

Measuring at Collision Scenes

Once you have identified your evidence and photographed it, it is time to start taking some measurements. The key to accurate measurements is to maintain a straight line. While you can measure a scene by yourself it will be a lot easier with one or two assistants.

Measure **temporary** evidence first. This will be anything that will not be there in the very near future. Bodies, cars, small debris, and fluids are examples of temporary evidence.

Short-lived evidence will be measured next. This is evidence that may be there for awhile but will eventually go away or be repaired. Tire marks are considered short-lived evidence. Damage to trees, buildings, and utility poles will be there for a little while before being removed or repaired.

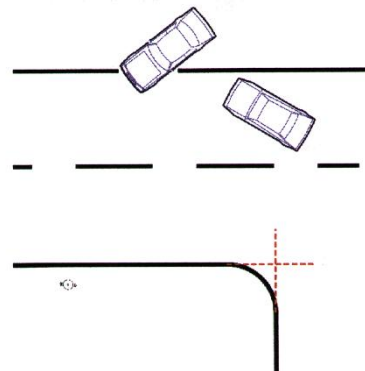
The last thing to be measured will be **the roadway**. You will need to know the width of the entire roadway as well as each lane. Do not assume that each lane has the same measurements.

Reference Points

Before you take your first measurement you will have to determine where to put the zero end of your tape. This is called a *Reference Point*. A reference point is a location where you start your measurements. This also has to be a point you can locate later. There are two types of reference points, *Tangible* and *Intangible*.

A **tangible reference point** is something that you can physically see and touch. It should also be a somewhat permanent object that cannot easily be moved or destroyed. Fire hydrants, utility covers, storm drains, and corners of buildings are examples of tangible reference points. A stop sign or even a tree would not be considered a tangible reference point.

Sometimes there may not be a tangible reference point within a reasonable distance of your scene. If this is the case you will have to make up an **intangible reference point**. An example of this would be extending the lines of two curbs at an intersection (right). While this is not something that you can readily see or touch, you can come back to the scene and locate it again.

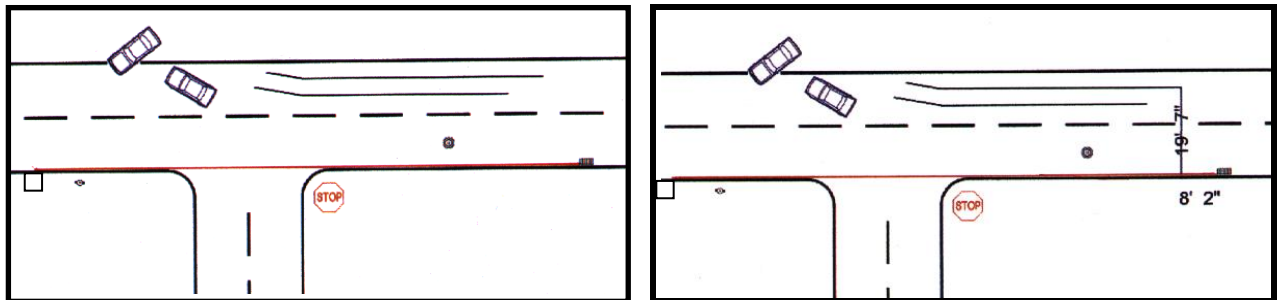


Methods of Measuring

There are two basic methods for measuring a scene. The first is called a *Coordinate Method* (this is also known as the *Baseline Method*). The second method is called *Triangulation*. Both ways have their advantages and disadvantages.

The **coordinate method** starts by running a baseline (a tape measure) from your reference point through your scene. This line must be straight and pass all points of evidence that you want to measure. You will also have to orient your scene with the point of a compass- north, south, east, and west (although it is not a rule, generally the top of the paper is north). If you have a straight curb or roadway edge going through your scene run your baseline along the side of it.

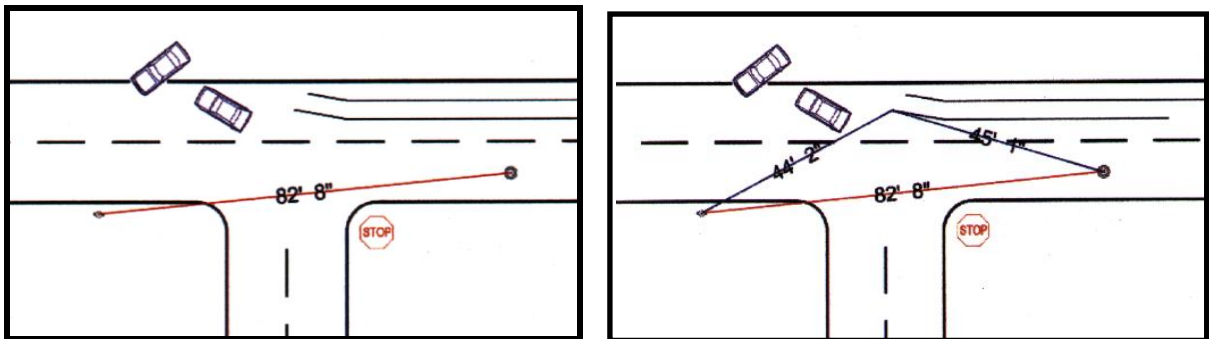
In the diagram below-left the corner of the storm-grate was made the reference point. The red line represents the tape and the zero-end was placed on the corner of the grate. The tape was pulled all the way across the scene using the edge of the roadway as a guide. All your measurements will start from the reference point. Walk down the baseline until you come across your first piece of evidence you want to measure (for above, it will be the start of the passenger side skid mark). Extend your second tape measure from the start of the skid mark back to the baseline (right).



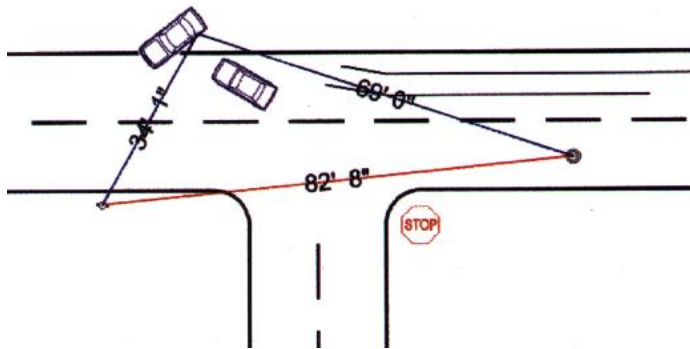
To get an accurate measurement, make sure the intersection of the two tapes is at a right angle. Note the distance and direction from the reference point to the intersection with the second tape. In this case it is 8' 2" west. Now note the distance and direction from the baseline to the start of the skid mark – 19' 7" north. Continue down the baseline until you have taken measurements to all your evidence. Each piece of evidence will have two measurements. One measurement will be the distance from the reference point along the baseline. The second measurement will be from the baseline to the evidence.

The advantage to the baseline method is that with a little practice it can be drawn fairly quickly on paper. The disadvantage is that it can be time consuming at the scene taking the measurements.

Triangulation has been used for over a century to make maps and navigate over land. You will need **two reference points** for triangulation. You will also need to know the straight-line distance between these two points (below, left).



This distance will never change and can be considered as the base of your triangle. From each reference point measure to a single point of evidence (above, right & below) and note the distance.



Once again this will require at least two tape measures with the zero end anchored at each reference point. Each piece of evidence will have two measurements, one from reference point one and one from reference point two.

The advantage to triangulation is that you can take your measurements at the scene fairly quickly. If the zero-end of the tapes are securely anchored to a reference point, you can walk around with both tapes in hand, moving from point to point, noting the two measurements. The disadvantage with this technique is if you try to draw it by hand. It can be very cumbersome manipulating two rulers at once. However, triangulation will work very well if you have a computer program to do your drawing.

Measuring yaw marks requires a more advanced technique and is not included here. Length of the mark is not of much use. Document the direction of the marks.