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Your Ref: JLC/0219/2016.LLL  
Our Ref : CI1/LAW18000933/D

15 February 2018

**Fatal Road Traffic Accident On 07 June 2016 At About  
2107Hrs, Along Jurong West Avenue 1 Towards Jurong  
Town Hall Road, Near Lamppost 55, Involving A Motor  
Car SJD 5210M And A Female Pedestrian**

**Requested By  
Jay Law Corporation  
101 Upper Cross Street #04-17A  
People's Park Centre  
Singapore 058357**

## Introduction

1. I refer to your letter dated 02 May 2017.
2. By way of introduction, I set out below a brief description of my professional qualifications and professional work experiences.
3. I am a Senior Technical Investigator and certified Accident Reconstructionist with LKK Auto Consultants Pte Ltd. I have been carrying out assessments, valuations, inspections and technical investigations of motor vehicles involved in, among other things, accident since 2007. I have also carried out accident reconstruction basing on the laws of dynamics and physics by applying mathematical equations with technique competencies aligned with international standards, ensuring proper cause analysis. Some of my clients include the Singapore Police Force, NTUC Income Insurance Co-Operative Limited, AIG Asia Pacific Insurance Pte Ltd, AXA Insurance Singapore Pte Ltd, Cycle & Carriage Industries Pte Ltd and Performance Motors Limited amongst others. I also have experience in providing analysis and commentaries on damages and faults of motor vehicles.
4. I have given oral evidence as an expert witness in both the State Court and High Court, for both the prosecution and the defence for criminal proceedings and also for both the plaintiff and the defendant in civil proceedings. For instance, in MC Suit 17701/2010/Q, I acted as an expert witness in proceedings which involved among other things, a claim by an owner of a Mercedes sedan against the dealer for allegedly carrying out negligent works on the Mercedes sedan; in Suit 760/2011, I was asked by the dealer to provide my expert opinion on whether a brand new BMW sedan sold to a customer was defective. I have also been jointly appointed by both a car dealer and a car owner to provide my expert opinion as to whether the transmission of a brand new car was defective.
5. My testimony as an expert witness for accident reconstruction and speed analysis cases involving criminal proceedings for the prosecution include amongst others, MAC 2350-51/2011, an accident involving four motor cars and a motorcycle resulting in the death of the motorcyclist; DAC 039421-2011, a motor car and motorcycle accident resulting in the death of the motorcyclist; MAC 3935/12, a motor lorry and pedal bicycle accident resulting in the death of the cyclist.

6. Cases where I have been engaged by an accused person include amongst others, DAC 60889-90/10, a motorcycle and motor car accident resulting in the death of the pillion rider; DAC 049130-2013 & DAC 049131-2013, self-accident involving a SMRT bus resulting in the death of one of its passengers.
7. I have also carried out numerous line of sight simulation, in close replication of an accident scenario, to determine a driver's view and sighting capability.
8. I hold a certificate in Technical Accident Investigation and Reconstruction from the Society of Automotive Engineers Australasia and a National ITE Certificate (Intermediate) in Automotive Technology (Light Vehicle) from the Institute of Technical Education. I have also attended training and passed a practical examination on correct repair methods, safe and cost-effective assessment of damaged motor vehicles (Thatcham Escribe System).
9. I am an affiliate member of the Society of Automotive Engineers Australasia; an affiliate member of the Institute of Automotive Engineer Assessors (UK); an associate member with the Society of Operations Engineers (UK).
10. For this particular case, I was requested to comment and provide an expert opinion on the accident basing on my technical analysis of the documents that were made available to me.

#### **Documents**

11. The following documents, provided to me, were reviewed and considered in preparing this report:-
  - a) police report T/20160625/2077 lodged by the driver of the motor car SJD 5210M;
  - b) police sketch plan;
  - c) 19 coloured photographs of the accident scene taken by the police;
  - d) police first information report;
  - e) police charge to the driver of the Motor Car SJD 5210M dated 25 October 2016;



- f) survey report of the motor car SJD 5210M, including 53 coloured photographs showing the damage that it had sustained;
- g) traffic light sequence report of the junction where the accident had occurred, dated 22 November 2017 by M/s Eng Hup Engineering Pte Ltd;
- h) 06 additional coloured photographs taken at the accident scene.

### The Accident

- 12. On 07 June 2016 at about 2107hrs or thereabouts, Mr Liu Li Liu (herein referred to as "**Driver**") was driving the motor car SJD 5210M (herein referred to as "**Motor Car**") on the extreme right lane along Jurong West Avenue 1 towards the direction of Jurong Town Hall Road when the Motor Car collided into a female pedestrian (herein referred to as "**Deceased**"). The location of the accident was at the signalized cross junction of Jurong West Avenue 1 by Jurong West Street 41 by Jurong West Street 42 (herein referred to as "**Accident Junction**").
- 13. The police charge stated that the Driver had failed to conform to red light signal in his direction along Jurong West Avenue 1 towards Jurong East Avenue 1 and subsequently collided against the Deceased, who at the material time, was crossing along the pedestrian crossing at the Accident Junction on a "green man".
- 14. Given the contents of the charge, the investigation that was carried out by the police revealed that i) the colour of the traffic light signal facing the Motor Car was red at the material time; ii) the Deceased was crossing along the pedestrian crossing and; iii) the pedestrian signal was showing "green man" at the material time.

### Discussions, Comments & Opinions

#### A) Damages Sustained by the Motor Car

- 15. The damage to the front right portion of the Motor Car correspond to a typical motor car vs pedestrian collision where the pedestrian was struck below his/her centre of mass, resulting in the pedestrian being thrown onto the front bonnet and/or front windscreen of the Motor Car before falling/sliding onto the road surface and rolling/tumbling to his/her final rest position. See photo 1 & 2 below.



**Photo 1** shows a general view of the front body of the Motor Car. The damage to the front right body (circled) of the Motor Car was a result of its collision with the Deceased. Such damage profile is typical of a motor car vs pedestrian collision where the impact onto the pedestrian was below his/her centre of mass. In such type of collision, the pedestrian will be thrown onto the front bonnet and/or front windscreen of the motor car.



**Photo 2** shows the front body of the Motor Car. The damage to the front bumper (arrowed), front right headlamp and front bonnet (circled) were all caused by the Motor Car's collision with the Deceased.



16. Apart for the damage to the front right body, the front right wheel rim of the Motor Car was also broken. The front right tyre was deflated and loosely wrapped around the broken front right wheel rim. The rear right tyre was also deflated however it was still wrapped around the rear right wheel rim.
17. Further examination of the available photographs had showed the front right wheel rim was broken on the inner side width of the wheel rim. This indicates that the impact causing the wheel rim to be broken was from the underside of the Motor Car and not from the exterior side of the Motor Car.
18. These damages that were found in the right side of the Motor Car did not arise from the collision with the Deceased. The information and observations that could be gathered from the police accident scene photographs and police sketch plan seem to suggest that these damages were a result of the Motor Car mounting the centre divider kerb. See photo 3 - 5 below.



**Photo 3** shows the Motor Car at the accident scene. The front right wheel rim was broken while the front right tyre was deflated and loosely wrapped around the front right wheel rim. The exterior surfaces of the wheel rim did not appear to have sustained any significant damage except for some blackish grazed marks (arrowed) on its outer spokes.



**Photo 4** shows a closer view of the damaged front right wheel rim of the Motor Car. Upon closer examination of the photograph, it was observed that the front right wheel rim was broken on the inner side width of the wheel rim (arrowed). This indicates that the impact causing the wheel rim to be broken was from the underside of the Motor Car and not from the exterior side of the Motor Car.



**Photo 5** shows the slightly deflated rear right tyre of the Motor Car (arrowed). The damage to the front right wheel rim, deflation of the front right tyre and deflation of the rear right tyre did not arise from the collision with the Deceased.



## B) Point of Impact

19. The police sketch plan had recorded damage to the centre divider road kerb. Chipped mark, gouge mark and scratch mark were recorded and marked with placard 3, 5 and 6. Upon examination of the police scene photographs, I had observed scratch marks, gouge marks and tyre marks on the top surface area along the centre divider kerb, at the stretch just after the pedestrian crossing. The marks at placard 5 and 6, although not clearly depicted in the police scene photographs, appear to be fresh when compared against the relatively old and dirty stained top surface area of the centre divider kerb.
20. With regard to the chipped mark at placard 3, I was not able to conclusively ascertain whether this chipped mark was a fresh damage or old damage. The police accident scene photograph showing a close up view of this particular chip mark had showed the rounded end of the centre divider road kerb broken. The lack of powdery residue surrounding the chipped off areas and/or on the road surface suggest that the damage to this part of the road kerb may have been not related to this accident. It is therefore unlikely that the Motor Car had mounted the centre divider kerb at placard 3. See photo 6 – 10 below.



**Photo 6** shows a closer view of placard 3, identified by the police to be chipped and scratch mark. I was not able to conclusively ascertain whether the chipped mark was a fresh damage or old damage. The lack of powdery residue surrounding the chipped off areas and/or on the road surface suggest that the damage to this part of the road kerb may have been not related to this accident.





**Photo 7** shows the start of placard 5, identified by the police to be gouge mark. Although the gouge mark was not clearly depicted in the photograph, I was still able to observe marks (arrowed) that appeared to be fresh, on the top surface of the centre divider road kerb.

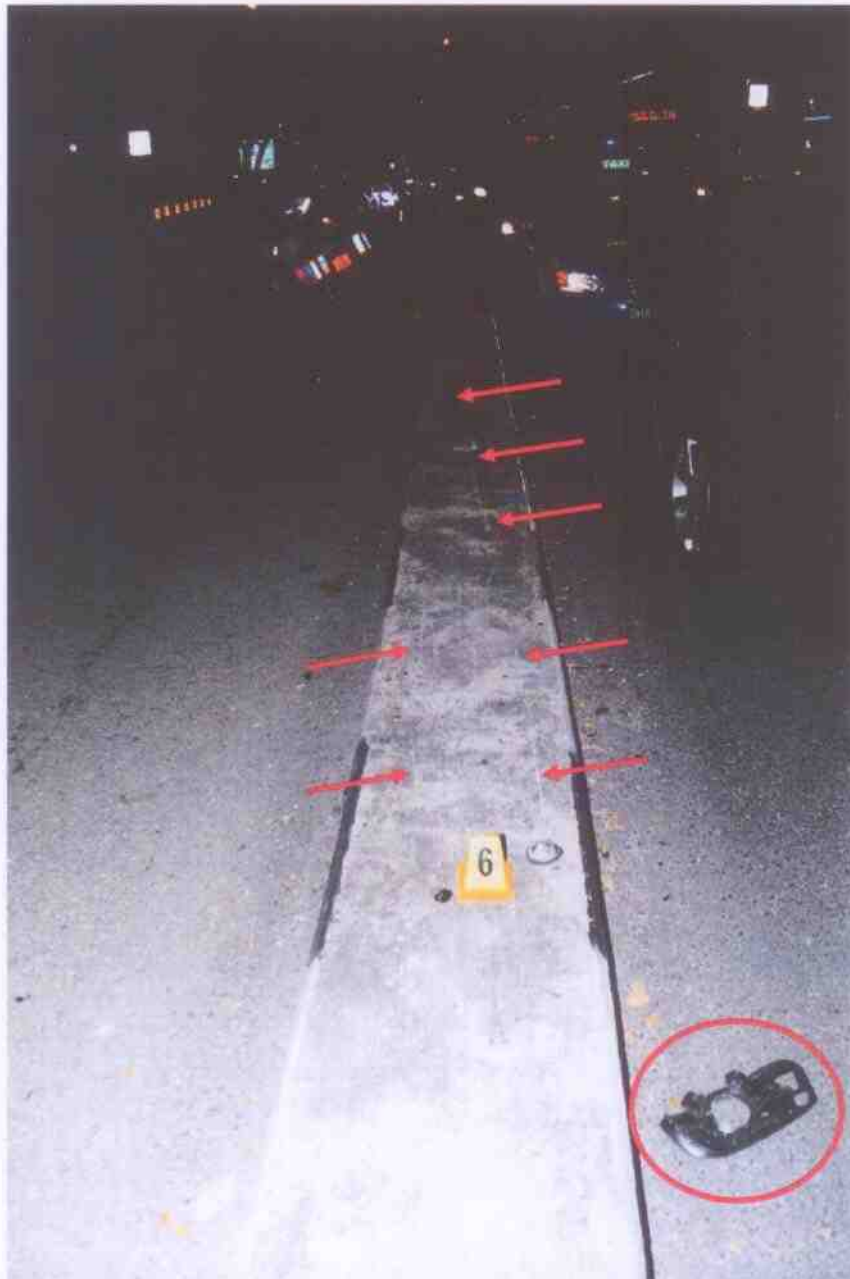


**Photo 8** shows the stretch of centre divider road kerb from placard 5 leading to placard 6. Although not recorded by the police, I had observed what appears to be tyre marks (arrowed) on the top surface area leading towards placard 6.





**Photo 9** shows the stretch of centre divider road kerb from placard 5 leading to placard 6. Although not recorded by the police, I had observed what appears to be tyre marks (arrowed) on the top surface area along another stretch of the centre divider road kerb leading towards placard 6.



**Photo 10** shows the stretch of centre divider road kerb from placard 6. The police had identified placard 6 to be scratch marks and debris. The dislodged front right fog lamp cover (circled) of the Motor Car can be seen lying on the road surface on the opposite side of the Motor Car's travel direction. Several scratch marks (arrowed) can also be seen on the top surface of the centre divider road kerb leading towards the roadway, to placard 7, which is recorded by the police to be tyre mark.



21. The damage at the front right wheel rim and deflation of the rear right tyre together with the various marks that were found on the top surface of the centre divider kerb indicates that the right side of the Motor Car had mounted the centre divider kerb. The point/location where the Motor Car had mounted the centre divider kerb does not appear to be at the rounded end of the centre divider road kerb that was marked as placard 3. It is more likely to be after placard 3, just before placard 5. The plastic bollard, marked as placard 4, could have then been possibly damaged by the Motor Car as it was mounting the centre divider kerb. See photo 11 below.



**Photo 11** shows a general view of the centre divider kerb just after the pedestrian crossing. The Motor Car was likely to have mounted the centre divider kerb after placard 3, just before placard 5 (circled). The plastic bollard (arrowed), marked with placard 4, would have been possibly damaged by the Motor Car as it was mounting the centre divider kerb.

22. The Driver had stated in his police report that the Deceased was standing on the centre divider kerb before she stepped down onto the roadway. During my conversation with the Driver when I visited the Accident Junction together with him on 23 August 2017, he had informed me that as far as he can recall, the Deceased was standing a distance away after the Accident Junction. This location was pointed out to me and it was noted to be at an area after the location where the Motor Car had mounted the centre divider road kerb. Police investigations had however revealed that the Deceased was crossing along the pedestrian crossing when she was struck by the Motor Car, as per the contents of the charge to the Driver.

23. Since the Motor Car had likely mounted the centre divider kerb at a location that was relatively close to the pedestrian crossing, the Deceased was then more likely to be crossing the pedestrian crossing rather than standing on the centre divider kerb a distance away from the Accident Junction, as recalled by the Driver. The location of the point of impact between the Motor Car and the Deceased was likely to be within the pedestrian crossing, on the right side of the extreme right lane of Jurong West Avenue 1. The event of the Motor Car mounting the centre divider kerb was a response to a situation encountered by the Driver. This situation was the Motor Car's collision with the Deceased. See photo 12 below.



**Photo 12** shows a general view of the accident scene. The location of the point of impact between the Motor Car and the Deceased was within the pedestrian crossing, on the right side of the extreme right lane of Jurong West Avenue 1 (circled). The Motor Car subsequently mounted the centre divider road kerb, at the approximate area indicated by the yellow arrow. It eventually dismounted the centre divider road kerb, coming to a complete rest on the extreme right lane, as seen in the police accident scene photographs.

### C) Speed of the Motor Car

24. The approximate speed of the Motor Car at the time when it had struck the Deceased can be determined by taking into consideration the throw distance of the Deceased upon the collision impact. This throw distance is the total horizontal distance from the point of impact between the Motor Car and the Deceased, to the final rest location of the Deceased.



25. The point of impact between the Motor Car and the Deceased, for this particular case, was likely to be within the pedestrian crossing while the final rest of the Deceased was at the location marked with placard A in the police accident scene photographs and similarly marked in the police sketch plan.
26. From the police sketch plan, the total throw distance of the Deceased can be established by measuring the distance between the first pedestrian crossing line to the location marked with placard A. By adding up the measured distance recorded in the police sketch plan, this distance was approximately 26.82m at maximum. A 0.22m was added to the measured distance in the police sketch plan as the distance between the second pedestrian crossing line and the start of the centre divider kerb was not indicated in the police sketch plan but was however measured by me during my visit to the Accident Location on 23 August 2017.
27. Basing on the relationship between pedestrian projection speed and motor car pre-impact speed, a throw distance of 26.82m produces a pedestrian projection speed of 56kmph to 67kmph. Therefore, the speed of the Motor Car at the time when it had struck the Deceased was approximately 56kmph to 67kmph. See calculations set out below.

By applying Searles Equation of Motion (Projection Velocity of Pedestrian),

Where:

$V_{\min}$  – Minimum vehicle velocity (Minimum vehicle speed)

$V_{\max}$  – Maximum vehicle velocity (Maximum vehicle speed)

$d_t$  – Total throw distance (26.82m)

$\mu$  – Co-efficient of friction of Pedestrian (recommended 0.66 for asphalt road on dry surface) ----- [1]

$g$  – Gravity (9.81m/s)

The minimum speed of the Motor Car at the point of impact with the Deceased was approximately: -

$$\text{Minimum Velocity, } V_{\min} = \sqrt{\frac{2\mu g d_t}{1 + \mu^2}} \text{ ----- [1]}$$

$$\sqrt{\frac{2 \times 0.66 \times 9.81 \times 26.82}{1 + (0.66 \times 0.66)}}$$

$$\sqrt{\frac{347.297}{1.435}}$$

$$\sqrt{242.018}$$

$$V_{\min} = 15.556 \text{ m/s}$$

$$\text{Speed} = 56 \text{ kmph } (15.556 \times 3.6)$$

The maximum speed of the Motor Car at the point of impact with the Deceased was approximately: -

$$\text{Maximum Velocity, } V_{\max} = \sqrt{2\mu g d_i} \text{ ---- [1]}$$

$$\sqrt{2 \times 0.66 \times 9.81 \times 26.82}$$

$$\sqrt{347.297}$$

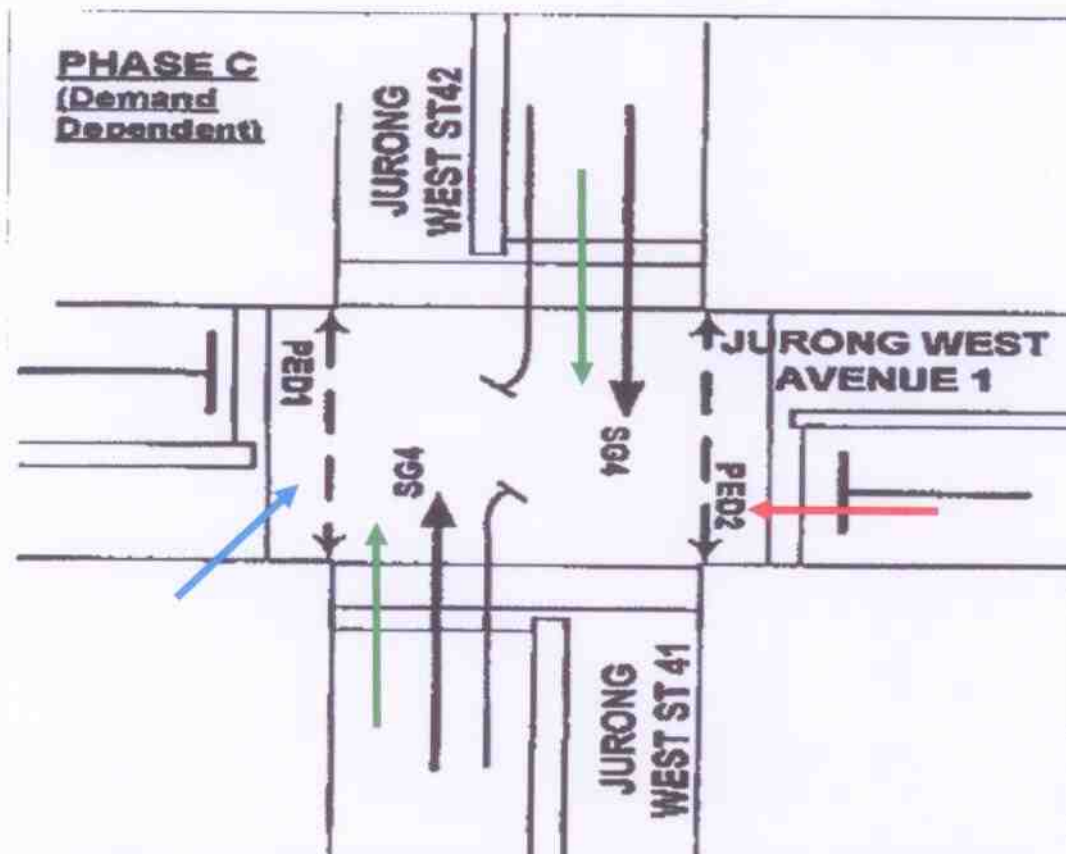
$$V_{\max} = 18.635 \text{ m/s}$$

$$\text{Speed} = 67 \text{ kmph } (18.635 \times 3.6)$$

#### D) Traffic Light Signal

28. The traffic light sequence report by M/s Eng Hup Engineering Pte Ltd had stated that there was no report of traffic light malfunctioning at the Accident Junction. The description of the traffic light sequence and their respective timings were also enclosed in the report. As per the police charge against the Driver, the traffic light signal facing him was red whilst at the same time, the signal for the pedestrian crossing facing the Deceased was "green man".

29. Following the traffic light sequence that was enclosed in the report by M/s Eng Hup Engineering Pte Ltd, in order for the condition of the traffic light in paragraph 28 to occur, the traffic light sequence at the Accident Junction would have to be at phase C. Illustration of phase C in the traffic light report is shown below.



Screenshot of phase C as gathered from the traffic light report. The direction of travel of the Motor Car is indicated by the red arrow while the pedestrian crossing that the Deceased was utilizing is indicated by the blue arrow. Phase C is when the traffic light facing the Driver was showing red while the pedestrian crossing facing the Deceased was showing "green man" signal. Traffic light signal along Jurong West Street 41 and Jurong West Street 42 would also be showing green during this phase (green arrow).

30. I note that the operational timings of the traffic light signal at the Accident Junction is dependent on the traffic volume condition while the pedestrian signal lights are demanded by push button. Regardless of the traffic volume at the material time of accident, the minimum operational timings that are reflected in the traffic light sequence report are executed.



31. The total minimum operational time between the traffic light signal facing the Driver turning red to the start of phase C is 6secs (if phase B was not executed) and 15secs if phase B was executed (this would be the minimum operational time for the entire phase B plus 1sec of all red period during phase A to phase B). In other words, if the Driver had failed to conform to red traffic light as per the police charge, the traffic light signal would have been showing red in his direction for at least 6secs to 15 secs before the 'green man' signal appeared for the pedestrian crossing that was utilized by the Deceased.
32. At the time of writing this report, the starting point of the Deceased was not made known to me. Whether she had started crossing the roadway at the beginning of the pedestrian crossing (from the right to left of the Driver's perspective) or whether she had started crossing the roadway from the centre divider kerb.
33. If the Deceased had started crossing the roadway at the beginning of the pedestrian crossing, she would have travelled a distance of approximately 9.83m to reach the extreme right lane of Jurong West Avenue 1 (travelling lane of the Motor Car). This 9.83m was gathered from measurements that I had obtained during my visit to the Accident Location on 23 August 2017.
34. Pedestrians walking tests carried out during research and studies to document walking speeds of pedestrians through a sampling size of 770 adults, 20 to 60 plus year old revealed that 85<sup>th</sup> percentile of 20 to 30 year old female is able to walk with a speed of 6.5fps (1.98m/s) ----- [3]. The Deceased would hence require approximately 4.9secs to walk to the point of impact. This is obtained by applying the mathematical formula with respect to the relationship between speed, distance and time, where time = distance divided by velocity (speed). See computation below.

$$t = \frac{9.83}{1.98}$$

$$t = 4.9\text{sec}$$

35. From the discussions in paragraph 30 to paragraph 34, since the pedestrian signal was showing 'green man' when the Deceased was crossing the roadway, the traffic light facing the Driver would have then been showing red for a minimum of 10.9secs (6secs plus 4.9secs) or a minimum of 19.9secs (15secs plus 4.9secs) when the Motor Car had struck the Deceased, if the Deceased had started crossing the roadway at the beginning of the pedestrian crossing.
36. Correlating the time for the Deceased to walk to the point of impact with the speed of the Motor Car (56kmph to 67kmph) that was computed earlier in paragraph 27, when the Deceased had first started crossing the roadway, the Motor Car would be approximately 76.22m to 91.31m away from the point of impact. Again, the mathematical formula with respect to the relationship between speed, distance and time was applied, where distance = velocity (speed) multiply by time. See computation below.

$$d = 15.556 \times 4.9 \text{ (for 56kmph)}$$

$$\text{distance} = 76.22\text{m}$$

$$d = 18.635 \times 4.9$$

$$\text{distance} = 91.31\text{m (for 67kmph)}$$

37. Comparing the approximate distance of 76.22m to 91.31m that the Motor Car would have been when the Deceased had first started crossing the roadway with the total distance that the Motor Car would require in order to come to a complete stop with a reasonable perception and reaction time -- -- [3] and [4], whilst travelling at a speed of 56kmph to 67kmph, it would appear that the Driver would have sufficient time and distance to bring the Motor Car to a complete stop after the traffic light signal at the Accident Junction had turned red in his direction. See computation below by applying equations of linear motion.

$$\text{Distance to stop (braking phase), } d = \frac{v_e^2 - v_i^2}{2a} \text{ ----- [1]}$$

Where:

$V_i$  – Vehicle velocity = 56kmph or 15.556m/s; 67kmph or 18.635m/s

$V_e$  – Vehicle end velocity = 0m/s

$a$  – Acceleration rate ( $a = gf$ ) where  $g = 9.81\text{m/s}$ ;  $f = 0.7$  (recommended 0.7 for asphalt road in dry weather condition) ----- **[2]** = -6.867 (negative as the motor car was decelerating).

$d$  – Distance travel in metres

$$d = \frac{0^2 - 15.556^2}{2 \times (-6.867)}$$

$$d = \frac{241.989}{13.734}$$

Distance to stop = 17.61m (braking phase)

$$d = \frac{0^2 - 18.635^2}{2 \times (-6.867)}$$

$$d = \frac{347.263}{13.734}$$

Distance to stop = 25.28m (braking phase)

Distance travelled during perception and reaction phase,  $d = t \times v$

Where:

$d$  – Distance that the Motor Car would have travelled in a given time

$t$  – The time = 1.5secs --- **[3]** and **[4]** (average driver's perception and reaction time)

$v$  – Vehicle velocity = 56kmph or 15.556m/s; 67kmph or 18.635m/s



The distance that the Motor Car would have travelled during the perception and response time was: -

$$d = 1.5 \times 15.556$$

$$d = 23.33\text{m}$$

Distance travelled = 23.33m (perception and reaction phase)

$$d = 1.5 \times 18.635$$

$$d = 27.95\text{m}$$

Distance travelled = 27.95m (perception and reaction phase)

38. The calculations set out in paragraph 37 suggest that if the Motor Car was travelling at 56kmph, it would require approximately 40.94m to come to a complete stop and If the Motor Car was travelling at 67kmph, it would require approximately 53.23m to come to a complete stop. The stopping distances of 40.94m to 53.23m includes a reasonable perception and reaction time for the Driver to perceive and thereafter react to a given situation.
39. Earlier it was discussed in paragraph 36 that the Motor Car would be approximately 76.22m to 91.31m away from the point of impact when the Deceased had first started crossing the roadway. This was also when the traffic light signal facing the Driver was showing red. The Driver would have been able to bring the Motor Car to a complete stop well before the Accident Junction.
40. The length of the Accident Junction as recorded in the police sketch plan was 17.3m. If the Motor Car was travelling at 56kmph, the Driver would have been able to stop the Motor Car approximately 17.98m (76.22m less 40.94m less 17.3m) before the Accident Junction with a reasonable perception and reaction time. If the Motor Car was travelling at 67kmph, the Driver would have been able to stop the Motor Car approximately 20.78m (91.31m less 53.23m less 17.3m) before the Accident Junction with a reasonable perception and reaction time.

41. The discussions and calculations in paragraph 27 to paragraph 40 show that when the traffic light signal facing the Driver turned red, he would have been able to reasonably bring the Motor Car to a complete stop before the Accident Junction. This was also taking into consideration that my observations during my visit to the Accident Junction revealed that there was no fixed object(s) and/or road feature(s) in the direction of travel of the Motor Car that could have prevented the Driver from having a clear line of sight of the Accident Junction and; for him to be able to see the colour of the traffic light signal that was showing in his direction at the material time.
42. Given that the accident had occurred late evening (2107hrs), within a residential estate with amenities like shops and eateries in close proximity, even if the Driver had somehow failed to notice the red traffic light signal facing him, the Motor Car would have needed to avoid vehicular traffic, that can reasonably be expected along Jurong West Street 41 and Jurong West Street 42, in a left to right direction and right to left direction, perpendicular to the Motor Car's travel direction, before it could reach the pedestrian crossing that the Deceased was crossing from. Refer to screenshot at paragraph 29 above.
43. Even if the Motor Car, travelling at a constant speed of approximately 56kmph to 67kmph, had entered the Accident Junction immediately after the traffic light signal facing him had turned red, the minimum all red period of 1sec during phase A would have allowed the Motor Car to completely travelled passed the Accident Junction before the traffic light sequence changes to phase B or phase C. Calculations show that the Motor Car would require 0.88secs to 0.73secs to travel passed the Accident Junction. This is obtained by applying the mathematical formula with respect to the relationship between speed, distance and time, where time = distance divided by velocity (speed). See computation below.

Where:

$d$  – Distance = 13.7m (length of Accident Junction recorded in the police sketch plan)

$v$  – Vehicle velocity = 56kmph or 15.556m/s; 67kmph or 18.635m/s

$$t = \frac{13.7}{15.558}$$

$$t = 0.88\text{sec}$$



$$t = \frac{13.7}{18.635}$$

$$t = 0.73\text{sec}$$

## Conclusion

44. Having reviewed the documents/information for this particular case, the following paragraphs sets out my opinions with respect to this accident.
45. The accident was a typical motor car vs pedestrian accident, where the front right body of the Motor Car had struck the Deceased.
46. The physical evidence found at the accident scene seems to suggest that the point of collision between the Motor Car and the Deceased was likely to be within the pedestrian crossing, on the right side of the extreme right lane of Jurong West Avenue 1.
47. The speed of the Motor Car at the point of impact with the Deceased was approximately 56kmph to 67kmph.
48. The contents of the police charge against the Driver, in particular the red traffic light signal facing the Motor Car's direction of travel and simultaneous "green man" for the pedestrian crossing that the Deceased was using, falls under phase C of the traffic light sequence at the Accident Junction. My calculations by applying mathematical formulae relating to accident reconstruction however does not seem to suggest that the traffic light sequence at the Accident Junction was at phase C at the material time of accident.
49. In other words, at the time of accident, it was unlikely for the traffic light signal facing the Driver to be showing red with "green man" simultaneously also showing at the pedestrian crossing that the Deceased was utilizing to cross the roadway.



**Ang Bryan Tani**

Senior Technical Investigator

Technical Investigation & Reconstructionist (SAE-A)

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**Reference:**

- [1] Technical Accident Investigation & Reconstruction Course, Society of Automotive Engineers, Australasia. Chapter 13, Pedestrians Impact on Motor Cars; Chapter 15 Dynamics; Equations in Relation to Linear Motion.
- [2] Technical Accident Investigation & Reconstruction Course, Society of Automotive Engineers, Australasia. Chapter 7, Friction Application in Accident Reconstruction.
- [3] Jerry J. Eubanks and Paul F. Hill, Pedestrian Accident Reconstruction and Litigation, Lawyers & Judges Publishing Co. Inc. Perception and Reaction, Pg 315; Adults Walking Speed, Page 86.
- [4] Paul L. Olson, Forensic Aspects of Driver Perception and Response, Lawyers & Judges Publishing Co. Inc. Chapter 9, Page 187 & 192