❑ EXPEDITE
■ Hearing is set:
Date: July 7, 2016
Time: 9:00 am
Judge/Calendar

IN THE SUPERIOR COURT
IN AND FOR

CHRISTIAN DOSCHER, an individual

Plaintiff,

vs.

RANSIT, a political subdivision of the State of

Defendant.

No. 16-2-01487-34

DECLARATION OF ERIC HUNTER IN RESPONSE TO PLAINTIFF'S MOTION FOR PARTIAL SUMMARY JUDGEMENT

I, Eric Hunter, declare as follows:

1. I am over the age of 21, am competent to testify to the facts and opinions stated herein, and make this declaration based on my personal knowledge, education, training, experience and expertise.

2. I am an expert in vehicle accident reconstruction. Attached hereto as Exhibit 1 is a true and correct copy of my Curriculum Vitae which sets forth my education, training and experience in the area of accident reconstruction. I have qualified as an expert in the area of accident reconstruction on a number of occasions in superior court in the State of

3. I was retained by the law firm o Bogdanovich, P.S., to analyze the incident at issue in this case and render expert opinions regarding the location and speed of the bus, operator reaction time, bus braking distance and forces generated as well as other pertinent opinions

pertaining to this incident and it's causes, including the allegations, assumptions and assertions set forth in plaintiff's complaint and motion for summary judgment. For purposes of preparing this declaration, I have reviewed the video of the incident recorded by the cameras and digital video recorder on the bus; I have visited the scene and made measurements pertinent to my evaluation; I have conducted field testing and measurements of the bus with respect to the braking forces generated upon the bus passengers at the time of the incident.

4. Attached as Exhibit 2 to this declaration is a true and correct copy of my report to Mr dated August 29, 2016 which sets forth my investigation, analysis and most of my opinions with respect to this matter. In addition to the opinions expressed in my report I have some additional opinions pertaining to the claims asserted by Mr. Doscher in his motion for summary judgment. These are set forth below.

5. The time it takes a driver to perceive a stimulus and react to that stimulus by braking is known as the perception reaction time. For example, it is the time it takes for a driver to see a stop sign, process the information in their brain that they need to stop, and initiate the physical response of putting their foot on the brake. It has been determined that human perception reaction time for a simple stimulus, such as a stop sign, can range from 1.0 to 1.5 seconds. My analysis disclosed the bus operator's perception reaction time was .53 seconds after the traffic signal changed from green to yellow. This is a quick reaction time which clearly establishes the operator was paying attention, observed and reacted promptly. Clearly she was not distracted or inattentive and there are no facts to suggest otherwise.

6. My analysis as set forth in my report disclosed the speed of the bus before braking was 32 to 33 miles per hour. The speed limit at the location was 35 mph. Based on the location of the bus at the time of the traffic signal turning yellow my

reconstruction further established the bus would not have cleared the intersection before the signal changed from yellow to red.

7. The bus at issue has the following dimensions. The overall length of the bus at issue in this matter is 36.4 feet from bumper to bumper, the Gross Volume Weight Ratio (GVRW) is 39,600 pounds. The bus is also equipped with an air brake system. The size, weight and air braking system are factors affecting the braking distance of the bus. These factors cause the bus to require a longer braking distance than a small passenger vehicle.

8. The air brake system on the bus has a lag of 0.25 to 0.5 seconds after the brake pedal is engaged before braking actually begins. The bus required 115 feet of braking distance. The bus decelerated at about 0.35 g's deceleration as a result of the braking employed by the operator. This is moderate braking, it is not severe.

9. I have used my education, training and experience to specifically and accurately measure and calculate the stopping distance of the bus at the time of this incident. This cannot be accurately calculated from the calculator at the website relied upon by Mr. Doscher. The website brake distance calculator cited by Mr. Doscher is not useful for the brake application by the bus driver on the date of the incident. His inputs are correct but the website calculations are assuming a hard brake application or scenario where tire marks are being left on the roadway from a hard brake application by a vehicle. The incident at issue was not a hard brake application by the bus driver, it was a moderate brake application. The website assumes that a tire - road coefficient of friction of 0.70, in other words a hard brake maneuver resulting in 0.70g's deceleration value. The tested and calculated moderate deceleration from the bus braking/slowing on the date of the incident was half this value at approximately 0.35g's. Plaintiff's conclusion regarding the stopping distance of the bus based on the website he cited is incorrect. Furthermore,

plaintiff's conclusion that the bus must have been traveling at 49 mph is also incorrect and based on faulty assumptions as discussed above. Mr. Doscher's speed and braking conclusions are not based or calculated on accepted scientific standards, methods, principles and methods applicable to this accident reconstruction analysis.

10. All of my analysis and opinions expressed herein and in my report are based on my expertise in the area of accident reconstruction and in accord with accepted scientific standards, methods, principles and practices in the field of physics and accident reconstruction.

I declare under penalty of perjury under the laws of the State of Washington that the foregoing is true and correct.

DATED this 16 day of June, 2017, at _

Eric Hunter

Investigative Training Service, LLC

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August 29, 2016

RE: Doscher v ransit

Dear Mr.

I have completed an analysis of the incident involving Christian Doscher occurring on February 8, 2016 in Mr. Doscher was a passenger on the Transit Bus number 940 during dry, daylight conditions. The incident occurred on south of the intersection with The documented speed limit of the roadway was 35 mph. My analysis is based on a consideration of the following information:

- Copy of th Transit onboard bus videos for the date of the incident.
- Scene inspection on July 2, 2016.
- Inspection and testing of the ansit Bus number 940 on July 25, 2016.
- Copy of the Providence nedical record for Christian Doscher dated March 9, 2016.
- Copy of the City of Tumwater traffic signal timing data and controls for the intersection of

- Use of the Interactive Driver Response Research by Crash Safety Solutions.

The incident with Mr. Doscher was captured on the Transit onboard bus videos. Christian Doscher was seated in a forward facing seat near the rear passenger's side door to the bus. There was a backpack occupying the seat next to him. The bus was traveling northbound on SW approaching the intersection with As the bus traveled northbound the traffic signal transitioned from green to yellow. In response to the light cycle change, the coach operator applied the brakes and brought the bus to a complete stop near the south side crosswalk for the intersection. During the braking, Christian Doscher came out of his seat and rolled down the length of the center of the bus, coming to rest near the bus driver at the front of the bus.

EXHIBIT 2

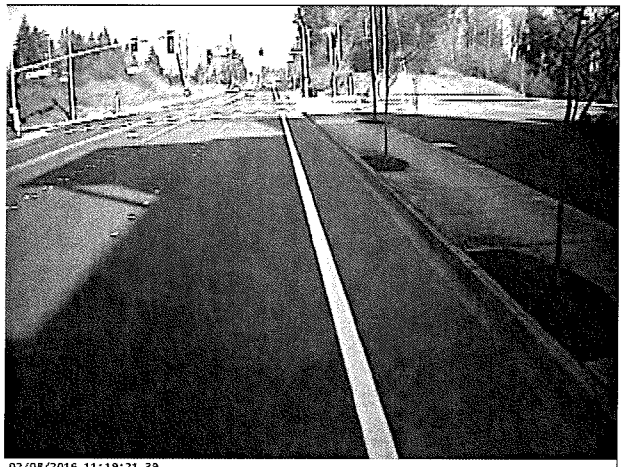
Analysis:

Investigative Training Service was asked to review and analyze the available data to determine the bus driver's reaction time, bus speed and distance from the intersection when the northbound traffic signal changed cycles from a green cycle to a yellow cycle. We were also asked to determine the deceleration forces during the braking maneuver in response to the changing traffic signal.

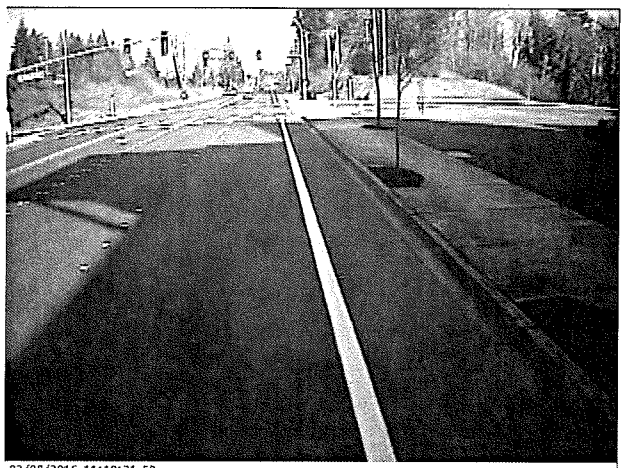
Th ransit onboard bus videos provided valuable information for the incident on February 8, 2016. Before the incident, the bus was traveling northbound in lane 1 (right lane) approaching the intersection. Christian Doscher was seated on the passenger's side of the bus on the inside forward facing seat located just in front of the rear bus door. There was a black backpack in the outside forward facing seat next to Mr. Doscher. Located just forward of this are three inward facing seats with an armrest just in front of Doscher's right knee.

There are nine cameras on the Bus capturing video at various increments. The camera system has an indicator tied directly to the braking system such that when a minimum of 4 psi of pressure is applied to the brake switch on the bus a "BRAKES" notice will be displayed in the event data for the recording system. This is essentially indicating when the bus driver applies the brakes to the vehicle. The "Road" camera was mounted at the front of the bus showing the view outside of the front windshield. Although pixilated, the northbound traffic signal can be seen changing from a green signal to yellow at time 11:19:21.50. The "BRAKES" notice first appears in the event data at the time of 11:19:22.03, essentially 0.53 seconds after the traffic signal has changed from a green signal to a yellow. This is a very fast response time by the bus driver as studies show that the average perception and reaction time for a driver to apply the brakes on a vehicle in response to a yellow traffic signal change is approximately 1.0 seconds.[1] In my opinion, the bus driver had a response time less than average and was able to apply the brakes quicker than most drivers faced with the same scenario. The images below show the traffic signal change. The length of the yellow traffic signal would match the traffic light timing of 3.5 seconds as the signal remains yellow until moving out of the camera view at the time 11:19:24.94.[2]

[1] Crash Safety Solutions IDRR yellow traffic signal response timing.
[2] Approximately 3.44 seconds after changing from green to yellow.



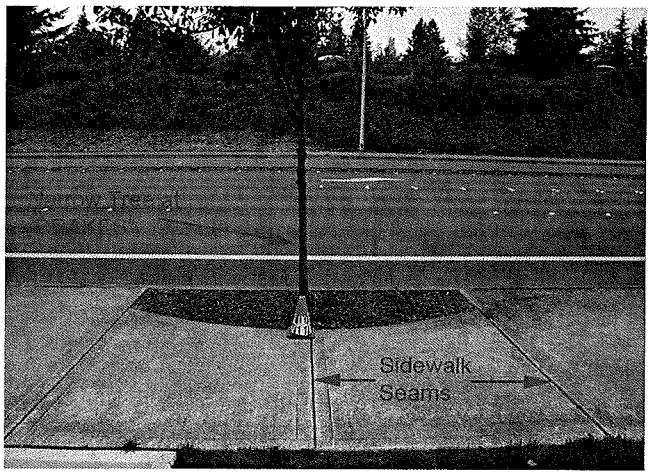
Green Traffic Signal



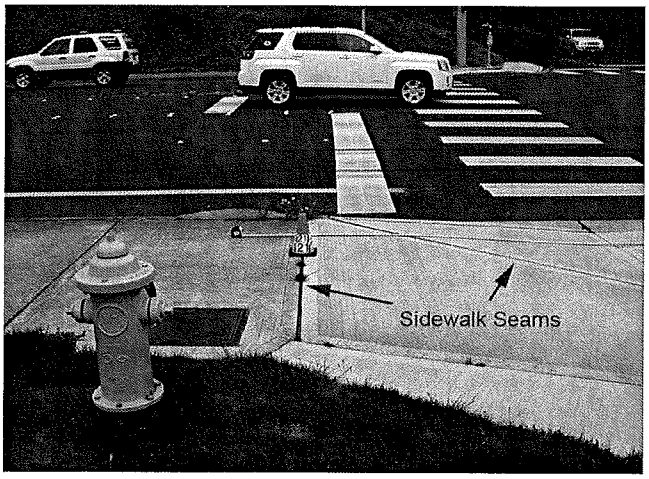
Yellow Traffic Signal

The initial travel speed and average deceleration of the Transit bus was calculated by inspecting and measuring the scene and the bus involved in the incident. The first step was to determine the brake lag for the air-brake system on the bus. Brake lag is an inherent property of the air-brake system common on buses and tractor-trailer combinations and is the time from when the brake pedal is depressed until the vehicles tires start braking. Typical brake lag on these type of heavy vehicles range from 0.25 to 0.5 seconds. Knowing that the bus driver had stepped on the brake pedal at the time of 11:19:22.03, the various cameras were reviewed in an attempt to observe the first point at which deceleration, or slowing, of the bus occurred. The best indicator of this was a seat belt mounted on the passenger's side of the bus on the paneling just forward of the rear door and next to Mr. Doscher. It is my understanding that this was a seat belt used for securing passengers operating a wheelchair. The "Rear Door" camera has a good perpendicular view of the long, vertical seat belt, and shows the start of the bus deceleration. As the bus decelerates, or slows, objects within the bus will move forward slightly due to their inertia. Although it is subtle, the seat belt can be seen starting to move slightly forward at the time of 11:19:22.29, approximately 0.26 seconds after the bus driver has applied the brakes. For purposes of my analysis I have used a 0.25 second brake lag for my calculations.

I next determined how far the bus traveled and how much time passed from when the "BRAKES" notice was first displayed until the bus stopped its forward movement. The best indicator of this was also the "Rear Door" camera. Due to the camera mounting location there is a horizontal hand bar that extends essentially perpendicular from the viewpoint of the camera to the passenger's side of the bus. This creates a good measuring line as the roadside objects and environment can be seen through the window below the horizontal hand rail. When the "BRAKES" notice is first displayed the horizontal hand rail appears to be in-line with either a narrow tree in the center of a shoulder planting section and/or a sidewalk seam that is at the same general location.



As can be seen in the photograph above, this location was marked with a cone for reference during the scene inspection. The forward movement of the bus stops at the time of 11:19:26.30. This same horizontal hand rail was used to determine the approximate stopped position of the bus.[3] The rail is almost in-line with a sidewalk seam just south of the crosswalk cut-out for the southern crosswalk at the intersection. This location was also marked with a cone for reference during the scene inspection. This distance between these two cones (representing the distance from when "BRAKES" were initially applied to the stopped position of the bus) was approximately 115 feet. The total time elapsed for this was 4.27 seconds.[4]

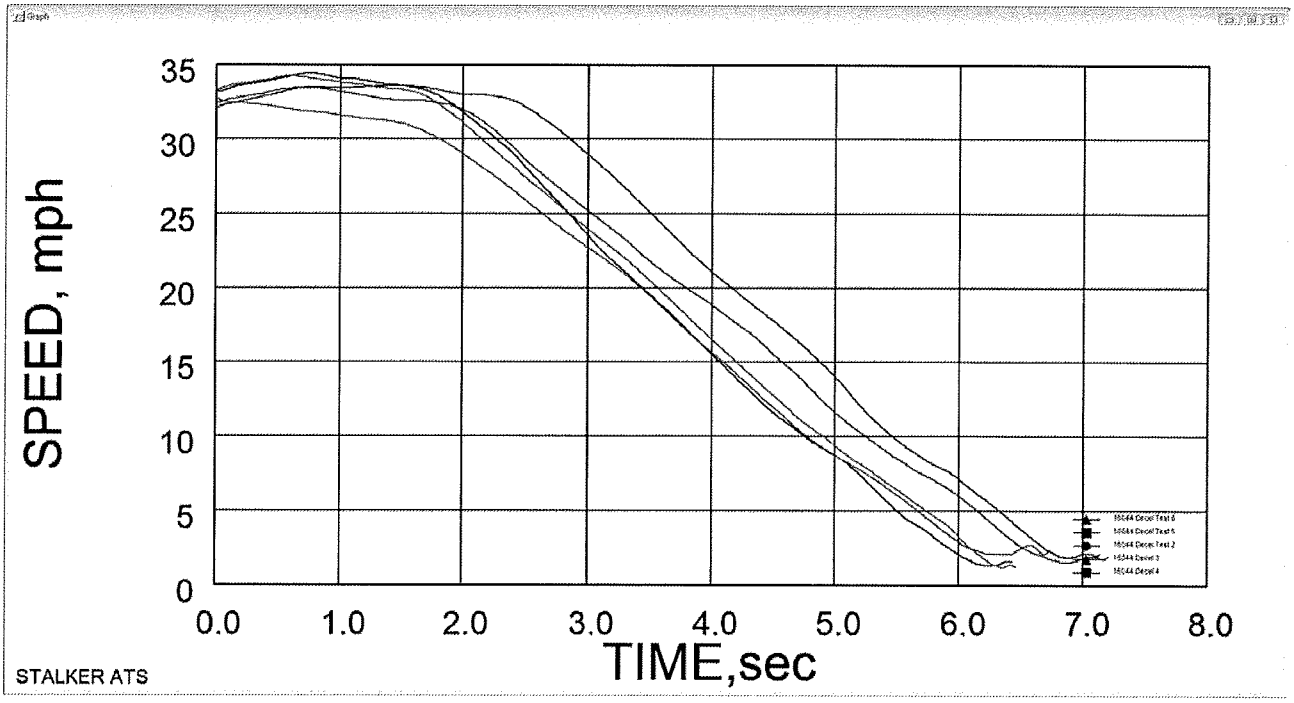


[3] At this time in the video the bus has stopped its forward movement but still "rocks" on its suspension for a short time after this.

[4] Difference in time from 11:19:22.03 to 11:19:26.30.

The total travel distance of 115 feet from when the driver first applied the brakes to the stopped position of the bus was used in conjunction with a brake lag time of 0.25 seconds and a total stopping time of 4.27 seconds to calculate the initial travel speed and average deceleration value of the bus. The initial travel speed of the bus was approximately 32 mph to 33 mph with an average deceleration rate of approximately 0.35 g's. The total distance the bus was from its stopped position near the south side crosswalk for the intersection when the traffic signal changed from green to yellow was approximately 140 feet.

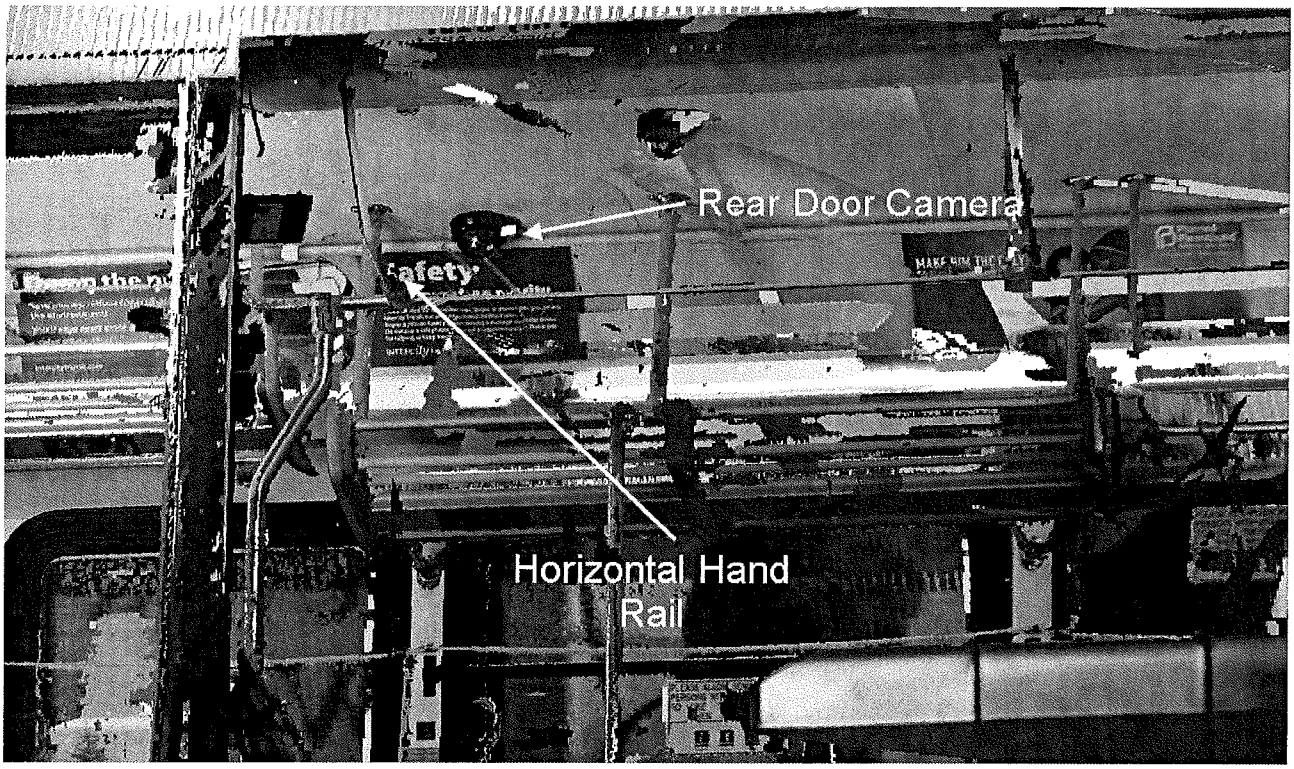
The Transit Bus number 940 was inspected and tested on July 25, 2016 at the transit facility. Brad Probst was present during the inspection and participated in the testing. The purpose of the testing was to measure the acceleration (or deceleration) values of the bus specific to the seat position that occupied by Christian Doscher. Cones were placed 115 feet apart on a straight level surface and a bus driver was instructed to accelerate up to approximately 32 – 33 mph and then apply a constant braking when the bus passes the first cone such that the bus comes to a stop at the same relative point at the second cone. Brab Probst was on the bus during the testing and using an accelerometer to measure the forces associated with the braking maneuver at the seat location of Christian Doscher. A Stalker radar gun was used to measure the speed and deceleration of the bus during the brake application.[5] The results of those tests can be seen in the graph below.



The average deceleration for the tests ranged from approximately 0.30 g's to 0.34 g's. The test labeled "Decel Test 6" was the most accurate to the braking conditions on the day of the incident with an average deceleration of approximately 0.34 g's.

[5] The Stalker radar gun was calibrated prior to any testing.

The Transit bus was scanned with a FARO laser scanner to measure the relative dimensions on the vehicle and determine the relative location of the "Rear Door" camera to the horizontal hand bar used for the camera and scene analysis. The camera location is almost directly perpendicular to the horizontal hand bar, validating that this camera view is a good resource to measure the roadside objects and place the bus location on the roadway at specific time intervals.



Conclusions & Opinions:

In my opinion, the Intercity bus was traveling below the posted 35 mph speed limit when the brakes were applied in reaction to the changing traffic signal. The average deceleration associated with the stop was approximately 0.35 g's, which is a typical slowing rate for the circumstances. The bus driver was able to perceive and react to the changing traffic signal in approximately 0.5 seconds. In my opinion, the Intercity bus driver had a response time less than average and was able to apply the brakes quicker than most drivers faced with the same scenario.

Should any further information become available please let me know.

Sincerely,

Eric Hunter, ITS