

Auto vs Manual Metering: Bridge Case Study

We were contracted to photographically document this bridge before the new construction was demolished. Demolition was scheduled to begin at 6:30 AM on the day of the project, so it was necessary to arrive before dawn (6:09 AM) to wait for the sun to rise and supply the necessary illumination for photography.

Three different focal length lenses were used (50, 210, and 500MM) on a conventional film camera to document the appropriate parts of the bridge. In all cases the camera was leveled using a built-in bullet level in the tripod head for side-to-side orientation, and a torpedo level on the camera for the up-and-down.

The sky was light before, but there was no direct lighting on the bridge until after sunrise. After sunrise the sun shone more brightly on the east side (northbound lanes) than the west side of the bridge. For a photographer to allow the camera to be set on automatic light metering for this type of documentation could be a grave error. The exception would be a camera with optional spot metering in the automatic mode.

In this case, badly exposed digital photographs were knowingly made with a second camera set on variables of automatic operation to illustrate the possible problems associated with automatic metering under these conditions.

The photos used for these examples are digital in origin and appear as-exposed, not adjusted for exposure, contrast, or sharpness. Photo #1 was taken without a tripod and with the camera pointing NNW along the side of the new southbound lanes. The camera was set on telephoto zoom and fully automatic exposure. The built-in flash fired and the camera chose an appropriate exposure for flash under the ambient lighting conditions. Outdoor firing of a built-in flash on this particular camera covers a maximum distance of 12-15 feet. The wooden barrier with the orange paint in the lower left corner of the frame is approximately 20 feet from the camera. Several problems with photo #1 are immediately obvious. The image is too dark, lacks sharpness, and has insufficient depth-of-field.



When using a fully automatic camera in this type of marginal lighting, the built-in flash will always fire unless it is purposely turned off. If the flash is allowed to fire, the camera circuitry will set the internal exposure systems as if the flash would be sufficient to illuminate the entire frame. The outcome is a photo exposed at a shutter speed too fast for adequate exposure, too slow for hand-held sharpness, and with an aperture too large for adequate depth-of-field.

Photo #2 was exposed shortly after #1. The camera was set on manual and the flash was turned off. In this case, a small lens aperture was chosen to supply adequate depth-of-field for



front-to-back sharpness and a slow shutter speed to supply adequate exposure. The camera was on a tripod to avoid camera movement during the long exposure. The traffic was moving slowly so the headlights are not blurred. These settings

allowed proper exposure, extended depth-of-field, and maximum detail in the shadows.

Photo #3 was exposed with the flash turned off but with the camera set on fully automatic exposure. The camera was pointed SSE along the side of the southbound lanes. The position of the early morning sun is indicated by the variation in the brightness of the sky. The inclusion of bright sky in the image caused the camera to compute the scene as brighter than would be appropriate



for a proper exposure of the side of the bridge. Shortening the tripod legs to afford a level point of view and eliminating the sky from the composition would have resulted in a better exposure. The image is usable and could be printed lighter, but as-exposed, it is missing information in the shadows due to underexposure. The shutter speed and lens aperture picked by the camera are marginally appropriate in this image for capturing sufficient depth-of-field.

Photo #4 is the view NNW along the side of the northbound lanes of the bridge. The camera was again set on fully automatic with the flash turned off. This image exhibits the most appropriate of the auto exposures. The visible part of the sky and the bridge are both subject to the same intensity of illumination from the rising sun. The dynamic range (contrast) of the scene is somewhat wider than the capabilities of the camera to handle at the default settings, but in



this case the area under the bridge is not the area in question.

Photo #5 was actually the first frame exposed. Automatic exposure and no flash produced a finished image with good contrast and density, but the auto-focus reacted to the closer parts of the bridge and the large lens aperture necessary



for proper exposure limited the depth-of-field. In ALL cases, there are multiple combinations of shutter speeds and lens apertures, which will result in proper exposure on film or digital sensor. In many cases, a specific part of the resultant photograph is the area needed for documentation. For optimum sharpness and contrast in difficult lighting situations, it is advisable to manually determine the intensity of the light reflected from, or falling upon the subject area, and to have the camera set correspondingly to the best speed/aperture combination to either stop the action or supply sufficient depth-of-field, or if necessary and possible, both.