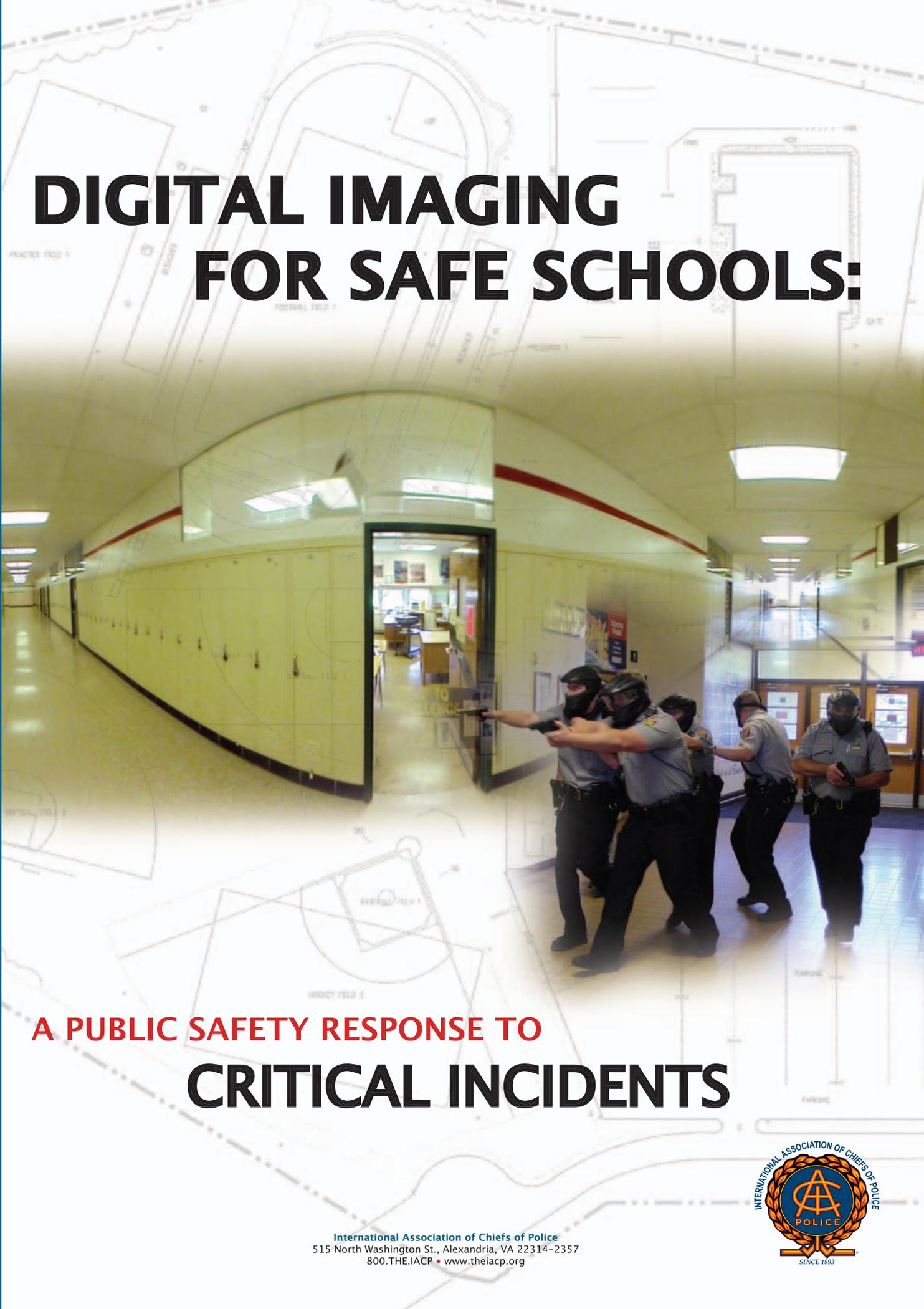


The CUTTING EDGE of TECHNOLOGY

# DIGITAL IMAGING FOR SAFE SCHOOLS:



## A PUBLIC SAFETY RESPONSE TO CRITICAL INCIDENTS

International Association of Chiefs of Police  
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## Dear Reader:

This Resource Guide contains step-by-step instructions that detail the process for creating a simple, cost effective method for capturing three-dimensional images on CD for use during a critical incident on school property.

**Part I** is for the Police Chief who must champion the goals and objectives of the project and enlist support from the community and educational leadership.

**Part II** is for the Project Manager who will develop a strategic plan for design, development, funding, and implementation of the project's activities and resources.

**Part III** lists the Five Basic Steps of Digital Photography and the process to follow for capturing images to be used during a critical incident.

**Part IV** details the process for Integrating the Images and Creating a Data CD.

**Part V** summarizes information found in the Resource Guide.

“The Centreville High School Incident” documents a real-life critical incident exercise to illustrate how planning and preparation for these traumatic events can result in community awareness and support for this type of project.

We've also included a Glossary of Terms, Product Reference Guide, Sample Image Photo Log and Floor Plan, and a case study about an innovative approach taken by the Washington Association of Sheriffs and Police Chiefs (WASPC) to secure funding for their state's critical response plan to assist in your project development. Together with the quick reference guide, you should have all the necessary tools to undertake this project and provide another resource for public safety response to critical incidents.

To those departments and school administrations embarking on projects to create safer schools, we wish you well and offer our support and thanks as you commit resources and talent to this worthwhile effort.

Sincerely,

The Cutting Edge Team

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# INTRODUCTION

The amount of information available to police during a critical incident can directly impact the outcome of the event. And if the incident occurs in a school, the response must come quickly and be carefully planned and executed. Hostage situations and school shootings are not uncommon in today's society, therefore it is essential that law enforcement be well equipped to respond with every possible tool available.

In March of 2003, the International Association of Chiefs of Police (IACP), through a grant funded by the National Institute of Justice, convened a School Resource Officer (SRO) Roundtable to identify school-related technology needs in law enforcement (see inset). The Roundtable, hosted by the Fairfax County, Virginia Police Department, challenged participants to choose one of the recommendations for further analysis based on funding and immediate impact. Their choice, "School Mapping for Critical Incident Response"; their goal, to create a simple, cost effective method for capturing three-dimensional images onto a CD for use during a critical incident on school property.

What followed was a partnership between the IACP and Fairfax County to develop a prototype resource guide for school imaging that could be used by SWAT personnel, Rescue Teams, and other first responders receiving guidance and direction from an on-site Command Center. The IACP purchased two digital cameras and lenses, and worked closely with the Fairfax County Police Department and the Fairfax County Public Schools' Office of Safety and Security to develop a practical application for the captured images, integrating them with school floor plans and exterior views of the surrounding area. The success of this prototype prompted Arlington County, Virginia to become a participant in the project, which led to the purchase of another camera and lens.

The results of this joint undertaking can be found in the pages that follow. In addition, we have included a quick reference guide for use by project participants, and additional resources to assist with the selection and purchase of equipment. There is a brief account of a real-life critical incident exercise to illustrate how planning and preparation for these traumatic events can result in community awareness and support for this type of project, and a case study from the State of Washington, highlighting an innovative process for enabling state mandated opportunities for digital imaging projects.

## Summary of SRO Roundtable Recommendations

- **School Mapping for Critical Incident response**
- **Educating/Awareness of SROs' Roles**
- **Tracking of school students and staff during and after critical incident**
- **Communications in schools**
- **Training and minimum standards for SROs**
- **Counseling training courses for SROs**
- **SRO Recruitment, Retention, and Promotion**
- **CCTV Guide for School Administrators and Community**

# I. THE ROLE OF THE POLICE CHIEF

As champion of the school-imaging project, the Police Chief works closely with command staff and selected partners (school administrators, students, community leaders, and volunteers) to develop a strategic plan to guide activities that will result in the successful integration of the images into a resource tool supporting operational procedures for critical incident management.

Table 1 identifies the basic parameters a police chief needs to consider in order to undertake this project.

<b>Time</b>	Varies depending on size of facility (square footage), type of equipment, scheduling challenges, learning curve of teams, review and comment period
<b>Personnel</b>	Project Manager, team(s) of two to three people to photograph the schools and integrate images with floor plans
<b>Cost</b>	Camera equipment, computer, software, staffing, and training
<b>Support</b>	Set goals and objectives, interact with school administrators and governing bodies to facilitate the process, select a Project Manager

*Table 1: Project Parameters*

With a basic understanding of the parameters in Table 1, the Chief can assume a leadership role and set the criteria for selection of a Project Manager.

Some additional uses for digital imaging that would support a proposal involving an expenditure of resources may include:

- Crime scene investigation/re-creation
- Courtroom demonstrations/ testimony facilitation
- Tabletop exercises
- Vehicle accident investigation/reconstruction
- Threat assessment
- Tactical training

## II. THE ROLE OF THE PROJECT MANAGER

The Project Manager oversees the school-imaging project and guides team members through the planning, imaging, and integration processes. He/She assembles the imaging team members, coordinates the selection and purchasing of the necessary equipment, schedules assignments, and establishes contacts for the onsite visits.

### Team Members

Team members can consist of police officers, School Resource Officers, and volunteers (i.e. students, school personnel, parents). The ideal composition for a field team is three individuals. For example, field teams from both Fairfax and Arlington Counties were staffed and given the following assignments:

- Photographer
- Recorder: maintains the photo log and map coordination
- Facilitator: assists with route planning, unlocking doors, turning lights on/off, monitoring the site

A good suggestion is to cross-train team members to allow more flexibility. These individuals are the keys to a successful project and need to be provided with training and tools to perform the assigned tasks.

### TIP

Spend one day building team dynamics.

### Equipment Selection and Purchase

The Project Manager should obtain and review information about the capabilities and quality of the digital recording equipment, which includes cameras and lenses, for recommendation to the appropriate command staff.

The following equipment listing is for reference purposes only, and represents the minimum requirements that would be needed to undertake an imaging project.

### Equipment Requirements

- Digital Camera with spare battery
- Lens
- Tripod
- Level
- Digital Storage Media – compatible with camera selected and with sufficient storage capacity plus spare media card to facilitate downloading of images
- Laptop/Computer, with requisite camera and graphics design software
- Media storage—CD/DVD re-writeable drives

Equipment	Approximate Price Range
Digital Cameras	\$300-\$30,000
360 degree Lens	\$250-\$2500
Accessories	\$50-\$500 per item
Software	\$50-\$500

Table 2: Equipment Costs



Figure 1. Camera and lens

Equipment needs and approximate price ranges are listed in Table 2. Consider this a starting point for developing a budget for the project. Fairfax and Arlington Counties used two Nikon 5000 Coolpix digital cameras provided by the IACP, together with Kaidan 360 One VR 360-degree panoramic lenses (Figure 1). The cost for each camera kit averaged 2,500 dollars. The selection of this camera and lens combination enabled field teams to take one photo of the entire room as opposed to taking multiple shots and photo stitching them into one panoramic view.

### Imaging Methods

The methods available for capturing the images are listed in Table 3, together with the advantages/disadvantages of using each method.

	Advantages	Disadvantages
<b>360 Degree Lens</b>	Time effective Lower personnel costs Good image quality	Steep learning curve Higher equipment costs
<b>Photo-Stitching</b>	Equipment and software cost effective	Time Intensive: Longer editing process per room (30-60 minutes)

Table 3: Imaging Methods

- 360-Degree Lens Method: One-shot cameras that utilize mirrors to capture 360-degree images in one frame. Software is then used to “flatten” the captured donut-shaped image into a panoramic image.
- Photo-Stitching Method: To create a seamless panoramic view, with a film or digital camera, a series of images around a single point or rotation is captured. The multiple views are then “stitched” together with software.

## TIP

Break shooting schedules into manageable phases allowing for more flexibility.

## Scheduling

Develop an imaging schedule for each school. Ideal times are summer breaks, school vacations, three-day weekends, winter and spring breaks. Consider team member size, school size and layout and equipment being utilized, as well as weather and seasonal issues. Personal schedules of team members must be taken into account as well. Team members should also devote time to equipment familiarization.

When creating a shooting schedule, divide the project into manageable phases as shown in Table 4.

School	School A	School B
Photo Status	Done	In Progress
Image Transfer	Yes	–
Image Backup	Yes	–
Log	Yes	–
Map Notations	Added exits	–
Comments	Need roof access	–

Table 4: Sample Shooting Schedule

## Contacts

The shooting schedules should be coordinated with administrative and building staff to avoid delays or interruptions. Table 5 lists the key personnel that need to be contacted prior to beginning onsite activities.

### PEOPLE TO CONTACT

<b>School Principal</b>	Inform him/her about the project and its goals.
<b>School Administrative Personnel</b>	Inform about team activities and schedules and possible time disruption in photographing work areas.
<b>Building/Facility Maintenance</b>	Obtain current building floor plans and enlarge for easy notation. Obtain keys to open all rooms. Some areas, under normal circumstances, are restricted, so be sure to note these before undertaking the onsite imaging.
<b>Student Activities Coordinator</b>	Acquire activity schedules and building use locations

Table 5: Contact List

Prior to commencing a photographing session, the imaging team should conduct a walkthrough of the building to become familiar with school floor plans, layout, equipment and lighting conditions. The walkthrough enables a more efficient shooting schedule and provides time to ensure that all project staff have the same set of floor plans and scaleable maps in a format large enough to make notations that are easy to read during the integration process.

### III. THE FIVE BASIC STEPS OF DIGITAL PHOTOGRAPHY

When the walkthrough is complete, the imaging team(s) can then follow the five basic steps for capturing images.

#### Step 1: CHECK THE CAMERA

Place the camera on a tripod, and check to see that it is securely mounted and level. If using a 360-Degree Lens, the camera and lens will be in a horizontal position (*Figure 2*). Make sure the lens is clean, and that the battery is fully charged prior to shooting. Have a fully charged spare battery in reserve.

Camera settings will vary depending on the lens and software used. Familiarize each team member with the aperture settings or the F-stop functions. These settings and functions determine how much light is allowed through the lens and affect focus quality. More light would produce a bright and clear picture. Set the camera in macro mode. This allows better focusing quality.

#### Step 2: CHECK THE LIGHTING

If shooting outside, pick a slightly overcast day to ensure even, consistent lighting across the entire photo. When taking pictures indoors, make sure there is plenty of light throughout the whole room, with minimal shadowed areas. If the light in the room is not evenly dispersed, it will have a negative impact on the quality of the photo. Refrain from using the flash, as the strobing effect can impact picture quality.

Ensure you have even lighting in the area, since lighting variations affect the quality of photos. For example, images taken from the middle of entryways can be affected by contrasting light from hallways and rooms.



Figure 2. 360 Degree Lens

Light sources in proximity to the camera will affect the quality of the shot, so avoid positioning the camera next to or directly under a source of light. Adjust camera settings to obtain optimal clarity. (Arlington and Fairfax County's experience showed that turning the lights off in the presence of natural lighting would result in better quality photographs). If possible, obtain access to portable lighting that may assist in providing a light source in areas where none is available.

#### Step 3: FRAME THE SHOT

Frame the first shot in the camera's LCD screen. Avoid shots that require zooming in or out to the far end of the range. Distortion occurs at those extremes, with resultant poor image quality. Using the LCD screen rather than the optical viewfinder presents a more accurate preview of the image. (Figures 3 and 4)



Figure 3. Sample photo through viewfinder



Figure 4. Sample 360-degree image through LCD screen

## Step 4: CAPTURE THE IMAGES

Depending on the method chosen, the process of capturing images is as follows:

**360-Degree Lens:** Continue to photograph each room. Adjust focus as necessary. To check quality, use included software to unwrap images.

**Photo Stitching:** Shoot the first frame, and then rotate the camera so that the first and second frames overlap by 30 to 50 percent. Continue to rotate the camera clockwise in approximately 25-degree increments, overlapping each photo as before, until the entire room has been photographed. If the images do not overlap, distortion or missing sections will occur. After each camera rotation, use a level to check if camera is horizontal.

Many cameras have a special panoramic mode that will display guidelines on the LCD screen to assist with overlapping shots. It is recommended that a level be used to ensure image consistency as the camera is rotated.

## Step 5: SAVE THE IMAGES

Once all the images have been recorded, download them to a computer and save into a single directory (e.g., High School – First Floor). If necessary, preview the images and move any poor quality shots to a new directory. Make corresponding notations on the Photo Log.

Be aware that each school has several different types of doors. Field teams should note this and photograph all types of doors (Figure 5). This can provide additional information to tactical teams when planning response operations.

## Photo Log

Use a photo log to track your progress (See Appendix B). After each picture is taken, sequence the picture and log number. Mark poor quality photos in your log—do not delete—to help keep your log and pictures in sequence. It is a good idea to keep all the photographs that have been shot, even those of poor quality. By keeping the poor quality photographs, the numbered sequence remains consistent. Delete these images during the integration process. (Refer to Section IV). Reset the media storage card and camera every time a new school is photographed so that the number on the photo log matches the number on your camera.

## TIPS

- Have spare media storage cards available.
- Have a lens cleaning cloth available to remove dust.
- Use the 10-second delay or stand directly under the camera to avoid appearing in the photograph if using the 360-degree method.
- Be aware of reflective surfaces that place the photographer in the picture.



Figure 5. Door Types

Suggestions:

- Use image number as shown on camera. (e.g. DSCN001)
- Use agreed upon standard language. (Next to, beside, adjacent, etc.)
- Ensure the photo log has a notes section.

## Maps, Photo Logs, & Computers



Figure 6. Sample High School Floor Plan

The use of different colors for notations on maps and floor plans makes them easier to read. For example, choose one color for room numbers, another for the shot number, and another color for side notations. If, however, too many notes are placed on the map, it can become confusing, making it difficult to coordinate images with their map location. Photo Logs provide an accurate description of the location and room numbers, and are a necessity for documenting project progress.

When photographing the exterior of a building, it is important to get shots of all entrances and exits. A good rule of thumb is to make sure sequential photographs are within eyesight of one another. This will ensure capturing the entire exterior of the building. Photograph corners of the building for a perspective from adjacent sides in relation to one another (Figure 7), as well as hidden alcoves, inner courtyards, or other smaller areas outside the building that may otherwise be missed (Figure 8). Photographing access roads and parking lots will assist in managing priority traffic flow in the event of a critical incident.

Use large, scaleable maps for note taking purposes. For example, enlarging an 8.5" x 11" floor plan to 22" x 34" increases accuracy and makes it easier to read (Figure 6.) If resources to make a larger map are not available, use a local printing vendor. Consider using smaller maps for exterior shots where detail is not as important.

Room numbers may not correspond with existing floor plans, so as photographs are taken, notate changes on the photo log. Mark all exits and stairwell numbers. Pinpoint the precise location of the camera for photographs taken in larger rooms (e.g. cafeteria, gymnasium), as this will aid with data entry. In smaller rooms, this is less important. For the most part, photographs of classrooms will be taken from the center of the room.



Figure 7. Emergency Exit



Figure 8. Main Entrance with side wall



Figure 9. Aerial View

If aerial photographs of buildings are not available, shoot exterior shots from the roof or from a distance. Other possible alternatives include using photographs from county property surveys, real estate surveys, or state land surveys. If more detail is desired, consider consulting with local aerial units for assistance in compiling this data (Figure 9).

Field teams will have to decide when to transfer the image files onto a computer, since the process is time consuming and reduces the amount of time available for photographing the school. Options include downloading at various times throughout the day, or at the

conclusion of the session. Initially, the team should check image quality after every few shots. With more experience, the team may decide to wait until the media storage card is full.

During the transfer of images to a computer, store poor quality images in a separate file, keeping track of shots that need to be retaken. If the retakes are easy to find, the team can return to the school another time.

## Keep on Track!

Maintain clear and concise notes on the project. Establish a timeline and stick to it. This not only helps during the photographing of the school, but also in the post-photography stages of the project. Note areas of the school that still need to be photographed because of unforeseen circumstances (e.g. locked doors, construction, room cleaning, student or faculty presence, etc).

## TIPS

- Divide school into sections to prevent areas being missed.
- Maintain good communication within team to ensure accurate notation.
- Consider using a laptop to log images and other data during the imaging session.

## IV. INTEGRATING THE IMAGES AND CREATING A DATA CD

This final phase of the project integrates the digital images with the school floor and site plans. The Project Manager should dedicate a knowledgeable team member to this function, or contract with a professional organization to complete this phase of the work.

Computer-Aided Design programs assist in the linking of images, movies, and floor plans with a browser interface created by Web Page Development software for access by end users.

Table 6 lists several available software options for the integration process, each with varying levels of difficulty and cost.

Image Viewing	Image Editing	Computer-Aided Design	Web Page Development	Internet Browsers
VoloView Express® 2	Adobe® Photoshop® 5.5	AutoCAD® 2000	FrontPage®	Microsoft® Internet Explorer® 5.5 or Greater
QuickTime® 6	Microsoft® Photo Editor®	AutoSketch® 7.0	Dreamweaver®	Firefox®
			Microsoft Word®	

Table 6. Software Options

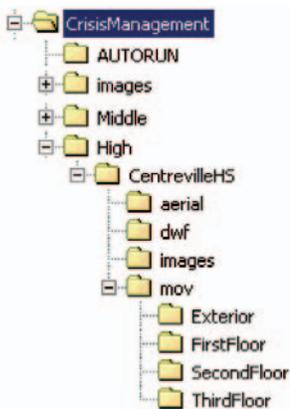


Figure 10. Folder Structure Sample

### Step 1: DEFINE FOLDER NAVIGATION STRUCTURE FOR FILE MANAGEMENT

For file management, create a master Project Folder (e.g., Crisis Management), and add sub-folders as necessary (Figure 10). Next, place the movie files and other images into their appropriate folders. It is recommended that each movie file be renamed with a corresponding description (i.e. Change Image number DSCN 0001 to 001 Main Entrance Hallway).

### Step 2: CREATE AN IMAGE OR LOGO FOR THE FRONT PAGE

Create an image or logo for the front page (e.g. Department or County logos make good front-page graphics). Arlington County used Microsoft Word to design their front page. Other menus can be added to the front page, such as links to aerial photos or floor plans.

### Step 3: DRAWING MODIFICATION AND SETUP

For illustration purposes, AutoSketch™ 7.0 was utilized to import the school diagram files. Turn off all unnecessary layers (e.g. square footage layer, electricity layer, etc.) Change light color layers to a darker color in order to make the diagram easier to read. It is recommended that all walls should be changed to one color, and all room numbers and descriptions of rooms and areas to another color. This enables the finished diagram to be easily read.

If floor plans are divided into several zones, use the overall diagram to HYPERLINK all the files first. When the overall diagram is complete, copy and paste each zone separately and save them as new files. This eliminates the need to HYPERLINK more than one diagram for each floor.

#### **Step 4: DRAWING HYPERLINKS**

Select or highlight the room numbers or room descriptions. Most room images will be in the middle, so room location numbers should be placed in the middle of the room on the diagram. If several shots were taken from the same room or adjacent hallway, create a symbol to identify the camera location.

Select the HYPERLINK option in AutoSketch™ to link each room number to its corresponding movie file. An automatic relative path function, which provides directional information to the files required for a web page, is not available in AutoSketch™ but is available in other software programs. Therefore, it is very important to keep all the movie files and CAD files in the original directory for the files to work properly.

#### **Step 5: SAVE THE DRAWING INTO DWF FORMAT**

Save the finished AutoSketch file into a DWF (Drawing Web Format) format available under the save features option in the software program.

#### **Step 6: HYPERLINK ALL FILES**

Hyperlink the front page to the designated photos, doors, and respective floor plans. Doors can be color-coded and a legend created to distinguish different doors.

#### **Step 7: CREATING A DATA CD**

Required Equipment:

- Computer with internal or external CD-RW drive (Recording software included)
- Blank writeable CDs

#### **CD Creation Process**

1. Insert a blank, writeable CD into the CD recording drive.
2. Open the recording software and refer to the software manual or click on the CD recording help wizard for step-by step instructions.
3. Add the files or folders to the CD. To select more than one file, hold down the Control key and select the appropriate files.
4. Verify that the files and folders to copy are displayed.
5. Follow the instructions in the wizard to begin the recording process.
6. After copying the files to a CD, view the CD to confirm that all files have been properly recorded.
7. When the recording process is complete, label the CD.

## V. SUMMARY

The *Digital Imaging for Safe Schools* Resource Guide represents one of many systemic models that support critical incident response planning. With its companion *Quick Reference Guide* and reference lists for equipment and software vendors, public safety officials now have the tools necessary to construct a cost-effective method for capturing detailed images and creating a virtual landscape for use in the event of a critical incident. The images are easily distributed and updated, and provide critical tactical and strategic information for first responders.

The unique approach taken by the Fairfax and Arlington County law enforcement and school administrative personnel to develop a life-saving database serves as a best practice for communities working to safeguard their schools and other public facilities.

Another approach that has been utilized by some jurisdictions is legislative lobbying to enable state mandated opportunities for digital imaging (Appendix C).

What we have provided is a starting point in the incident planning process that focuses on a community's most precious resource-its children.

## Glossary of Terms

**360-Degree Lens.** One-shot cameras use mirrors to capture 360-degree images in one frame. Software is then used to “flatten” the captured donut-shaped image into a familiar panorama.

**Aperture.** The opening in a camera lens through which light passes to expose film.

**CAD.** Computer Aided Design. The use of a computer in industrial design applications such as architecture, engineering, and manufacturing.

**CD-R.** A CD-ROM format that can record up to 650 megabytes of data onto a compact disc.

**CD-RW.** CD Read/Write format. A CD-ROM format that not only reads standard CD-ROMs, but can read and write CD-R disks, and also read and re-write CD-RW media.

**Digital Storage Media.** Digital camera’s re-usable memory card on which images taken by the camera are stored. Available in a wide range of storage capacities and formats.

**DVD-R.** Digital Video Disc Read Format. A format that enables information to be written to a disk up to a maximum of 4.7 gigabytes data; can only be recorded once and then can be read by standard DVD-ROM devices.

**DVD-RW.** Digital Video Disc Read/Write Format. The rewriteable form of DVD-R, which allows for data to be overwritten multiple times.

**DWF™.** Design Web Format™ is an open, secure file format developed by Autodesk for the efficient distribution and communication of rich design data to anyone who needs to view, review, or print it.

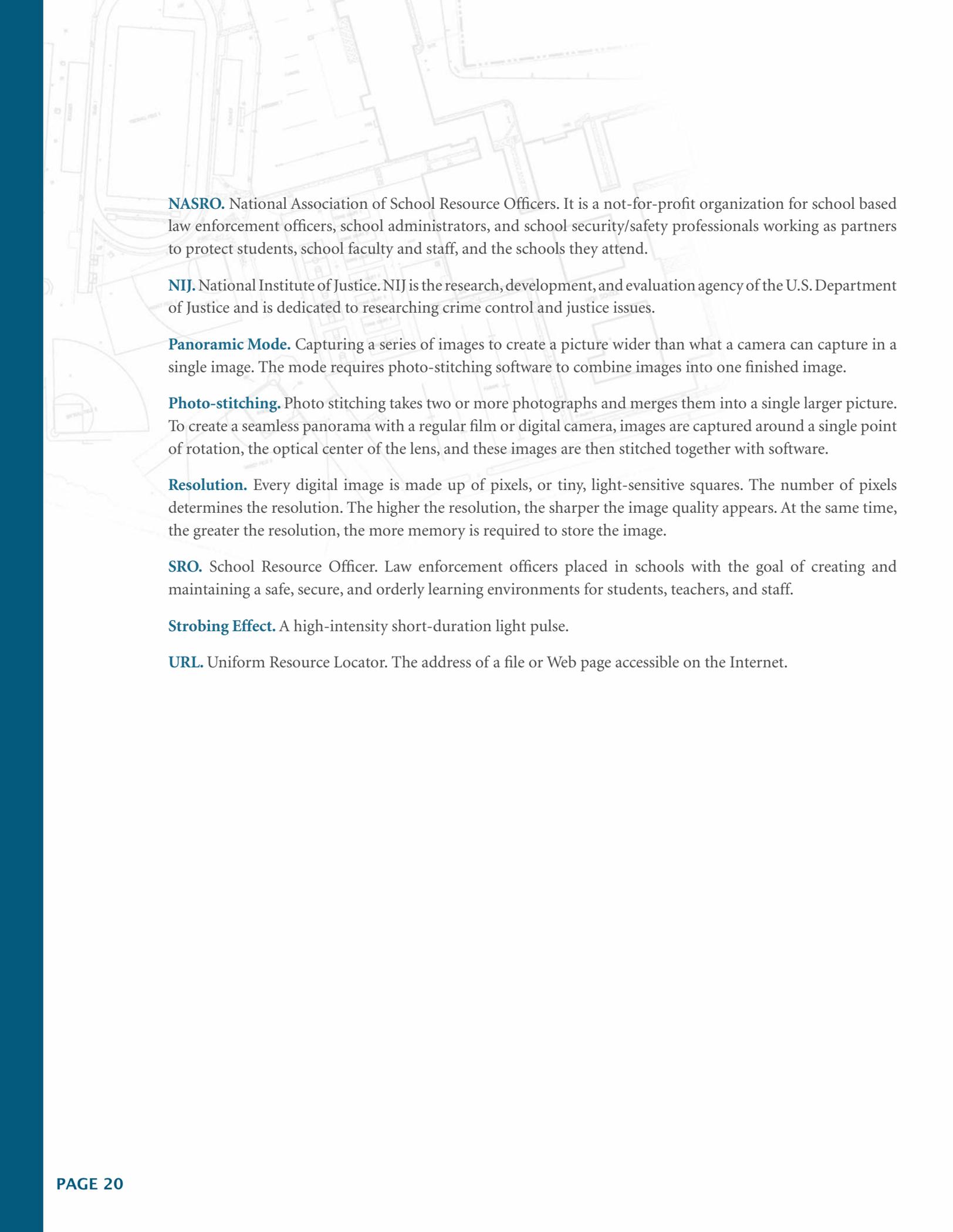
**F-stop.** A number that indicates the size of the lens opening on an adjustable camera. It works in conjunction with shutter speeds to indicate exposure settings.

**Hyperlink.** Underlined words, phrases, or files used in World Wide Web documents that link to another screen, page, or file. They are also used to load multimedia files, such as movies or graphics.

**IACP.** International Association of Chiefs of Police. The world’s oldest and largest nonprofit membership organization of police executives, with over 19,000 members in over 89 different countries. IACP leadership consists of chief executives from international, federal, state, local, and tribal law enforcement agencies and organizations of all sizes.

**LCD.** Liquid Crystal Display. A full-color display screen on cameras used to preview and review pictures and view information, such as menu options and camera settings.

**Macro Mode.** A camera setting that changes the focus of the camera so it can focus on very close objects. The macro setting is for photographing objects within a few inches or feet away. Use of the macro setting sets the optimum lens aperture and shutter speed on the camera.



**NASRO.** National Association of School Resource Officers. It is a not-for-profit organization for school based law enforcement officers, school administrators, and school security/safety professionals working as partners to protect students, school faculty and staff, and the schools they attend.

**NIJ.** National Institute of Justice. NIJ is the research, development, and evaluation agency of the U.S. Department of Justice and is dedicated to researching crime control and justice issues.

**Panoramic Mode.** Capturing a series of images to create a picture wider than what a camera can capture in a single image. The mode requires photo-stitching software to combine images into one finished image.

**Photo-stitching.** Photo stitching takes two or more photographs and merges them into a single larger picture. To create a seamless panorama with a regular film or digital camera, images are captured around a single point of rotation, the optical center of the lens, and these images are then stitched together with software.

**Resolution.** Every digital image is made up of pixels, or tiny, light-sensitive squares. The number of pixels determines the resolution. The higher the resolution, the sharper the image quality appears. At the same time, the greater the resolution, the more memory is required to store the image.

**SRO.** School Resource Officer. Law enforcement officers placed in schools with the goal of creating and maintaining a safe, secure, and orderly learning environments for students, teachers, and staff.

**Strobing Effect.** A high-intensity short-duration light pulse.

**URL.** Uniform Resource Locator. The address of a file or Web page accessible on the Internet.

# APPENDIX A: PRODUCT REFERENCE GUIDE

IACP endorsement is in no way implied.

## LENS

### **0-360.com**

2483 Simons Ct.  
Carson City, NV 89703  
(800) 495-0360  
www.0-360.com

### **IPIX InfoMedia**

1009 Commerce Park Drive,  
Suite 400  
Oak Ridge, TN 37830  
(877) 338-4749  
www.ipix.com

### **Kaidan Incorporated,**

703 East Pennsylvania Blvd.  
Feasterville, PA 19053  
(215) 364-1778  
www.kaidan.com

### **Voyager 360 of North America**

3600 Cerrillos Road, Studio 504 B  
Santa Fe, New Mexico 87507  
(866) 902-3600  
www.voyager360.com

## CAMERAS

### **Canon**

850 Greenbrier Circle  
Chesapeake, VA, 23320  
1-800-OK-CANON  
www.usa.canon.com

### **Fuji Photo Film USA, Inc.**

P.O. Box 7828  
Edison, NJ 08818-7828  
(800) 800-3854  
www.fujifilm.com

### **Hewlett-Packard Company**

3000 Hanover Street  
Palo Alto, CA 94304-1185  
(800) 752-0900  
www.hp.com

### **Nikon Inc.**

1300 Walt Whitman Road  
Melville, New York 11747-3064,  
(800) 645-6687  
www.nikonusa.com

### **Olympus America Inc.**

2 Corporate Center Drive  
PO Box 9058  
Melville, NY 11747  
(888) 553-4448  
www.olympusamerica.com

### **Panoscan**

5632 Van Nuys Blvd. #150  
Van Nuys, CA 91401-4600  
(818) 908-4641  
www.panoscan.com

### **Sony**

The Sony Corporation of America  
550 Madison Avenue  
New York, NY 10022.  
(800) 222-7669  
www.sony.com

## SOFTWARE

Adobe Systems Incorporated  
345 Park Avenue  
San Jose, California 95110-2704  
(800) 833-6687  
www.adobe.com

### **Apple**

1 Infinite Loop  
Cupertino, CA 95014  
1-800-692-7753  
www.apple.com

### **Autodesk, Inc.**

111 McInnis Parkway  
San Rafael, CA 94903  
(415) 507-5000  
www.autodesk.com

### **Macromedia, Inc.**

600 Townsend Street  
San Francisco, CA 94103  
800-470-7211  
www.macromedia.com

### **Microsoft Corporation**

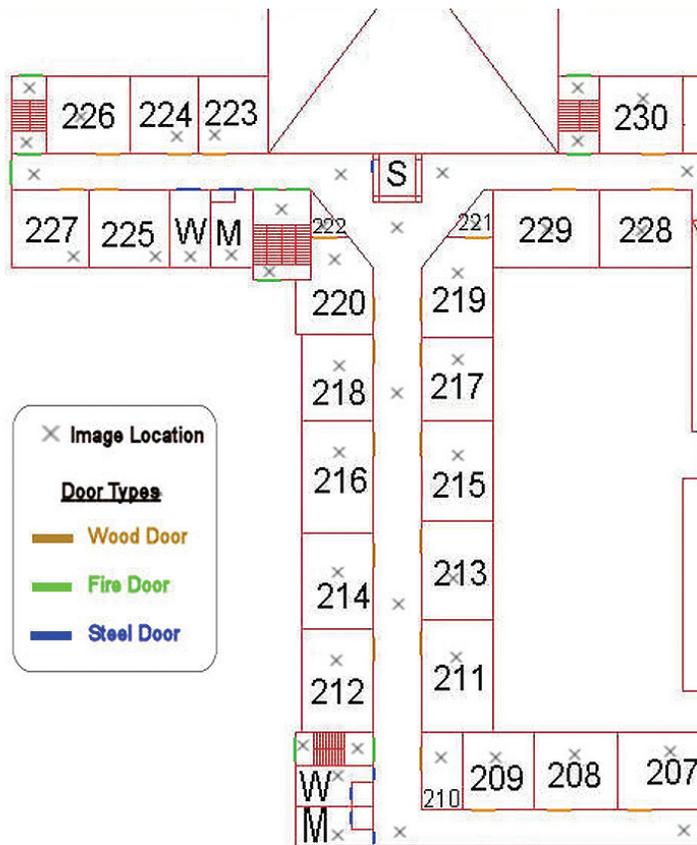
One Microsoft Way  
Redmond, WA 98052-6399  
(800) 426-9400  
www.microsoft.com

### **Mozilla Foundation**

1350 Villa Street, Suite C  
Mountain View, CA 94041-1126  
www.mozilla.org

# APPENDIX B: SAMPLE PHOTO LOG AND FLOOR PLAN

Photo #	Image #	Location	Door Type	Notes
1	267	Courtyard (NW)	None	
2	268	Courtyard (NE)	None	
3	269	Courtyard (SE)	None	Bad shot - overcast
4	270	Courtyard (SW)	None	
5	271	Inside of Room 207	Wood	
6	272	Hallway by Room 207	None	
7	273	Inside of Room 208	Wood	Center of room
8	274	Inside of Room 209	Wood	
9	275	Inside of Room 210	Wood	
10	276	Hallway Intersection by Room 210	None	
11	277	Women's Bathroom by Room 210	Steel	Bad Shot
12	278	Men's Bathroom by Room 210	Steel	
13	279	Top landing of Stairwell #1	Fire Door	
14	280	Bottom landing of Stairwell #1	Fire Door	
15	281	Inside of Room 212	Wood	



## APPENDIX C: FAIRFAX COUNTY POLICE DEPARTMENT REACTS “The Centreville High School Incident”

Two officers on routine patrol with the Fairfax County, Virginia Police Department receive a call from dispatch to meet with the Principal of Centreville High School regarding a reported death threat. Upon arriving at the school, they hear an alarm sound and see eleven students running from the main entrance. One student falls down, the victim of what appears to be a gunshot wound to the leg. The officers immediately call for back-up and establish a checkpoint. A second unit arrives on the scene and takes up position at the opposite corner of the school. The students tell officers that two suspects are in the cafeteria armed with shoulder weapons. Suddenly, a call comes through from the onsite School Resource Officer (SRO) who yells, “Gunshots in the cafeteria, I’ve been shot!” Every available unit is now sent to the school, including the SWAT and Incident Command Trucks.

A five-man unit of patrol officers becomes an emergency response team, entering the building and responding to the threat. Upon entering the cafeteria, they find two students dead, two seriously wounded, and the SRO who is protecting ten uninjured students. The team gets descriptions of both suspects, and learns that one left out the north door, and the other through the south door.

Dispatch receives a call from a student still trapped inside who pleads for help and says that one of the suspects is on the third floor killing students. At this point, the tactical team joins with the patrol units. Another call comes from a student, “He’s in the gymnasium with a gun.” Several students tell the team where the shooting is taking place. The team reacts quickly, killing the shooter. They find a two-way radio and try to negotiate with the other suspect who is threatening to kill more students. Suddenly, a student is heard yelling from Room 205 where the sound of gunfire pierces the silence. Another call from dispatch announces that one student in the library and one in Room 102 have been shot and need help immediately. Two students found hiding in the back of the school tell the team that the second suspect is in the auto mechanics room. When negotiations fail, the team enters the room and kills the second suspect.



### Epilogue

While this was only a tactical exercise conducted by the Fairfax County Police Department, “The Centreville High School Incident” depicts a scene all too familiar in today’s society. Recognizing the potential impact of such an incident on the community, the Fairfax County Police Department and the Fairfax County Schools Office of Safety & Security partnered with the IACP to capture digital images of their school buildings and overlay these images on floor plans using readily available software. The images were then transferred to a CD,



creating a virtual rendering of the schools that can be used to guide police and fire personnel in the event of a critical incident.

At Centreville High School, the images were used to coordinate a tactical response, directing teams to classrooms and providing intelligence on rooms and locations prior to actual entry, enabling more direct routes to suspect locations. The images also illustrated major access points into the school and choke points such as stairs or long hallways where suspects might be hiding.

The tactical teams' review of the software found that it was a valuable tool for providing essential intelligence, enabling them to contain or eliminate the threat as quickly as possible. More importantly, the end result would be lives saved.

## APPENDIX D: WASHINGTON STATE CASE STUDY

The Digital Imaging for Safe Schools Resource Guide represents one of many systemic approaches that support critical incident response planning. The unique approach taken by Fairfax and Arlington County law enforcement and school administrative personnel to develop this potential life-saving database serves as a model practice for communities working to safeguard their schools and other public facilities.

Now imagine a statewide system where first responders can quickly access detailed information about public buildings over the Internet or from mobile data terminals in the event of a critical incident. Details like floor plans, locations of command posts, observation posts, staging areas, utility shut-offs, and contact information are all available to support tactical response plans.

Larry Erickson, former Executive Director of the Washington Association of Sheriffs and Police Chiefs (WASPC), envisioned just such a system, and in 2001 was able to secure funding for the project through the state legislature with the help of Representative John Lovick. WASPC then contracted with Prepared Response, Inc., a Seattle-based company, to develop what is now called Rapid Responder™.

At the conclusion of a successful pilot project, legislation was passed to authorize additional spending to map all of the state's high schools using the new product. WASPC took the position that while Homeland Security initiatives focusing on critical infrastructure were important, from a local perspective, schools were a higher priority.

Deployment of the Rapid Responder™ system consisted of four stages: orientation, data collection, development of tactical pre-plans, and stakeholder planning. The major advantage of this process is that it provides an opportunity for key stakeholders such as police, fire, school, state, and federal emergency responders to articulate what type of information is needed in the system, and to facilitate the building of relationships that are essential for communication and coordination during a critical incident.

Security of the data is a top priority of the Rapid Responder™ system. Encryption is employed to safeguard the text and numerical data, while multiple locations of Internet servers provide another layer of protection from physical or electronic entry.

Development of a response plan for critical incidents can easily include systems for capturing data and images similar to those in this Guide or more detailed designs from professional firms such as Prepared Response, Inc. What we have provided is a starting-point, focusing on a community's most precious resource – its children.

For more information on WASPC and the State of Washington's approach to public safety, please visit the following web sites:

<http://www.waspc.org>

<http://www.preparedresponse.com>

# APPENDIX E: PROJECT STAFF

## Executive

Joseph Estey	2005 IACP President
Dan Rosenblatt	IACP Executive Director
Eugene Cromartie	IACP Deputy Executive Director
John Firman	IACP Research Center Director

## Project

Valencia Kyburz	Program Manager
Albert Arena	Project Manager
William Albright	Project Team Leader
Kristy Fowler	Field Technical Assistant
Keegan Johnson	Field Technical Assistant
Laura Nichols	Technical Advisor
Angelique Savvakis	Field Technical Assistant
Patrizia Strupp	Field Technical Assistant
Dan Welch	Field Technical Assistant



## Look to the Cutting Edge for:

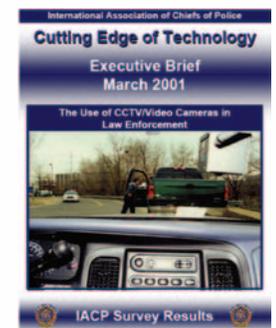
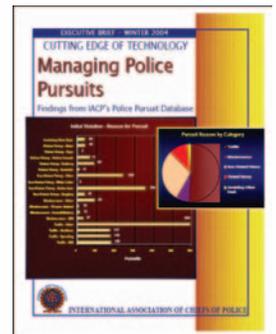
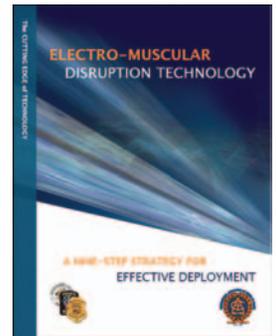
Future development of comprehensive digital in-car camera minimum performance standards and testing protocols.

## IACP Cutting Edge of Technology products

Electro-Muscular Disruption Technology (EMDT) is a group of devices that use a high-voltage, low power charge of electricity to induce involuntary muscle contractions that cause temporary incapacitation. The increased use of these less lethal weapons, however, has raised concerns about the safety of EMDT devices. The IACP, with grant support from the National Institute of Justice, in collaboration with the Montgomery County Maryland Police Department, developed an Executive Brief to inform law enforcement leadership on deployment challenges surrounding EMDT technology.

The IACP internet-based Police Pursuit Database is a repository for local agency pursuit data. The Database enhances the policy and decision making capabilities of law enforcement leaders, and can also be utilized to identify and analyze pursuit trends, recognize technology and training needs, avoid departmental liability, dispel false information, and inform the public.

The Use of CCTV/Video Cameras in Law Enforcement Executive Brief. This executive brief presents the uses and interests of over 200 responding law enforcement agencies using CCTV today. It also highlights some of the practical considerations and policy issues police executives must consider when employing this technology.



**For more information on Cutting Edge products and services, or to request publications, please contact us at [cuttingedge@theiacp.org](mailto:cuttingedge@theiacp.org) or visit us on the web at: [www.theiacp.org](http://www.theiacp.org).**

**Founded in 1893, the International Association of Chiefs of Police is the world's oldest and largest association of law enforcement executives with more than 19,000 members in nearly 100 countries.**

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