Rhode Island State Police

Collision Reconstruction Unit Report

Case Number: 20-298-CRU

Date: October 18th, 2020

Elmwood Avenue at Bissell Street

Providence, RI

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Collision Reconstruction Unit Case # 20-298-CRU

Date:	**October 18th, 2020**
Time:	**5:50 PM (approx.)**
Location:	**Elmwood Avenue at Bissell Street, Providence, Rhode Island**
Weather:	**Partly Cloudy, 55° and falling**
Involved Agencies:	**Providence Police Department, Providence Fire and Rescue Department, Rhode Island State Police**

Vehicle 1:	**1999 Black and White Yamaha Zuma 50 CC Scooter** **No Registration** **(Displayed VIN# VG54UYA06XA105925)** **(Matching Engine VIN #VG54UYA09XA105482)** **(Hereinafter referred to as the "Yamaha or Yamaha scooter")**
Owner:	**Jhamal E. Gonsalves, [redacted]**
Operator:	**Same**
Injuries:	**Non-Fatal**
Passenger:	**None**
Charges:	**Unknown**

Vehicle 2:	**2017 White Ford Explorer - Police Interceptor** **Rhode Island Police Registration 24** **(VIN# 1FM5K8AR9HGE13352)** **(Hereinafter referred to as the "Providence Police Cruiser or Cruiser")**
Owner:	**City of Providence - Providence Police Department**
Operator:	**Providence Police Officer Kyle Endres**
Injuries:	**None**
Passenger:	**None**
Charges:	**Unknown**

Tow Company:	**City Towing (Yamaha), State Towing (Ford)**
Vehicle Storage:	**Providence Police Department** **325 Washington Street** **Providence, Rhode Island**

Initial Synopsis / Preliminary Investigation

On Monday, October 19th, 2020, at approximately 4:50 PM, I was contacted by Rhode Island State Police Major D. Weaver. Major Weaver advised that the Providence Police Department and the Rhode Island Attorney General's Office had requested the assistance of the State Police Collision Reconstruction Unit to assist with determining whether a Providence Police Cruiser struck a Yamaha Zuma scooter that was involved in a crash at the intersection of Elmwood Avenue and Bissel Street on Sunday, October 18th. This crash occurred while members of the Providence Police Department were following a group of motorcycles, ATVs, and scooters south on Elmwood Avenue.

The initial investigation revealed that a Yamaha Zuma scooter was traveling south on Elmwood Avenue while being followed by Providence Police Cruiser # 24. As a second Providence Police Cruiser entered onto Elmwood Avenue from Bissell Street in front of the approaching scooter, the scooter made an abrupt right turn and traveled behind the second Providence Police Cruiser and onto the southwest sidewalk at the corner of Elmwood Avenue and Bissell Street. Providence Police Cruiser # 24 also made an abrupt right turn and turned onto the sidewalk behind the Yamaha scooter and struck a vertical stop sign post. The stop sign and its post were then projected downward and forward from its broken mount in the sidewalk. During this time, the Yamaha scooter struck the brick wall of the building located on the corner of Elmwood Avenue and Bissell Street. The Yamaha scooter and its operator then fell over onto the sidewalk and came to rest. Providence Police Cruiser # 24 came to rest on the sidewalk approximately six (6') feet after striking the stop sign. The operator of the Yamaha scooter sustained a significant head injury during this incident and was transported to Rhode Island Hospital.

A bystander was able to capture a portion of this incident with their cellular phone camera and a preliminary review of this video footage was inconclusive as to whether the front of Providence Police Cruiser # 24 struck the Yamaha scooter – precipitating the operator of the scooter to crash.

Major Weaver provided me the cellular telephone number for Providence Police Captain L. San Lucas as their point of contact.

At approximately 5:00 PM, I telephoned and spoke with Captain San Lucas and arrangements were made for me to respond to the Providence Police Headquarters Complex on Tuesday morning.

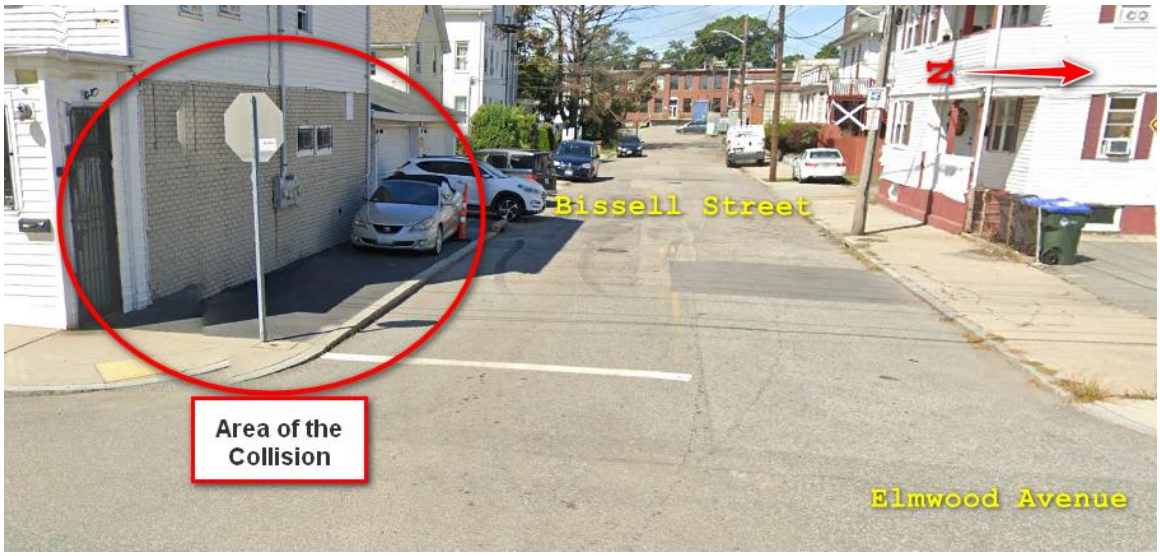
On Tuesday, October 20th, 2020, at approximately 9:20 AM, Rhode Island State Police Forensic Services Detective A. Cybowicz and I responded to Providence Police Headquarters and met with Providence Police Sergeant P. Mulholland and Officer J. Deschamps. Sergeant Mulholland escorted us into a locked vehicle garage bay that was accessed for us by Providence BCI Detective D. Moscarelli. Inside this garage bay was the Providence Police Cruiser, the Yamaha scooter, and a stop sign attached to its mounting post.

Detective Cybowicz and I were then given full access to both vehicles and the stop sign and we began to conduct our investigation.

Roadway Information

In the vicinity of the collision scene, Elmwood Avenue is a four-lane divided roadway with painted double yellow lines separating the two northbound lanes from the two southbound lanes of travel. There are painted white dashed lines separating each of the northbound lanes and each of the southbound lanes. The right shoulders of the roadway are painted with solid white lines separating the travel lanes from designating street parking along the raised curbing and sidewalks. There are breaks in the painted shoulders and the double yellow lines for access to the numerous intersecting side streets. Bissell Street runs in an east and west direction and intersects with Elmwood Avenue in the 1200 block. At the intersection with Bissell Street, there is a break in the double yellow lines and the solid white lines on Elmwood Avenue. For eastbound traffic on Bissell Street at the intersection with Elmwood Avenue, there is a visible stop sign affixed to a post and a white painted stop bar in the roadway. (Figures 1, 2 & 3)

(Google® Earth Pro Image from 2018)
Figure 1



(Google® Earth Pro Image from 2019)
Figure 2

(Google® Earth Pro Image from 2019)
Figure 3

The roadway surface in this area is comprised of bituminous asphalt and was in good condition at the time of the collision. There were no roadway defects or abnormalities identified or located at the scene. The raised curbing and sidewalk on the southwest corner of the intersection was sloped downward to just above the height of the ground plane. There was also a yellow tactile mat on the corner to assist the visually impaired with crossing the roadway. Both the sloped curbing and the tactile mat are part of the Title II requirements of the Americans with Disabilities Act relating to pedestrian crossings at intersections. There were areas of cracks and asphalt crack sealant throughout the roadway, however, they did not factor into this collision. The painted roadway markings delineating the lanes of travel and the shoulders of the roadway were all in good condition throughout this area.

At the time of the crash, the weather was mostly cloudy, and the roadway was dry. There was one area of standing water on Bissell Street, but it did not factor into this collision. The temperature was approximately 55 degrees and falling. The posted speed limit was 25 miles per hour for both north and southbound traffic on Elmwood Avenue.

Roadway Evidence / Scene Examination

Neither Detective Cybowicz nor I responded to the scene of the collision at the time of the crash. However, as part of our investigation, we were given access to the scene photographs taken by members of the Providence Police Department. During a review of the photographs, Officer J. Deschamps explained the significance of each photograph. The following scene analysis is based upon the photographs taken by members of the Providence Police Department in conjunction with our independent analysis and photographs.

Figures 4 and 5 below depict the location of the Providence Police Cruiser as it came to rest on the sidewalk of Bissell Street. To the left of the Providence Police Cruiser and to the right of the tactile mat was a tire scuff along the sidewalk.

Figure 4

Figure 5

Underneath the Providence Police Cruiser was an area of broken cement in the sidewalk that marked the location of the stop sign post. This stop sign post hole was located to the southwest of a previous stop sign post that had also been broken from its mount. The directionality of the broken cement to the southwest was consistent with the Providence Police Cruiser striking the post while traveling on a southwesterly trajectory. (Figure 6)

Figure 6

Along the cream-colored brick wall of the building located at 1245 Elmwood Avenue, there were several areas of contact transfer located. The first area located had several scrapes in the cream-colored paint and red paint transfer onto the bricks, just to the right of the downspout drainage pipe. This area was attributed to the side of the stop sign contacting the wall after being struck by the Providence Police Cruiser. The second area located was a larger and deeper gouge through the paint and into the brick material.

This area was attributed to the knob end of the left brake lever of the Yamaha scooter contacting the wall. The third area located was a black scrape along the third row of bricks up from the ground. This area was attributed to the rear foot peg along the left side of the scooter. The fourth and fifth areas located were black scuff marks along the bricks. These areas were attributed to the left side panels of the scooter contacting the wall. (Figure 7)

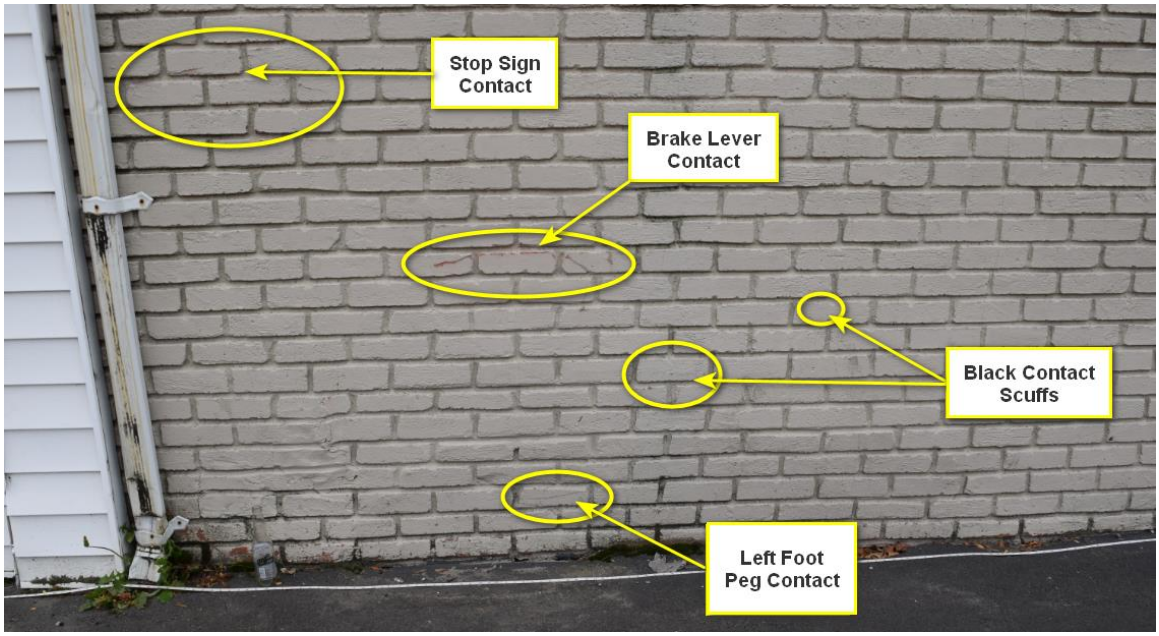


Figure 7

A closer examination of the first area of contact showed the outline of a portion of the octagonal side of the stop sign. This area started approximately four feet and five inches (4'5") above the ground and continued diagonally up to approximately four feet and eight inches (4'8") above the ground. From that point, the scrape was directed diagonally down to approximately four feet and five inches (4'5") before tapering off in a westerly direction. Within this scrape, a fragment of grey and white reflective material was located. This material was consistent with the reflective outer edge material of the

stop sign. An examination of the edges of the stop sign showed contact damage and transfer evidence consistent with striking this wall. (Figures 8 – 10)

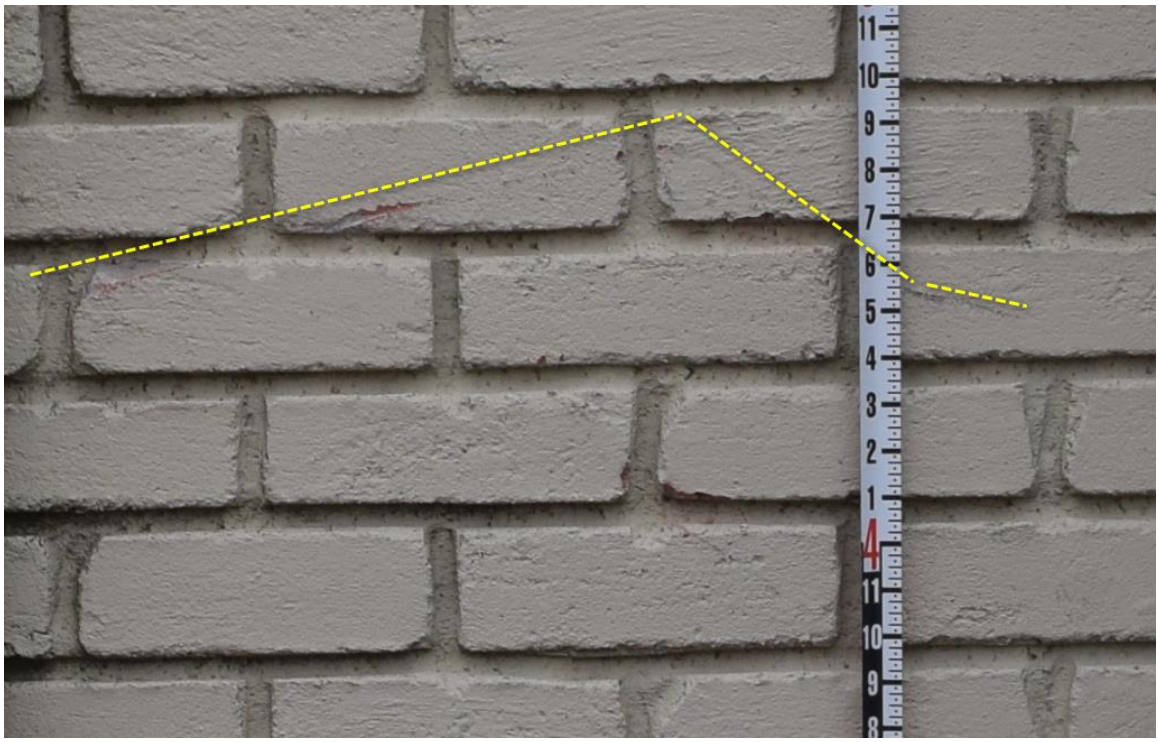


Figure 8

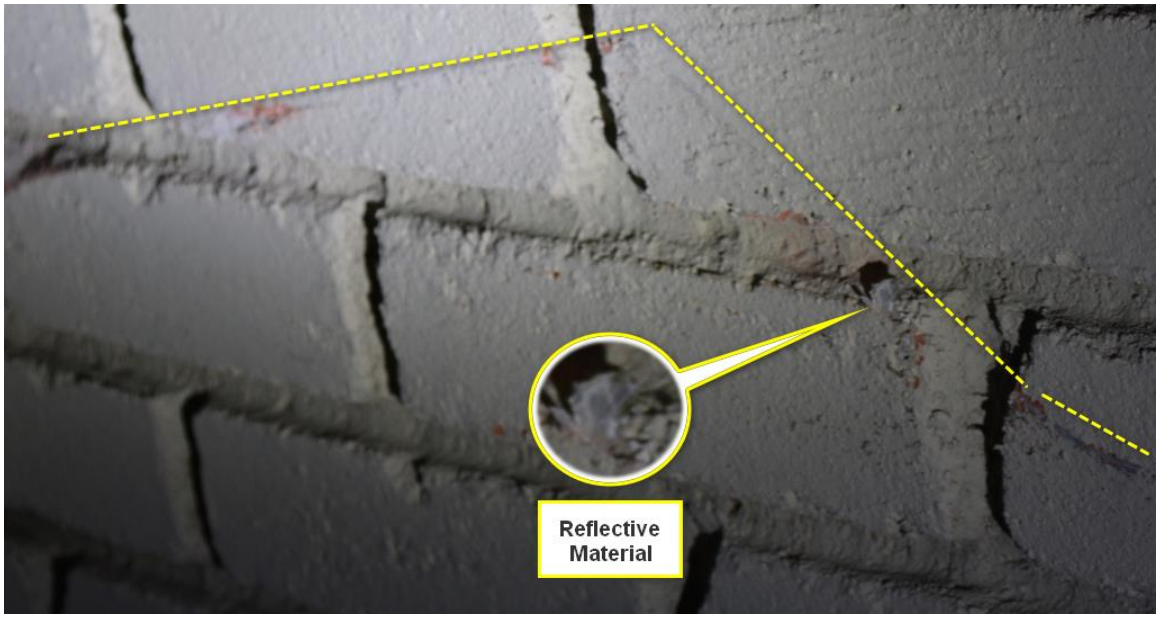


Figure 9

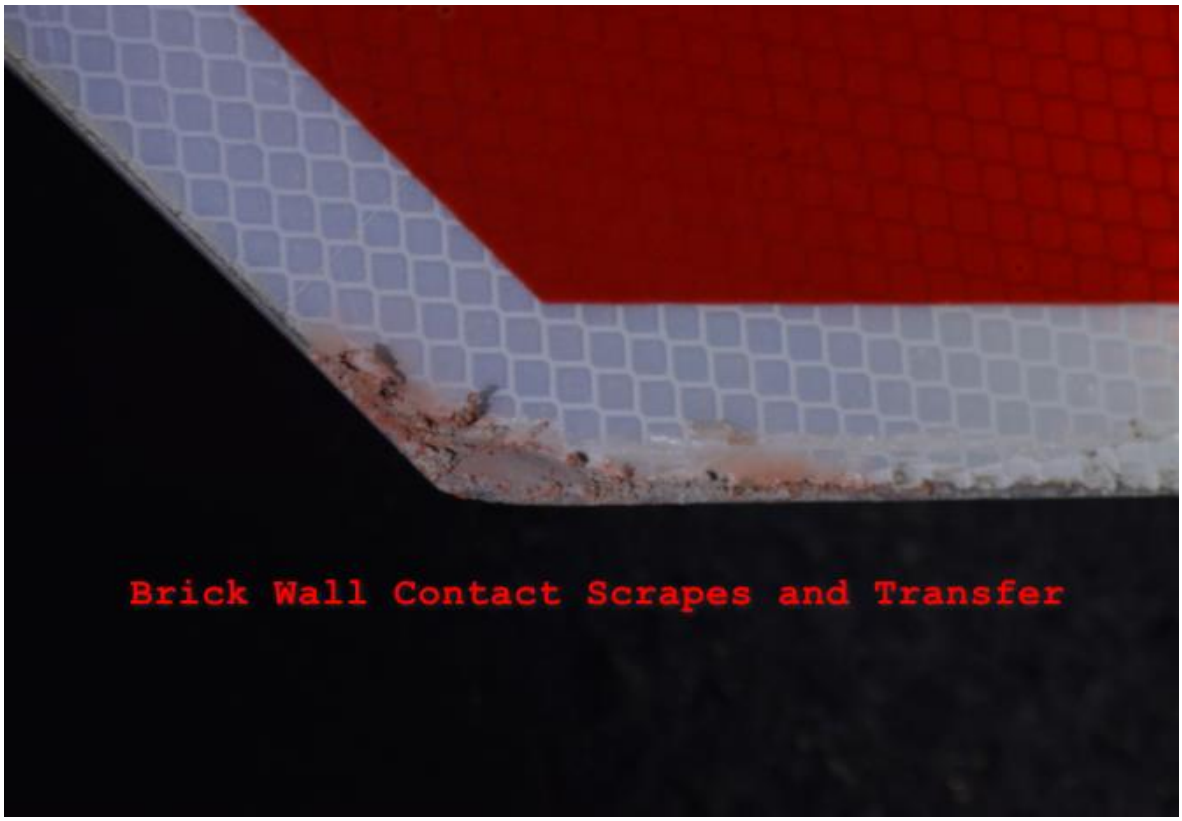


Figure 10

A closer examination of the second area of contact showed the distinct contact and damage pattern that was consistent with the knob end of the left brake lever of the scooter striking the wall. This contact area started approximately two feet and eleven- and one-half inches (2'11.5") above the ground, rising to approximately three feet and one inch (3'1") above the ground and continuing between the gap of two layers of bricks. An examination of the scooter showed that the left side of the handlebars were deflected rearward and downward. The knob end of the brake lever was scraped with course striations, consistent with contacting the brick wall. A measurement of the undamaged right side of the scooter showed that the right brake lever knob was approximately two feet and eleven- and three-quarter inches (2'11.75") above the ground. (Figures 11 – 13)

Figure 11

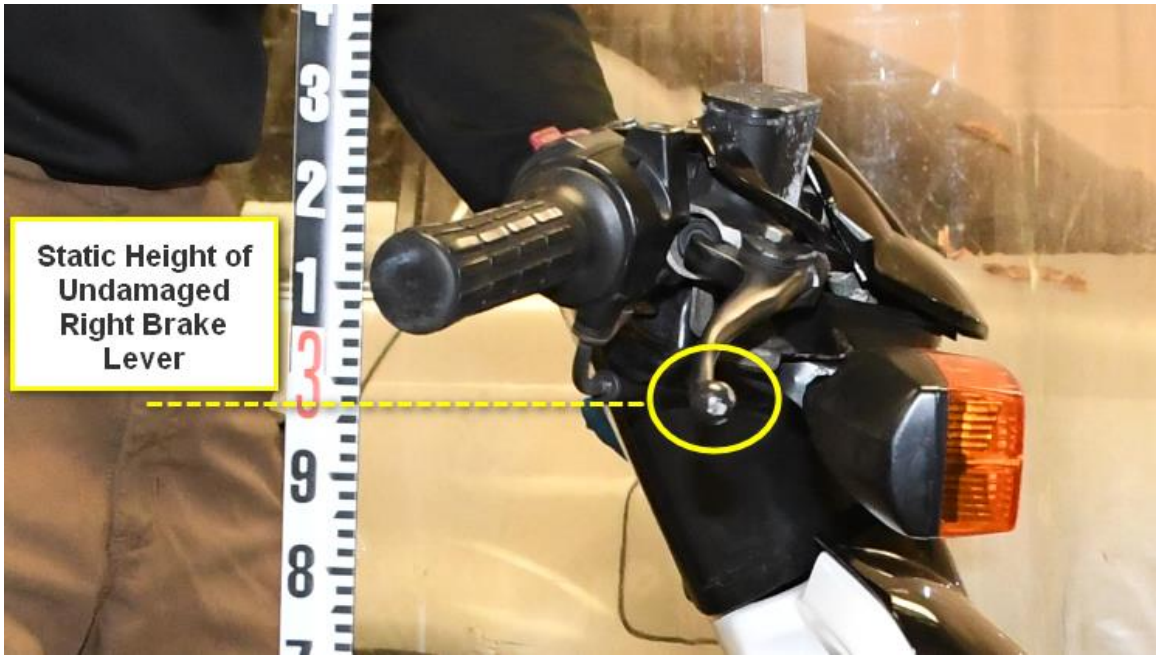


Figure 12

Figure 13

An examination of the third area of contact showed a black scuff mark on the white painted surface of the bricks that was consistent with the left foot peg of the scooter. This contact area started approximately eight inches (8”) above the ground and continued diagonally up to approximately nine and one-half inches (9.5”) above the ground. An examination of the scooter showed that the static height of the left foot peg was approximately nine inches (9”) above the ground. This foot peg also contained an area of white paint transfer along its outside edge that was consistent with the color of the painted brick wall. (Figures 14 & 15)

Figure 14

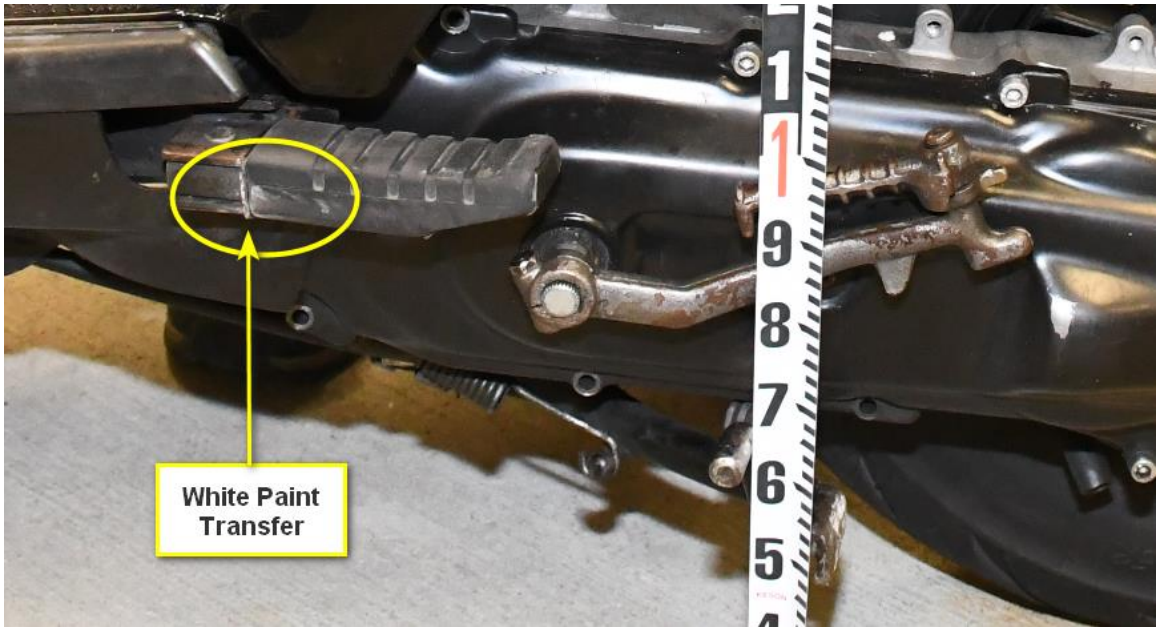


Figure 15

An examination of the fourth and fifth areas showed black scuff marks consistent with the plastic body panels of the scooter. The first mark was located approximately one foot and ten to eleven inches (1' 10"-11") above the ground. The second mark was located approximately two feet and five and one-half inches (2'5.5") above the ground and was shorter than the first scuff mark. (Figures 16 & 17) An examination of the left side panels of the scooter revealed numerous areas of scraping both in a horizontal and a vertical direction. Based on a review of the body camera footage, the scooter was also dragged on its left side after the collision before being stood upright and onto its kickstand.

The two areas of the scooter that were located that were consistent with these height profiles of the scrapes on the brick wall are depicted below in Figures 18 and 19. Whether the additional scrapes to the left panels of the scooter occurred during this crash event into the brick wall, or when the scooter fell over onto its left side onto the sidewalk, or whether they were from a previous incident(s), was undetermined by this investigation.

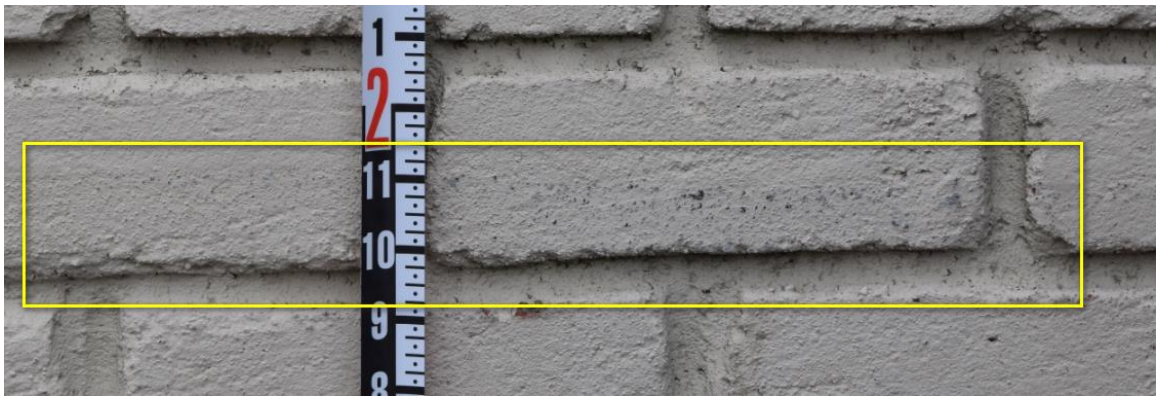


Figure 16

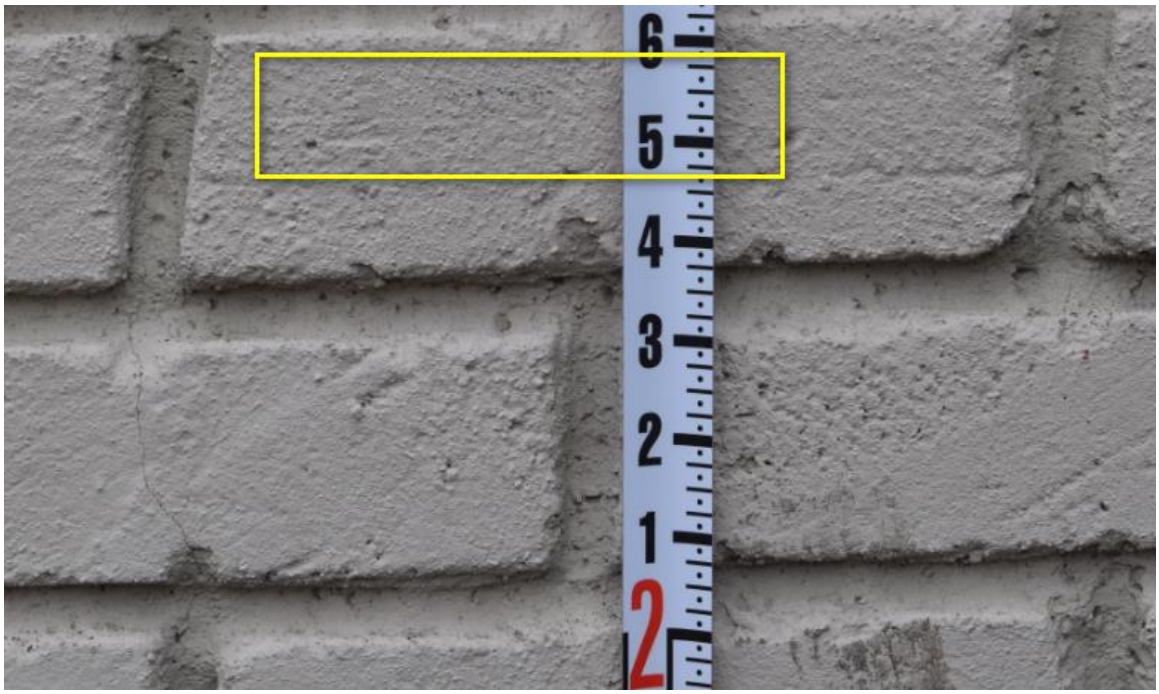


Figure 17

(This ruler scale is in decimals – 2.8 feet is equivalent to 2'10")

Figure 18

Figure 19

An examination of the sidewalk showed numerous gouges and scratches in the asphalt sidewalk that were consistent with the Yamaha scooter falling over onto its side while traveling in a westerly trajectory. (Figure 20)

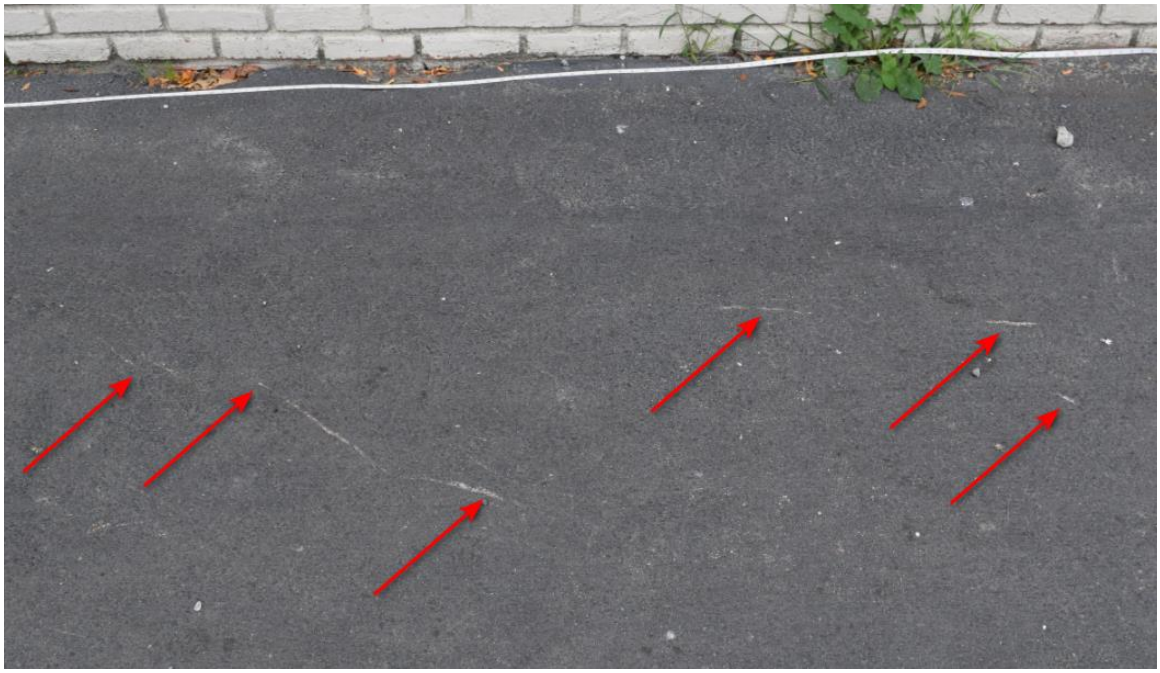


Figure 20

As the Providence Police Cruiser drove onto the sidewalk at the corner of Elmwood Avenue and Bissell Street, it struck a vertical stop sign and broke it from its mount in the sidewalk. The scene photographs show that the two inside cross rails of the front push bumper were deflected inward along the driver's side. This damage profile is consistent with the contour shape of the stop sign post. (Figures 21 & 22). Further analysis of this contact damage will be discussed in the **Vehicle Examination** section of this report. (Pages 41 – 42)

Figure 21

Figure 22

Figure 23 below shows the area of the collision facing east from the sidewalk on Bissell Street. From this photograph, the location of the Providence Police Cruiser at rest is depicted. The photograph also shows the location of the stop sign, the Yamaha scooter and a saliva pool on the sidewalk. However, based on a review of the body camera footage, it was determined that the stop sign and the Yamaha scooter had been moved by members of the Providence Police Department after coming to rest during the crash event. A screen shot of the body camera footage in Figure 24 depicts the actual final rest locations for the stop sign, the scooter and its operator.

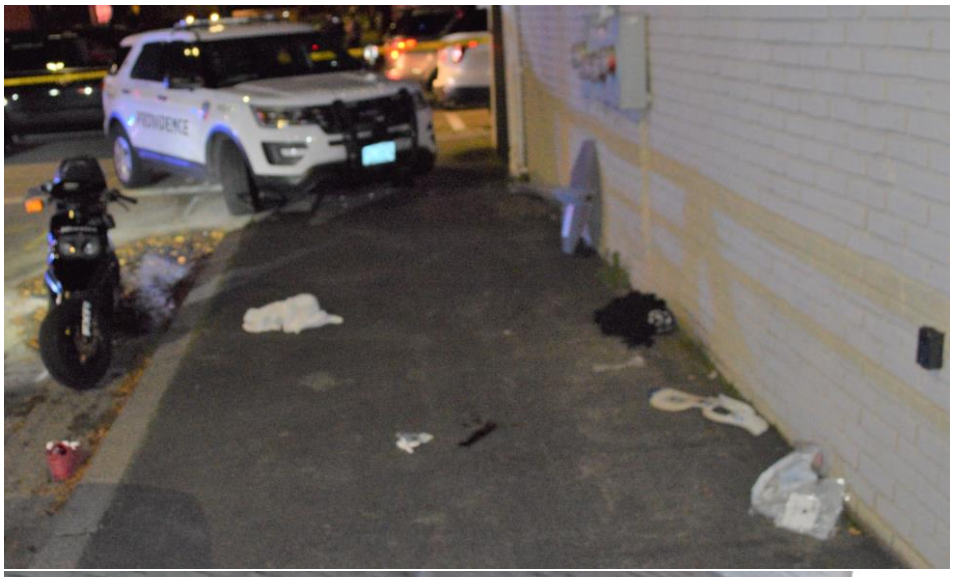
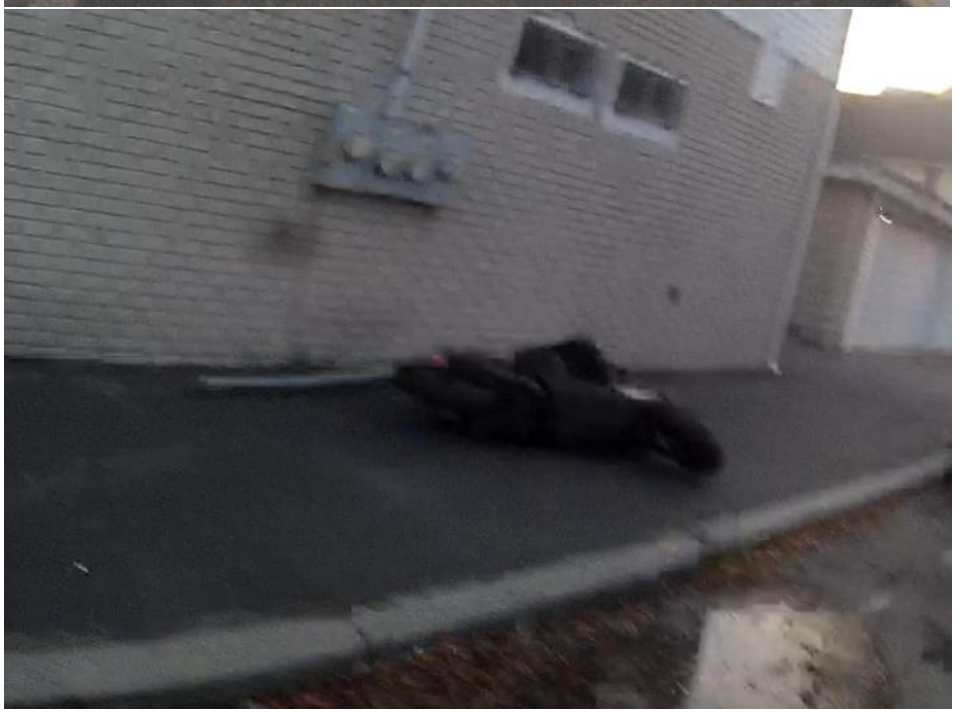


Figure 23



Axon Body Camera Footage from Officer Endres

Figure 24

Vehicle Examination

The Vehicle Examination section of this report will focus on the overall examination of the exteriors of both vehicles and any/all visible damage observed on each. Further in-depth analysis of the damage profiles will be discussed later in the **Forensic Examination** section (Pages 37 – 47) and the **Vehicle Alignment** section (Pages 53 – 58) of this report.

2017 Ford Explorer – Providence Police Cruiser # 24:

The examination of the Providence Police Cruiser took place in the vehicle garage bay in the basement of the Providence Police Department Headquarters Complex. Based upon the circumstances of this crash, we focused on the front of the vehicle along with both left and right front quarter panels.

An examination of the front of the vehicle showed visible contact damage and deformation to the upper and lower cross rails of the push bumper. (Figure 25)

Figure 25

An examination of the passenger side and driver's side quarter panels and wheels showed no evidence of contact damage. (Figures 26 & 27)

Figure 26

Figure 27

A closer examination of the front passenger side of the Ford showed one area of black scuffing contact transfer just below the headlight assembly. (Figure 28)

Figure 28

A closer examination of the rubber housing around the vertical structure of the push bumper on the passenger side of the vehicle showed an area of a whitish scuffing and paint transfer. There were also numerous areas of superficial scratches and scuffs and additional white paint splatter. (Figure 29)

Figure 29

An examination of the external siren mounted to the upper cross rail of the push bumper showed no evidence of contact damage. (Figure 30)

Figure 30

An examination of the upper and lower inner cross rails of the push bumper to the driver's side of the siren, showed the area of visible contact damage and deformation. The contoured profile of this area of damage was attributed to it striking the vertical stop sign post. (Figure 31)

Figure 31

A closer examination of the rubber housing around the vertical structure of the push bumper on the driver's side of the vehicle showed an area of scuffing with a whitish area of paint transfer. There was a diagonal impression scuff above this area and numerous superficial scratches and scuffs and additional white paint splatter below. (Figure 32)

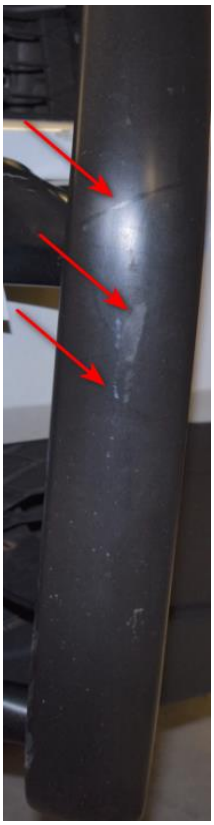


Figure 32

Behind the push bumper assembly were three areas of visible contact transfer onto the front bumper cover of the Providence Police Cruiser. These three areas of transfer were consistent with the push bumper being deflected rearward during its collision with the stop sign post and making contact with the plastic bumper cover. (Figures 33 & 34)

Figure 33

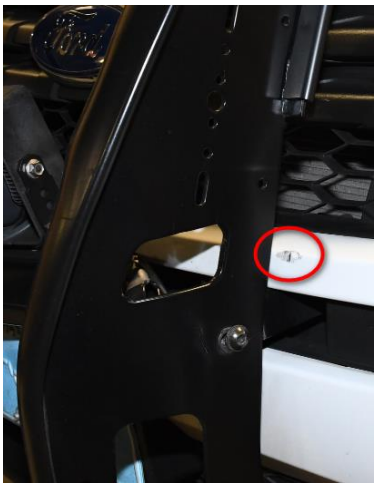


Figure 34

A closer examination of the front driver's side of the Ford showed two areas of contact transfer. The first area was above the contoured horizontal facia of the bumper cover, just below the headlight assembly. The second area was lower, along the edge of a molded and recessed decorative black panel. (Figure 35)

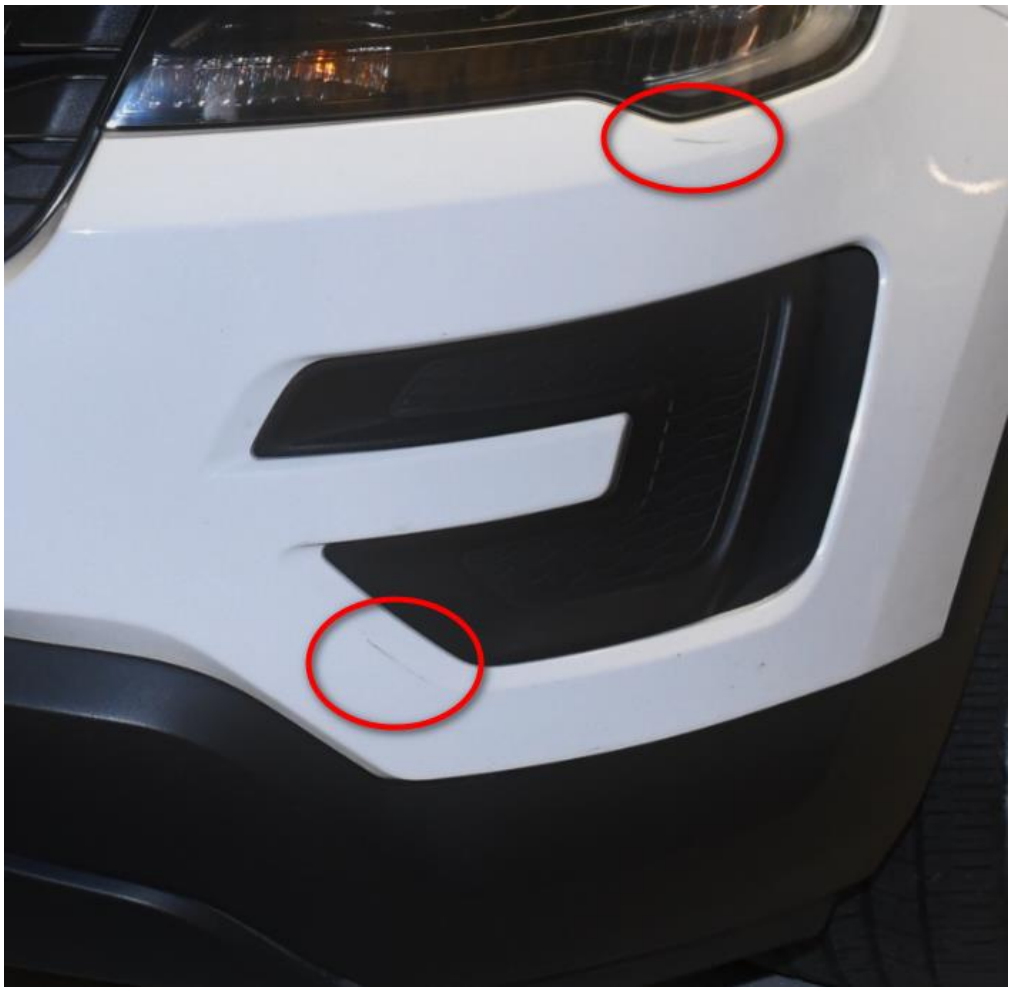


Figure 35

Besides several tiny pockmarks from being struck with stones, there were no additional dents, scuffs, marks, or scrapes located on the front plastic bumper cover or push bumper of the Providence Police Cruiser during this examination.

1999 White and Black Yamaha Zuma Scooter:

The examination of the Yamaha scooter also took place in the garage bay of the Providence Police Department Headquarters Complex. The scooter had numerous areas of minor scuffs and scratches throughout the vehicle, however, most of them were superficial and cosmetic in nature.

An examination of the right side of the scooter showed various areas of scratches, scuffs, and a deeper area of scraping along the muffler. However, none of these areas were attributed to this crash event. (Figure 36)

Figure 36

An examination of the front of the scooter showed that there were superficial scratches to the front tire fender mudguard. The right side (while sitting on the scooter) of the handlebars appeared undamaged. The right brake lever and the orange directional light assembly were intact. The left side of the handlebars (while sitting on the scooter) were deflected rearward and downward. The orange directional light assembly was broken and hanging by its wires. Its original mount appeared to have been previously broken and was being held in place with black electrical tape. The front tire of the scooter was no longer in alignment with the handlebars and was offset to the right. This damage was consistent with the left side of the scooter contacting the brick wall and deflecting the handlebars rearward and from its fall over onto its left side. (Figure 37)

Figure 37

An examination of the front faring and the instrument panel showed that the black plastic was fractured in several areas and the clear plastic cover of the instrument panel was cracked and displaced rearward. This damage was consistent with the left side of the scooter striking the brick wall and falling over onto its left side. (Figure 38)

Figure 38

An examination of the left side of the scooter showed several areas of contact damage to the side panels and protruding components. At the front of the scooter, below the orange directional light assembly, were scratches and scuffs to the black plastic body panel. At the base of the footwell was an area of course scratches to the black plastic edge. The rear foot peg had scuffs containing a white material, consistent with its contact with the brick wall. The body panel above the chain case had an area of scratching and deeper scuffs through the black paint. The body panel above and outside the rear shock assembly also had an area of scratches and scuffs in the black plastic. The leather seat had two areas of transfer markings that were of an unknown origin. (Figure 39)

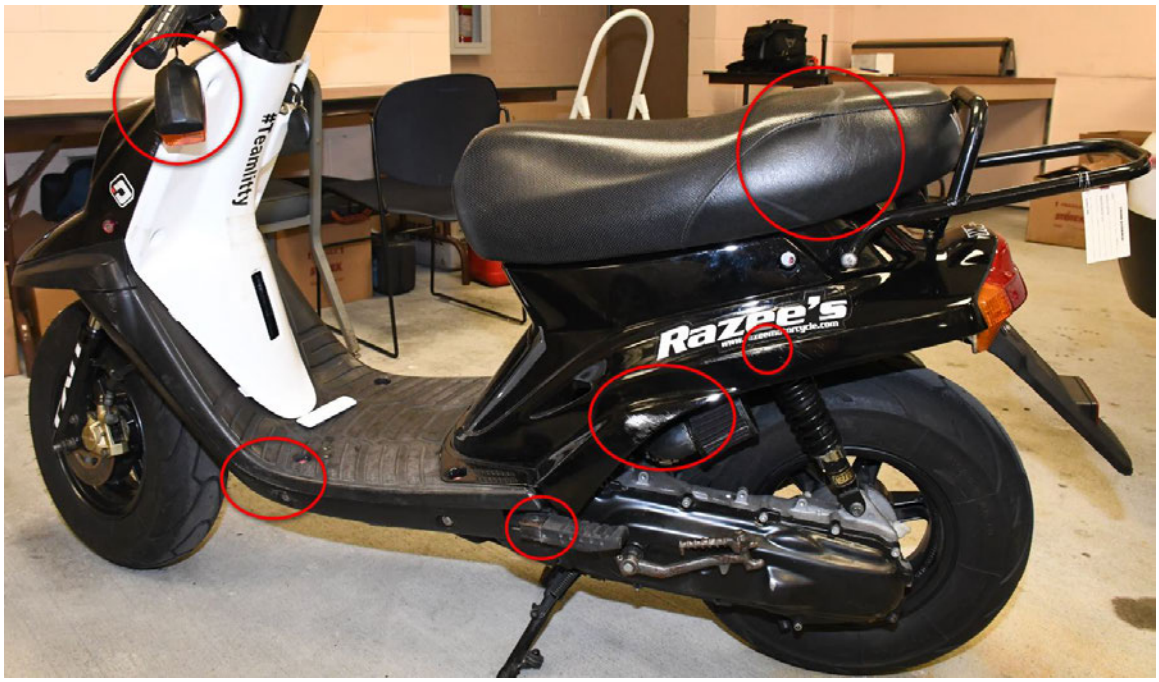


Figure 39

An examination of the rear of the scooter showed two areas of heavy scraping through the paint and into the steel of the metal cargo carrier bar. Both of these scraped areas were heavily oxidized and rusted, indicating that they had occurred prior to this incident. There was an additional area of contact scratches at the bottom of the rear mud flap in an irregular linear fashion. Along the right side of the steel cargo bar was an area of superficial scuff marks that did not penetrate the painted black surface. This examination showed no damage, displacement, cracks, or scuffs to the rear tail light assembly nor the rear plastic reflective lens on the mud flap. Both the cargo bar and the mudflap itself were in the proper alignment and showed no evidence of being struck and deflected forward. (Figures 40 – 43)

Figure 40

Figure 41

Figure 42

Figure 43

Forensic Vehicle Examination

Newton's Third Law of Motion states that for every action, there is an equal and opposite reaction. This law dictates that an analysis of any contact damage sustained from the forces of the front of the Providence Police Cruiser striking the rear of the Yamaha scooter, will result in apparent forces and/or damage patterns sustained by the rear of the Yamaha scooter – equal and opposite to those sustained by the Providence Police Cruiser.

Forensic Scientist Edmond Locard's exchange principle also states that for any contact between two items, an exchange of materials of some sort occurs between them. This exchange or transfer of evidence is generally produced by forcible direct contact between two objects. During this exchange, physical patterns in the forms of fractures, indentations, striations, imprints, markings, or deposits will occur.

After locating and examining all the areas of contact damage or transfer on both the Providence Police Cruiser and the Yamaha scooter, a forensic examination was done to assist with determining the origin of the damage or contact transfer. This examination was conducted to determine whether there was any forensic evidence that the front of the Providence Police Cruiser struck the rear of the Yamaha scooter during this crash event.

2017 Ford Explorer – Providence Police Cruiser # 24:

During the vehicle examination of the Providence Police Cruiser, we located six (6) distinct areas of contact damage or transfer. (Figure 44) Each one of those areas was measured and examined closely using macrophotography. Each one of those areas was later compared to the rear of the Yamaha scooter – both for contact transfer evidence and vehicle alignment configurations.

Figure 44

Area # 1 –

This area below the passenger side headlight assembly was determined to be a two and a quarter-inch (2.25”) black horizontal scuff mark, approximately two feet and five inches (2’5”) above the ground. (Figure 45) This mark did line up with the rear cargo bar of the Yamaha scooter, however, during this investigation, video surveillance footage of the crash event was obtained from the west end of Bissell Street. This video surveillance footage clearly shows that at no time did this area of the Providence Police Cruiser come in contact with the rear of the scooter. As a result, Area # 1 will be excluded from any further analysis. This video surveillance footage will be discussed at length later in the report. (Pages 59 – 79)

Figure 45

Area # 2 –

The area of the whitish scuffing and paint splatter on rubber housing around the vertical structure of the push bumper was examined. The area of the deepest scuffing was approximately one foot and nine inches (1'9") to one foot and eleven inches (1'11") above the ground – on the damaged and slightly out of alignment push bumper. There were also numerous areas of white paint splatter below. (Figures 46 & 47) Macrophotography of this area showed that there were scuffs and white latex or oil-based paint chips on the rubber itself. (Figure 48) These paint chips were consistent with a white latex paint or oil-based paint-controlled sample. (Figure 49)

When comparing this area of paint transfer to the rear of the Yamaha scooter, there was no white paint or protruding component that could have caused this contact damage transfer.

Figure 46

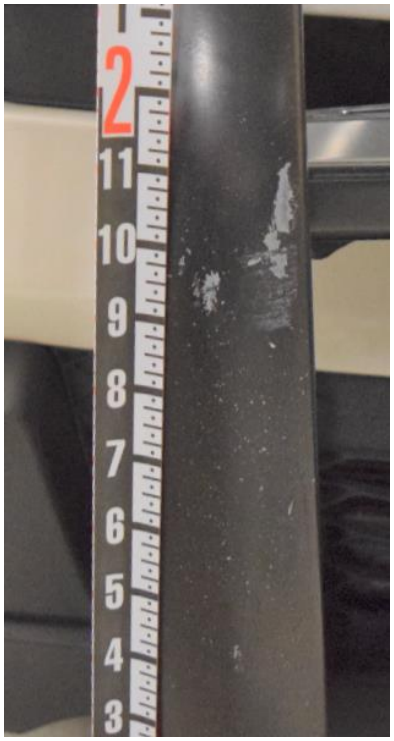
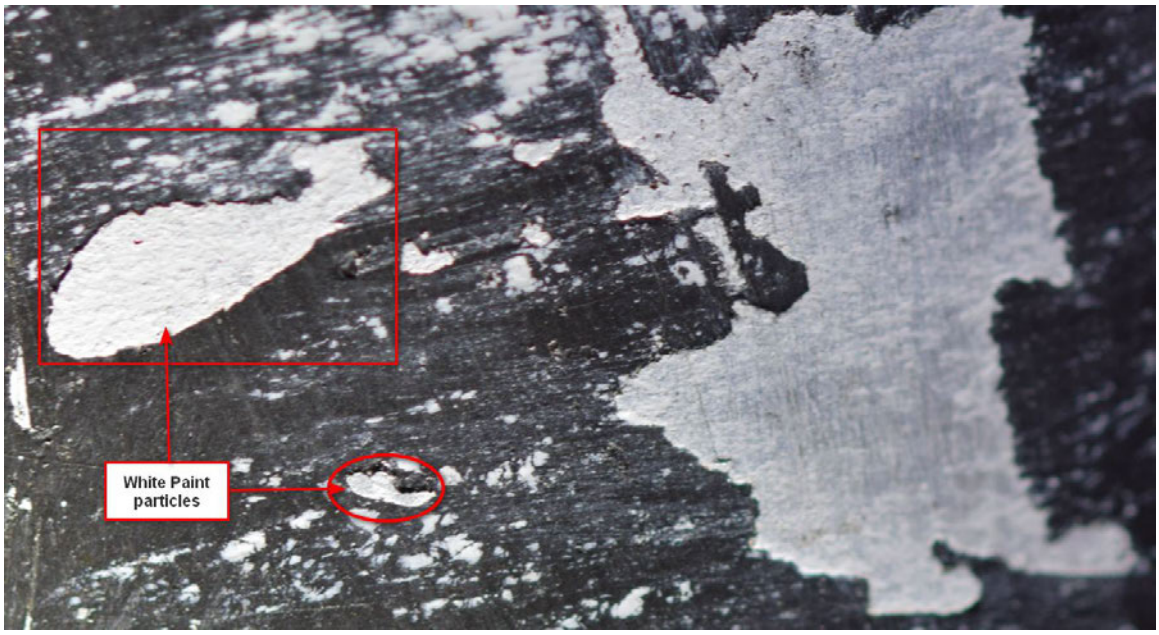
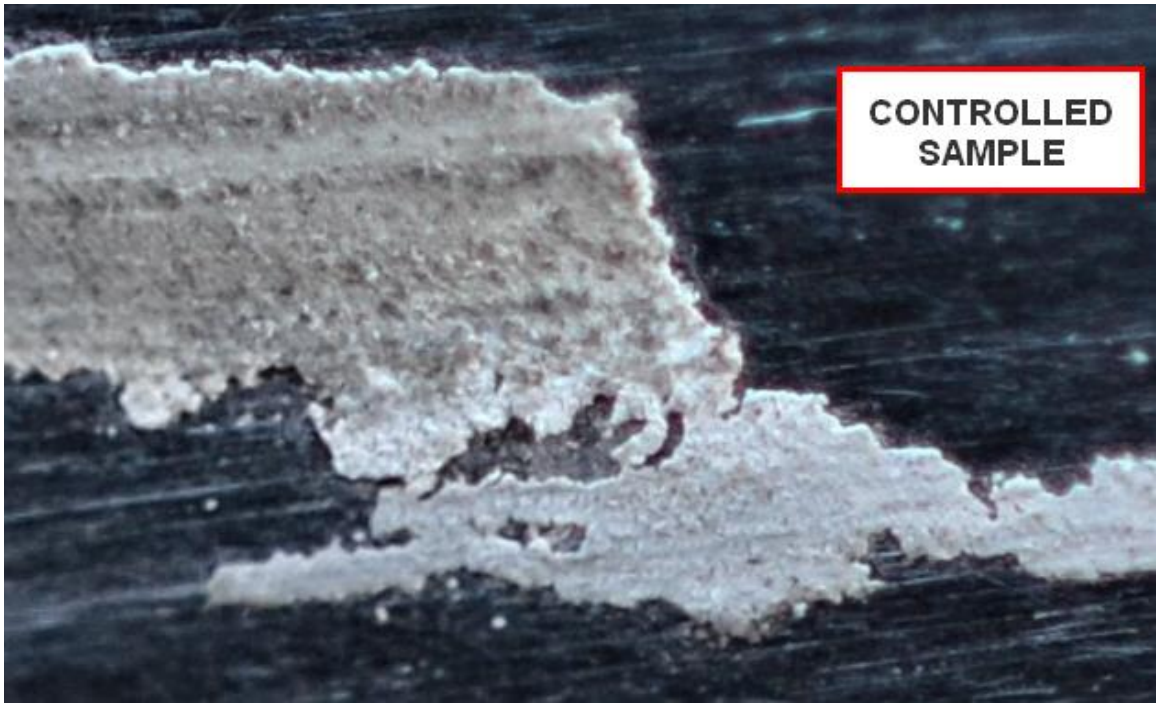


Figure 47



Macro photograph of push bumper

Figure 48



Controlled Sample of white latex/oil-based paint on a black automotive painted surface

Figure 49

Area # 3 –

The area of the damage to the upper and lower cross rails of the push bumper were determined to be from striking the vertical stop sign post. The width and contour of the damage was consistent with this impact. The corresponding black paint and rubber contact transfer onto the signpost was also consistent with this impact. A further examination of the damage profile under magnification showed no evidence of any type of transfer evidence that was not consistent with the signpost contact. (Figures 50 – 53)

Figure 50

Figure 51

Figure 52

Figure 53

Area # 4 –

The area of the scuffing and white paint transfer on the rubber housing around the vertical structure of the driver's side push bumper was examined. The area of the deepest scuffing was approximately one foot and ten inches (1'10") to one foot and eleven inches (1'11") above the ground – on the damaged and slightly out of alignment push bumper. There was a diagonal impression scuff above this area. Below this scuff were numerous superficial scratches and additional white paint splatter – consistent with the white paint splatter on the vertical push bumper on the passenger side of the vehicle. (Figures 54 – 56) Macrophotography of this area showed that there were scuffs and white latex or oil-based paint transfer on the rubber itself. (Figure 57) When comparing this area of paint transfer to the rear of the Yamaha scooter, there was no white paint or protruding component that could have caused this damage.

Above this scuff and white paint transfer was the diagonal impression scuff. This scuff traversed the width of the push bumper and was approximately two feet and one inch (2'1") to two feet and two inches (2'2") above the ground. A closer examination showed no evidence of any transfer that could be associated with the rear of the Yamaha scooter. The vertical alignment of this scuff was too low in comparison to the height of the rear cargo bar of the Yamaha scooter. This alignment will be depicted in the **Vehicle Alignment** section of this report. (Page 56)

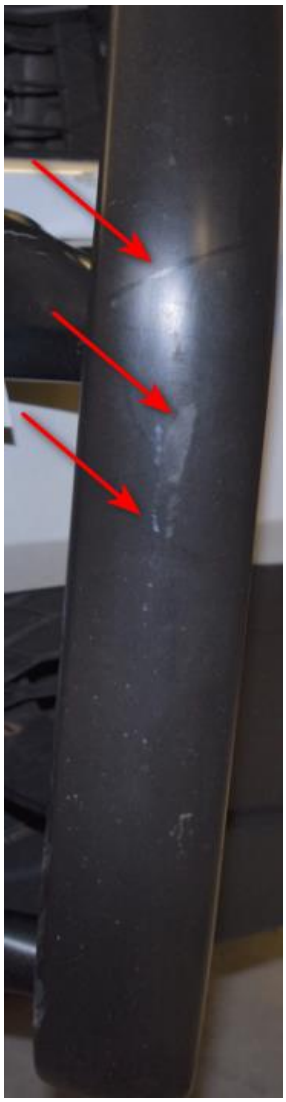


Figure 54

Figure 55

Figure 56

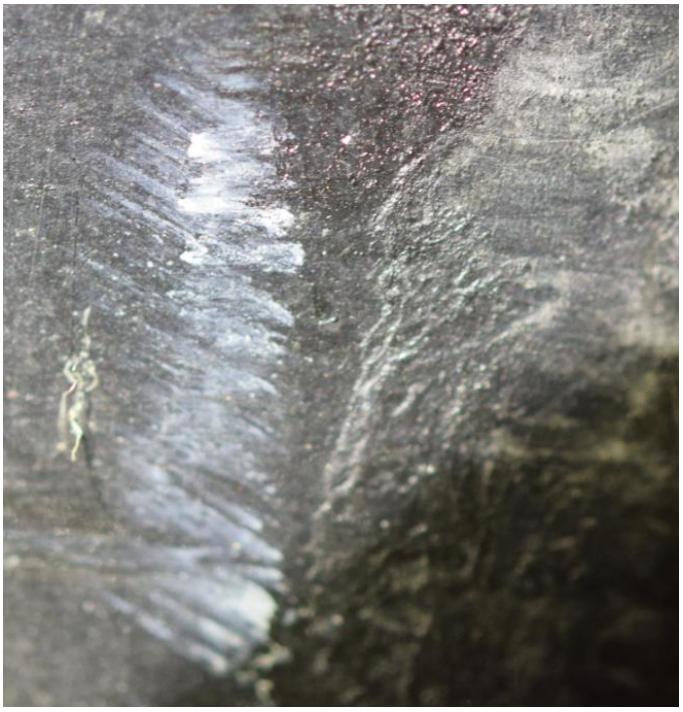


Figure 57

Area # 5 –

An examination of the whiteish contact transfer just below the driver's side headlight assembly was determined to be an approximate two-inch (2") horizontal scuff, approximately two feet and seven inches (2'7") above the ground. A closer examination of this transfer with macrophotography showed that there were strands of the material curling or peeling away from the plastic bumper cover. This material did not appear to be consistent with latex or oil-based paint, nor consistent with automotive paint. The composition of the substance was not identified during this investigation. (Figures 58 & 59)

A closer examination showed no evidence of any transfer that could be associated with the rear of the Yamaha scooter. The vertical alignment of this scuff was also too high in comparison to the rear of the Yamaha scooter. This alignment will be depicted in the **Vehicle Alignment** section of this report. (Page 57)

Figure 58

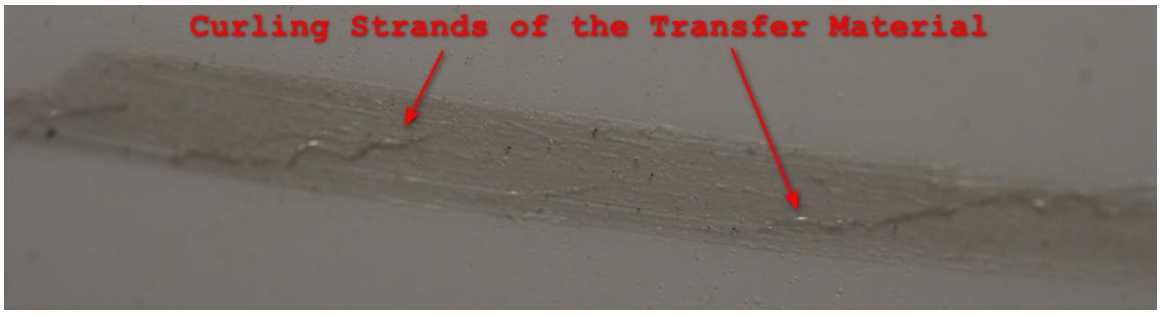


Figure 59

Area # 6 –

An examination of the dark transfer scuff along the edge of the molded recess in the plastic bumper cover showed it to be approximately one foot and six and one-half inches (1’6.5”) to one foot and eight inches (1’8”) above the ground. A closer examination of this transfer with macrophotography showed the substance to be dark brown and tan and not consistent with a plastic or rubber compound. This contact transfer was in a consistent horizontal manner across the plastic bumper cover. (Figures 60 & 61)

A closer examination showed no evidence of any transfer that could be associated with the rear of the Yamaha scooter. The vertical alignment of this scuff would have aligned with a section of the rear mud flap of the scooter; however, the cargo carrier bar would have to contact the front bumper for this to occur. This alignment will be depicted in the **Vehicle Alignment** section of this report. (Page 58)

Figure 60

Figure 61

1999 White and Black Yamaha Zuma Scooter:

During the vehicle examination of the Yamaha scooter, we located three (3) distinct areas of contact damage along the rear of the vehicle. (Figure 62) Each one of these areas was measured and examined closely. Each one of these areas was also compared to the front of the Providence Police Cruiser – both for contact transfer evidence and vehicle alignment comparisons.

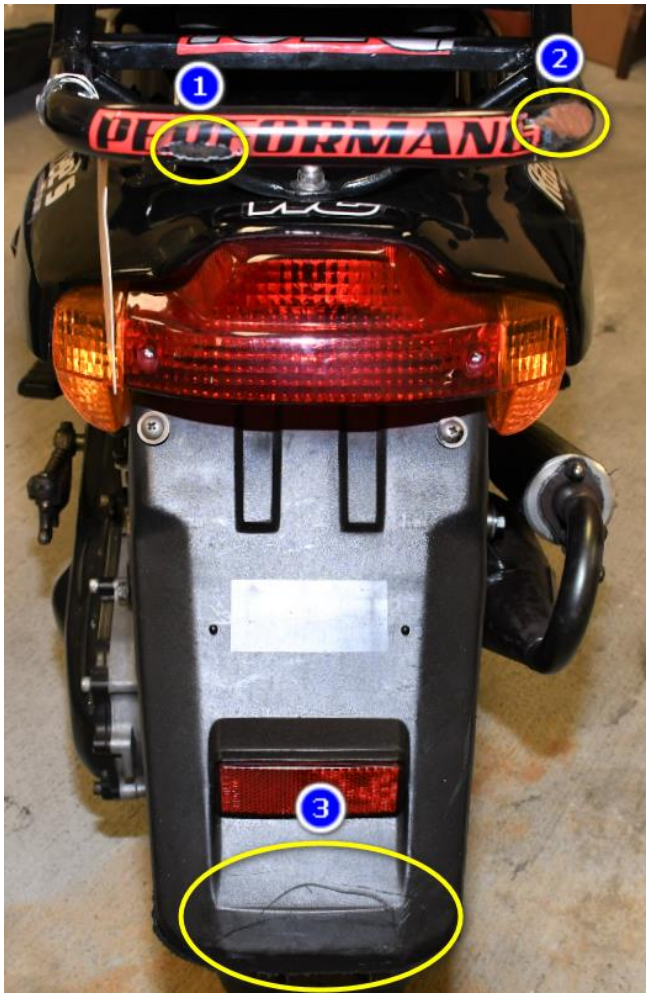


Figure 62

Area # 1 –

This area of contact damage to the rear cargo carrier bar was to the left of the centerline of the scooter. This contact damage was an approximate one inch (1") horizontal scrape into the metal of the cargo bar, approximately two feet and six inches (2'6") above the ground. A closer examination showed that the channels of the scrapes were in a vertical direction. Within the scrapes were significant oxidation and rusting of the metal. This level of oxidation and rusting was not consistent with this damage occurring approximately forty-one (41) hours prior to these photographs being taken. (Figures 63 & 64)

Figure 63 **(This ruler scale is in decimals – 2.5 feet is equivalent to 2'6")**

Figure 64

Area # 2 –

This area of contact damage was to the right side of the rear cargo carrier bar of the scooter. This contact damage was an approximate one and one-half inch (1.5”) horizontal scrape into the metal of the cargo bar, approximately two feet and six inches (2’6”) above the ground. A closer examination showed that the scrapes were in vertical direction and tapered off towards the rear of the scooter. Within the scrapes were significant oxidation and rusting of the metal, much heavier than the other scrape to the rear of the cargo bar as described previously. This level of oxidation and rusting was also not consistent with this damage occurring approximately forty-one (41) hours prior to these photographs being taken. (Figures 65 & 66)

(This ruler scale is in decimals – 2.5 feet is equivalent to 2’6”)
Figure 65

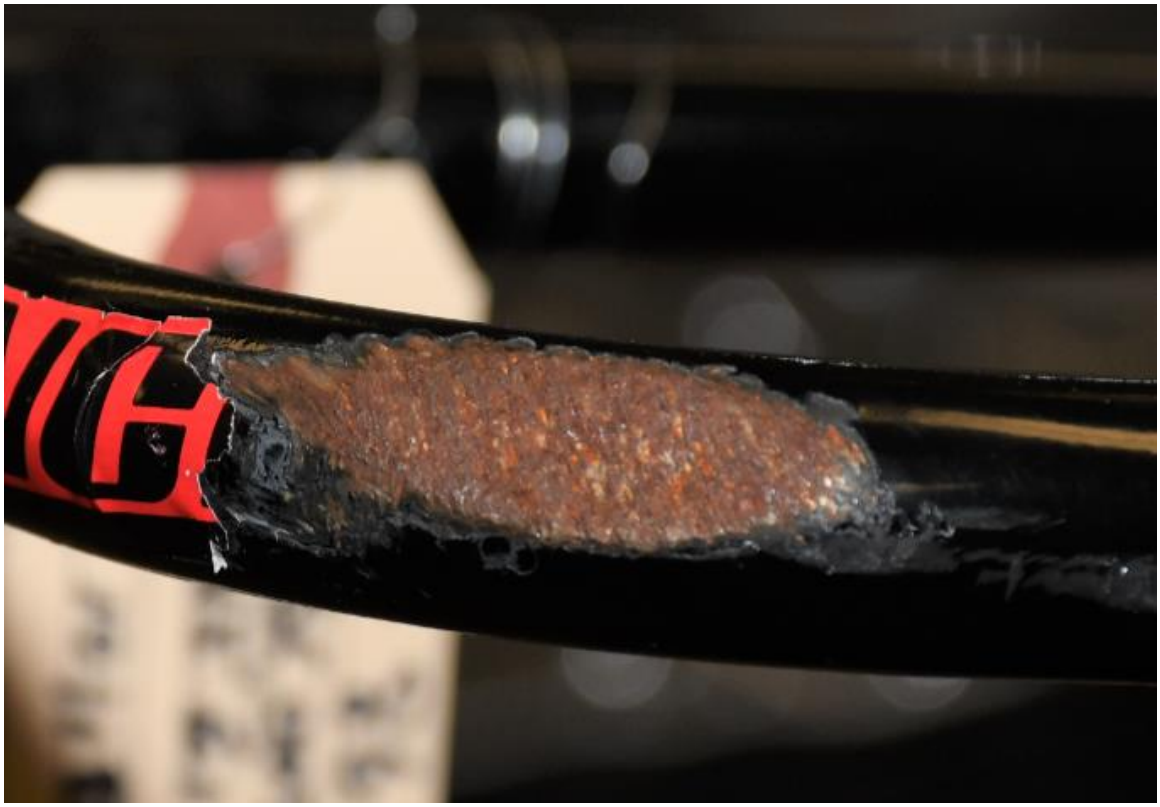
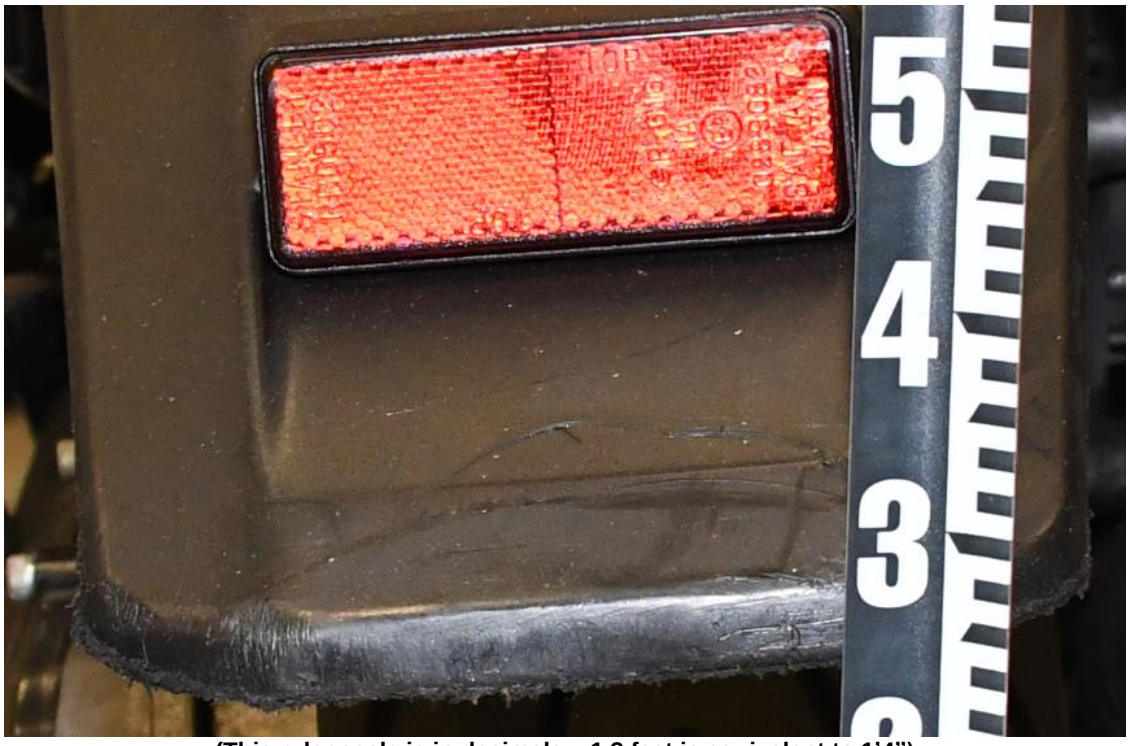


Figure 66

Area # 3 –

This area of contact damage was to the rear, underside, and edges of the rear black plastic mud flap of the scooter. The areas of damage were numerous course scrapes, gouges and scratches through the plastic in multiple directions. These scrapes were approximately one foot and three inches (1’3”) to one foot five inches (1’5”) above the ground. While the origin of all these scrapes and gouges was unknown, they are consistent with contact with course structures or aggregate such as asphalt or concrete, and not with any of the frontal components of the Providence Police Cruiser. (Figures 67 & 68)



(This ruler scale is in decimals – 1.3 feet is equivalent to 1'4")
Figure 67

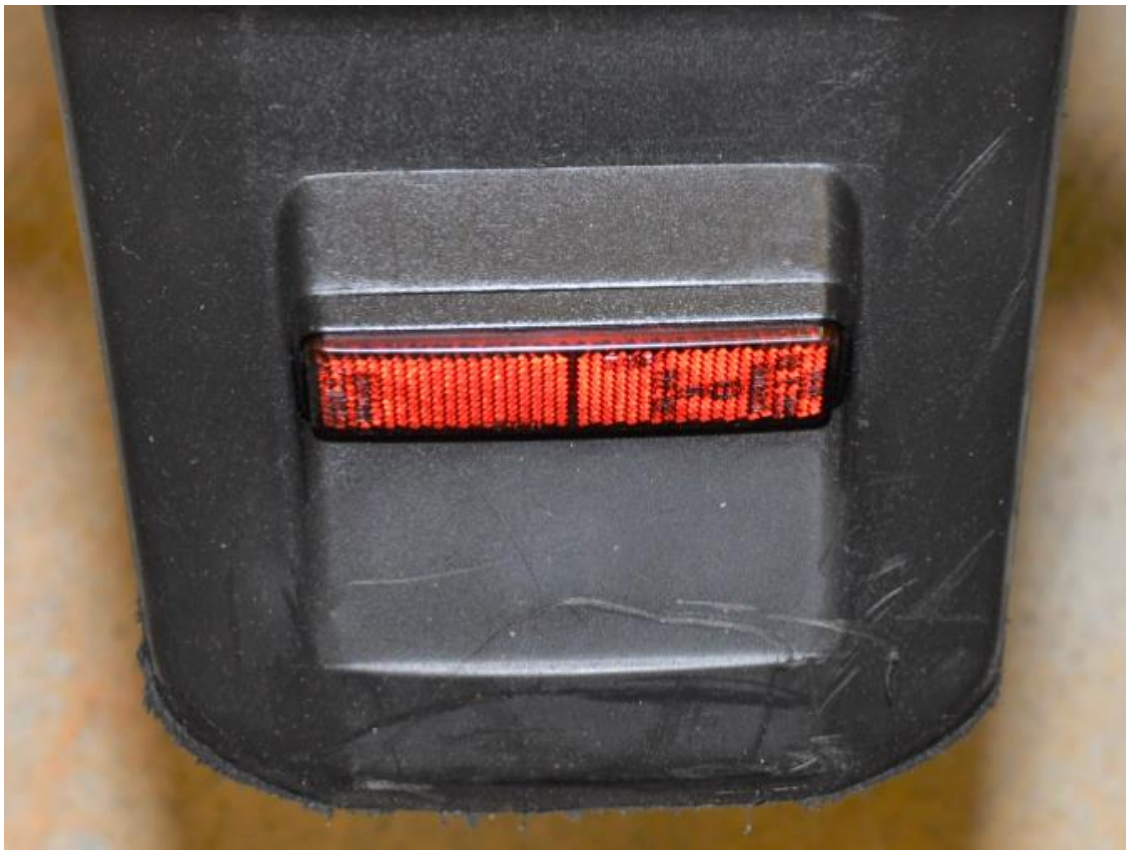


Figure 68

Vehicle Alignment

As part of our examination of the two vehicles, we placed the rear of the Yamaha scooter against all six (6) of the identified areas of contact damage and transfer on the Providence Police Cruiser. We also placed the scooter in several areas within the vertical rails of an undamaged push bumper on an exemplar 2017 Providence Police Cruiser with the same push bumper configuration. The alignment of each of these areas will be discussed below.

As mentioned earlier, Area # 1 of the Providence Police Cruiser did line up with the rear cargo carrier bar of the scooter, however, this area was later excluded based on an examination of the video surveillance footage. (Pages 59 – 79)

Area # 2, the vertical edge of the passenger side push bumper of the Providence Police Cruiser, contained areas of white paint transfer, not consistent with the rear of the scooter. An alignment of the scooter in this area showed that there was no corresponding contact damage or transfer on the push bumper from the rear cargo bar or mud flap of the scooter. (Figure 69)

Figure 69

An examination of Area # 3 and the area between the two vertical rails of the push bumper was conducted. This examination showed that if the Providence Police Cruiser struck the rear of the Yamaha scooter anywhere in this area, there would have been visible contact damage somewhere along the interior vertical rails of the push bumper, the siren mounted in the center of the push bumper, the front grille of the Providence Police Cruiser, the cargo bar of the Yamaha scooter, the rear mud flap of the Yamaha scooter, or anywhere along the plastic lenses of the scooter's tail light assembly. The lack of any visible damage or contact transfer to either vehicle in these areas confirms that the Providence Police Cruiser did not strike the Yamaha scooter within the interior of the push bumper. (Figures 70 – 73)

Figure 70

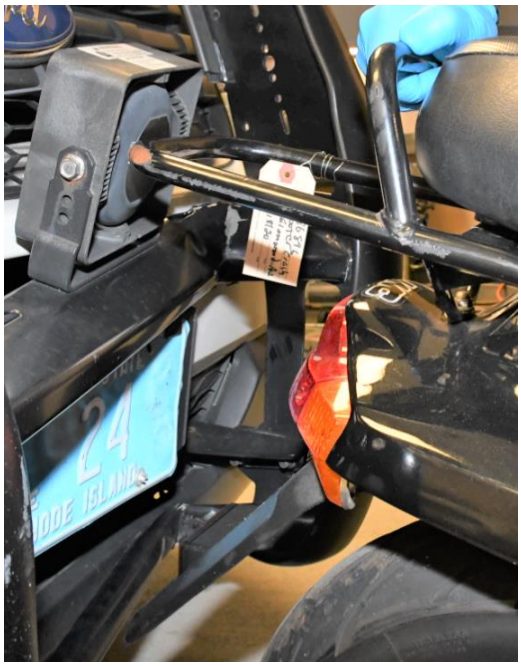


Figure 71

Figure 72

Figure 73

Area # 4, the vertical edge of the driver's side push bumper of the Providence Police Cruiser contained areas of white paint transfer, not consistent with the rear of the scooter, and a diagonal impression scuff. An alignment of the scooter in this area showed that the rear cargo bar was too high for both the scuffed area and the diagonal impression, and there was no corresponding contact damage or transfer on the push bumper from the rear mud flap of the scooter. The scuffs along the inside edge of the bottom of the rubber of the push bumper were attributed to its contact with the flared metal edge of the stop sign post, and not the soft and pliable plastic mud flap of the scooter. (Figure 74)

Figure 74

The alignment of the Yamaha scooter to Area # 5, the whiteish contact transfer just below the driver's side headlight assembly, was determined to be too high for any component from the rear of the Yamaha scooter. There were also no corresponding marks from the rear mud flap to the lower portion of the front of the Providence Police Cruiser's front bumper. The whitish substance itself was determined to not be consistent with any component on the rear of the Yamaha scooter. (Figures 75 & 76)

Figure 75

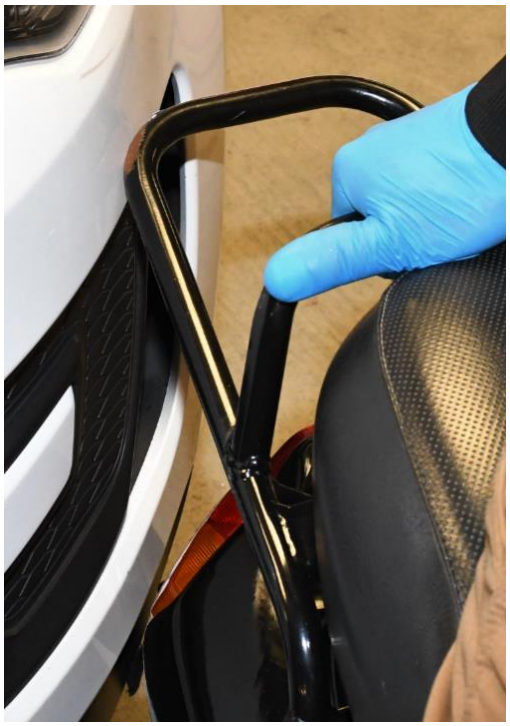


Figure 76

Area # 6, the black scuff along the molded edge of the recessed panel, did align with the height of a section of the rear mud flap of the scooter. However, the composition of the scuff itself was not consistent with the black plastic of the rear mud flap, as previously discussed on Page 47. There was also no corresponding contact damage or transfer to the front bumper of the Providence Police Cruiser from the rear cargo bar of the Yamaha scooter. During this alignment examination, the rear cargo bar made contact with the front bumper cover first, before the rear mud flap. Therefore, we were able to conclude that the contact transfer in Area # 6 was not from any contact with the mud flap of the Yamaha scooter. (Figure 77)

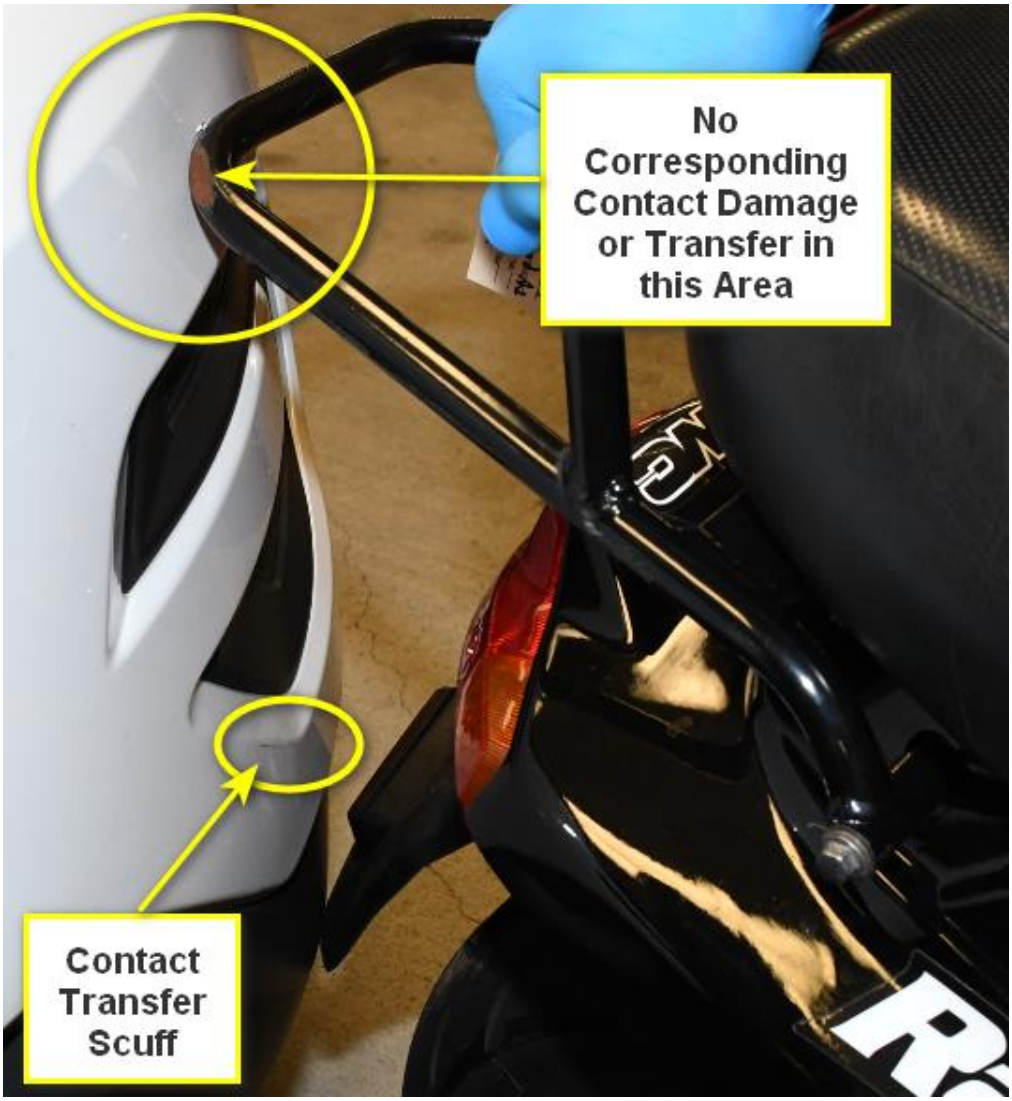


Figure 77

Video Surveillance Footage Analysis

During this investigation, members of the Providence Police Department Detective Bureau were able to obtain copies of several cellular phone videos and fixed camera surveillance videos of this incident. The video footage shows portions of this incident from different angles and from different perspectives. Two of the videos, one obtained from the cellular phone camera of [redacted], who was standing on his porch at [redacted], and one obtained from a fixed surveillance camera from the Advanced Telesystems Group Inc. building at the west end of Bissell Street, captured the sequence of the crash event most clearly. An additional video, from the external surveillance camera mounted on the front porch of the [redacted] residence, captures additional footage of the scooter and the Cruiser mounting the sidewalk before exiting the camera view.

All three of these videos were then analyzed by Rhode Island State Police Forensic Services Detective Lieutenant J. Grassel and Detective A. Cybowicz at State Police Headquarters. Detective Cybowicz processed the cellular phone video and the Advanced Telesystems Group Inc. videos through their Amped FIVE Video Analysis System. Detective Cybowicz was able to break each video up into individual frames and synchronize each video to play side by side in real-time from their different perspectives.

The following analysis will use a combination of frames from all three videos to best portray the sequence and timing of the events. Each page will display the screenshots of the cellular phone video and the Advanced Telesystems Group Inc. videos taken at the approximate same time. [redacted] fixed surveillance video will be used to show the beginning of the sequence of the scooter and Cruiser driving onto the sidewalk that was missed by the cellular phone video. The synchronized videos will also be attached to this report for viewing.

The two screen captures below depict both the Advanced Telesystems Group Inc. surveillance footage **(top)** and the [redacted] cellular phone video **(bottom)** at the same time. In these two images, the Yamaha scooter can be seen traveling south on Elmwood Avenue and Officer McParlin's Police Cruiser turning north on Elmwood Avenue from Bissell Street.

Video Time 5:50:08.266

Video Time 5:50:08.266

In these two images, the Yamaha scooter can be seen traveling south on Elmwood Avenue as Officer Endres' Police Cruiser follows and becomes visible in the Advanced Telesystems Group Inc. surveillance footage.

Video Time 5:50:08.666

Video Time 5:50:08.666

In these three images, the Yamaha scooter begins to drive onto the sidewalk along the southwest corner of Elmwood Avenue and Bissell Street. In the [redacted] cellular phone video, Officer Endres can be seen turning to the right while activating the brakes of the vehicle.

Video Time 5:50:09.433

[redacted] Video Footage

Video Time 5:50:09.433

In these images, the Yamaha scooter has driven up onto the sidewalk and is to the south of the stop sign post. In the [redacted] cellular phone video, Officer Endres' is still activating the brakes of the vehicle as the Cruiser exits the camera view from this point.

Video Time 5:50:09.600

[redacted] Video Footage

Video Time 5:50:09.600

In these two images, the Yamaha scooter has driven up onto the sidewalk and is passing the stop sign post as it travels west on the sidewalk. In the [redacted] cellular phone video, Officer Endres's Cruiser has exited the camera view as [redacted] follows Officer McParlin's Cruiser.

Video Time 5:50:09.800

[redacted] Video Footage

Video Time 5:50:09.800

In these images, the last visible area of the Yamaha scooter / operator is captured from this angle on the Advanced Telesystems Group Inc. video. Its full view is obstructed by the foliage of a tree on Bissell Street. Officer Endres's Cruiser is just starting to drive onto the sidewalk at this point. From the perspective of the home video surveillance footage it appears as though the front of the Cruiser and the rear of the scooter are close. However, from the Advanced Telesystems Group Inc. video, we can see that the two vehicles are separated by at least the entire width of the visible sidewalk at this time. The [redacted] cellular phone video does not capture any of this and is not depicted below.

Video Time 5:50:10.033 Amped FIVE Video Frame # 179

[redacted] Video Footage

In these images, the front of Officer Endres's Cruiser makes contact with the stop sign post. These images capture the stop sign beginning to move for the first time. The second image is a magnification of the same frame of the video. From the [redacted] home video footage the stop sign being struck is not visible, however the below image depicts the approximate same time based upon the Cruiser's tire positions. Again from the home video perspective, the two vehicles appear very close to each other, but from the Advanced Telesystems Group Inc. video, we know that they are still separated by at least the entire width of the visible sidewalk.

Video Time 5:50:10.166

Amped FIVE Video Frame # 183

[redacted]
Video
Footage

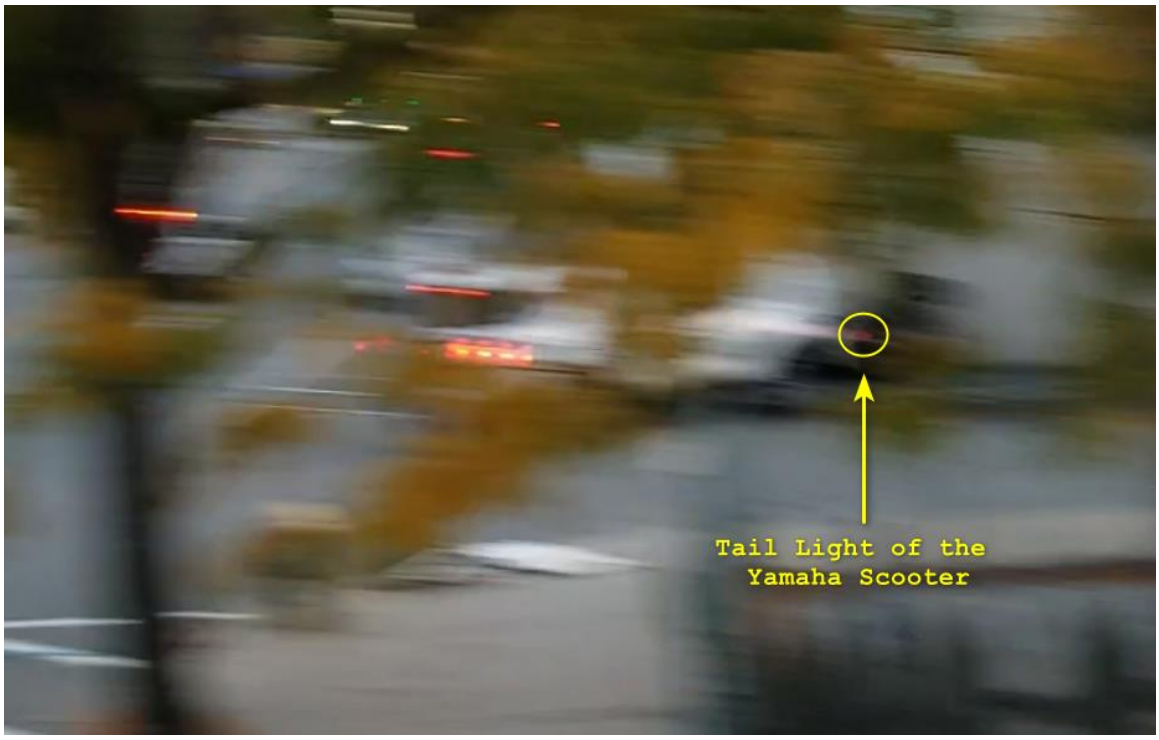
In these two images, the stop sign is being driven over and deflected downward. The images capture the red stop sign face as it is moving downward. Its motion is consistent with the 'blurring" of the red image. The Yamaha scooter / operator are not visible in this video frame. From these images, we can determine that the front of Officer Endres's Cruiser struck the stop sign post and had not made contact with the Yamaha scooter – which is out of the video frame. The [redacted] home video footage was recorded with a different frame rate and could not be broken down to capture the stop sign moving. The next frames of the home video capture the front of the Cruiser and the entire scooter out of camera view. These frames are not depicted below.

Video Time 5:50:10.200

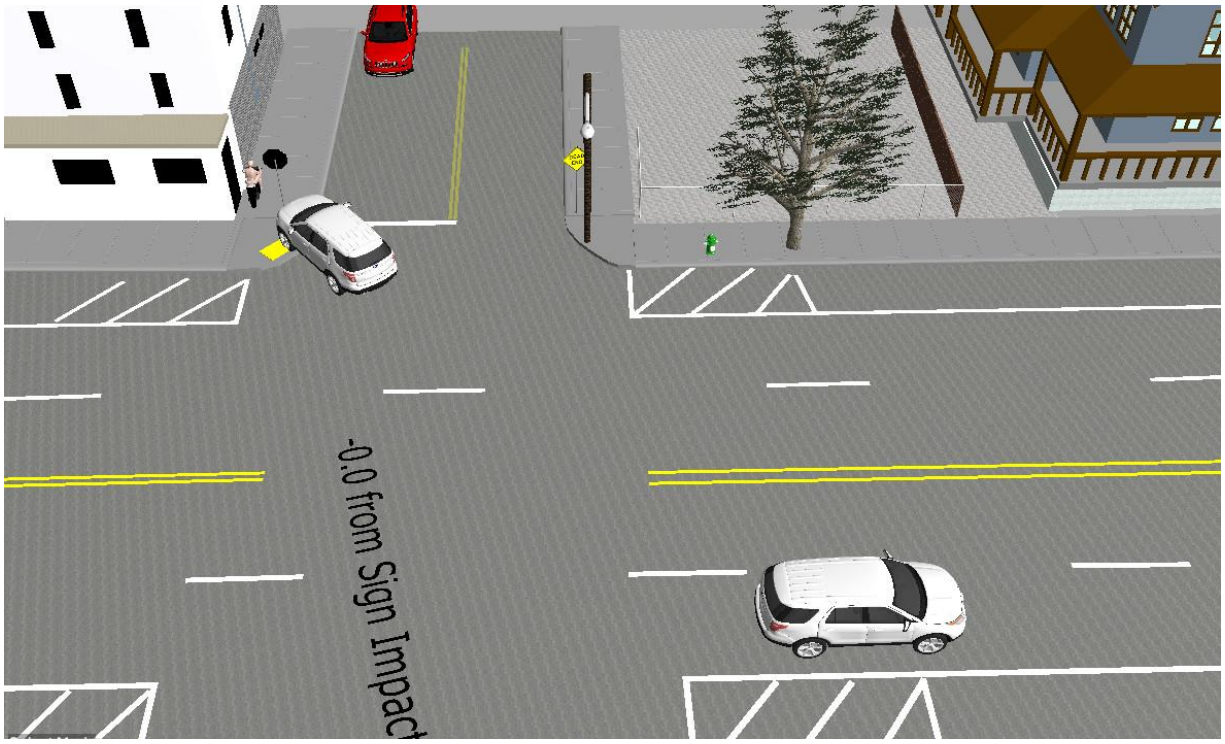
Video Time 5:50:10.200 Amped FIVE Video Frame # 186

In the two images below, the elapsed time from the images on the previous page is approximately three tenths (3/10ths) of a second. The driver's side front of the Cruiser is not captured in the Advanced Telesystems Group Inc. surveillance footage, however, the [redacted] cellular phone video, which was panning back to Officer Endres's Cruiser and the Yamaha scooter, captured both the front of the Cruiser and the rear of the Yamaha scooter. While the image is blurred due to the motion of the camera, the rear tail light of the Yamaha scooter can be seen in the [redacted] image. Although it looks like the two vehicles are very close to each other in this frame, the image is only a two-dimensional view of this moment. When comparing these two images below with the previous images, we know that the Yamaha scooter drove to the south around the stop sign post and was traveling along the brick wall of 1245 Elmwood Avenue. We also know that the Providence Police Cruiser had just mounted the sidewalk and while the front of the Cruiser cannot be seen, we know the Yamaha scooter had already driven through this area of the sidewalk. From the perspective of the [redacted] camera, it would appear that the Providence Cruiser and the Yamaha scooter are closer than they actually are. The third image is a scaled diagram of this moment with the Providence Police Cruiser and the Yamaha scooter being placed in their approximate locations. The top-down view of this diagram illustrates the separation between the two vehicles that is not apparent from the perspective of the [redacted] video footage.

Video Time 5:50:10.500 Amped FIVE Video Frame # 193

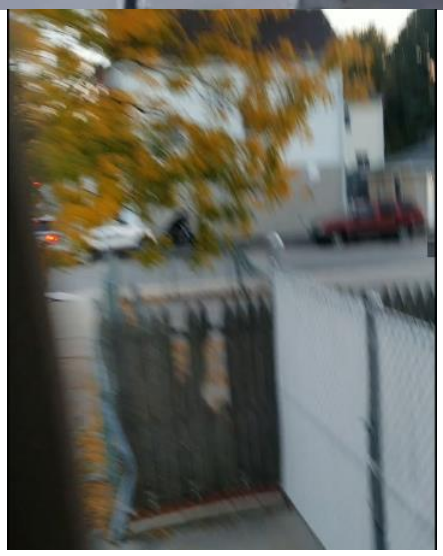


Video Time 5:50:10.500 Amped FIVE Video Frame # 1273



Scaled Diagram at the time of the Cruiser's impact with the stop sign post.

In the four images below, the stop sign has been driven over and Officer Endres' Cruiser's passenger front tire has just mounted the curbing. The rear brake lights of the Cruiser can also be seen. From the Advanced Telesystems Group Inc. surveillance footage view, the Yamaha scooter / operator are still not visible in this video frame. In the [redacted] cellular phone video, which has panned back to Officer Endres's Cruiser and the Yamaha scooter, we can see the separation from the front of the Providence Police Cruiser to the rear of the Yamaha scooter. Both individual video frames were magnified on the following page. With the previously identified left brake lever contact on the brick wall of the building (Figure 7), we know that the scooter at this point needs to be aligned along the brick wall. Based on the alignment of the Providence Police Cruiser at this point, these individual frames clearly show that the front of the Providence Police Cruiser could not strike the Yamaha scooter in this alignment.



Video Time 5:50:10.633

Video Time 5:50:10.633 Amped FIVE Video Frame # 197

Video Time 5:50:10.633 Amped FIVE Video Frame # 1277

In the two images below, the Yamaha scooter / operator first comes back into the video frame of the Advanced Telesystems Group Inc. surveillance footage. In the [redacted] cellular phone video, the separation between the front of the Providence Police Cruiser and the Yamaha Scooter is more evident. Both individual video frames were magnified on the following page. An analysis of these individual frames clearly shows that the front of the Providence Police Cruiser did not strike the Yamaha scooter at this point.

Video Time 5:50:10.700

Video Time 5:50:10.700 Amped FIVE Video Frame # 1279

The two images below are magnifications of Amped FIVE Video Frame # 1279 of the [redacted] cellular phone video. In this frame, it appears that the stop sign and its post are first visible. While the image could not be clarified any further, the video frames following this one shows the sign and its post more clearly.

Amped FIVE Video Frame # 1279

The two images below were taken thirty-three (33) milliseconds after the above images. The [redacted] cellular phone video clearly captures the stop sign post in contact with the operator of the Yamaha scooter.

Video Time 5:50:10.733

Video Time 5:50:10.733 Amped FIVE Video Frame # 1280

In the two images below, the Providence Police Cruiser has come to a complete stop and the Yamaha scooter and its operator can be seen falling onto the sidewalk in the Advanced Telesystems Group Inc. surveillance footage. In the [redacted] cellular phone video, the stop sign and post can be seen still falling as the Yamaha scooter is obscured by a tree branch.

Video Time 5:50:10.933

Video Time 5:50:10.933 Amped FIVE Video Frame # 1286

In the two images below, the Providence Police Cruiser remains at a complete stop and the Yamaha scooter and its operator continue to fall over onto the sidewalk in the Advanced Telesystems Group Inc. surveillance footage. In the [redacted] cellular phone video, the stop sign face is clearly visible alongside the fallen Yamaha scooter and its operator.

Video Time 5:50:11.500

Video Time 5:50:11.500 Amped FIVE Video Frame # 1297

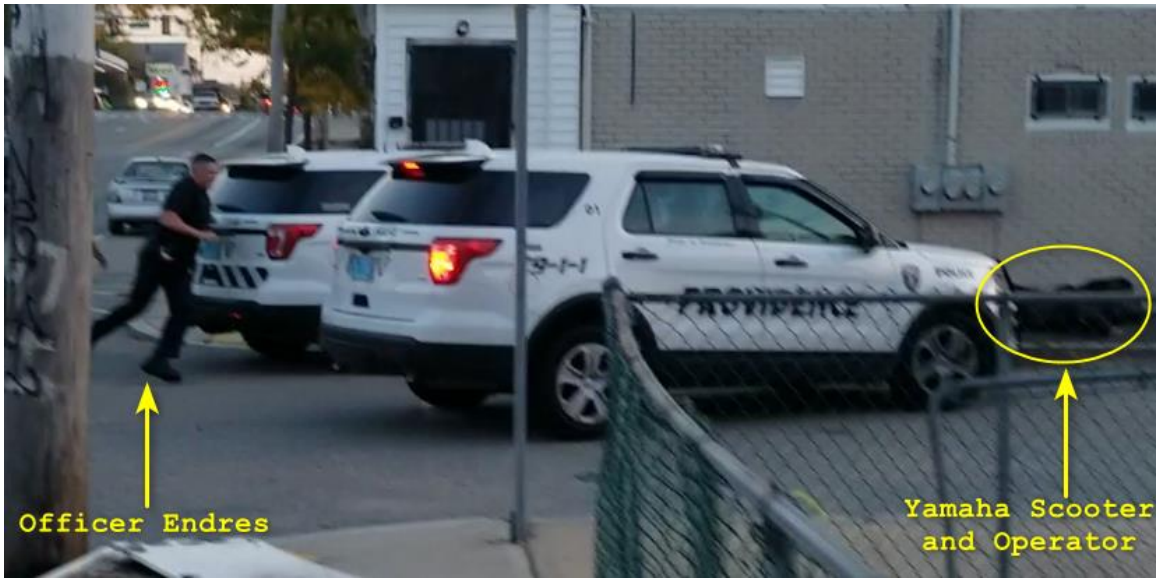
In the two images below, the Providence Police Cruiser remains at a complete stop and the Yamaha scooter and its operator both come to a complete stop as well.

Video Time 5:50:11.766

Video Time 5:50:11.766 Amped FIVE Video Frame # 1311

In the two images below, Providence Police Officer Endres has exited his Cruiser and run around the back of it, towards the Yamaha scooter and its operator. The operator of the scooter, Jhamel Gonsalves, remained at rest on the sidewalk. Additional Providence Police Cruisers began to arrive on the scene from this point forward.

Video Time 5:50:15.333



Video Time 5:50:15.333 Amped FIVE Video Frame # 1418

After reviewing the video surveillance footage from three different perspectives, we were able to conclude that at no point did the front of the Providence Police Cruiser strike the Yamaha scooter. Rather, we were able to conclude that the stop sign that was struck by Officer Endres' Cruiser, was projected forward and downward, and struck Jhamel Gonsalves. This impact separated Mr. Gonsalves from the scooter and both he and the Yamaha scooter fell over onto the sidewalk of Bissell Street. An analysis of whether the left side of the scooter struck the brick wall with its brake lever before, during, or after being struck by the stop sign was inconclusive.

Stop Sign and Helmet Impact

After reviewing the video surveillance footage as well as the stop sign and helmet of the Yamaha scooter operator, we were able to conclude that the stop sign struck Gonsalves along the back-right side of his helmet. Figure 78 below illustrates the area of the helmet that was struck.

Figure 78

An examination of the stop sign itself showed an area of corresponding damage on the face of the stop sign. It should be noted that this area was in line with the metal signpost behind the face of the stop sign. This indicates that the helmet was not struck by the periphery of the sign, but rather by the metal post that runs through the center of the sign. (Figure 79)

Figure 79

An examination of the rest of the exterior of the helmet showed superficial scrapes and scratches along the left side of the helmet. (Figure 80) These scrapes and scratches were consistent with contact with coarse or aggregate materials, such as asphalt or concrete.

Figure 80

An examination of the interior of the helmet showed that the interior Styrofoam type liner was cracked in several areas. These cracks in the Styrofoam type liner were prevalent along the interior right side of the helmet. (Figure 81)

Figure 81

Both the stop sign face and the helmet were seized by Detective Cybowicz. These items were then turned over to the Rhode Island Crime Lab to determine if the red paint on the helmet was consistent with the red face of the stop sign.

The Rhode Island Crime Lab analysis determined that the red transfer on the helmet was similar in class characteristics, including physical and chemical properties, as the red polymer of the stop sign. The analysis also determined that the red transfer on Mr. Gonsalves' black sweatshirt and the black fiber transfer onto the white graffiti type paint on the stop sign, were both similar in class characteristics, including physical and chemical properties, as the red polymer of the stop sign and the fibers of the sweatshirt. This analysis is consistent with the stop sign contacting Mr. Gonsalves' helmet and sweatshirt during this crash event. **(Appendix A)**

Police Cruiser / Stop Sign / Yamaha Scooter Alignment

Although the analysis of the forensic examination, vehicle alignments, and video surveillance footage revealed that the Yamaha scooter was not struck by the Providence Police Cruiser, we conducted additional testing to see if it were possible in this crash sequence. This examination focused on whether the front of the Cruiser could strike the stop sign post and the rear of the Yamaha scooter – and still have the stop sign strike the back-right side of the scooter operator's helmet.

To perform this examination, we used Officer Endres' involved Providence Police Cruiser, the stop sign post that was struck, a scooter operator who was the same size as Mr. Gonsalves' listed license height, a black helmet, and the involved Yamaha Zuma Scooter.

A mark was made on the garage floor of the Providence Police Department Headquarters Complex. This mark depicted the area of the sidewalk where the stop sign post was mounted. The stop sign face had been removed to be submitted to the Rhode Island Crime Lab, so red tape was affixed to the post at the same height as the contact area of the sign (approximately ninety-eight inches (98") above the ground- Figure 79 above). The scooter operator wore a black helmet and sat on the Yamaha scooter.

To conduct the examination, we drove the Cruiser forward into contact with the stop sign post. We then lowered the signpost down from this area and aligned the scooter and operator with the marked area of the post where the contact occurred. We continued to drive the Cruiser closer to keep the push bumper rails in direct contact with the stop sign post. This examination of this alignment showed that the closest the Cruiser could be to the rear of the Yamaha scooter was thirty-eight (38") inches. When we drove the Cruiser any closer, the post continued to be deflected downward to ride under the bottom push bumper rail. As the Cruiser advanced, the lowered height of the post became too low to strike the Yamaha operator in the helmet. (Figures 82 – 84)

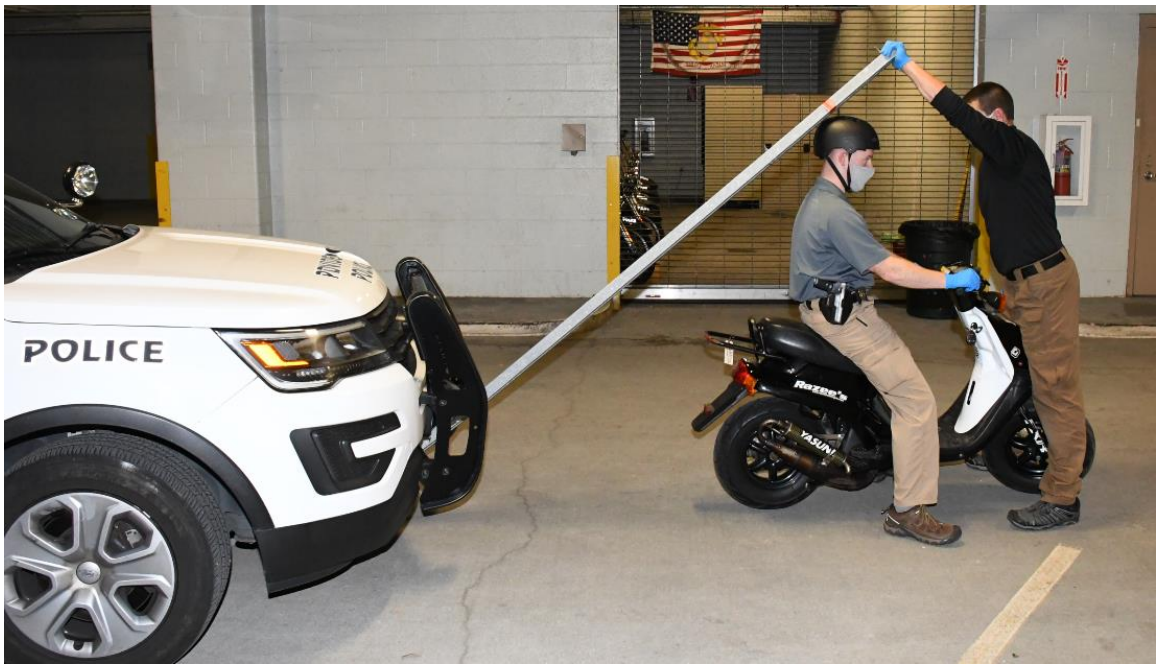


Figure 82

Figure 83

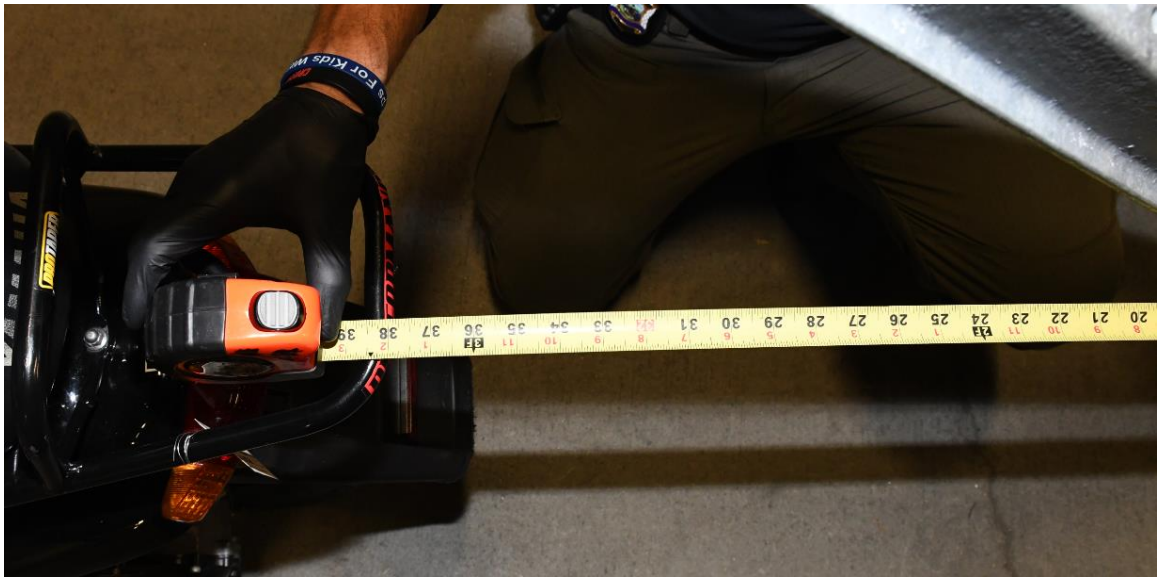


Figure 84

An additional examination was conducted with the scooter operator standing, with both feet on the ground, and not sitting on the seat of the Yamaha. The examination of this alignment showed that the closest the Cruiser could be to the rear of the Yamaha scooter with the operator standing was approximately thirty (30") inches. (Figures 85 – 87)

Figure 85

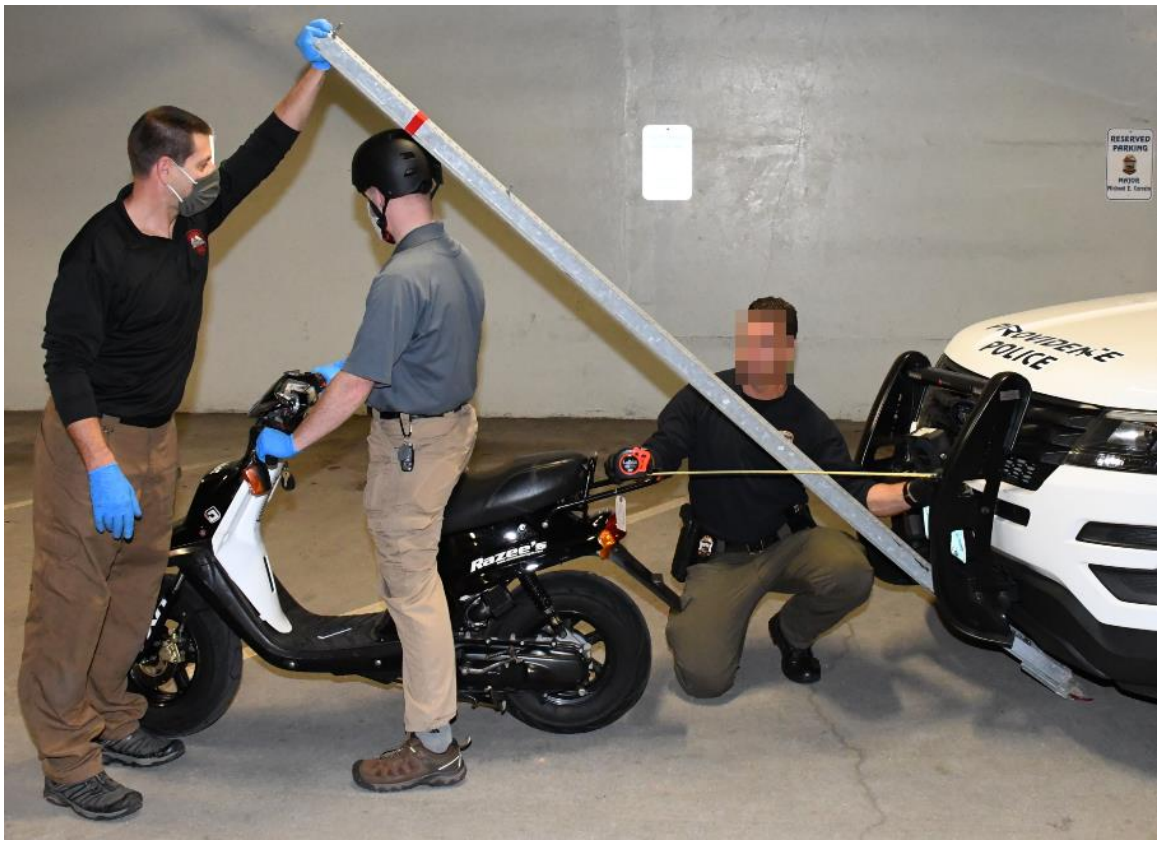


Figure 86

Figure 87

It was determined that due to the configuration of the inner rails of the push bumper and the clearance above the ground, that the Cruiser could never get close enough to the rear of the Yamaha scooter and still have the stop sign post make contact with its operator in the alignment that it did. The higher up the post the Cruiser drove, the lower the end of the post became. (Figure 88)

Figure 88

These examinations confirmed again that the front of the Providence Police Cruiser could not strike the rear of the Yamaha scooter during this established crash sequence.

Speed Analysis

2017 Ford Explorer – Providence Police Cruiser # 24:

On Monday, October 19th, 2020, Providence Police Officer T. Hastings used the Bosch Crash Data Retrieval System to download the Providence Police Cruiser. This download showed that the Cruiser recorded one Event Record. (Figure 89)

CDR File Information

User Entered VIN	1FM5K8AR9HGE13352
User	T. HASTINGS
Case Number	20-86896
EDR Data Imaging Date	10/19/2020
Crash Date	10/18/2020
Filename	1FM5K8AR9HGE13352_ACM.CDRX
Saved on	Monday, October 19 2020 at 12:17:36
Imaged with CDR version	Crash Data Retrieval Tool 19.4.2
Imaged with Software Licensed to (Company Name)	Providence Police Department
Reported with CDR version	Crash Data Retrieval Tool 19.5.2
Reported with Software Licensed to (Company Name)	Rhode Island State Police
EDR Device Type	Airbag Control Module
ACM Adapter Detected During Download	No
Event(s) recovered	Event Record 1

Figure 89

An analysis of the data showed that this recorded event occurred on the 4,846th ignition cycle and the download occurred on the 4,852nd ignition cycle, which is consistent with this crash. The data showed that the module recorded a non-deployment event and was able to fully record the Pre-Crash Data for the five (5) seconds leading up to that event. (Figure 90)

System Status at Time of Retrieval

VIN As Programmed into RCM at Factory	1FM5K8AR9HGE13352
Current VIN (From PCM)	1FM5K8AR9HGE13352
Ignition Cycle, Download (First Record)	4,852
Ignition Cycle, Download (Second Record)	N/A
Restraints Control Module Part Number	HB5T-14B321-AA
Restraints Control Module Serial Number	7063269437220000
Restraints Control Module Software Part Number (Version)	GR3T-14C028-AA
Driver Side/Center Frontal Restraints Sensor Serial Number	00282A72
Driver, Row 1, Side Restraint Sensor 1 Serial Number	000000FE
Driver, Row 2, Side Restraint Sensor 2 Serial Number	002A2A6C
Passenger Frontal Restraints Sensor Serial Number	00282A72
Passenger, Row 1, Side Restraint Sensor 1 Serial Number	0000006C
Passenger, Row 2, Side Restraint Sensor 2 Serial Number	001A2ADD
Steering Wheel Location	Left Hand Drive

Pre-Crash Data -1 sec (First Record)

Ignition cycle, Crash	4,846
Frontal Air Bag Warning Lamp, On/Off	Off
Safety Belt Status, Driver	Unbuckled
Seat Track Position Switch, Foremost, Status, Driver	Not Forward
Seat Track Position Switch, Foremost, Status, Front Passenger	Not Forward
Safety Belt Status, Front Passenger	Buckled
Brake Telltale	Off
ABS Telltale	Off
ESC/TC Telltale	Off
ESC/TC Off Telltale	Default Mode
Powertrain Wrench Telltale	Off
Powertrain Malfunction Indicator Lamp (MIL) Telltale	Off

Figure 90

The Pre-Crash Data indicated that at approximately five (5.0) seconds prior to Time Zero ("Time Zero," is defined as the start of the algorithm "wake up" during a crash event) which was the impact with the stop sign, the Cruiser had an indicated speed of 35 miles per hour, a 23.4% accelerator pedal input percentage, and no activation of the brakes. At approximately four and one half (4.5) seconds prior to the impact with the stop sign, the Cruiser had an indicated speed of 35.8 miles per hour, no accelerator pedal input, and no activation of the brakes. At approximately four (4.0) seconds prior to the impact with the stop sign, the Cruiser had an indicated speed of 34.9 miles per hour, no accelerator pedal input, and the activation of the brakes. At approximately three and one half (3.5) seconds prior to the impact with the stop sign, the Cruiser's indicated speed had decreased to 32.6 miles per hour, there was no accelerator pedal input, and the brakes were still activated. At approximately three (3.0) seconds prior to the impact with the stop sign, the Cruiser's speed continued to decrease to 29.7 miles per hour, there was no accelerator pedal input, and the brakes were released. At approximately two and one half

(2.5) seconds prior to the impact with the stop sign, the Cruiser had an indicated speed of 28.3 miles per hour, there was no accelerator pedal input, and the brakes were activated again. At approximately two (2) seconds prior to the impact with the stop sign, the Cruiser had an indicated speed of 27.7 miles per hour, there was no accelerator pedal input, and the brakes were not activated. At approximately one and one half (1.5) seconds prior to the impact with the stop sign, the Cruiser had an indicated speed of 27.4 miles her per hour, the accelerator pedal input percentage reached 100%, and the brakes were not activated. At approximately one (1) second prior to the impact with the stop sign, the Cruiser had an indicated speed of 26.5 miles per hour, the accelerator pedal percentage decreased to 84.8%, and the brakes were activated. At approximately one-half second (0.5) prior to the impact with the stop sign, the Cruiser had an indicated speed of 22.9 miles per hour, the accelerator pedal percentage decreased to 0.0%, the brakes were activated and the ABS braking system engaged. At Time Zero, (0.0), the Cruiser had an indicated speed of 18.5 miles per hour, the was no accelerator pedal input, the brakes were activated and the ABS braking system remained engaged. (Figure 91)

Pre-Crash Data -5 to 0 sec [2 samples/sec] (First Record) - Table 1 of 2

Time (sec)	Speed, Vehicle Indicated (MPH [km/h])	Speed, Vehicle Indicated, Quality Factor	Accelerator Pedal, % Full	Accelerator Pedal, % Full, Quality Factor	Service Brake, On/Off	Service brake, Quality Factor	Engine RPM	ABS Activity (Engaged, Non-Engaged)
-5.0	35.0 [56]	OK	23.4	OK	Off	OK	5,254	Non-engaged
-4.5	35.8 [58]	OK	0.0	OK	Off	OK	4,556	Non-engaged
-4.0	34.9 [56]	OK	0.0	OK	On	OK	3,414	Non-engaged
-3.5	32.6 [52]	OK	0.0	OK	On	OK	1,998	Non-engaged
-3.0	29.7 [48]	OK	0.0	OK	Off	OK	1,714	Non-engaged
-2.5	28.3 [45]	OK	0.0	OK	On	OK	1,178	Non-engaged
-2.0	27.7 [45]	OK	0.0	OK	Off	OK	1,062	Non-engaged
-1.5	27.4 [44]	OK	100.0	OK	Off	OK	1,310	Non-engaged
-1.0	26.5 [43]	OK	84.8	OK	On	OK	2,004	Non-engaged
-0.5	22.9 [37]	OK	0.0	OK	On	OK	1,512	Engaged
0.0	18.5 [30]	OK	0.0	OK	On	OK	1,018	Engaged

Figure 91

This data indicates that the Providence Police Cruiser struck the stop sign at approximately 18.5 miles per hour, while the ABS Braking system was engaged.

An examination of the Longitudinal Crash Pulse data showed that the Providence Police Cruiser lost approximately six to seven (6-7) miles per hour of forward velocity as a result of its impact with the stop sign. (Figure 92) With an approximate impact speed of 18.5 miles per hour and a sudden velocity change of –6 to –7 miles per hour, the post-impact speed of the Providence Police Cruiser would have been approximately 11 to 13 miles per hour. From measurements taken at the scene, it was determined that the front of the Cruiser traveled approximately six to seven (6-7) feet from its impact with the stop sign post to its final rest position on the sidewalk of Bissell Street. This would result in a calculated acceleration rate of approximately -30.3 fps^2, with full ABS braking, which is well within the mechanical capabilities of the vehicle. **(Appendix B)**

Longitudinal Crash Pulse (First Record)

Time (msec)	Delta-V, longitudinal (MPH)	Delta-V, longitudinal (km/h)
0	-0.59	-0.95
10	-1.01	-1.62
20	-1.70	-2.74
30	-2.14	-3.45
40	-2.70	-4.34
50	-3.05	-4.91
60	-3.62	-5.83
70	-4.03	-6.49
80	-4.42	-7.11
90	-4.70	-7.57
100	-4.92	-7.92
110	-5.08	-8.18
120	-5.13	-8.26
130	-5.19	-8.35
140	-5.30	-8.53
150	-5.51	-8.87
160	-5.62	-9.05
170	-5.74	-9.23
180	-5.78	-9.31
190	-5.87	-9.44
200	-5.95	-9.57
210	-5.99	-9.64
220	-6.08	-9.78
230	-6.20	-9.97
240	-6.34	-10.20
250	-6.50	-10.46

Figure 92

The Pre-Crash Data also provided the steering wheel angle in degrees, for every tenth of a second, for the five (5) seconds leading up to Time Zero. A positive steering wheel angle is indicative of left steering input, while a negative steering wheel angle is indicative of right steering input.

The data showed that from five (5) seconds to three-point eight (3.8) seconds prior to Time Zero, Officer Endres' steering input decreased from approximately 18.8 degrees to the left to 10.1 degrees to the left. From three-point seven (3.7) seconds to two point four (2.4) seconds prior to Time Zero, Officer Endres' began steering the vehicle to the right, reaching a maximum of -43.6 degrees. From two-point three (2.3) seconds to one point seven (1.7) seconds, Officer Endres' steered the vehicle back to the left, reaching a maximum of 53.2 degrees. From one-point six (1.6) seconds to zero point nine (0.9) seconds prior to Time Zero, Officer Endres' rapidly increased the steering back to the right, reaching a maximum of -282.4 degrees. From zero-point eight (0.8) seconds to zero point two (0.2) prior to Time Zero, Officer Endres' steered the vehicle back to the left, reaching a steering angle of -111.6 degrees. For the last two-hundredths of a second (0.1 to 0.0) the steering angle indicated a rapid steering increase back to the right, ending at Time Zero with a steering angle of -269.8 degrees. (Figure 93)

Pre-Crash Data -5 to 0 sec [10 samples/sec] (First Record)

Time (sec)	Stability Control Lateral Acceleration (g)	Stability Control Longitudinal Acceleration (g)	Stability Control Yaw Rate (deg/sec)	Stability Control Roll Rate (deg/sec)	Steering Wheel Angle (deg)
-5.0	0.16	-0.11	4.58	-0.63	18.8
-4.9	0.12	-0.16	4.42	0.87	16.4
-4.8	0.11	-0.07	3.72	-0.07	14.0
-4.7	0.09	-0.03	2.66	-0.19	10.8
-4.6	0.11	-0.05	1.95	1.11	10.6
-4.5	0.09	-0.10	2.29	-0.19	10.9
-4.4	0.06	-0.16	2.18	0.44	10.2
-4.3	0.10	-0.13	1.95	0.23	10.1
-4.2	0.08	-0.13	2.09	0.71	10.1
-4.1	0.07	-0.17	2.11	-0.71	11.1
-4.0	0.06	-0.16	2.29	0.39	11.3
-3.9	0.05	-0.21	2.18	-0.19	10.9
-3.8	0.06	-0.34	2.15	-0.95	10.1
-3.7	0.04	-0.53	2.04	-0.52	7.0
-3.6	0.00	-0.57	0.77	-1.40	0.8
-3.5	-0.06	-0.38	-1.40	-1.64	-8.9
-3.4	-0.16	-0.11	-4.70	-2.96	-22.6
-3.3	-0.13	-0.05	-7.33	-1.51	-26.6
-3.2	-0.28	-0.05	-7.98	-0.71	-33.3
-3.1	-0.20	-0.05	-8.79	-1.91	-36.0
-3.0	-0.20	-0.10	-8.81	1.32	-31.5
-2.9	-0.14	-0.29	-6.45	3.60	-21.6
-2.8	-0.06	-0.25	-3.95	2.72	-13.7
-2.7	-0.06	-0.12	-2.88	2.12	-10.8
-2.6	-0.11	-0.05	-3.84	-1.16	-19.8
-2.5	-0.17	-0.05	-6.63	-1.19	-30.8
-2.4	-0.26	-0.05	-9.38	-1.67	-43.6
-2.3	-0.19	-0.04	-10.40	1.59	-38.5
-2.2	-0.17	-0.03	-7.65	3.95	-26.6
-2.1	-0.08	-0.03	-5.04	3.28	-17.9
-2.0	0.00	-0.06	-2.76	2.99	-5.1
-1.9	0.15	-0.06	1.38	4.19	17.5
-1.8	0.30	-0.06	8.23	5.72	49.7
-1.7	0.27	0.00	13.22	1.43	53.2
-1.6	0.21	0.01	9.72	-4.79	29.9
-1.5	-0.03	0.01	2.22	-7.87	1.9
-1.4	-0.42	-0.05	-8.54	-12.59	-64.0
-1.3	-0.61	-0.11	-21.57	-9.72	-137.5
-1.2	-0.73	-0.31	-29.61	-0.31	-179.3
-1.1	-0.92	-0.10	-35.43	-0.36	-219.6
-1.0	-0.91	-0.12	-41.41	-3.95	-266.1
-0.9	-0.83	-0.10	-45.39	0.76	-282.4
-0.8	-0.90	-0.27	-42.68	-0.52	-274.9
-0.7	-0.77	-0.58	-31.89	3.47	-244.3
-0.6	-0.74	-0.53	-28.29	9.40	-200.5
-0.5	-0.58	-0.48	-27.57	4.84	-172.2
-0.4	-0.33	-0.60	-22.88	3.60	-138.1
-0.3	-0.32	-0.74	-17.50	0.28	-113.6
-0.2	-0.21	-0.85	-14.91	-1.51	-111.6
-0.1	-0.35	-0.75	-16.59	2.99	-166.8
0.0	-0.38	-0.80	-21.61	-0.23	-269.8

Figure 93

Based upon an analysis of the data within the report, it was determined that the Providence Police Cruiser was slowing decreasing its speed with intermittent braking, from 35 miles per hour to approximately 27 miles per hour, approximately one and one half (1.5) seconds prior to the collision. At that time, the operator of the Providence Police Cruiser began to initiate a rapid turn to the right and subsequently activated the brakes and engaged the ABS System. The Providence Police Cruiser then struck the stop sign post while traveling approximately 18.5 miles per hour, with full ABS braking.

(See full Bosch Crash Data Retrieval Report – Appendix C)

1999 White and Black Yamaha Zuma Scooter:

Due to the circumstances of this crash, the speed of the Yamaha scooter was not calculated. However, using the video surveillance footage along with the established speeds of the Providence Police Cruiser, it appears as though the scooter enters the Advanced Telesystems Group Inc. surveillance footage while traveling less than the speed of the Cruiser at that point. Based upon a review of the Bosch Crash Data Retrieval System report and the time and distance calculations, the estimated speed of the Cruiser in this area was approximately twenty-seven miles per hour (27 MPH) and decreasing. The Yamaha scooter can also be seen braking from this point and then turning right onto the sidewalk. During that time, the Cruiser continues to close on the scooter and applies its brakes before striking the stop sign post.

Time and Distance Calculations

For this investigation, we had five (5) different videos capturing all or portions of this crash event. Using the established point of contact with the stop sign post (Time Zero, -0.0), the displayed time of the synchronized video footage from both the Advanced Telesystems Group Inc. and [redacted] cellular phone, was 05:50:10.166. From these two videos, and from the fixed surveillance camera footage from [redacted] residence, the following scaled diagrams were created.

These diagrams depict the approximate locations of the Officer Endres' Cruiser, Officer McParlin's Cruiser, and the Yamaha scooter in full half (0.5) second intervals, for the last two and one-half (2.5) seconds leading up to the collision with the stop sign post, and one half (0.5) second after the collision with the stop sign post. For these diagrams, the times are based on Time Zero being the impact with the stop sign post at 05:50:10.166.

When comparing these diagrams to the video analysis, there are slight fluctuations in the locations of the vehicles in the fixed surveillance camera footage from [redacted] residence, when compared to the sychronized Advanced Telesystems Group Inc. and [redacted] cellular phone videos. The Advanced Telesystems Group Inc. and [redacted] cellular phone video recorded the event at approximately 28 to 30 frames per second – which is one video frame every thirty-three (33) to thirty-five (35) milliseconds. [redacted] fixed surveillance camera footage from his residence recorded the event at approximately 21 frames per second – which is one video frame every forty-seven (47) milliseconds. The three video images displayed with each scaled diagram are as close as could be established based on the differing frame rates. For illustrative purposes, these slight fluctuations in precise locations, in comparison to each other over the course of milliseconds, will have a negligible effect.

The following scaled diagrams provide a three dimensional, top-down perspective of the vehicles and their locations on the roadway. This perspective replicates the spacing and measured distances between Officer Endres' Cruiser and the Yamaha scooter as they approach the stop sign post in one half (0.5) second intervals. For these scaled diagrams, the EdgeFx software was used to measure the distances between the vehicles at each interval and is displayed within the diagram in feet.

For each time interval below, the indicated speed of Officer Endres' Cruiser, as recorded by the Bosch Crash Data Retrieval System Report and displayed in Figure 91 above, was identified.

The following scaled diagram depicts the top-down view of the approximate locations of Officer McParlin's Cruiser, Officer Endres' Cruiser, and the Yamaha scooter approximately two and one-half (2.5) seconds prior to the impact with the stop sign post. (Figures 94 – 97) At this point, Officer Endres' Cruiser was traveling at approximately 28.3 miles per hour and was approximately thirty-two (32') feet from the rear of the Yamaha scooter.

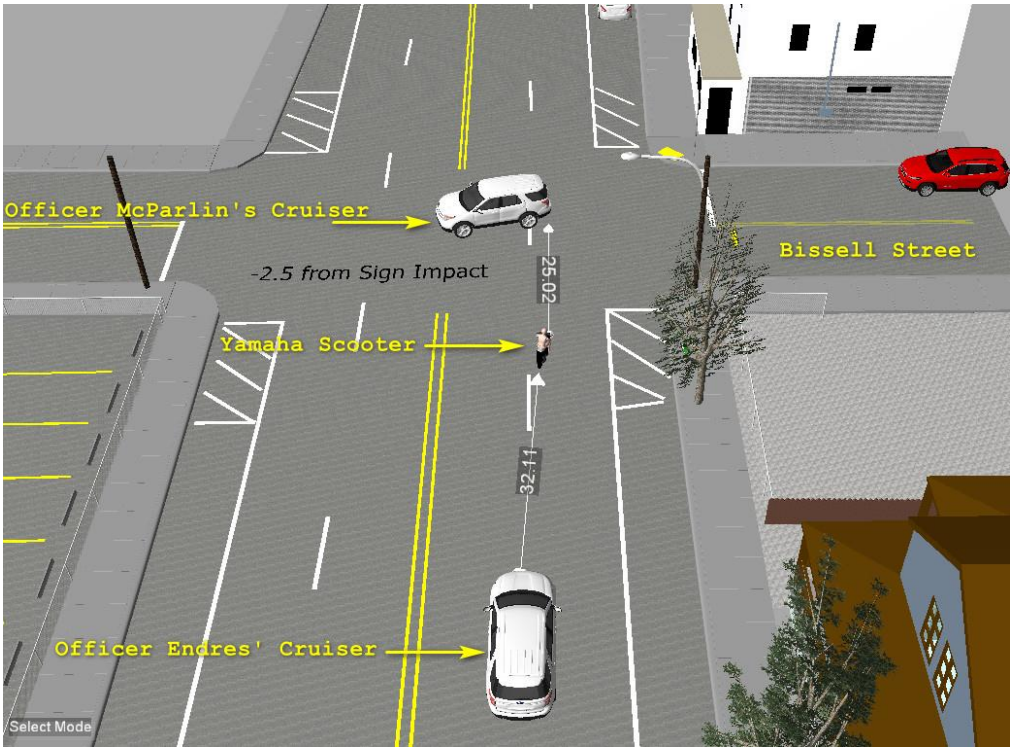


Figure 94

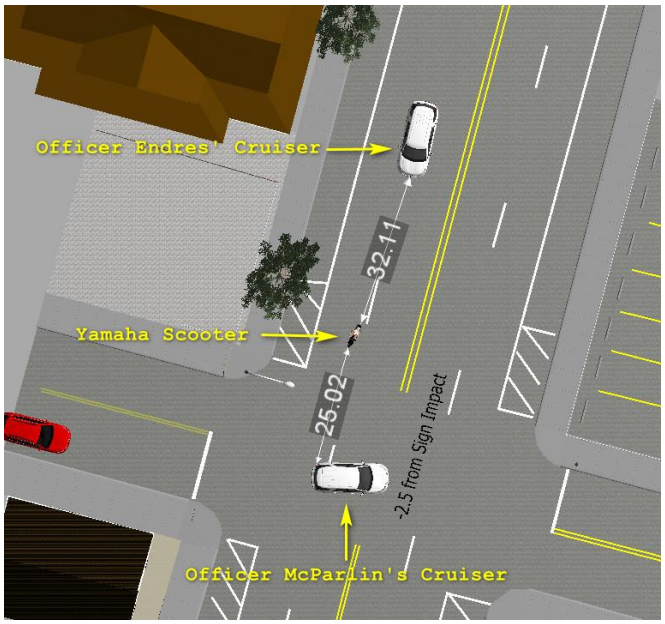


Figure 95

Advanced Telesystems Group Inc. **[redacted] cellular phone**

TIME 05:50:07.666

Figure 96

[redacted] residence surveillance video

Figure 97

The following scaled diagram depicts the top-down view of the approximate locations of Officer McParlin's Cruiser, Officer Endres' Cruiser, and the Yamaha scooter approximately two (2.0) seconds prior to the impact with the stop sign post. (Figures 98 – 100) At this point, Officer Endres' Cruiser was traveling at approximately 27.7 miles per hour and was approximately thirty (30') feet from the rear of the Yamaha scooter.

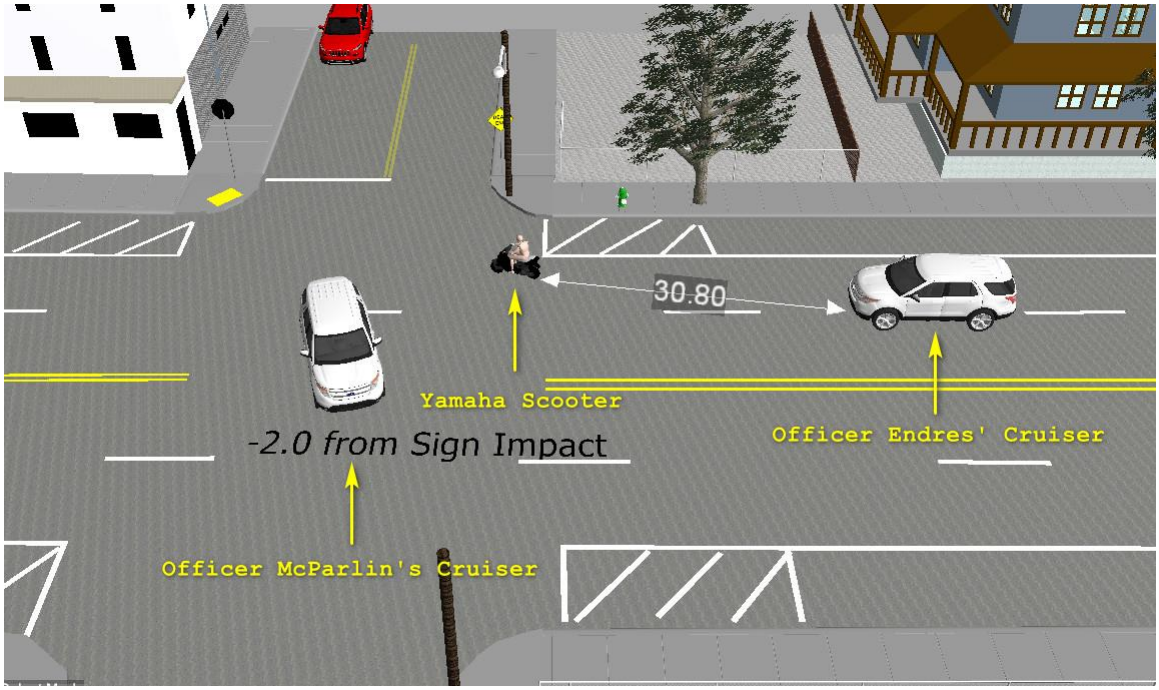


Figure 98

Advanced Telesystems Group Inc. **[redacted] cellular phone**

TIME 05:50:08.166

Figure 99

[redacted] residence surveillance video

Figure 100

The following scaled diagram depicts the top-down view of the approximate locations of Officer McParlin's Cruiser, Officer Endres' Cruiser, and the Yamaha scooter approximately one and one half (1.5) seconds prior to the impact with the stop sign post. (Figures 101 – 103) At this point, Officer Endres' Cruiser was traveling at approximately 27.4 miles per hour and was approximately eighteen (18') feet from the rear of the Yamaha scooter.

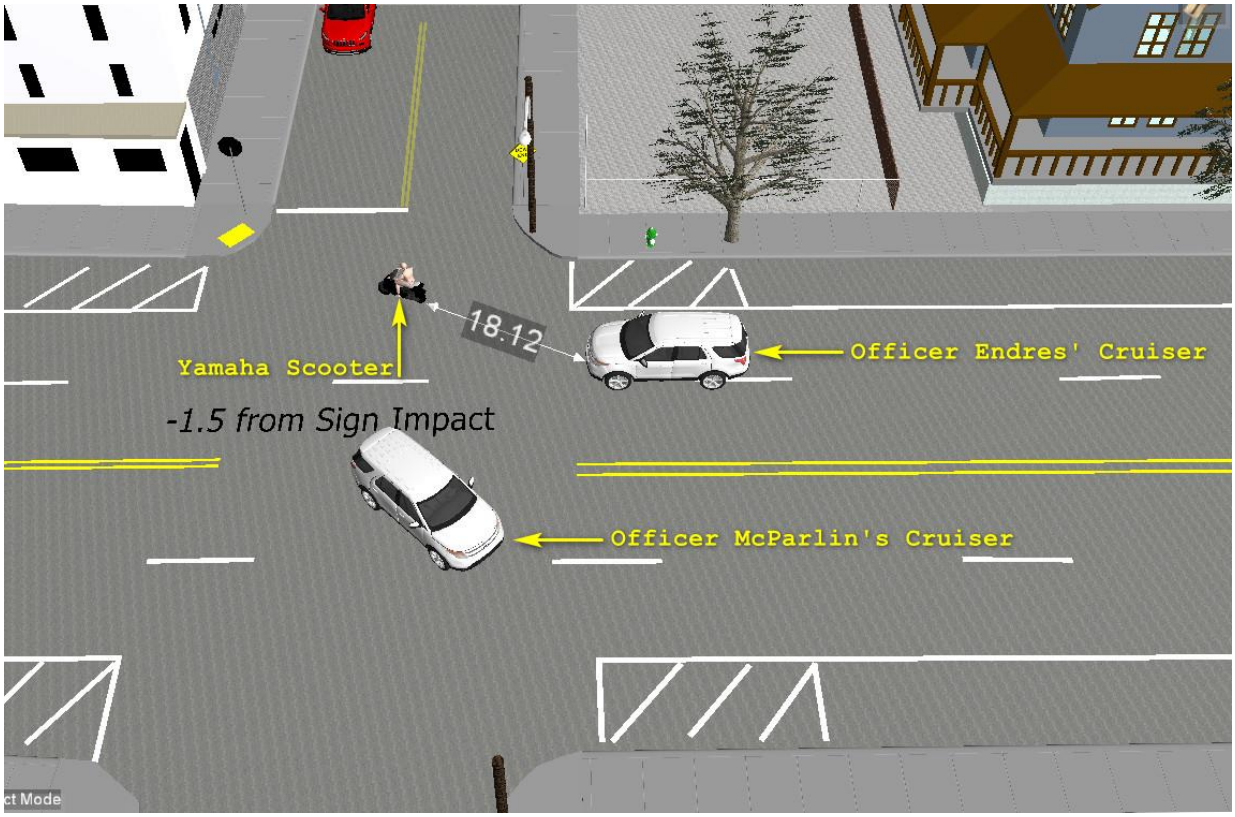


Figure 101

Advanced Telesystems Group Inc. **[redacted] cellular phone**

TIME 05:50:08.666

Figure 102

[redacted] residence surveillance video (*Closest Frame)

Figure 103

The following scaled diagram depicts the top-down view of the approximate locations of Officer McParlin's Cruiser, Officer Endres' Cruiser, and the Yamaha scooter approximately one (1.0) second prior to the impact with the stop sign post. (Figures 104 – 106) At this point, Officer Endres' Cruiser was traveling at approximately 26.5 miles per hour and was approximately fourteen (14') feet from the rear of the Yamaha scooter.

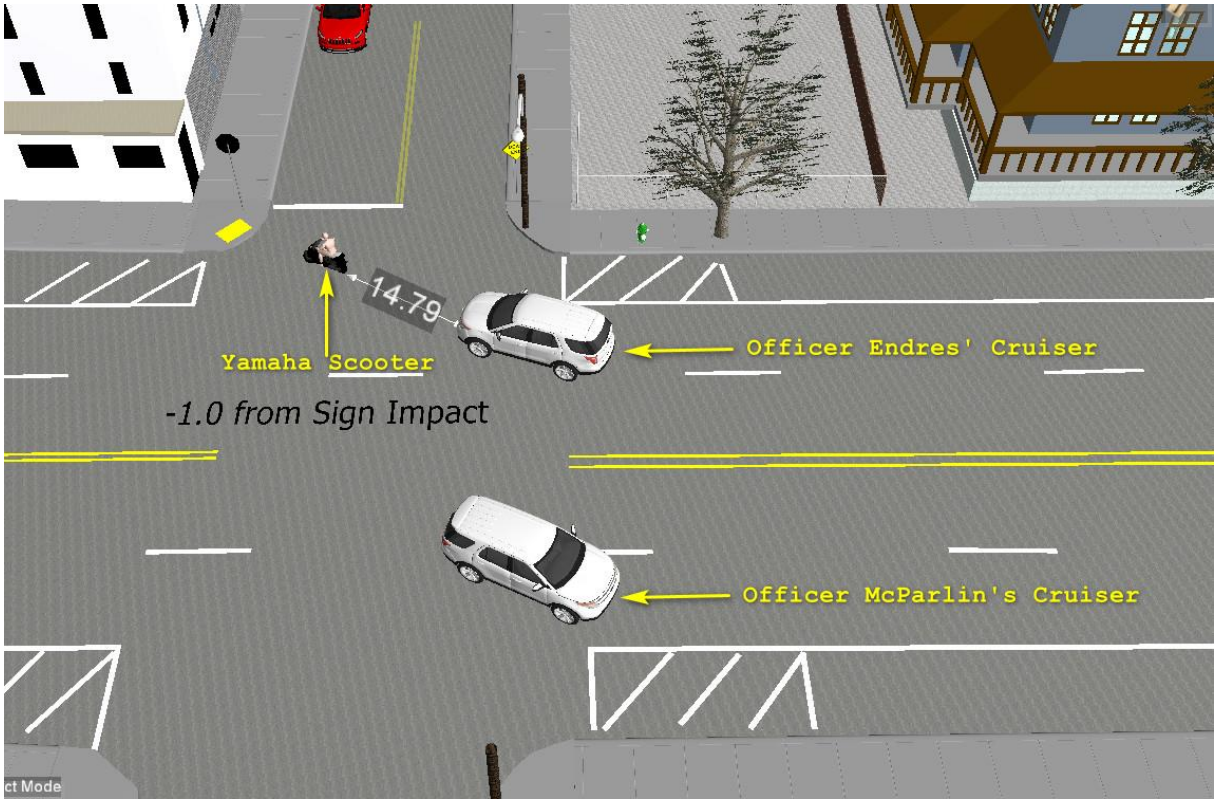


Figure 104

Advanced Telesystems Group Inc. **[redacted] cellular phone**

TIME 05:50:09.166

Figure 105

[redacted] residence surveillance video

Figure 106

The following scaled diagram depicts the top-down view of the approximate locations of Officer McParlin's Cruiser, Officer Endres' Cruiser, and the Yamaha scooter approximately one half (0.5) second prior to the impact with the stop sign post. (Figures 107 – 109) At this point, Officer Endres' Cruiser was traveling at approximately 22.9 miles per hour and was approximately eleven (11') feet from the rear of the Yamaha scooter.

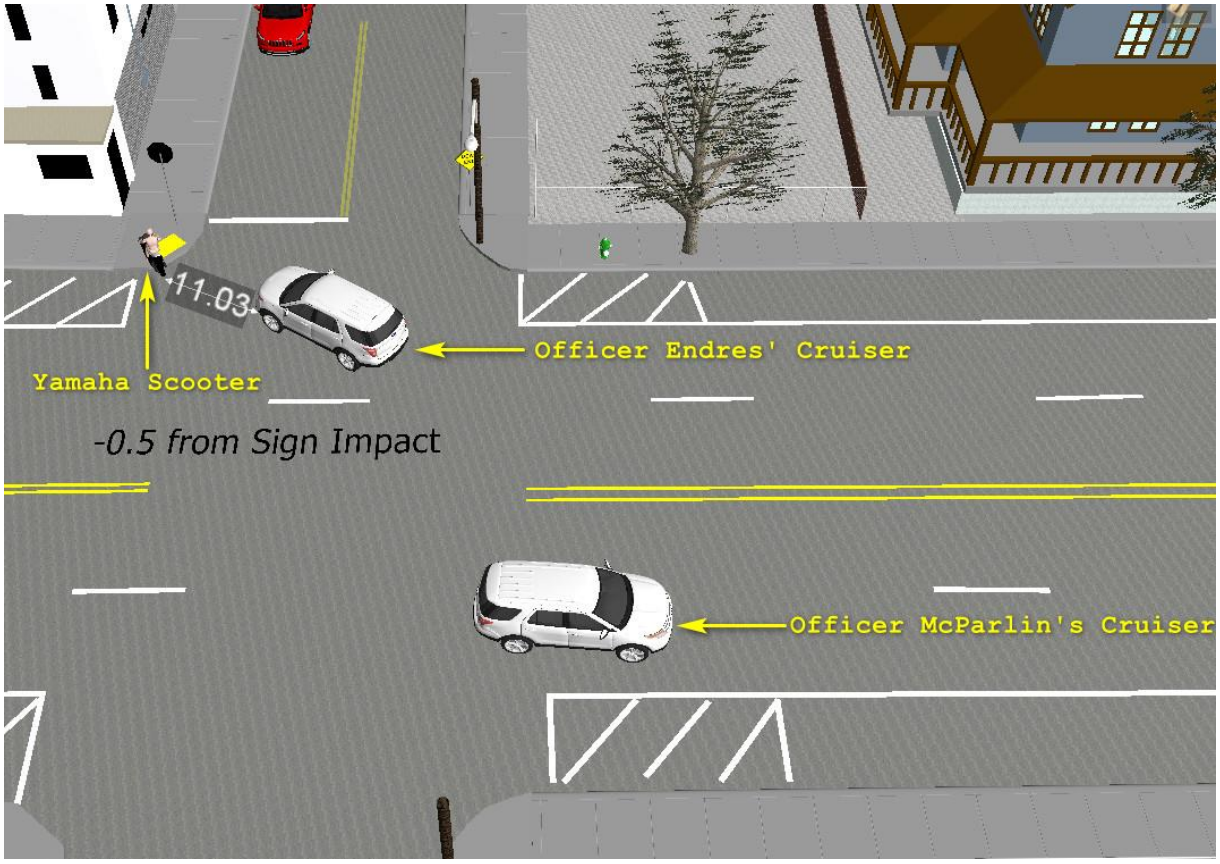


Figure 107

Advanced Telesystems Group Inc. **[redacted] cellular phone**

TIME 05:50:09.666

Figure 108

[redacted] residence surveillance video

Figure 109

The following scaled diagram depicts the top-down view of the approximate locations of Officer Endres' Cruiser and the Yamaha scooter at the time of the impact with the stop sign post (Time Zero -0.0). (Figures 110 – 112) The location of the Yamaha scooter was estimated from the surveillance video from [redacted] residence and placed east of the stop sign contact and left brake lever contact with the brick wall. At this point, Officer Endres' Cruiser was approximately five (5') feet from the rear of scooter, while traveling at approximately 18.5 miles per hour with the ABS braking system engaged.

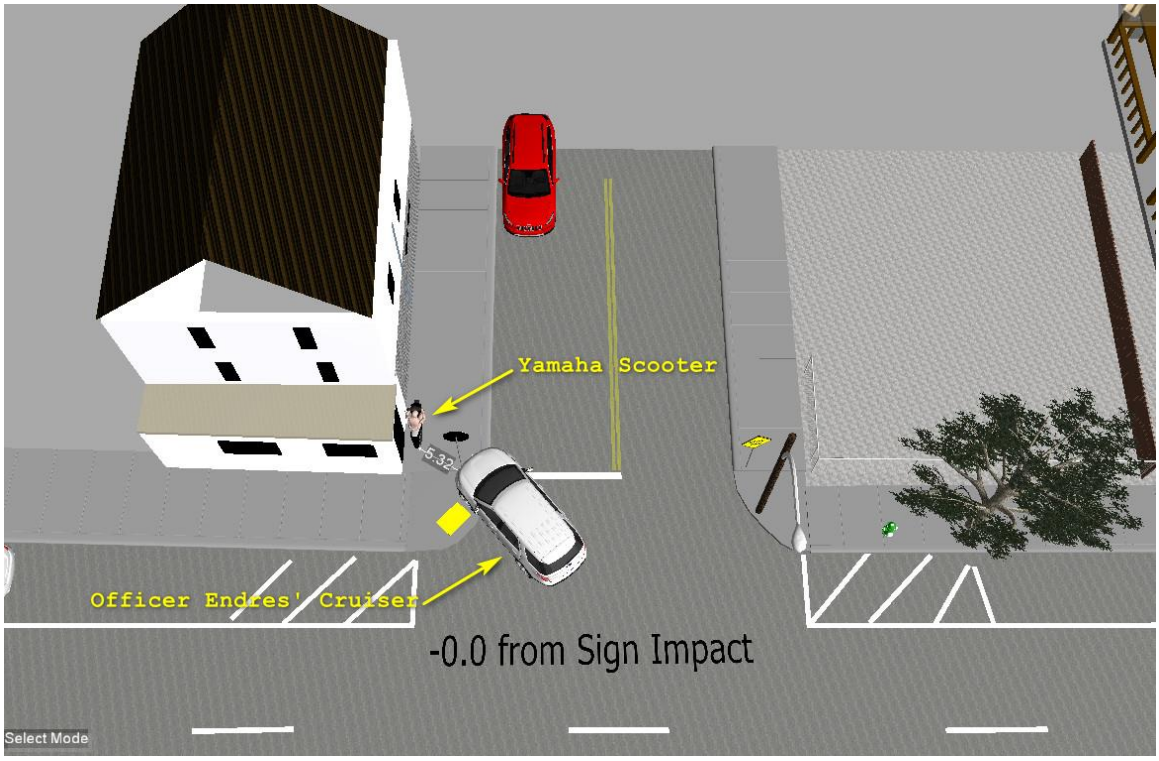


Figure 110

Advanced Telesystems Group Inc. **[redacted] cellular phone**

TIME 05:50:10.166

Figure 111

[redacted] residence surveillance video

Figure 112

The next diagram illustrates the approximate location of the Yamaha scooter as the stop sign deflected downward and struck the wall. The sign was moved forward into contact with the brick wall at the measured height, and the left brake lever was placed along the beginning of the measured impact scuff mark in the brick wall. Both the stop sign and the brake lever appear to be striking the wall at nearly the same time. In this diagram, the Providence Police Cruiser was left at the area of first contact with the stop sign post to better illustrate the post moving away from its base in the sidewalk. The diagram also illustrates the final rest area of Mr. Gonsalves and the Yamaha scooter after the impact. (Figure 113)

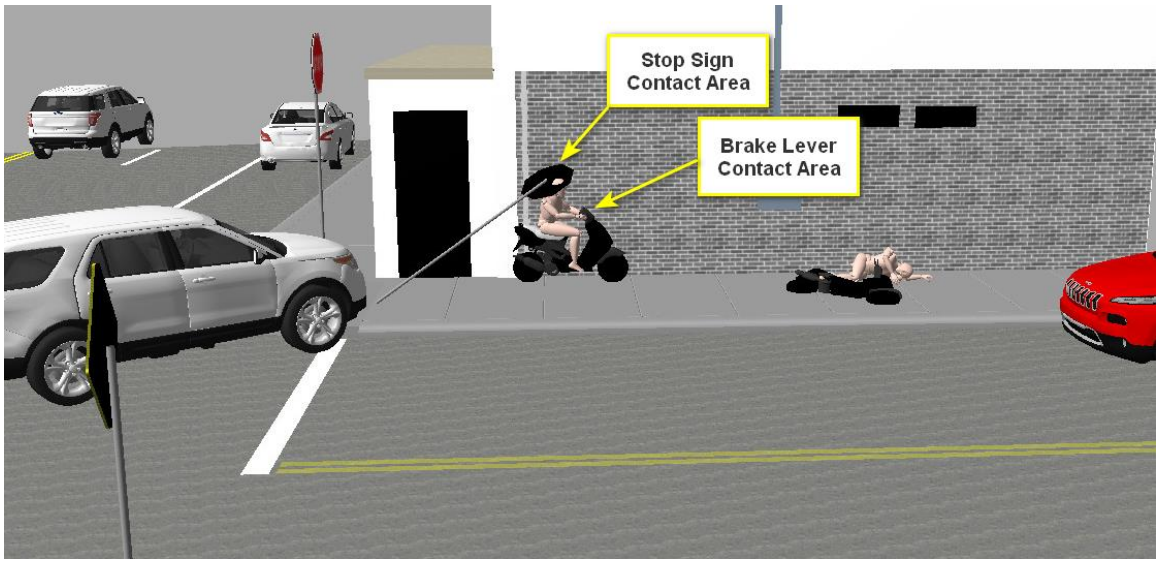


Figure 113

The following scaled diagram depicts the top-down view of the approximate locations of Officer Endres' Cruiser and the Yamaha scooter approximately one half (+0.5) second after the impact with the stop sign post. (Figures 114 – 117) At this point, Officer Endres' Cruiser was coming to a complete stop as the stop sign can first be seen in [redacted] cellular phone video. The estimated distance from the front of Officer Endres's Cruiser to the rear of the Yamaha scooter was over five (5') feet and increasing.

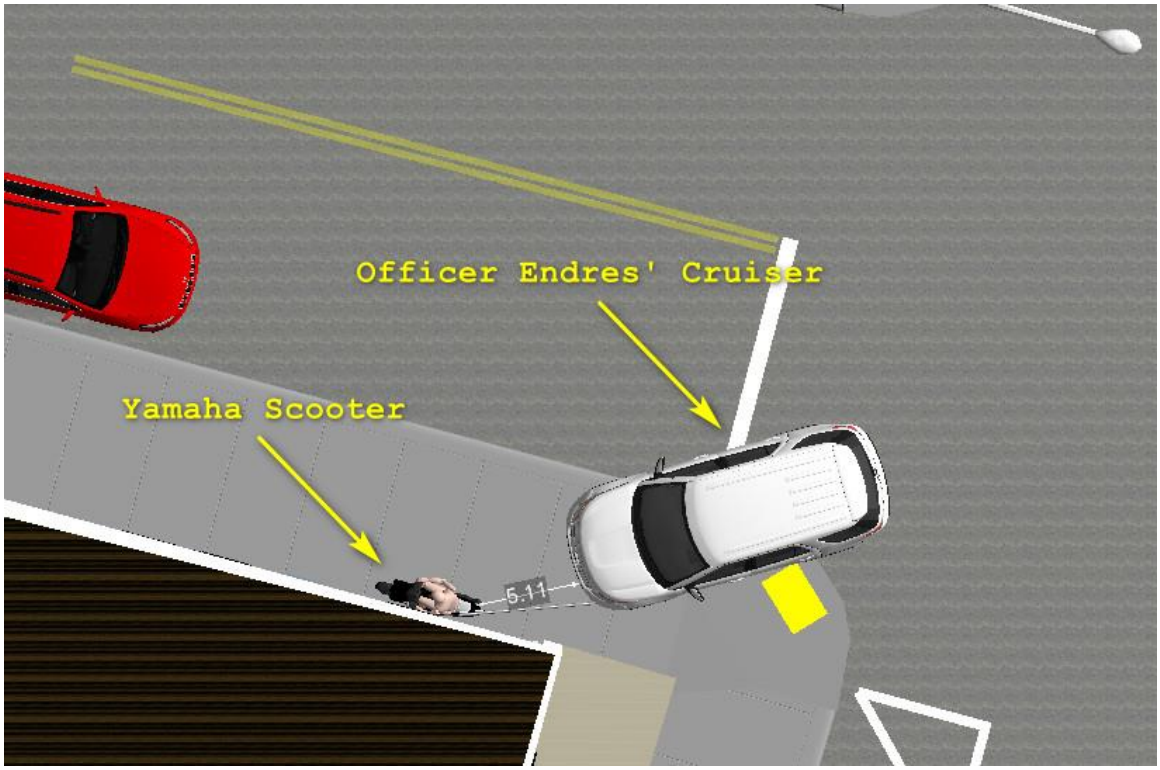


Figure 114

Figure 115

Advanced Telesystems Group Inc. **[redacted] cellular phone**

TIME 05:50:10.666

Figure 116

Figure 117

After viewing the scaled diagrams from a top down perspective, it was again evident that the front of the Providence Police Cruiser did not strike the Yamaha scooter at any point during this crash sequence.

Conclusion

As part of this investigation, the members of the State Police investigative team examined the scene of the crash, photographed and measured the Providence Police Cruiser, the Yamaha scooter, the stop sign, and its post. The members conducted additional forensic examinations of the vehicles and the stop sign using magnification and macrophotography. The members examined the vehicle contours, damage profiles, and corresponding vehicle alignments. The members conducted a speed analysis and time and distance calculations. The members broke down the cellular phone video footage and fixed surveillance camera footage into individual video frames and linked two video angles together, synchronizing them over the same elapsed time. The members created scaled diagrams of the crash sequence to view from a top down perspective. The Rhode Island Crime Lab conducted a separate forensic examination of the stop sign and the helmet of the Yamaha scooter operator, and it provided its findings to the investigative team.

The Rhode Island State Police investigation revealed that the Yamaha scooter was traveling south on Elmwood Avenue and turned west onto the southwest sidewalk of Bissell Street. The Yamaha scooter traveled along the side of the brick wall of the building at 1245 Elmwood Avenue. As the Providence Police Cruiser attempted to follow the Yamaha scooter, the operator of the Cruiser performed an emergency braking and steering maneuver, however, the front of the Cruiser struck a vertical stop sign post on the corner. The stop sign and post broke from its mount in the sidewalk and was projected forward and downward towards the brick wall. During this time, the left side of the Yamaha scooter struck a portion of the brick wall in a minor sideswipe manner. As the stop sign and post continued downward, the center of the stop sign, in line with its metal post, struck the operator of the Yamaha scooter on the back right-side of his helmet. The contact with the signpost knocked the Yamaha scooter operator unconscious and he fell onto the sidewalk and came to rest. The Providence Police Cruiser stopped

approximately six feet after striking the stop sign and came to rest on the sidewalk of Bissell Street, to the east of the Yamaha scooter and its operator.

After an extensive examination of the scene, the vehicles, the damage profiles, the forensics, and the video footage, the Rhode Island State Police have determined that the Providence Police Cruiser did not strike the rear of the Yamaha scooter or its operator at any point during the crash sequence.

The causation of Mr. Gonsalves' scooter crash was determined to be the Providence Police Cruiser striking the vertical stop sign post and projecting it downward onto the helmet of the Yamaha scooter operator traveling ahead.

For additional information of the above crash reference:

CRU Case File # 20-CRU-298
PPD Case File # 2020-86896

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