mr. Dewar.

7.0 CONCLUSIONS

1) The impact speed of the Finnigan Mazda was about 46 km/h.
   a) It is likely that at impact, the brakes of the Finnigan Mazda were engaged.
   b) Pre-impact braking would result in higher pre-braking speed of the Finnigan Mazda.
2) If the Finnigan Mazda delayed it arrival at the point of impact by about 0.8 seconds or more, then Mr. Dewar would have cleared its path. Under identical circumstances:
   a) If the average speed of the Finnigan Mazda had been 36 km/h or less, then its arrival at the point of impact would have been delayed by 0.8 seconds or more. The speed of 36 km/h requires no brake application from Ms. Finnigan.

b) With detection of Mr. Dewar as Mr. Dewar cleared the parked vehicles along the southbound curb and followed by the application of brakes, the Finnigan Mazda could have delayed its arrival at the point of impact and avoided impact from a speed of 44 km/h or less.

3) At impact, Mr. Dewar had already cleared the southbound section of the road. If the Finnigan Mazda had travelled in the southbound section of the road, then it also would not have collided with Mr. Dewar.



Amrit S. Toor, Ph.D., P.Eng.
July 28th 2020

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