Torrence Security/Surveillance Camera Design Guide **Published 7-16-19**

There are a wide variety of security cameras intended for specific environments and purposes. A comprehensive Needs Analysis and Site Survey are required to design a camera system correctly. The Site Survey is performed to identify the locations, camera types, and quantities needed to provide adequate coverage of your community buildings and grounds. Torrence provides this Needs Analysis / Site Survey as a free value-added benefit with every system we install. The Design Guide below will help lead you through the steps required to implement an effective security camera system.

Note - this guide is focused on the installation of surveillance cameras in the public areas of Long Term Care communities and the "employee only" areas within the community. This document does not suggest or provide guidelines on installing cameras within a resident's room, resident shower area, or any location that exposes the community to resident privacy concerns.

Start big and work your way down

1) Print a Google Earth picture of your property. Print both an overview photo that includes parking lots and grounds and also a tighter view of just the building outline.

- Scale the photos to estimate distances.
- Identify and number all public and employee entrances to your building.
- You'll want a camera view covering every door on the exterior of your building.
- Don't forget doors from utility rooms, kitchens, etc.

2) Identify and number all parking lots and remote areas of the property that need camera coverage.

- Resident, Visitor, and Employee parking lots.
- Entrance Driveways, Resident Loading / Unloading areas, Canopies.
- Outdoor Courtyards/Resident Seating areas.
- Loading Docks/Delivery Doors, Ambulance Entrance, Outbuildings, Dumpsters, etc.

3) Look for locations on the exterior of your building with clear site-lines to the outdoor areas you want to view.

- When viewing distant locations with a camera, it's easier and more cost-effective to mount Hi-Resolution cameras with a telephoto lens on your building rather than attempting to wire out to parking lot light poles.
- The Electrical Code prohibits running low-voltage/category cables in the same conduit as power cables.
- Outbuildings can be useful locations for cameras but will require a conduit or direct-bury category cable to the main building for wiring. Consumer WI-FI cameras are not a viable option.

4) With the sightlines and estimated distances marked on your grounds photo, the system designer can calculate the number of cameras required to cover the area.

- A narrow-angle telephoto lens on a hi-resolution camera can provide good detail at long distances.
- For wide locations like parking lots, it typically requires more than one camera to ensure there are no "blind spots" in the coverage.
- In some cases, a single180-degree view camera may provide the coverage needed.
- Lighting at night will influence the quality of the image captured by the camera.
- Note: Outdoor rated cameras are a must.
    - Outdoor rated cameras include heaters to prevent snow and ice from forming on the lens and special lens covers or coatings to prevent glare and environmental damage.
    - Vandal-resistant cameras are recommended for remote areas of the buildings and where cameras are easily reached with a ball bat.

5) When complete, you should have a couple of documents identifying all the potential locations for cameras on the exterior of your property.

- It's useful to have photos showing building details where cameras will likely be mounted.
- Each camera will require a wire "home-run" back to the location with Digital Video Recorder (DVR) or Network Video Recorder/Server (NVR), so imagine a logical wire path when considering camera locations.
- Mounting cameras under roof extensions and soffits help shield them from the elements.

Cameras for the building Interior

1) Inside the building, you'll take dozens of photos and note locations on floor plan drawings.

- Security cameras are selected based on the view needed, mounting requirements, image quality required, etc.
- Photos will help determine the best camera choice for each location.
- When shooting pictures, position the camera, so the photo captures not only the door, hallway, or room but also the ceiling, walls, and floor.
- It's best if you have a floor plan drawing of the entire facility so you can mark each location with a number for every photo you take. Photocopies of fire escape diagrams are also useful for this task and are easy to locate.
- Use a simple color-coding system to ID similar items like Med-Room doors on your floor plan drawings.
- Note on your drawing if the area has drop ceiling tiles or a finished ceiling. (It's easier and less costly to pull wire above ceiling tiles than a finished drywall ceiling).
- Look for convenient locations to mount cameras, considering that wire must be run back to “head-end” closet.
- Note the locations of Fire Walls in hallways that will be penetrated and fire-caulked for wiring.

2) Doorways are natural "choke points" that everyone must pass through, which makes them ideal locations for cameras. Take photos, note, and number all doorways on your interior floor plans.

- All primary entrances and vestibules should have a camera that allows staff to view who is entering the building.
    - A flat-screen video monitor at each unit reception desk can provide views of all related cameras. This is particularly useful if your staff monitors entrance doors and grants access remotely with a button or PC to release locks.
- Camera views looking outside require special "High-Dynamic-Range" or "Backlight Compensation" cameras to filter out the sunlight so you can see the face of the person walking into the building, instead of just the outline of a person and a "bloom" of sunlight.
- Note all remaining doorways leading outside. Rarely used doors are often used during thefts.
- Note locked doorways between units.
- Note doors leading into Med-Rooms and Supply Closets.
- Note all doors that separate residents from staff, including doors to the kitchen, laundry facilities, offices, etc.
- It’s not necessary to put a camera at every door, but ideally, you want to make sure a hallway or room camera has a view of any door that a resident or outsider can use to enter restricted areas.

3) Public and Common Areas including:

- Lobbies, Vestibules, and Greeting areas
- Dining rooms, Exercise rooms, Activity rooms, etc.
- All resident hallways
    - A single narrow-angle HD camera turned sideways can provide an excellent image looking down long hallways. Conversely, it may require a few wide-angle or 180 cameras to cover wide, open areas like dining rooms.
- Note any expected camera views that have exterior windows present (special cameras are required when looking into sunlight).
- If your administrative offices have a hallway, a single camera covering the hallway can document all activity leading into an office.

General Notes about Security Cameras

There are many specifications and features associated with security cameras. Below are some general notes that will help you communicate with your system provider.

Analog vs. IP Cameras

- Standard Analog cameras generally have much poorer picture quality than IP cameras.
- True IP high-megapixel HD cameras can capture excellent quality video but are more costly to purchase initially, require special Power-Over-Ethernet (POE) network switches, and store much larger files, requiring larger hard drives in the server/recorder for a given length of storage time.
- Analog HD (AHD) and TVI are analog cameras that provide HD quality images over Cat5 or coax cable and are a cost-effective improvement over basic analog at substantially less cost than IP cameras.
- "Megapixels" are not the only element that makes for a good video image. The quality of the lens and amount of available light are also important for a good, clear video image.
- Your Torrence Account Representative can do an onsite demo showing you a live image from each camera type for comparison in your building.

Dome Cameras vs. Bullet Cameras

- Dome Cameras are preferred for most interior applications.
- They can be flush mounted to the ceiling or walls for an unobtrusive and clean look.
- Outdoor Dome cameras protect the camera from the elements and include heaters and special coatings to prevent snow and ice buildup.
- Dome cameras can be made "vandal-resistant" and are less susceptible to damage and tampering than bullet cameras.
- Bullet Cameras are generally less costly, but the appearance is more "industrial" and less attractive than domes.
- Bullet cameras offer more lens options and are easy to mount to a variety of surfaces.

Day/Night Cameras

- Day/Night cameras are designed to adjust for the available light.
- As the level of light changes, an automatic aperture adjusts to let the correct amount of light enter the camera.
- In total or near darkness, Day/Night cameras use integrated IR elements to provide light to capture the image.
- Day/Night cameras automatically switch from color to black and white during low light.
- Low light conditions can make the video look "grainy."
- Both Dome and Bullet cameras are available with Day/Night capabilities.

Motion Detection

- Motion Detection triggers the camera to start recording when it senses motion or a change in the image it last "saw." Motion detection is used in areas without a lot of activity or is switched on during times when activity is reduced, like night time.
- Setting cameras or the system software to record on motion saves hard drive space on the server/ recorder and makes searching for video quicker.
- Motion Detection can be a part of the camera setup features; however, most VMS software allows you to switch a camera from full record to record-on-motion based on time clock settings.
- Cameras mounted outdoors are generally not set to record-on-motion.

System Infrastructure

- Each Network/ IP camera will require a Category 5 or 6 cable home-run back to a port on a Power-Over-Ethernet (POE) Network Switch in the nearest data closet. (TVI cameras use Cat5e or coax cabling)
- The maximum distance from an IP camera to the POE Switch location is 300'.
- Analog and HD Analog/TVI cameras using Coax can be up to 1500' from the recorder.
- For large facilities, POE Switches in multiple data closets are linked together with a hi-speed data "backbone."
- Cameras can be placed on your existing data network if your administrator is comfortable with the additional load that video traffic will place on the network.
- A dedicated video IP network, separate from the existing data network in the community is often the preferred method.
- Data closets should ideally be on generator power with surge protection and battery backup to ensure the system remains active during power outages. Clean, stable power is required for reliable operation.
- If you have an Access Control system that uses a card or fob swipes to enter a restricted area, the camera system can be configured to time stamp the video from the associated camera so you can quickly find the video image recorded every time the door is unlocked. (This feature requires a compatible Access Control system.)
- Torrence offers Access Control systems that easily link to our Video systems.

DVR / NVR / Server considerations

- Video storage requirements are typically discussed as "Days, Weeks, or Months" that recorded video needs to be available after an event takes place.
- Storage Hard Drives (HD) specifications are related to the total number of cameras, the resolution/data storage requirements for each camera, and the number of days video must be stored.
- Stored video will be automatically erased once the storage capacity of the drives is exceeded.
- Redundant / Offsite storage of recorded video is available as an option.
- Video Hard Drives (HD) are active 24/7/365 and are subject to failure. Assume the video HDs will need to be replaced every 3-5 years.
- The recorder(s) should be mounted in a locking metal equipment cabinet, within a locked data closet or office with restricted access to employees and outsiders.
- The recorder(s) should ideally be on generator backup power, and be powered through a UPS / Surge Protection device.
- Video Management Software (VMS) with full access privileges is typically installed on the administrators PC
- Remote Access and cell phone apps are typically deployed as part of the installation.
- View-only monitors showing live camera feeds from multiple cameras can be installed at reception desks and nurse stations.

Torrence is happy to provide a complete Needs Analysis, Site Survey, and Quote for a fully installed, configured, and warranted Video Security system. Free in-service training is included with every system installation. Torrence onsite service is available24/7/365 for every system we install. Contact your Torrence Account Administrator to schedule an appointment at 419-661-0678 or email your contact information to info@torrencesound.com.

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