Rampion
Visual Productions LLC

Moving Media Demonstrative Evidence Experts

DRAFT January 25, 2019

Examination of Surveillance Videos
From 1050 Tremont St., Boston, MA - October 28, 2012
Relating to the Case of David Yarde, Defendant

At the request of attorneys Jarrett Adams, Esq. and Carlton Williams, Esq., I have examined four digital video files that were recorded by a surveillance system at 1050 Tremont Street in Boston, MA on October 28, 2012. Each video file represents a different exterior surveillance camera's angle of view; all were recorded simultaneously during a fatal shooting incident. While none of the four cameras show the exact moment that the fatal gunshot was fired, attorneys Adams and Williams inquired if it would be possible to ascertain, from the content of the four videos, a more precise time period that the fatal shot was fired; and consequently, would their client, David Yarde, have been in a position to fire the fatal gunshot.

The surveillance recordings were identified by "Camera Number" and were labeled as 5, 7, 13, and 14. Cameras 14 and 7 offer the most direct views of the area involved in the shooting, both providing reverse angle coverage of the walkway area and the interactions between the four individuals visible on-camera. Cameras 5, 7, and 13 were static views with the cameras locked at stationary angles; however, Camera 14 was set to automatically sweep and pan a 180-degree area of view. I am familiar with the movements of Camera 14 from an unrelated 2011 murder case (*Commonwealth v. Steven E. Rolley SUCR 2011-11088 Suffolk Superior Court*) that I performed forensic work on. Unfortunately in this case, Camera 14 pans away from the area of the shooting just before the incident would have been recorded, but the reverse angle of view from Camera 7 shows Deandrea Russ's body fall to the ground.

Knowing that all four camera views were recorded simultaneously by the same surveillance system, I knew that the recordings would by synchronized to the same date/time clock which is displayed in each video's interface window. I used digital compositing software (Adobe After Effects CS5.5) to create a new single quad-screen video file that would play all four videos simultaneously, synchronized so that the hour, minute, and seconds displayed in each of the four interfaces matched for all four video recordings.

The Camera 5 video clip (lower left) did not start until after the group of three individuals were already running from the scene of the shooting, and Camera 13's view (lower right) of the area of the shooting was blocked by one of the building's rectangular columns, so neither were useful in determining an exact time of the shooting; therefor, Cameras 14 and 7 were my main views to focus on.

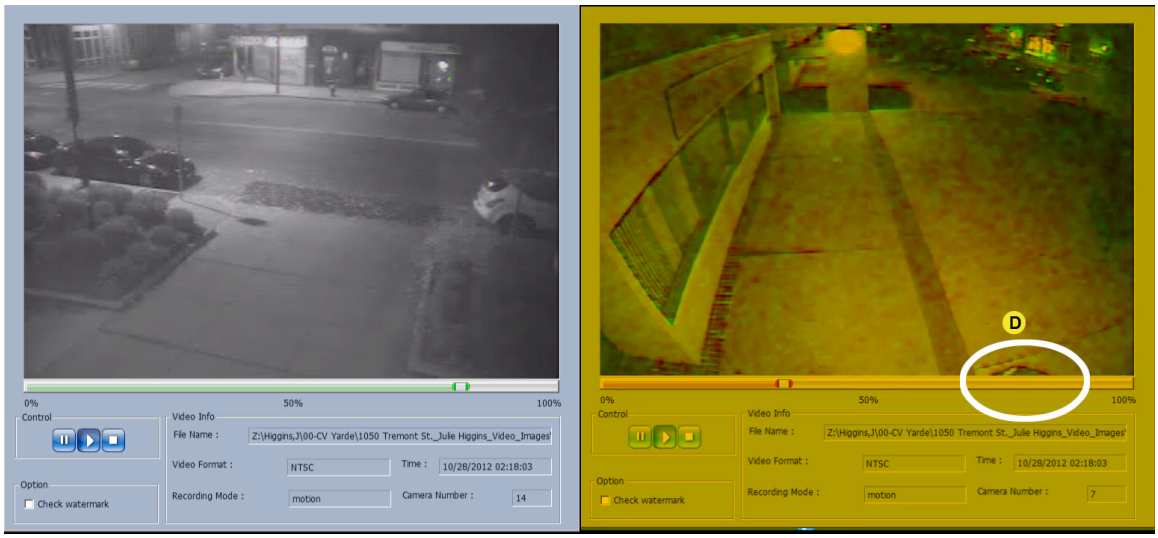
From 2:17:55 AM until 2:18:03 AM, Camera 14 (left) shows the interactions between Deandrea Russ, the decedent (D), to the left of the rectangular column and the three individuals (#1-3) including David Yarde (#1), wearing the white cap, to the right of the column.

As the video progresses to 02:18:00 AM, the camera zooms in on the group and crops Individual #3 out of the camera frame, to the right of David Yarde (1); Individual #2 begins to move around to the back side of the rectangular column, blocked from the camera's view.

Two seconds later, at 02:18:02 AM, on the last clearly visible frame before Camera 14 pans away from the area of the shooting, David Yarde (#1) can be seen moving to his right towards the right-hand side of the column; Individual #3 is now visible in the video frame to the right side of Mr. Yarde and on the back side of the column; and from behind

the left-hand side of the column (to the left side of Deandrea Russ) Individual #2's shadow and tip of his sneaker is visible (Green Arrow).

Based on the synchronization of the clocks in the two videos (14 and 7), Camera 14's video pans away from Mr. Russ at 02:18:02 AM, ten frames later at 02:18:03 AM Mr. Russ's body can be seen falling to the ground in Camera 7 (right) outlined in white. This means that the fatal gunshot had to be fired in the one-second period between 02:18:02 AM and 02:18:03 AM.



Additionally, having reviewed a report from Elizabeth A. Laposata, MD, FCAP, FASCP dated January 18, 2019, Dr. Laposata states,

> "In this case, the fatal gunshot entered the left side of Mr. Russ's forehead, passed through the skull and brain and exited the back of the right side of his head, in a pathway nearly horizontal. This wound would be expected to cause immediate unconsciousness and collapse. Gunpowder was found imbedded in the skin of the

face around this entrance wound…The presence of gunpowder tattooing or stippling give an approximate range of fire or the distance between the muzzle of the gun and the skin target. As a general rule, gunpowder can only travel about 2 to 3 feet…This established that Mr. Russ sustained the gunshot would to the forehead from a perpetrator firing a gun several feet away from him." (Pp. 1-2).

As is visible in the last clear video frame from Camera 14 at 02:18:02 AM, Mr. Yarde (#1) is moving to his right behind the column with Mr. Russ squarely facing him. At the same time, Individual #2 becomes visible, moving from behind the backside of the column and would be in a position directly facing the left side of Mr. Russ's forehead as he clears the corner of the column. Based on the thickness of the rectangular column from the pictures below, Individual #2 would be in a better location and distance to Mr. Russ to fire the fatal shot in the one second time window, than Mr. Yarde would be.

Figures 3 and 4
Spaced rectangular pillars on sidewalk and close-up of pillar dimensions

Images from Dr. Laposata's January 18, 2019 Report (p. 4)

Based upon my previous work with surveillance footage from the location of 1050 Beacon Street, Boston, MA I have taken into account that there are several technical Issues relating to the video files that I have examined relating to this case. First, the four video files are all Mac-based QuickTime movie (.mov) files, which are not consistent with standard surveillance video systems; in my professional experience, I have never come across a Mac-based surveillance system. Surveillance systems output either an executable (.exe) program file, which may include additional related files, or a PC-based video file (.avi, .wmv, etc.). Secondly, there is a clear discoloration to the video files from Cameras 7 and 13, which display a distinct greenish-yellow tint.

And third, from my previous forensic work with the Camera 14 video footage from 1050 Tremont Street in Boston, the files provided to me in my earlier case were *Divar MR Archive Player* files, not QuickTime movie files (.mov). The four video files that I examined in this case appeared to be screen capture/recording files, video segments generated by a computer program capable of recording content that is played back on a computer monitor. Depending on the settings of the software program used to create the

screen recordings, as well as the speed of the computer used, the frame rates of the video files generated could have been affected.

The technical aspect of "motion" that is visible in video is created by recording a series of still images every second (up to 30 images for standard, non-HD video) at a consistent rate. When the recording is played back, the viewer perceives any changes in the position of objects between the still frames as movement. The higher the number of frames per second (fps) up to 30, the smoother the motion will appear; the lower the frames, the more staccato or jerky the motion appears, and the finer details of movement will be lost.

In the case of the video files that I examined, three of the video recordings (Cameras 5, 7, and 13) all played back at 12 fps (frames per second), meaning that in a one second period of time (based on the time/date stamp generated by the surveillance system at 1050 Tremont Street) there are twelve distinct changes to the images generated by each camera view. Only Camera 14 differed in that it played back at 9 frames per second. Since these video files were not direct outputs from the 1050 Tremont Street surveillance system, the difference in frame rates could have been introduced by the screen capture recording process. However, the time/date stamp information generated by the 1050 Tremont Street surveillance system, which is visible on the interface window on each video file (.mov) would not have been altered by the screen capture process.

Based upon my review of the synchronized Camera 14 and 7 recordings, the clocks in the videos indicate a time period spanning 02:18:02 to 02:18:03, which includes the last frame that Mr. Russ is clearly visible in the Camera 14 video (just before the camera pan) up to the first frame that Mr. Russ's falling body is seen in the Camera 7 video. Camera 14 is playing back at 9 frames per second (fps), and the camera pan occurs 6 frames after the clock indicates 02:18:02, leaving only 3 frames until Camera 14's clock changes to 02:18:03. Camera 7, is playing back at 12 fps, and Mr. Russ's body appears 7 frames into the time change to 02:18:03. The math, based on the frame rates of the two videos, would indicate that the fatal shot had to be fired between 1/3 of a second before the clocks change to 02:18:03 (based on Camera 14's frame rate) and ½ of a second after the clocks change to 02:18:03 (based on Mr. Russ's body becoming visible in Camera 7). Regardless of the differences in frame rates of the two videos (9fps versus 12fps), both cameras are measuring the exact same one-second time period. From Camera 14's clock we can see (for 6 frames) that Mr. Russ has not been shot during 02:18:02, and from Camera 7's clock we can see Mr. Russ's body falling to the ground after the clocks on both video recordings have changed to 02:18:03.

Given the position of Mr. Yarde (#1), moving to his right behind the column with Mr. Russ squarely facing him, versus Individual #2 stepping out from behind the column to directly face the left side of Mr. Russ's forehead, and given the less-than-one-second window of time that the fatal shot had to be fired in, Individual #2 would have been in better position and have had more time to fire the fatal shot(s) than Mr. Yarde, who would have to navigate around the column, Individual #3, and #2 and then fire the fatal gunshot, all without Mr. Russ changing the position of his body.

Michael R. Garneau, Moving Media Expert
A/V Forensic Expert
General Partner, RAMPION

January 25, 2019