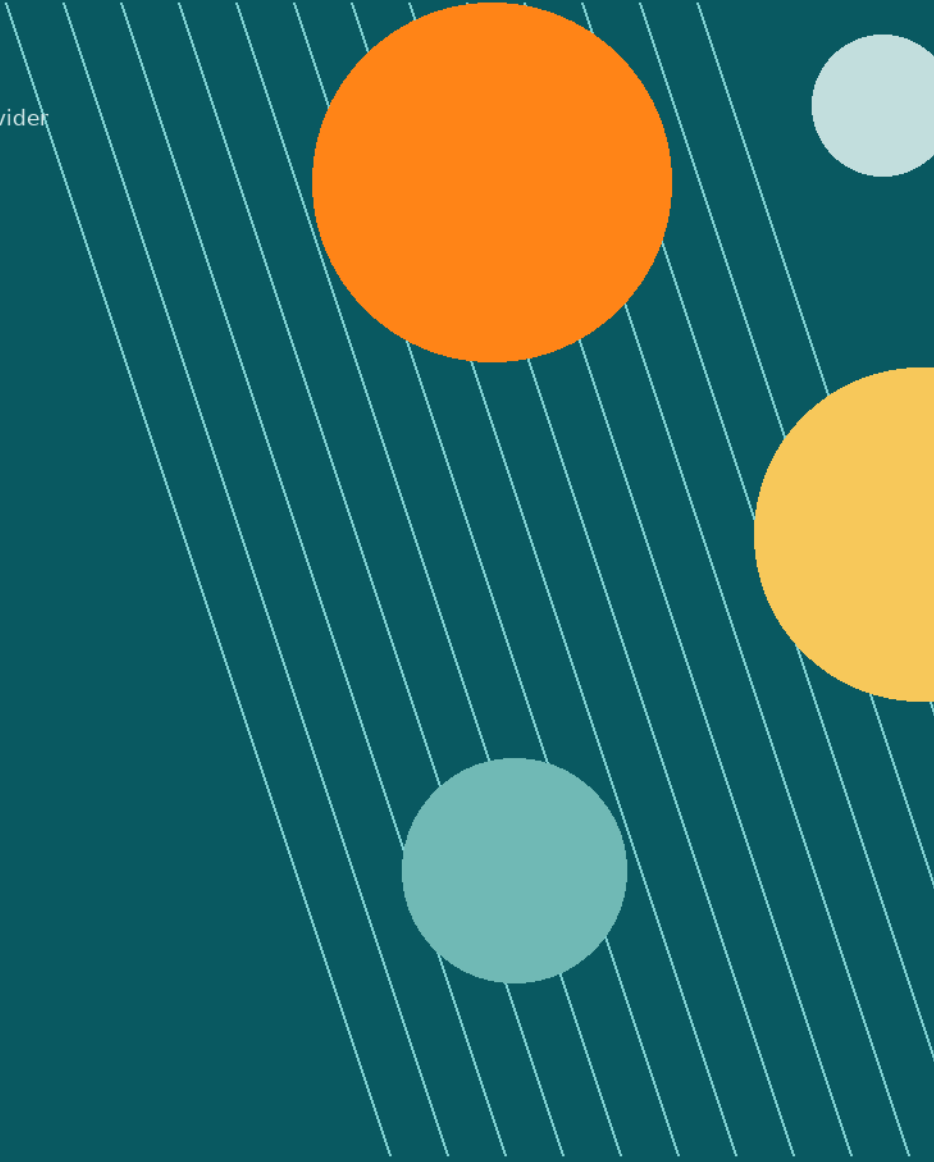


A decorative graphic on the right side of the page. It features a series of parallel diagonal lines in a light teal color. Overlaid on these lines are four circles of different colors: a large orange circle, a medium yellow circle, a small light blue circle, and a medium teal circle.

ACTi

Physical Security End-to-End Solution Provider

White Paper | High Resolution Cameras

HIGH RESOLUTION CAMERAS

A practical white paper for designing high-detail
surveillance systems for mission-critical evidence

Prepared by ACTi Corporation

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White Paper | High Resolution Cameras

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Document purpose

This white paper explains what high resolution cameras mean in professional video surveillance and how they should be specified, deployed, and evaluated. It is written for system integrators, consultants, security managers, facility managers, and procurement teams that need usable evidence in high-detail environments such as airports, casinos, banks, government facilities, transportation, campuses, city surveillance, retail, and industrial sites.

The document references ACTi public product information for the High Resolution Cameras category and ACTi corporate information. It avoids model-specific naming so the content remains useful even as individual part numbers or product generations change.

Reading guide

Use Sections 3 and 4 to define requirements, Section 5 to map use cases, Section 6 to check architecture, and Section 7 to align ACTi form factors with project needs.

1. Executive Summary

Security video often fails not because a camera is absent, but because the recorded image does not contain enough detail to support the required decision. A face at a wide entrance, a license plate at a parking gate, an object in a large retail area, or an incident across a campus may require more spatial detail than a conventional camera can provide.

ACTi describes its High Resolution Cameras category as a wide portfolio of professional surveillance cameras covering multiple form factors, with high resolution IP cameras up to 20MP. ACTi also states that each model in this category delivers at least 8 megapixels and is enhanced by capabilities such as zoom, long-distance IR illumination, low-light sensitivity, and WDR for balanced images. [1]

For system integrators, high resolution cameras create differentiation when proposals are designed around evidence quality, not only camera count or unit price. For consultants and end users, the correct specification should define the area of coverage, required detail level, target distance, lens, pixels on target, lighting condition, bit rate, storage retention, playback workflow, and operator response process.

Core message

High resolution should be specified as a detail-evidence outcome. Resolution, field of view, lens selection, sensor size, WDR, low-light sensitivity, IR, compression, bandwidth, storage, playback, export, and operator workflow all affect whether video can support real investigation and response.

Key takeaways

- High resolution is most valuable when the project requires wider coverage, finer detail, or both.
- ACTi public product information highlights high resolution security cameras up to 20MP, with multi-imager, dome, bullet, PTZ, hemispheric, cube, turret, and body-worn form factors available in the category.
- More pixels do not automatically guarantee better evidence; lens, viewing angle, lighting, compression, and storage quality must be planned together.
- Pixels-on-target is a practical bridge between megapixel count and actual recognition or identification objectives.
- High resolution video increases bit rate and storage demand, so recorder, VMS, network, and retention planning must be sized accordingly.
- Forensic review must include digital zoom, synchronized playback, accurate timestamping, evidence export, and a usable operator workflow.

Procurement principle

Do not specify high resolution only as a megapixel number. Specify the scene, coverage width, target distance, required evidence detail, lens, lighting, bit rate, retention, playback, export, and operator workflow together.

2. About ACTi Corporation

ACTi Corporation is the writer and publisher of this document. ACTi is a Taiwan-based international company founded in 2003 and serving customers in more than 100 countries. ACTi states that it has more than 20 years of security-industry experience and has been a pioneer in video-based security technology development and innovation. [2]

ACTi positions itself as a physical security end-to-end solution provider. Its ecosystem includes IP cameras, recording platforms, VMS, access control, central management, system health management, AI-enabled video technologies, and third-party system integration. [2]

This broader ecosystem matters for high-resolution projects. A camera may capture a high-detail image, but the project succeeds only when video is recorded, retained, displayed, searched, zoomed, exported, and acted upon correctly.

Why ACTi is relevant to high-resolution projects

ACTi strength	Project relevance
End-to-end system scope	High-resolution cameras can be planned together with NVR, VMS, CMS, clients, access control, alarms, third-party systems, and health management instead of being treated as isolated devices.
Clear video as a foundation	ACTi states that clear video is the basis of its solution evolution because smart technology depends on high-quality source video.
AI-enabled platform	High spatial detail can improve the practical value of analytics such as detection, tracking, counting, classification, recognition, and identification.
Compliance and project fit	ACTi public pages reference compliance considerations such as NDAA, TAICS, and vertical-market requirements.

3. Definition of "High Resolution Cameras"

A high resolution camera is a video surveillance camera selected to capture more spatial detail than conventional surveillance cameras. In practical project language, it provides enough pixels across the target area for the intended evidence task, such as observing overall context, recognizing a person, reading object attributes, reviewing a transaction, or supporting incident reconstruction.

In ACTi public product language, the High Resolution Cameras category covers cameras that deliver at least 8 megapixels, with portfolio capabilities up to 20MP. The category is positioned for professional surveillance projects where every detail matters, including airports, casinos, banks, government facilities, and city surveillance. [1]

In project terms, high resolution is not just a sensor or output number. It is the ability to capture a scene with enough pixel density, optical quality, exposure quality, and playback accessibility for the intended security or operational decision.

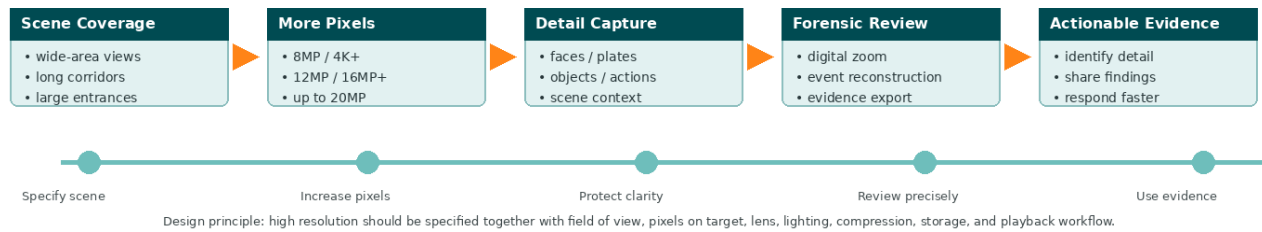
High resolution cameras vs. related concepts

Term	Meaning	Common misunderstanding
High resolution camera	Camera selected to preserve fine spatial detail, typically 8MP/4K or above in professional surveillance contexts.	It is not only a higher number of pixels; the full system must preserve the captured detail.
Megapixel count	Total number of image pixels, usually expressed as MP.	More megapixels can be wasted if the lens, focus, lighting, compression, or display workflow is weak.
Pixels on target	Number of pixels covering a person, plate, object, or area of interest.	A high-resolution camera can still fail if the target is too far away or the field of view is too wide.
Wide-area coverage	Use of high resolution to cover a larger scene while retaining more detail.	Wide coverage should not be confused with guaranteed identification across every point in the scene.
Digital zoom	Playback or live-view enlargement using recorded pixels.	Digital zoom is useful only when the original recording contains enough detail and low compression artifacts.

Visual concept

How high resolution cameras create evidence value

From wider coverage and finer pixel detail to more useful forensic investigation



Design note

A high-resolution camera increases the number of spatial samples in each frame, but useful evidence depends on the complete chain: the scene must be optically framed, focused, lit, exposed, encoded, transmitted, recorded, retrieved, zoomed, and exported without losing the detail that justified the higher resolution in the first place.

Practical interpretation: resolution defines potential detail; system design determines whether that potential detail becomes usable evidence.

4. Core Technical Concepts

Camera selection should begin with the evidence problem. The goal is to preserve usable detail at the area width, distance, lighting condition, retention period, and operator workflow that matter to the project. The following concepts help teams avoid under-designed specifications.

Concept	Practical meaning
Resolution and pixel count	Resolution determines how many pixels are available in the image. Higher pixel counts can support wider coverage, stronger digital zoom, or more pixels on target.
Pixels on target	Translate the evidence objective into pixel density at the target. A person, license plate, cash movement, or object attribute needs enough pixels at the actual distance.
Field of view and lens	The lens determines how pixels are distributed across the scene. A wide lens covers more area but reduces pixel density; a telephoto or zoom view concentrates pixels on distant targets.
Sensor, focus, and optical quality	High resolution requires accurate focus and suitable optics. Poor focus or lens mismatch can remove detail before the image is compressed or recorded.
Lighting, WDR, and low-light sensitivity	High pixel count does not solve backlight, glare, noise, or dark scenes. WDR, low-light sensitivity, IR, white light, and scene lighting should be planned.
Compression and bit rate	High-resolution streams require sufficient bit rate and codec planning. Over-compression can create artifacts that damage forensic review.
Storage and retention	More pixels usually increase storage demand. Retention days, bit rate, codec, frame rate, motion profile, and redundancy must be calculated before deployment.
Playback and export workflow	The VMS/NVR must support smooth playback, digital zoom, synchronized review, accurate timestamps, and evidence export at the required quality.
Analytics readiness	People, vehicle, object, face, or license-plate analytics depend on enough pixel quality, target size, angle, and scene consistency.

Specification interpretation

A 20MP camera can still fail if the field of view is too wide, the target is too small, the scene is too dark, focus is inaccurate, compression is too aggressive, or operators cannot retrieve footage efficiently. Conversely, a well-designed 8MP/4K system can outperform a nominally higher-resolution system when lens, lighting, bit rate, storage, and playback are properly matched to the scene.

Capability matrix

Scene challenge to high-resolution capability matrix

Match the evidence goal with camera, lens, network, and playback capabilities

Scene challenge	What can go wrong	Capabilities to specify
Wide entrances / halls	People or objects are too small for identification	8MP/4K+ or higher, proper lens/FOV, pixels-on-target validation
Large parking areas	License plates or vehicle attributes lack readable detail	Telephoto or PTZ view, sufficient pixels, IR/WDR, stable mounting
Retail / service counters	Dispute details are hard to confirm after zooming	High pixel density, close FOV, WDR, audio/DI/DO integration if needed
City / campus surveillance	Operators need both context and investigative detail	Multi-imager or panoramic view, VMS layout, search/export workflow
Low light / backlight	Higher resolution is recorded but images lack usable contrast	Low-light sensitivity, WDR, IR/white light, exposure and noise control

How to use this matrix

Use the matrix during site survey and proposal design. Each high-detail evidence problem should be translated into a camera requirement, a network/recording requirement, and an operator-review requirement. This reduces the risk of specifying a high-megapixel camera while leaving the rest of the system unable to preserve or use the captured detail.

Fast design checklist

- Define the object or detail that must be proven after the incident.
- Measure or estimate the target distance and scene width.
- Select lens and mounting position before finalizing megapixels.
- Validate playback digital zoom on recorded footage, not only live view.

5. High-Value Applications

High resolution cameras are most valuable where video is expected to support detailed incident review, recognition, investigation, compliance-sensitive documentation, or operational decision-making. ACTi references airports, casinos, banks, government facilities, and city surveillance projects as examples where additional clarity helps preserve critical evidence. [1]

Application	Operational value	Typical locations
Transportation and traffic	Capture vehicles, pedestrian events, lane behavior, plate-region detail, and fast incidents with more spatial clarity for review.	Intersections, gates, parking entrances, toll areas, loading zones, transit stations
Airports and public facilities	Support large-area monitoring while retaining sufficient detail for incident investigation and coordination.	Terminals, entrances, checkpoints, concourses, baggage areas, public halls
Casinos and gaming	Support review of table activity, hand movement, chips, cards, cash exchange, and disputed incidents.	Gaming floors, cashier areas, entrances, restricted areas, surveillance rooms
Banks and service counters	Preserve transaction, dispute, object, and face details where high-quality evidence is required.	Branches, teller counters, ATMs, reception desks, self-service areas
Campuses and city surveillance	Improve coverage of public areas while preserving detail for multi-camera monitoring and investigation.	Schools, universities, streets, plazas, parks, public buildings, transport nodes
Critical infrastructure	Improve review of intrusion, perimeter activity, vehicle approach, or incident sequence across large outdoor areas.	Utilities, ports, industrial plants, data centers, government sites
Retail and logistics	Review object movement, package handling, shrinkage events, queue activity, and operational disputes.	Stores, warehouses, sorting systems, loading docks, checkout areas

Value by stakeholder

Stakeholder	Main benefit
System integrator	Stronger differentiation when proposals are built around evidence detail, not only camera count or unit price.
Consultant	Clearer specification language for resolution, field of view, pixels-on-target, lens, WDR, low-light, bit rate, retention, and playback.
Security manager / operator	More reliable digital zoom, incident reconstruction, export, escalation, and evidence review.
Procurement team	A more defensible buying decision based on application fit, compliance readiness, and total evidence workflow.

6. System Architecture

High resolution should be designed as a system architecture. The camera creates the source image, but the full solution must preserve that detail through transmission, recording, storage, viewing, digital zoom, search, export, and response. If any layer is under-designed, the project may lose evidential value.

Reference system architecture

Reference system architecture

High resolution value depends on the complete path from scene capture to investigation workflow



Key architecture question: Can operators reliably view, search, export, and act on the detail the camera captures?

Architecture layers

Layer	Role in high-resolution surveillance
Field layer	Camera form factor, sensor, lens, zoom, focus, WDR, IR, resolution, frame rate, mounting height, viewing angle, target distance, weather exposure, and maintenance access.
Network layer	PoE, switching, uplink capacity, fiber or wireless links, VLANs, latency, cybersecurity controls, remote access, and bandwidth headroom for high-resolution streams.
Recording layer	NVR or VMS storage, bit rate, codec, frame rate, retention period, redundancy, backup, playback performance, and export workflow.
Management layer	Client software, web access, CMS, TV wall, user permissions, multi-site monitoring, event review, and system health management.
Analytics layer	People, vehicle, object, face, or license-plate analytics; analytic performance depends on image quality, target size, and scene design.
Response layer	Operator SOPs, alerts, access-control action, guard dispatch, escalation, incident reporting, evidence export, and audit trail.
Architecture warning: A camera that looks excellent in a datasheet can still underperform if the network bit rate, recording profile, display layout, storage retention, or operator search workflow is poorly planned.	

7. ACTi Product Portfolio Overview

ACTi positions its High Resolution Cameras category as a portfolio for professional surveillance projects requiring high-detail evidence. The public page highlights a wide range of high resolution IP cameras up to 20MP, including multi-imagers, domes, bullets, PTZ, hemispheric, and other advanced models. [1]

At portfolio level, ACTi highlights resolution up to 20MP, optical zoom up to 40x, IR distance up to 250 meters, frame rate up to 120fps under 2MP mode, PTZ models up to 8MP and 40x, hemispheric models up to 16MP, multi-imager models up to 20MP, built-in analytics with people and vehicle detection, classification and recognition, high-resolution anti-corrosion and anti-explosion models, and compliance options such as NDAA and TAICS. [1]

Portfolio categories

Category	Where it fits	Use-case fit
Cube cameras	Compact indoor form factor where simple installation, audio, and close-range observation may matter.	Offices, reception desks, small rooms, service counters, indoor checkpoints.
Bullet cameras	Directional outdoor form factor for visible deterrence and focused coverage of specific areas.	Traffic approaches, gates, driveways, loading docks, parking edges, perimeter points.
Dome and turret cameras	Lower-profile form factors often used where appearance, ceiling mounting, or vandal resistance matters.	Lobbies, corridors, banks, casinos, retail areas, public entrances, indoor/outdoor fixed views.
Hemispheric and fisheye cameras	Wide-area situational awareness where one camera can cover broad scenes with high pixel count.	Retail floors, halls, transportation areas, classrooms, public spaces where overall scene context matters.
Multi-imager cameras	Multiple sensors in one device to cover several viewing directions or a broad scene without relying on a single ultra-wide image.	Building corners, intersections, campuses, parking areas, large entrances, public spaces.
PTZ cameras	Wide-area monitoring with optical zoom, positioning control, and long-distance observation capability.	City surveillance, campuses, airports, industrial sites, parking, public spaces.
Environmental and compliance-ready options	Selections where corrosion, explosion-risk environments, NDAA, TAICS, cybersecurity, or regional availability must be confirmed.	Industrial sites, government projects, critical infrastructure, public sector, regulated enterprise projects.

Portfolio-level capabilities to confirm

- Required form factor, mounting method, field of view, target size, target distance, and lighting condition.
- Required resolution, lens type, zoom range, WDR, low-light performance, IR distance, frame rate, and actual evidence quality.
- Recorder/VMS compatibility, bit rate, codec, retention, playback, digital zoom, export workflow, CMS, and remote access requirements.
- Environmental casing, operating temperature, anti-corrosion or anti-explosion needs, vandal resistance, and maintenance access.
- Built-in analytics requirements and whether the scene can support reliable detection, classification, recognition, counting, or tracking.
- Cybersecurity and compliance requirements such as NDAA, TAICS, firmware policy, secure access, and regional availability.

Project note: Product availability, detailed specifications, compliance status, recorder compatibility, and regional part numbers should be confirmed from the latest ACTi product pages, datasheets, firmware release notes, and quotation documents before project submission.

8. Related Keywords and Terminology

The following keyword reference groups collect common terms related to high resolution surveillance, image detail, wide-area coverage, forensic investigation, system architecture, and project procurement.

Core topic keywords

high resolution camera, high resolution security camera, high resolution surveillance camera, 4K security camera, 8MP security camera, 12MP security camera, 16MP security camera, 20MP security camera, high megapixel IP camera, high detail security camera, forensic evidence camera

Image detail and evidence keywords

pixels on target, high detail video evidence, digital zoom surveillance, forensic video review, scene detail camera, identification quality video, recognition quality surveillance, evidence export workflow, high clarity security video, image detail surveillance

Wide-area coverage keywords

wide area surveillance camera, panoramic surveillance camera, 180 degree security camera, 360 degree security camera, multi sensor camera, multi imager camera, large area monitoring, campus surveillance camera, city surveillance camera, public area surveillance

Traffic and transportation keywords

traffic monitoring camera, vehicle monitoring camera, license plate capture camera, intersection surveillance camera, parking entrance camera, toll gate camera, transportation security camera, roadway surveillance camera, vehicle approach camera, smart traffic surveillance

Banking, gaming, and retail keywords

casino surveillance camera, bank security camera, cashier surveillance camera, service counter camera, retail surveillance camera, transaction dispute video, cash handling camera, public facility security camera, airport surveillance camera, government facility surveillance

Technical specification keywords

megapixel security camera, resolution vs field of view, pixels per foot, pixels per meter, lens selection for surveillance, bit rate planning, storage planning, H.265 high resolution, H.264 high resolution, WDR high resolution camera, low light high resolution camera, IR high resolution camera

Form factor keywords

cube camera, bullet camera, dome camera, turret camera, PTZ camera, fisheye camera, hemispheric camera, multi-imager camera, body-worn camera, outdoor bullet camera, fixed dome camera, zoom camera, vandal resistant camera, weatherproof security camera, anti-corrosion camera, anti-explosion camera

Analytics and intelligent video keywords

AI security camera, built-in analytics camera, people detection camera, vehicle detection camera, object classification camera, face recognition camera, license plate recognition camera, people counting camera, object metadata camera, auto tracking camera

System and architecture keywords

IP camera system, NVR camera system, VMS camera system, CMS surveillance, remote security monitoring, multi-site surveillance, system health management, security camera bandwidth planning, video retention planning, digital zoom playback

Procurement and project keywords

security camera specification, high resolution camera specification, camera selection guide, surveillance camera white paper, camera for system integrators, camera for consultants, camera for end users, NDAA security camera, TAICS security camera, ACTi high resolution camera

Common question phrases

what is a high resolution camera, when do I need a 4K security camera, when do I need a 20MP security camera, how does resolution affect surveillance video, does higher resolution improve identification, how many pixels are needed for facial recognition, how much storage do high resolution cameras need, how to choose a camera for large area monitoring, how to specify pixels on target, how to design high resolution surveillance for city projects

Source notes

Ref.	Source
[1]	ACTi Corporation, "High Resolution Cameras," official product category page. URL: https://www.acti.com/products/high-resolution-cameras . Accessed: June 12, 2026.
[2]	ACTi Corporation, "About ACTi," official corporate page. URL: https://www.acti.com/corporate/about . Accessed: June 12, 2026.

Revision note: This document is a marketing and technical education white paper. It is not a regulatory certification, safety standard, or final project design. Always validate target detail, viewing distance, field of view, lens choice, lighting, IR, recording settings, storage, and operator workflow in the target scene before deployment.

Prepared by ACTi Corporation

For high-resolution camera projects, confirm camera type selection, lens, lighting, recording platform, compliance requirements, mounting accessories, and regional availability with your ACTi sales contact or authorized system integrator.

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