

Nighttime Photography

by James O. Harris

Author's note: The following was originally written in response to a question posed on a traffic accident reconstruction Internet mailing list operated by the Institute of Traffic Accident Investigators (ITAI) in Great Britain. It was later published in the ITAI Journal "Impact," Autumn, 1998.

Night photography, to reproduce what the "average" person, or any person for that matter, would see or could see at any given moment borders on the impossible. Using routinely available 35mm films, standard 35mm camera and typical processing labs, or even a professional processing laboratory, will not produce an image representative of what the eye detected.

The first problem is film. 35mm films, the ones you buy in the local drug store, are daylight-balanced. Any light source, except daylight-balanced strobes, will create notable differences in what is produced in the final print. Artificial lights, headlights, streetlights, signs, etc. produce light in the red or cyan color range. This can be compensated for by filtering in either the exposure or printing process. It is routinely done, to the extent possible, in automated photo-printing systems.

Tungsten light balanced film is available but not in 35mm format to my knowledge. This film is easier to adjust for artificial light sources to obtain a color balance closer to what existed. A "cold light" print, made with no filtering, will show the color imbalance. Shot with halogen headlights as the source, you will see a lot of red/brown/yellow in the image. To see this for yourself, shoot 35mm slide film outdoors in the day and the same scene at night. Process normally and then take the slides outside using ambient light to view them.

You also run into variations with different film speeds, besides just grain. Higher speed films and films by different makers, have variations in contrast levels. This is caused by variations in what one manufacturer considers to be acceptable compared to another. Variations from roll to roll in print film, age of film, temperatures it was exposed to before being exposed and processed, will all affect contrast levels. Professional grade film, manufactured, tested, rated, stored and shipped under controlled conditions is available to minimize these effects.

Processing and printing of the image causes great variances. Printing "as is" may be interpreted several different ways, all producing vastly different results. Everything from chemical mix, timing, temperature, exposure rates and times has an effect. In-camera meters are the lowest end meters available. Some can be controlled as to metered area for the exposure, some take sample meters over the entire image area, some take just a few and some cannot be controlled at all.

Professional spot meters are available but the data must be available for the final printing of the image.

Shooting through a windshield will produce a higher contrast image. Windshields absorb up to 30% of the entire light spectrum. Humans can adjust to this contrast change rapidly, cameras cannot. Placing the camera outside the vehicle will produce a more realistic image as seen by a driver.

Final note, still images are not what the eye "sees". Staring at a print image, the observer may pick out details otherwise not visible to someone viewing a dynamic scene. This is a bit like watching a movie the second time and noting activities or objects in scenes not noted the first time.

Still photography is a useful tool in presenting what someone might have seen, or as a fair representation of what someone at the scene observed when the photos were taken but it must be kept in context and not presented as an absolute or near absolute "this is what a normal person would have/could have seen" representation.

To obtain night photos of a scene, it must be understood that what can be presented will only represent what someone, usually the accident reconstructionist, saw from inside the vehicle at the time the photos are taken. To accomplish this, certain procedures must be followed to compensate for the limitations listed above.

First, the observer must be inside the vehicle in the driver's position when the photos are taken. The photographer should be positioned directly in front of the vehicle, with the headlights on, and the camera at the driver's eye level. It may be necessary to use a time delay on the exposures for the photographer to move out of the headlight beams when the exposures are made. Two different film speeds should be used, one faster than the other, and the exposures bracketed + and - two f stops, at 1/2 stop increments, either side of the base meter reading. A spot meter is best for this, however, some 35mm SLR camera meters have proven to be adequate. Exposure time should be the minimum possible for the film speed and f stop at the base reading.

The film should be processed as soon as possible according to the manufacturer's directions. A set of prints will be produced, each with different contrast levels. The observer that was inside the vehicle will have to determine which prints best depict the scene as they saw it from inside the vehicle. This will be less than that observed by the photographer who was not viewing the scene through the windshield. A set of densitometer matched prints, producing enlargements of the original prints from the original negatives, matched to the original prints, are then produced. At each step in the process, meticulous records of film speed, f stops, exposure times and other information must be recorded. The final prints are what the observer saw.

Up through the 1960's, color photo-imaging was not very precise or stable. Black and white film using continuous tone shades of black and white was the best you could get. Subtle changes in shading from one color to another were visible, film speeds were higher and better control was possible using artificial lighting and printing techniques. Today, black and white film is pretty much relegated to artistic interpretations. Using black and white film in forensic work is strictly for highly specialized applications requiring high contrast between images not otherwise easily distinguished.

Using black and white film photography for accidents today is actually quite difficult, given that you would first have to articulate a justifiable reason for not using color film!

In conclusion, unless you are prepared to answer questions regarding color temperature, light balances, meter readings, contrast levels and minute details of film and print processing, taking night photographs to show what a driver might have seen is not recommended except under very limited circumstances.