



# Using 3D Laser Technology Results in Significant Savings for Interagency Investigation Team



## Challenge

Fatal and serious injury crashes were causing lengthy roadway closures in an Oregon county. An interagency crash investigation team was tasked with finding a way to reduce roadway closure times without compromising the crash scene data collection process.

## Solution

The team purchased and introduced the use of a FARO® Focus<sup>3D</sup> X 330 Laser Scanner.

## Results

Since purchasing the FARO Focus<sup>3D</sup> X 330 Laser Scanner:

- Road closure times decreased by 50%.
- The 50% reduction in man-hours required per accident resulted in more efficient use of officers' time who were then available for other investigations.
- In 32 months, the agency saved approximately \$73K in overtime costs alone. The ROI was likely faster when including other realized savings.
- Data gathered from the laser scanner was successfully used to establish points of view and liability, potentially saving Portland from an expensive liability case.

## Customer Profile



Customer:  
Clackamas County  
Sheriff's Office

Website:  
[www.clackamas.us/sheriff/](http://www.clackamas.us/sheriff/)  
CCSO has saved more than  
\$73,000 in overtime costs in  
32 months.

## Success Story: Clackamas County Sheriff's Office

FARO Focus<sup>3D</sup> X 330 Laser Scanner resulted in more time available for other investigations.

The Clackamas County Sheriff's Office (CCSO) in Oregon leads an interagency Criminal Reconstruction and Forensic Team (CRAFT) which includes one full-time and 18 on-call Reconstructionists from eight different police agencies. They have traditionally been called in to investigate fatal and serious injury crashes in Clackamas County and to assist with crime scene investigations. In the past, the team used a total station to map crash scenes and a handheld distance meter for interior scenes. Today, their measurement device of choice is a Focus<sup>3D</sup> X 330 Laser Scanner.

CCSO recognizes the inconvenience that roadway closures cause and rely on FARO's laser scanning technology "to help limit road closure time by speeding up the process while making it more accurate, and at a higher level of detail, than any other method being used around the country."<sup>1</sup> Since purchasing a FARO Focus<sup>3D</sup> X 330 Laser Scanner, the CRAFT team has been able to reduce the time and staff on scene by 50%.

In addition to the time-savings and increased efficiency, CRAFT members are able to be involved in more investigations than ever before. The Lake Oswego Police Department is one of the CRAFT member agencies. Lake Oswego Sergeant Clayton Simon explains how his police agency has benefited. "The capabilities of the scanner have allowed for a more flexible approach to utilizing CRAFT resources on a variety of calls. The ability to work a scene with fewer resources and at a more efficient rate, has opened up the possibilities for more frequent use of the team. Past incidents that may not have fit CRAFT's call out criteria, but were still incredibly important, can now utilize CRAFT resources without a large cost in time or resources. As a smaller agency, this has proven incredibly valuable".

CRAFT is now called out to scan scenes whenever there is an officer-involved shooting, an officer-involved crash, or where a county or city liability may exist. The laser scanner allows investigators to accurately document line of sight issues in a crash or shooting incident. According to Clackamas County Sheriff's Office Criminalist Bryon O'Neil, "In an officer-involved shooting, you can position the view of the point cloud to be at the officer's eye level. As you move through the cloud, you can see the scene exactly as they saw it."

O'Neil also commented on how effective the FARO Laser scanner is at capturing crash and crime scenes, "By using the scanner, we spend less time on the scene, we get better data, and we can use a smaller crew.



Figure 1. Image taken at a crash scene.

I prefer to have two people to set targets and move the scanner, but, if necessary, I can do it all myself." O'Neil calculated that the FARO Focus<sup>3D</sup> X 330 Laser Scanner has saved the CCSO more than \$73,000 in overtime costs in just 32 months of operation representing a return on investment of only 18 months based solely on overtime savings. The ROI was likely faster when including other realized savings.

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*Lake Oswego Sergeant,  
Clayton Smith*

<sup>1</sup> *Criminal Reconstruction and Forensic Team (CRAFT)*. (n.d.). Retrieved January 05, 2017, from <http://www.clackamas.us/sheriff/craft.html>

## Success Story: Clackamas County Sheriff's Office

### Better Courtroom Presentations Created with Point Clouds

Two dimensional diagrams are an important part of courtroom presentations, but sometimes the case requires more. O'Neil explains, "I like to use my 2D diagrams as a quick reference in court because it's easy to explain what we found at the scene, and 2D diagrams are always accepted. When we need to show more details, like line of sight, we bring up the point cloud on a big monitor that is set up in the courtroom."

CRAFT also purchased the FARO CADZone Point Cloud module add-on with their FARO Focus<sup>3D</sup> X 330 Laser Scanner. This add-on allows them to quickly create accurate, 2D and 3D diagrams, as well as animations from the point clouds they capture in the field with their Focus<sup>3D</sup> X 330 Laser Scanner.

CCSO investigators utilize the data that they capture with their FARO Focus<sup>3D</sup> X 330 Laser Scanner to create crash animations in FARO CrashZone software. Officers at the scene use evidence placards to mark important data points, such as the start and end of skid marks or gouges, then investigators create their animations in the CrashZone software so the vehicle symbols pass through each data point. This allows them to step through the animation and verify its accuracy. They can also run the animation through the point cloud of the actual scene, which creates a realistic digital replication.

### Saving the City from Liability: City Bus vs. Skateboarder

O'Neil and CRAFT were called out to investigate an incident where a Portland bus hit a skateboarder who sustained serious injuries. While it might have been easy to believe that the bus driver was at fault, the point cloud captured at the scene and O'Neil's analysis proved otherwise. "A skateboarder was on the sidewalk, at the top of the hill, when the bus started its turn. The guy rode down the sidewalk and right out in front of the bus. I created an animation in CrashZone and used the point cloud to verify the driver's line of sight. I was able to show that it was the fault of the skateboarder – not the bus driver," explained O'Neil.

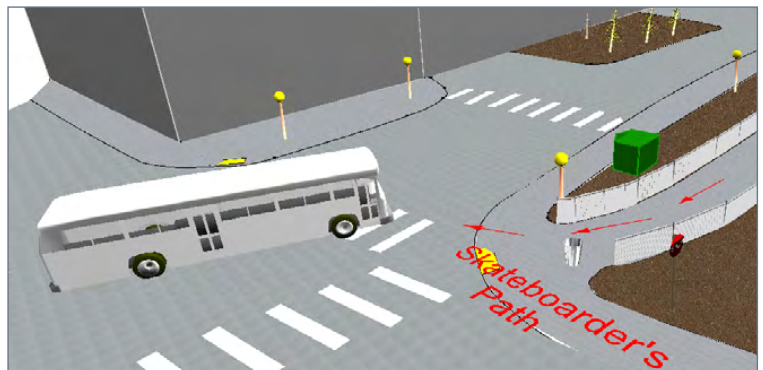


Figure 2. View of accident scene, created in CrashZone.

With the evidence exposed, the case did not go to court, potentially saving the city from an expensive liability case. The Focus<sup>3D</sup> X 330 Laser Scanner has become so important to CRAFT's investigations, the agency has taken special precautions to make sure they are never without access to a scanner. The nearby Gresham Police Department also has a FARO Laser Scanner and they have a cooperative agreement with CCSO to scan scenes for each other, if needed. O'Neil said, "If our scanner is not available, it's good to know we have another option."

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When we present it in court, the animation is much more realistic. The point cloud adds a big impact and the grand juries just love it."

*Clackamas County Sheriff's Office Criminalist,  
Bryon O'Neil*

O'Neil has presented some animations to grand juries, that included the point cloud data, with favorable results. He comments, "Running an animation through the point cloud is my new favorite thing to do. It's so quick and easy to do in CrashZone. When we present it in court, the animation is much more realistic. The point cloud adds a big impact and the grand juries just love it."

## Success Story: Clackamas County Sheriff's Office

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*Criminalist, Bryon O’Neil*

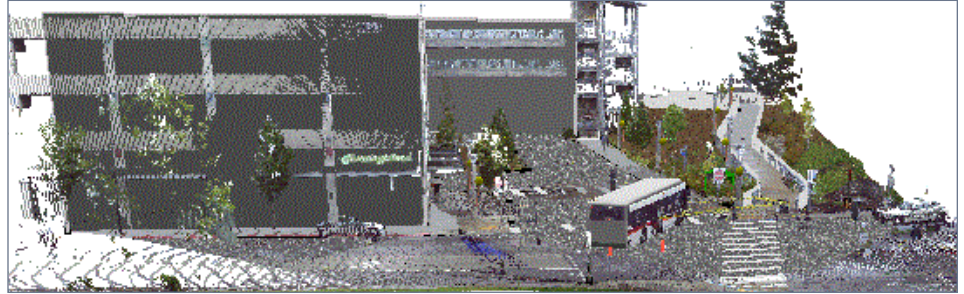


Figure 3. Point cloud of a bus-skateboarder crash scene, as captured with the laser scanner.

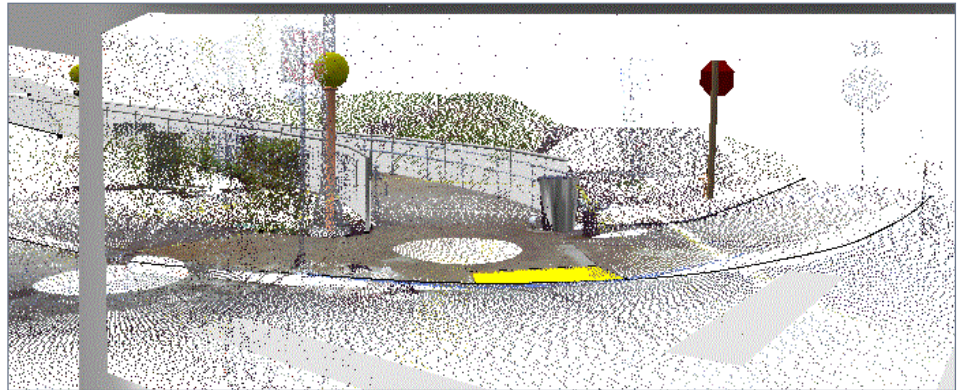


Figure 4. Bus driver's view, as shown in the point cloud.

### Summary

By switching from a total station to a FARO Focus<sup>3D</sup> X 330 Laser Scanner, the Clackamas County Sheriff's Office has seen a tangible return on their investment and introduced new ways the team leverages 3D technology to assist with cases. Since purchasing the scanner, the CRAFT team has not only reduced road closure times due to car accidents, but also reduced the time and staff on the scene by 50%, saving CCSO more than \$73,000 in overtime costs alone within 32 months. In addition to these savings, the CRAFT team has more man-hours available to assist in more investigations, provide analysis in point of view and liability cases, and deliver powerful courtroom presentations.

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