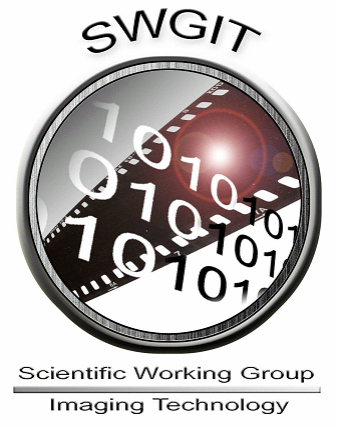

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Section 3

Field Photography Equipment and Supporting Infrastructure

** Previously called "*Guidelines for Field Applications of Imaging Technologies in the Criminal Justice System*" **

Introduction

The purpose of this document is to provide guidance and recommendations for equipment, infrastructure, training, Standard Operating Procedure (SOP) development and security and integrity issues for photography in the field environment.
This document addresses the photographic documentation of events or subjects that are not in a forensic laboratory or studio, or other controlled environment.

General Equipment Considerations

Equipment needs depend on the tasks performed and the intended use of the image. Agencies should identify specific requirements for resolution, color fidelity, exposure capability, dynamic range, durability, file formats, and storage. For example, Crime Scene Technicians should use a camera that is capable of manual override and has interchangeable lenses, off-camera flash, cable release, and a tripod mount. On the other hand, a good quality point-and-shoot camera may be sufficient for first responders. Cellular telephone and other personal electronic devices with integrated cameras should not be used unless their use is an operational necessity.

Digital cameras are widely used and images produced by them are accepted in the Criminal Justice System. Advances in imaging technology have allowed the images from digital cameras to be comparable to traditional film-based imaging. One study of footwear impression photography found no difference between the images from 35 mm film and 6 megapixel digital cameras and greater. (Blitzer, H. Effect of Photographic Technology on Quality of Examination of Footwear Impressions. *Journal of Forensic Identification, 2007; 57(5);*641-657)

The agency should have a specific mechanism for determining whether a piece of hardware meets a requirement. Some applications, such as impression evidence, have specific quantitative requirements regarding equipment or resolution (see SWGIT documents "*General Guidelines for Capturing Latent Impressions Using a Digital Camera*", "*General Guidelines for Photographing Tire Impressions*" and "*General Guidelines for Photographing Footwear Impressions*". Specification sheets may be used as a guide, but in most cases it will be necessary to test the equipment under operational conditions.

Equipment acquisition and SOPs should ensure that field personnel are provided with adequate consumables (e.g., batteries, removable storage media) and accessories (e.g., flash, tripods, cable release). In addition, adequate physical storage and protection of equipment and media is necessary to maintain operations.

Infrastructure

Infrastructure refers to both hardware and software necessary to store, secure, process, transmit and output data. Creating and maintaining a sound infrastructure requires developing a needs assessment, and validating, verifying, maintaining and upgrading the systems. Inadequate infrastructure will undermine the ability to secure and efficiently utilize the images.

- *Needs assessment*

  An agency should perform a needs assessment to determine what infrastructure is necessary for its specific tasks and should demonstrate how it plans to fulfill those obligations. This assessment should identify what tasks are to be performed, under what circumstances those tasks will be performed, and the end use of the imagery. Specific hardware, software, and training requirements can be targeted to each one of those tasks, circumstances, and end uses.

  Important aspects to consider are data transmission and output. Transmission includes the electronic transfer of the images from temporary storage media to permanent storage and movement across networks. The amount of data transmitted will determine the requirements for network bandwidth and storage capacity. Output of images refers to display devices, printers, and/or optical media. The end use of an image determines the appropriate output method. For example, the hardware requirements will differ significantly between images that are to be analyzed on an 8 x 10" print versus those that will be viewed with a projector or monitor.

- *Validation and Verification*

  Validation is a necessary part of infrastructure design and usage. The degree and type of validation should be reasonably targeted to the context within which the assets will be used; it is not necessary to validate functions or capabilities that will not be used. Verification that assets are functioning appropriately (sometimes called quality-control tests) should be an integral part of any SOP. The frequency and degree of verification may be application and agency-specific.

- *Maintenance*

  Agencies should plan for and adopt strategies and responsibilities for preventive maintenance, repair, and inspection of hardware and software to maintain optimum performance and to prevent catastrophic failure.

- *Lifecycle*

  Infrastructure assets, particularly in a high-technology area such as imaging, are subject to wear, tear and obsolescence. Equipment used will be subject to physical stress and will eventually require repair or replacement. Other assets, such as rechargeable batteries, have a finite lifespan. Technology advances quickly, and newer, less expensive hardware/software may provide better results at a lower operational cost. New technologies may allow expansion of service opportunities or provide capabilities that were previously not available. Agencies

should periodically assess their needs and determine if new technologies or upgrades are warranted.

Training

A training program is essential for successful image acquisition, processing and output of digital images. Training programs should be designed and implemented to provide the skills and knowledge required to successfully perform at an appropriate level of responsibility. See SWGIT document Section 6 "*Guidelines and Recommendations for Training in Imaging Technologies in the Criminal Justice System*."

SOP Development

SOPs are agency-specific and are important to provide structure and guidance, and to ensure consistency. See the SWGIT/SWGDE document "*Recommended Guideline for Developing Standard Operating Procedures*."

Security and Integrity

Integrity ensures that the digital images are complete and unaltered from the time of acquisition through its final disposition. Security is imperative to maintain integrity, which includes protection of portable data storage devices, computer facilities, and data stored and/or transmitted on computer systems. It involves the use of management, personnel, and operational and technical controls. Refer to SWGIT Document "*Best Practices for Maintaining the Integrity of Digital Images and Digital Video*."

Categories of Field Photography

Field photography generally falls into two different categories depending on the extent of documentation required. Each category will require different levels of training, knowledge, experience, and equipment.

- General photography
  - Requires basic knowledge of camera operation and photographic composition
  - May involve the use of a point-and-shoot camera
  - Utilized for documentation purposes
  - Advanced photography
  - Requires knowledge of manual exposure control, flash photography and other lighting controls, alternative light sources, use of tripods and remote shutter releases, filters
  - Requires the use of a SLR camera with interchangeable lenses and off-camera flash capabilities
  - Utilized for documentation and potential analysis, such as with latent fingerprints and other impression evidence
  - Images that will undergo analysis should be captured at the highest available resolution with no or lossless compression

In addition to general or advanced photographic knowledge, there are specialized applications that require additional training based upon specific needs, such as with aerial, surveillance, arson or hazardous materials (HAZMAT) photography.

Example of General Photography - First Responder

First responders are frequently called upon to document conditions they find at an incident where a crime scene photography unit or specialist may not be requested or available. Examples may include: domestic violence incidents, traffic accidents, minor property crimes, and other incidents as defined by agency-specific policies. Photography may not be the first responder's primary responsibility, and they may have general photography training. The first responder must be cognizant that the images captured may contain important information that was not recognized at the time the photograph was taken.

Equipment for First Responder Photography:

- A non-disposable camera with flash and close-up capability. The suggested minimum resolution for a digital camera is 6 megapixels and it should utilize removable storage media. The minimum requirement for a film camera is 35 mm.
- Other standard photographic equipment, such as off-camera flash or scales, can be utilized as necessary.
- Videography, when used, should be in a supplementary capacity.

Agencies should designate what first responders should photograph and what circumstances would prompt a request for individuals with advanced photographic training.

Example of Advanced Photography - Crime Scene Photography

Crime scene photography is directed towards documenting evidence and other details of a crime scene in a fair and accurate manner. Crime scene photography generally requires advanced photography with the ability to:

- Accurately represent the details and colors in a scene
- Capture overall, intermediate, close-up, and examination images with accurate spatial relationships
- Deal with varying lighting and physical conditions
- Record information that crime scene personnel may not have known was important at the time the images were captured

Crime scene photography is usually a time-sensitive activity with only one opportunity to correctly complete the task. Depending on the nature of the crime or incident, conditions at a crime scene may dictate the selection and use of a variety of equipment and techniques.

Equipment for Crime Scene Photography:

- A Single Lens Reflex (SLR) camera that is capable of manual override, with interchangeable lenses, off-camera flash, remote shutter release, and a tripod mount.

- Digital cameras should have at least 6 megapixels, and should be set to either uncompressed or lowest compression (highest quality format or fewest numbers of pictures per media card).
- The minimum requirement for a film camera is 35mm.

- Other standard equipment may include:
  - External battery packs
  - Sturdy tripod
  - Extra media
  - Gray card and/or color checker
  - Various types of known scales
  - Various types of filters
  - External flashes and cords
  - Remote shutter release
  - Light meter
  - Various types of lenses (macro, normal, wide-angle, telephoto)

- Videography, when used, should be in a supplementary capacity

Example of Photography Utilizing Special Applications - Surveillance Photography

Surveillance photography documents events and individuals engaged in acts as they occur. Surveillance activities may involve highly specialized techniques and equipment that require technical training and knowledge and are best accomplished by trained specialists.

Equipment for Surveillance Photography:

- A Single Lens Reflex (SLR) camera that is capable of manual override, with interchangeable lenses, remote shutter release, and a tripod mount.
  - Digital cameras should have at least 6 megapixels, a high sensitivity sensor, and should be set to either uncompressed or lowest compression (highest quality format or fewest numbers of pictures per media card).
  - The minimum requirement for a film camera is 35mm.
  - The ability to disable the flash, display screen, and infrared auto-focus transmitter as well as any other features that would compromise operational security. In covert surveillance situations, illumination of the photographer by the LCD screen may compromise safety.

- Other photographic equipment depending on operational necessity.

- Specialized equipment, which may include night vision or thermal imaging equipment.

- Videography can be used as the primary method or in a supplementary capacity.

The successful capture of images sufficient for identification of depicted individuals and/or objects (e.g., license plates) will require close attention to the selection and appropriate use of equipment.

REFERENCE LIST

SWGIT and SWGIT/SWGDE documents can be found at www.swgit.org

Section	Title
Section 1	Overview of SWGIT and the Use of Imaging Technology in the Criminal Justice System
Section 2	Considerations for Managers Migrating to Digital Imaging Technology
Section 3	Field Photography Equipment and Supporting Infrastructure
Section 4	Recommendations and Guidelines for Using Closed-Circuit Television Security Systems in Commercial Institutions
Section 5	Guidelines for Image Processing
Section 6	Guidelines and Recommendations for Training in Imaging Technologies in the Criminal Justice System
Section 7	Best Practices for Forensic Video Analysis
Section 8	General Guidelines for Capturing Latent Impressions Using a Digital Camera
Section 9	General Guidelines for Photographing Tire Impressions
Section 10	General Guidelines for Photographing Footwear Impressions
Section 11	Best Practices for Documenting Image Enhancement
Section 12	Best Practices for Forensic Image Analysis
Section 13	Best Practices for Maintaining the Integrity of Digital Images and Digital Video
Section 14	Best Practices for Image Authentication
Section 15	Best Practices for Archiving Digital and Multimedia Evidence (DME) in the Criminal Justice System
Section 16	Best Practices for Forensic Photographic Comparison
Section 17	Digital Imaging Technology Issues for the Courts
Section 18	Best Practices for Automated Image Processing
Section 19	Issues Relating to Digital Image Compression and File Formats
SWGIT/SWGDE	Proficiency Test Program Guidelines
SWGIT/SWGDE	Guidelines and Recommendations for Training in Digital and Multimedia Evidence
SWGIT/SWGDE	Recommended Guidelines for Developing Standard Operating Procedures
SWGIT/SWGDE	Glossary of Terms