VIVOTEK Technical Training

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VIVOTEK
SUPREME

VIVOTEK's name come from **Video, Voice, Teknology**

VIVOTEK HAS ITS OWN…

1. Hardware development
2. Software development
3. Electrical & mechanical integration

developed inhouse, giving us great capabilities to do customization

TOTAL SOLUTION FOR YOUR SURVEILLANCE SYSTEM

Network
Cameras

Video
Servers

Network
Video
Recorders

Central
Management
Software

170

More than 170 models

Rich

features for all
applications

500+

in-house engineers

More than **150**

distribution partners

More than

100+

solution partners

Within **24**

hours technical support

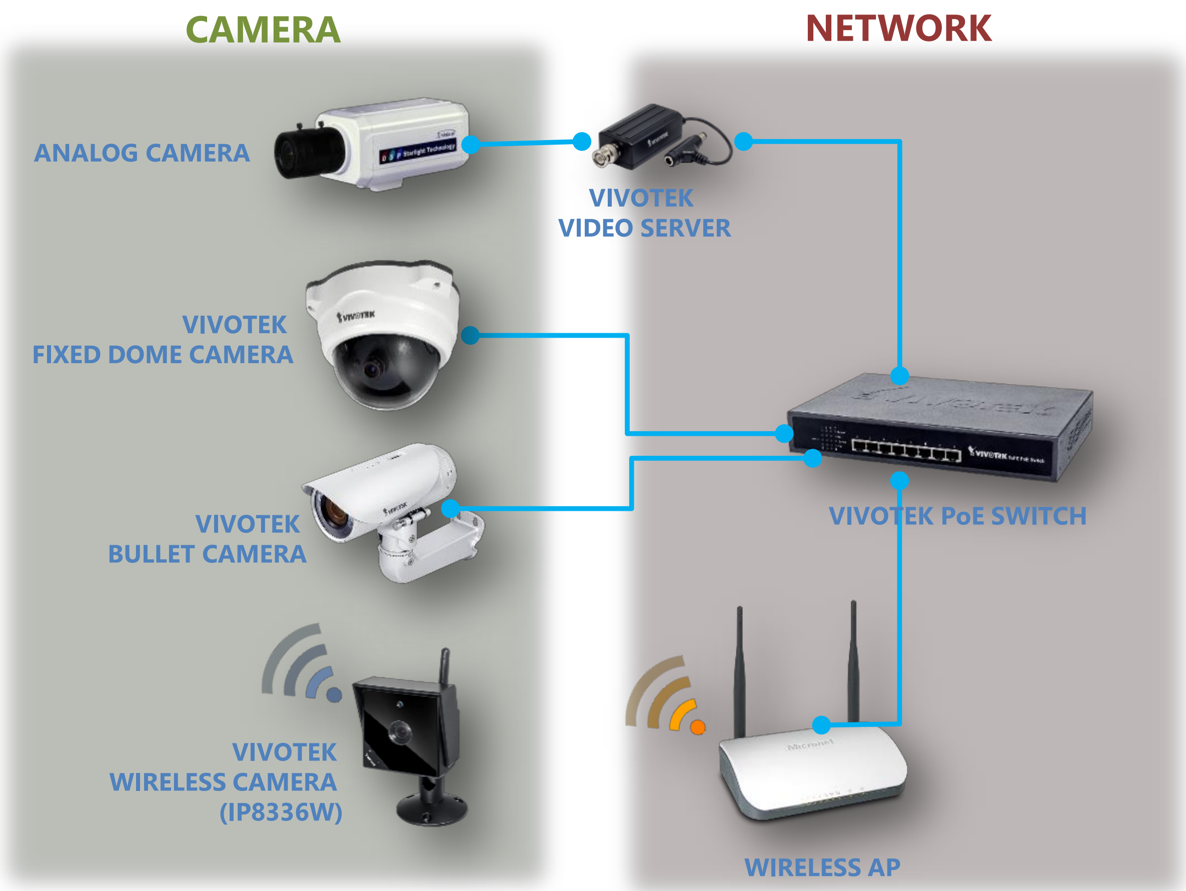
BUILD UP YOUR SURVEILLANCE SYSTEM

CAMERA

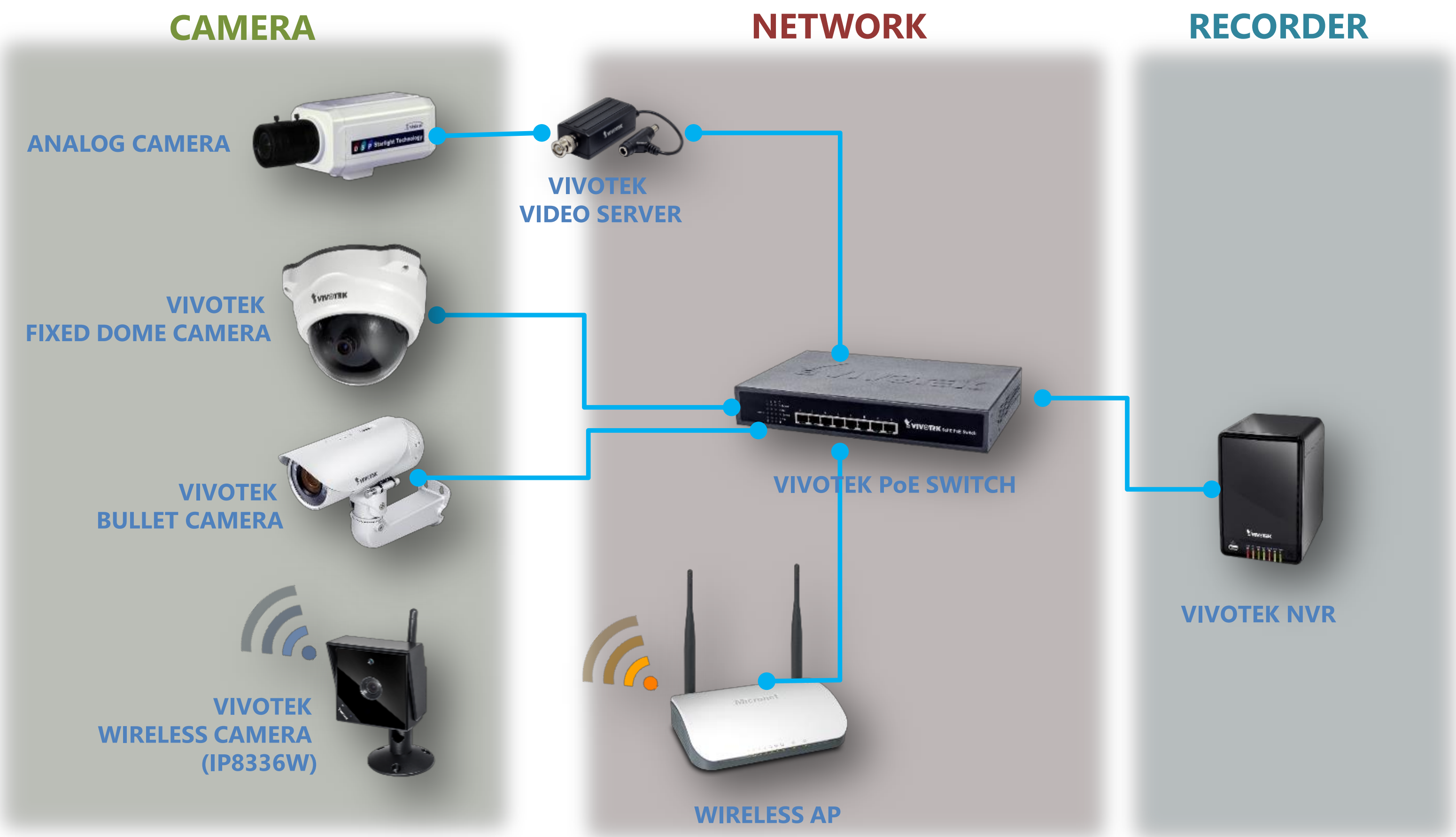
ANALOG CAMERA
VIVOTEK
FIXED DOME CAMERA
VIVOTEK
BULLET CAMERA
VIVOTEK
WIRELESS CAMERA
(IP8336W)

What is composition of IP Surveillance system?

BUILD UP YOUR SURVEILLANCE SYSTEM


CAMERA
NETWORK
ANALOG CAMERA
VIVOTEK
VIDEO SERVER
VIVOTEK
FIXED DOME CAMERA
VIVOTEK
BULLET CAMERA
VIVOTEK PoE SWITCH
VIVOTEK
WIRELESS CAMERA
(IP8336W)
WIRELESS AP

BUILD UP YOUR SURVEILLANCE SYSTEM


CAMERA
NETWORK
RECORDER
ANALOG CAMERA
VIVOTEK VIDEO SERVER
VIVOTEK FIXED DOME CAMERA
VIVOTEK BULLET CAMERA
VIVOTEK WIRELESS CAMERA (IP8336W)
VIVOTEK PoE SWITCH
WIRELESS AP
VIVOTEK NVR

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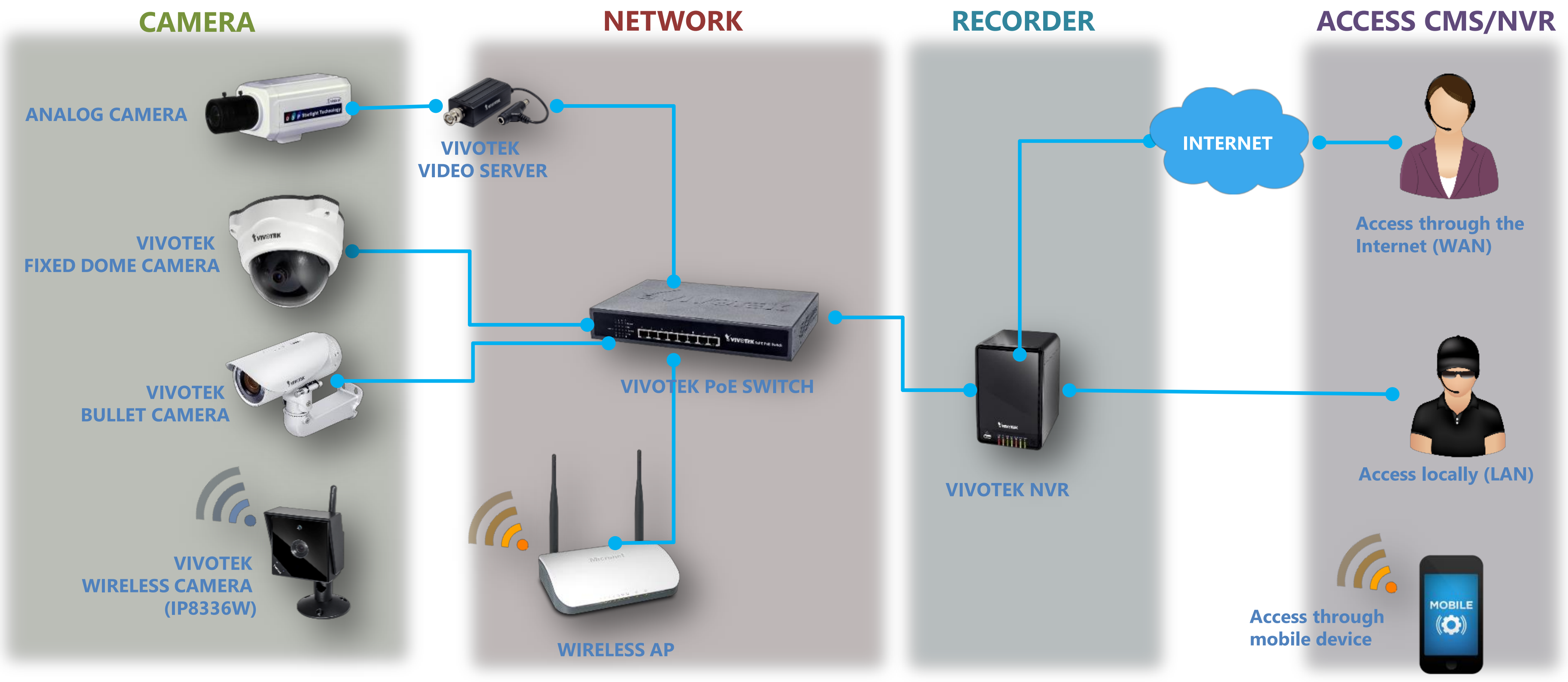
BUILD UP YOUR SURVEILLANCE SYSTEM


CAMERA
NETWORK
RECORDER
ACCESS CMS/NVR
ANALOG CAMERA
VIVOTEK VIDEO SERVER
VIVOTEK FIXED DOME CAMERA
VIVOTEK BULLET CAMERA
VIVOTEK WIRELESS CAMERA (IP8336W)
VIVOTEK PoE SWITCH
WIRELESS AP
VIVOTEK NVR
INTERNET
Access through the Internet (WAN)
Access locally (LAN)
Access through mobile device
MOBILE

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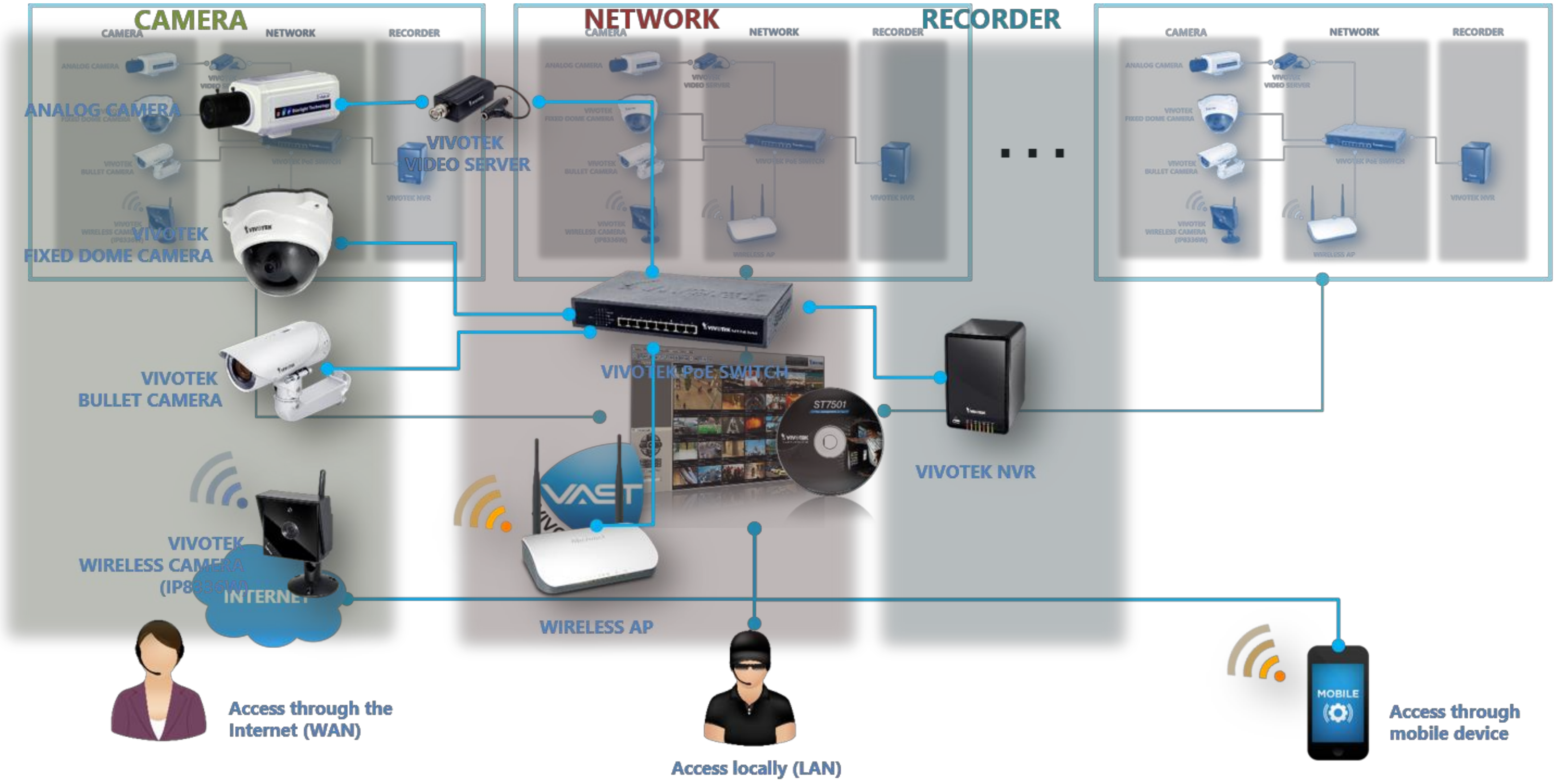
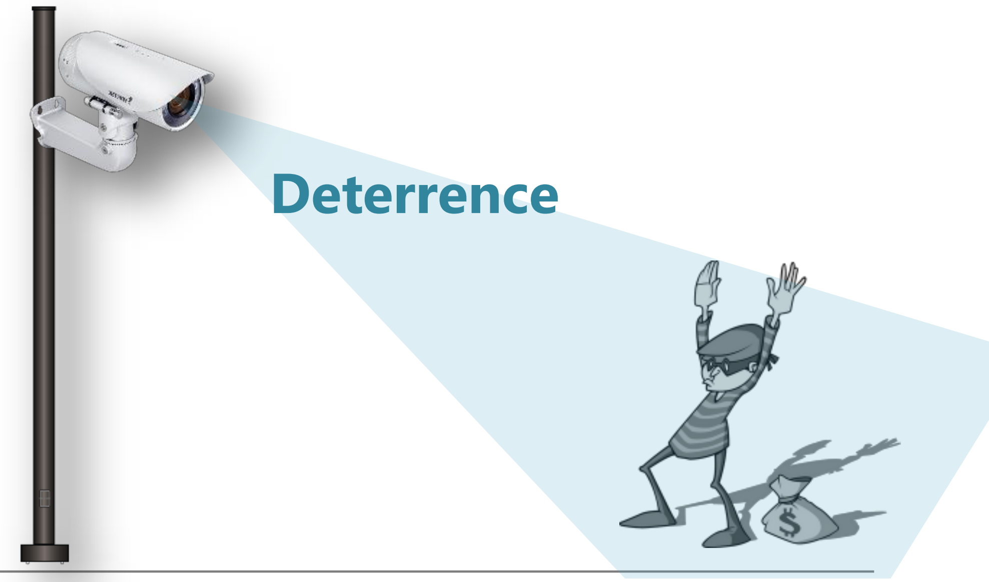
BUILD UP YOUR SURVEILLANCE SYSTEM


CAMERA
NETWORK
RECORDER
CAMERA
NETWORK
RECORDER
CAMERA
NETWORK
RECORDER
CAMERA
NETWORK
RECORDER
ANALOG CAMERA
VIVOTEK FIXED DOME CAMERA
VIVOTEK VIDEO SERVER
VIVOTEK BULLET CAMERA
VIVOTEK PoE SWITCH
VIVOTEK NVR
VIVOTEK WIRELESS CAMERA (IP8336W)
WIRELESS AP
INTERNET
ST7501
VAST
MOBILE
Access through the Internet (WAN)
Access locally (LAN)
Access through mobile device

DIFFERENT OBJECTIVES

1. Cameras can be installed for deterrence!

- To stop crimes before it happens.
- Deter people from stealing, drug dealing, burgling etc.
  (or cars from over speeding)



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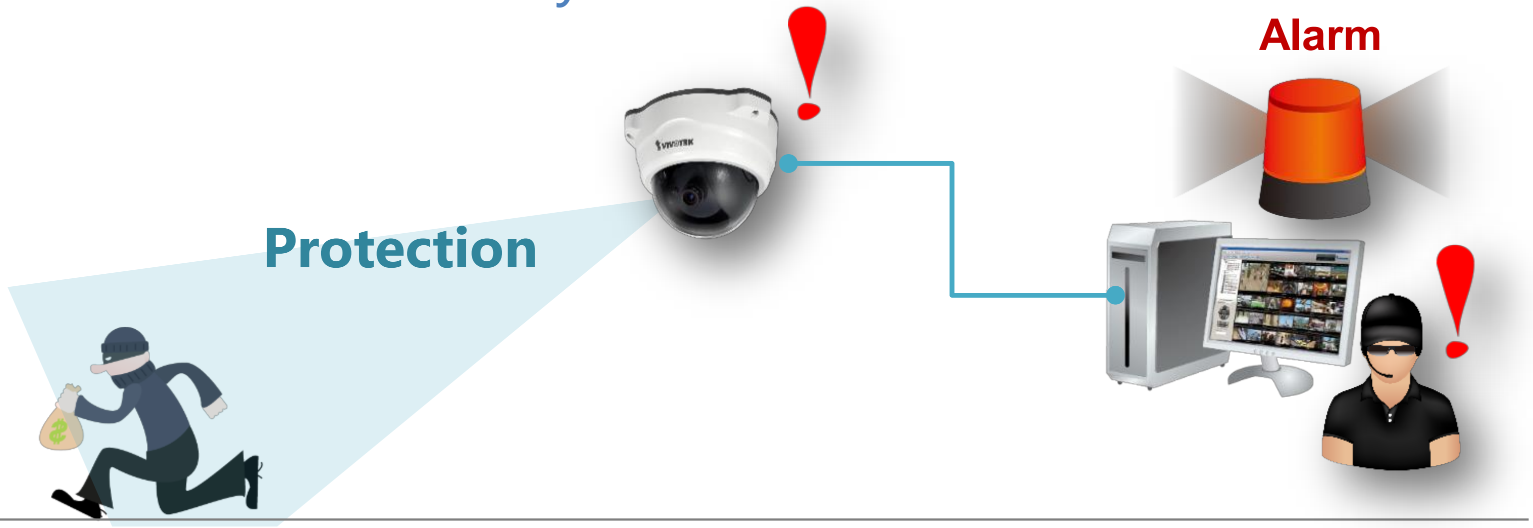
DIFFERENT OBJECTIVES

2. Surveillance system can provide real-time information!

- Improve the response time of onsite security guards.
- Confirm suspects in combination with an access control system
- Video Analytics increase efficiency.



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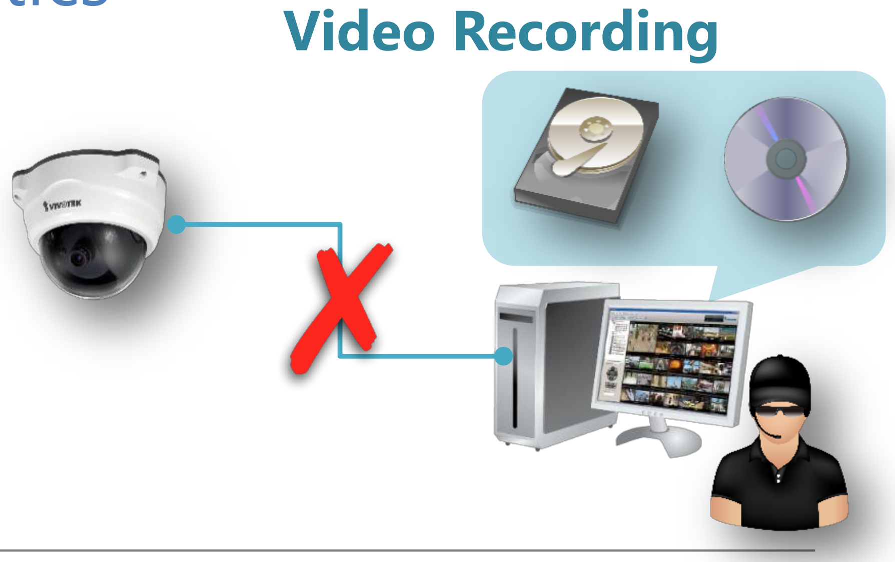
3. Use video recording as an evidence

- For further investigation or forensic evidence
- Business Analytics report / statistics



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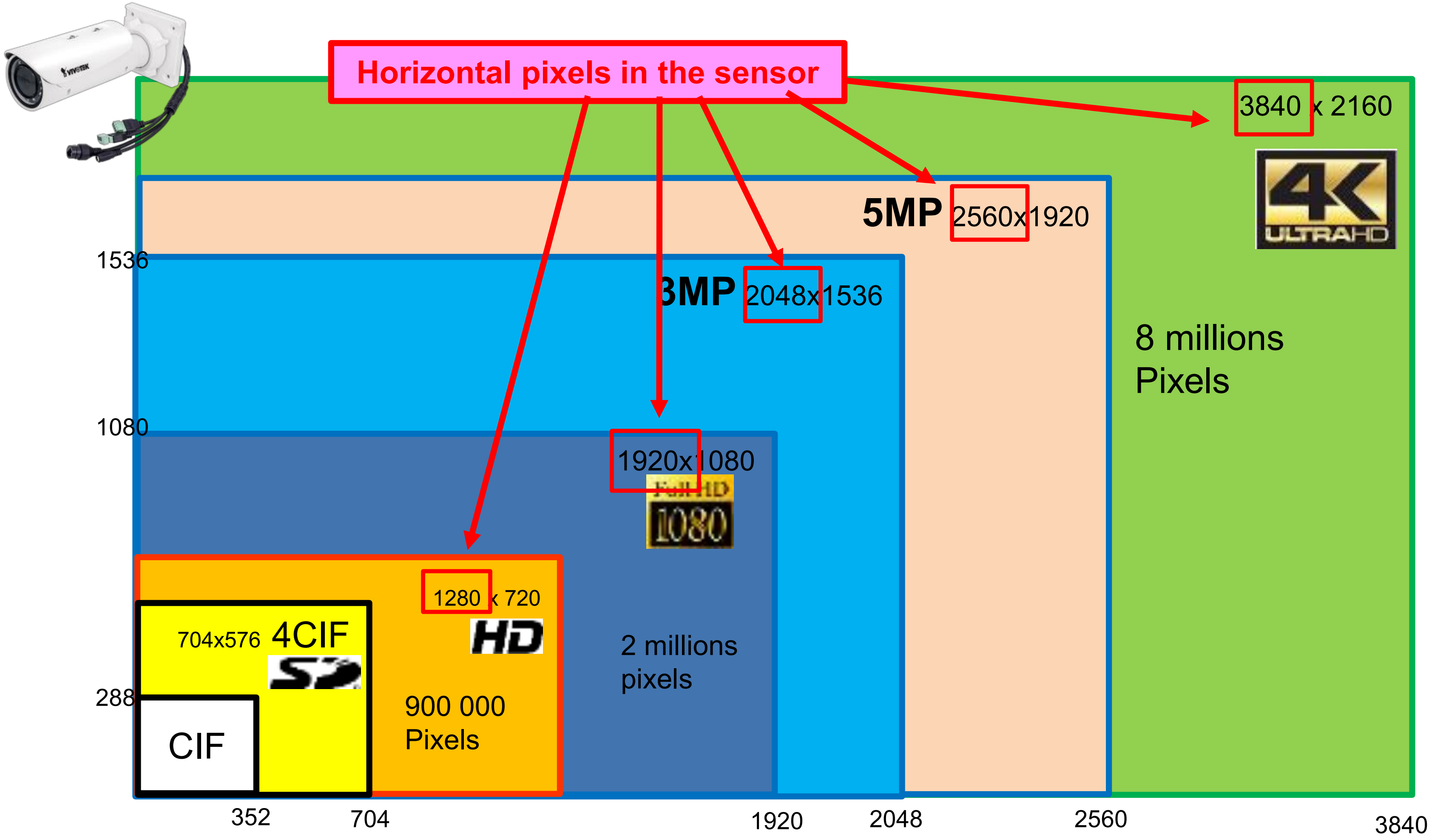
CAMERA RESOLUTIONS



Horizontal pixels in the sensor
3840 x 2160
4K ULTRAHD
5MP 2560x1920
3MP 2048x1536
8 millions Pixels
1536
1080
1920x1080
Full HD 1080
1280 x 720
HD
704x576 4CIF
SD
2 millions pixels
900 000 Pixels
288
CIF
352
704
1920
2048
2560
3840

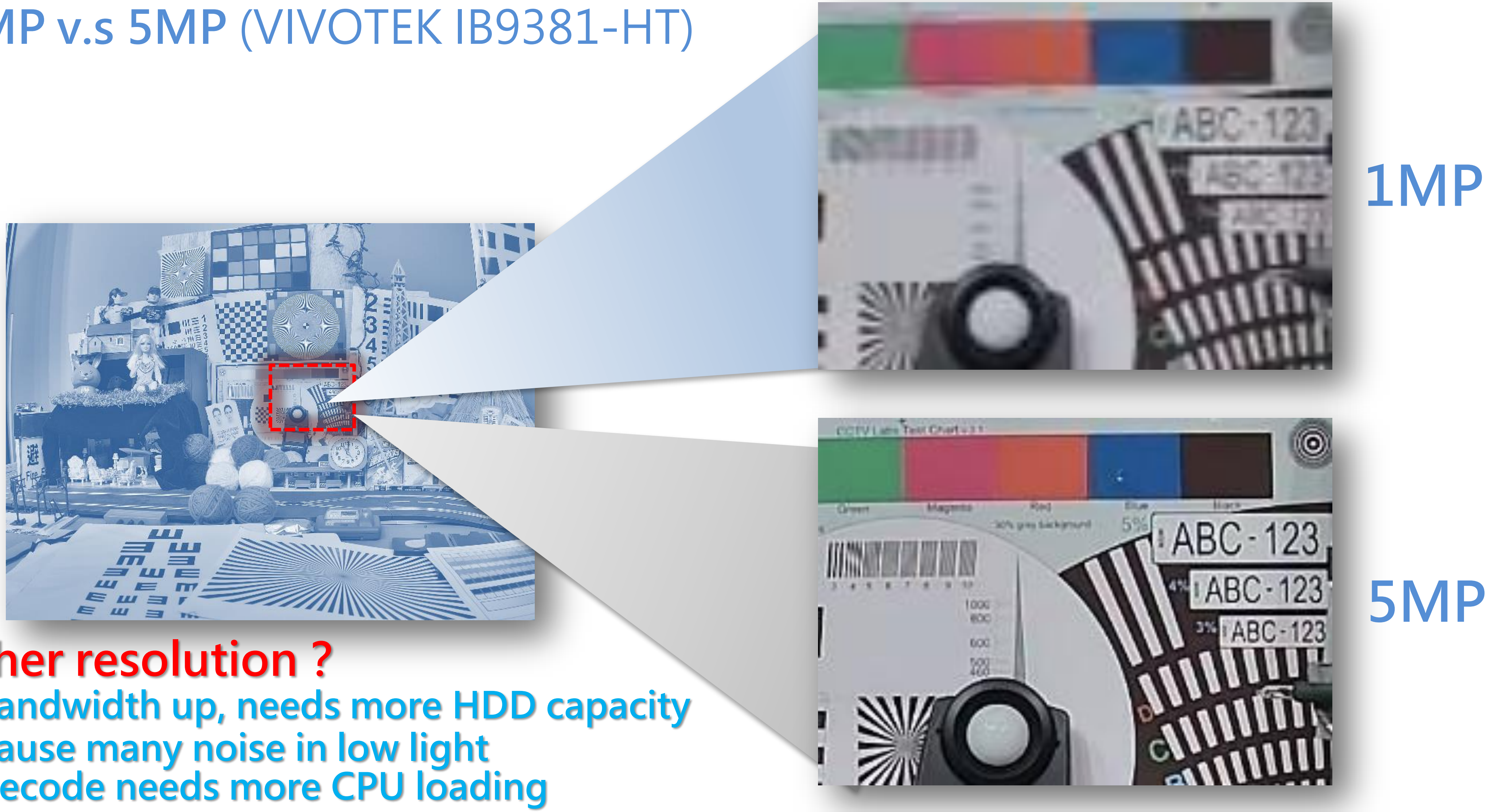
- 4:3 and 16:9
- 2MP=>4:3=1600x1200
- 2MP=>16:9=1920 x1080 =FullHD
- 1.3MP=>4:3=1280x960
- 1.3MP=>16:9=1280x720 =HD
- 4:3=>3MP, 5MP
- 16:9=>4MP, 8MP
- 16:9

  4MP=2K

  8MP=4K

Pixel Density

1MP v.s 5MP (VIVOTEK IB9381-HT)

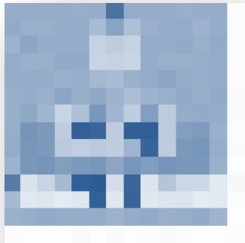


Higher resolution ?

- Bandwidth up, needs more HDD capacity
- Cause many noise in low light
- Decode needs more CPU loading

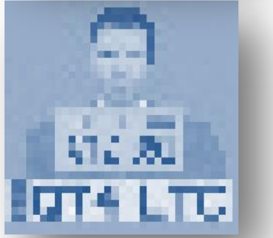
Camera main missions

- Pixels per foot (PPF) / Pixels per meter (PPM) is metric for specifying video surveillance image quality.



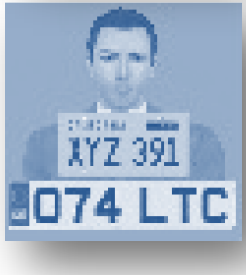
< 30 pixels per meter

Detection



30 - 100 pixels per meter

Observation

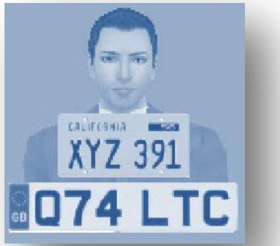


XYZ 391
074 LTC

> 100 pixels per meter

Recognition

(130 ppm for EN50132-7)

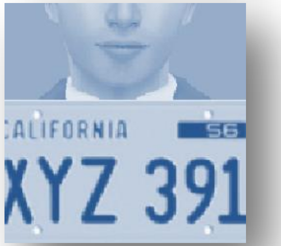


CALIFORNIA
XYZ 391
GB
074 LTC

> 180 pixels per meter

Identification

(250 ppm for EN50132-7)



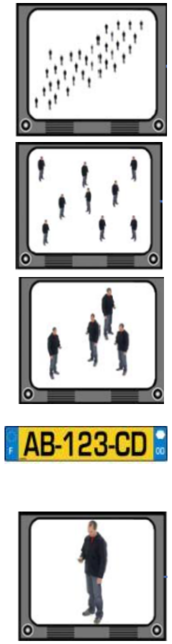
CALIFORNIA
56
XYZ 391

> 250 pixels per meter

Strong identification

Identification in Europe
EN50137-7 : 250 ppm
French law: : 400 ppm (60 pixels on face width)
Swedish law: : 500 ppm

Camera main missions

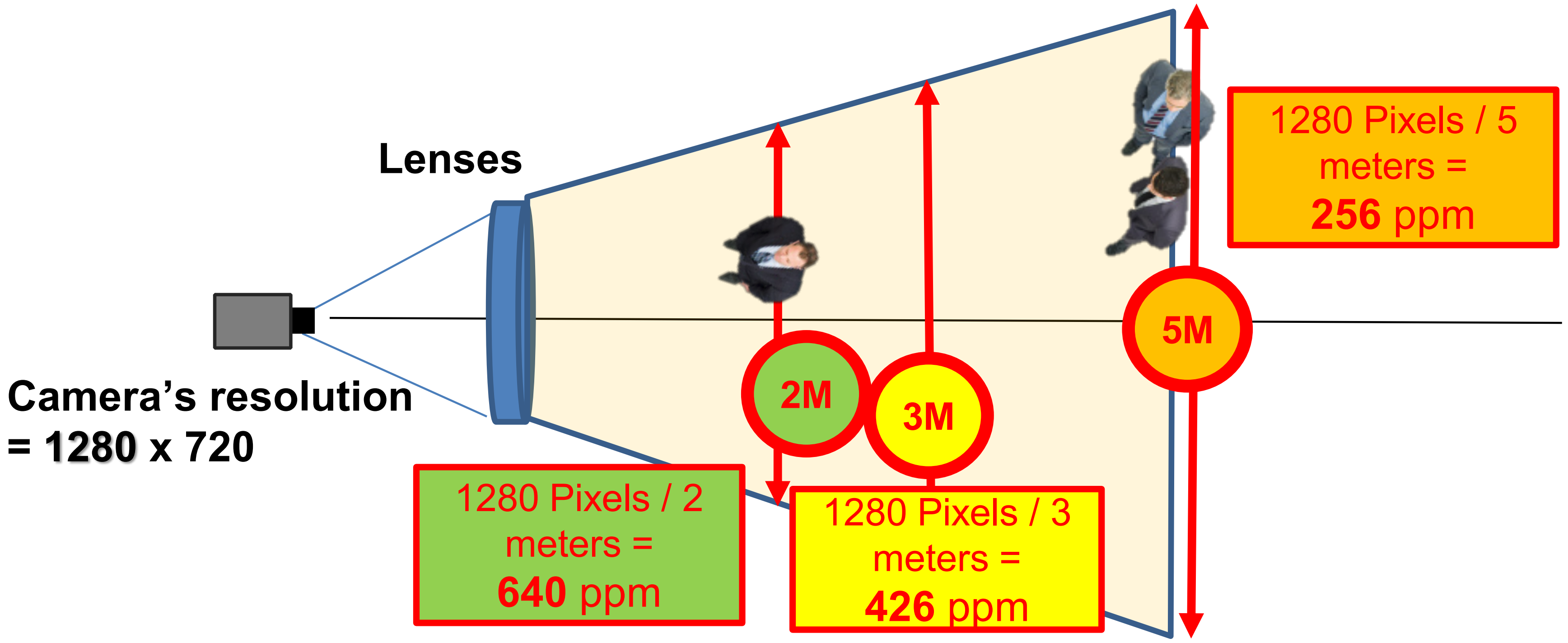


Categories European norms EN50132-7	Pixel Density per meter horiz. (PPM)	Missions
Monitoring / Control	PPM < 30	To watch the flow of traffic or the movement of people where you do not need to identify individual figures.
Detection / Deterrence	30< PPM <100	To detect the presence of a person in the image, without necessarily the need to see the face
Recognition	>100 « 130 »	to recognize somebody you know, or determine that somebody is an unfamiliar face
Plate reading Auto licence plate rec	>180 « 250 »	Allows you to clearly read a license plate on a live view or a recording. (Day/Night)
Identification	250 or more	To record high quality facial images which can be used in court to prove someone's identity "beyond reasonable doubt" in the legal context.

Identification in Europe
EN50137-7 : 250 ppm
French law: : 400 ppm (60 pixels on face width)
Swedish law: : 500 ppm

PPM(Pixels per meter) and PPF(Pixel per foot)

- PPM = Pixel per Meter = Pixels on the screen / actual width
- https://www.theia.us.com/TheiaCalculator.php



Camera's resolution = 1280 x 720

1280 Pixels / 2 meters = **640** ppm

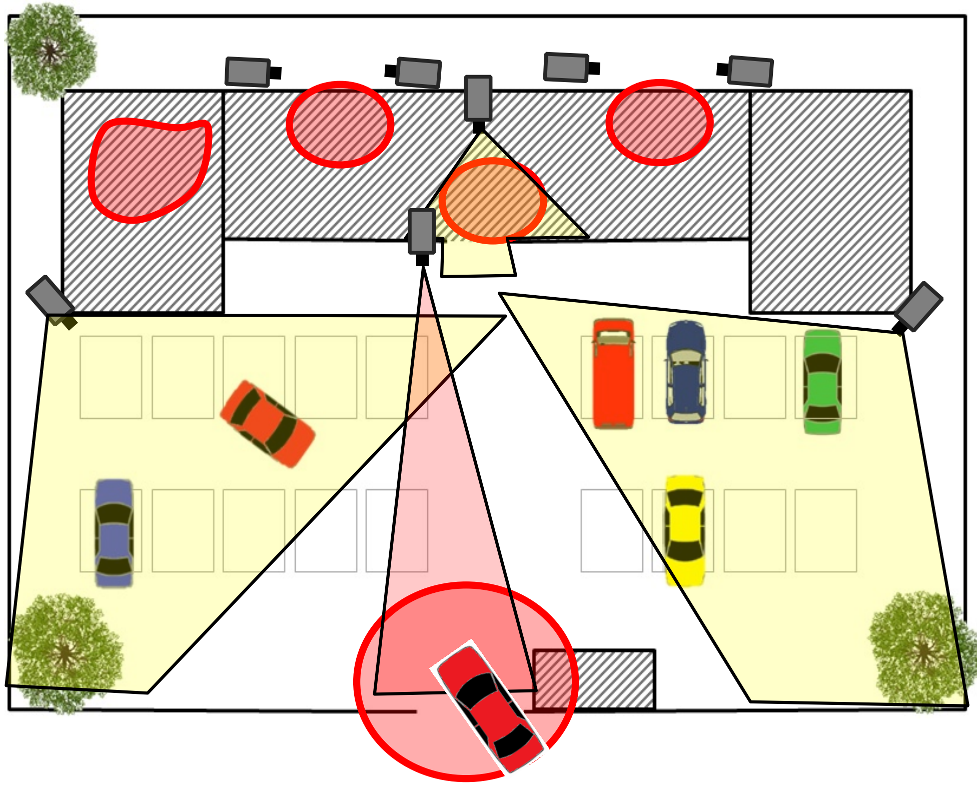
1280 Pixels / 3 meters = **426** ppm

1280 Pixels / 5 meters = **256** ppm

CHOOSING YOUR CAMERAS

How to choose correct cameras for your project?

- What kind of camera is more suitable?
- Which place should have **day and night** monitoring?
- Will the **environment** affect the image quality?

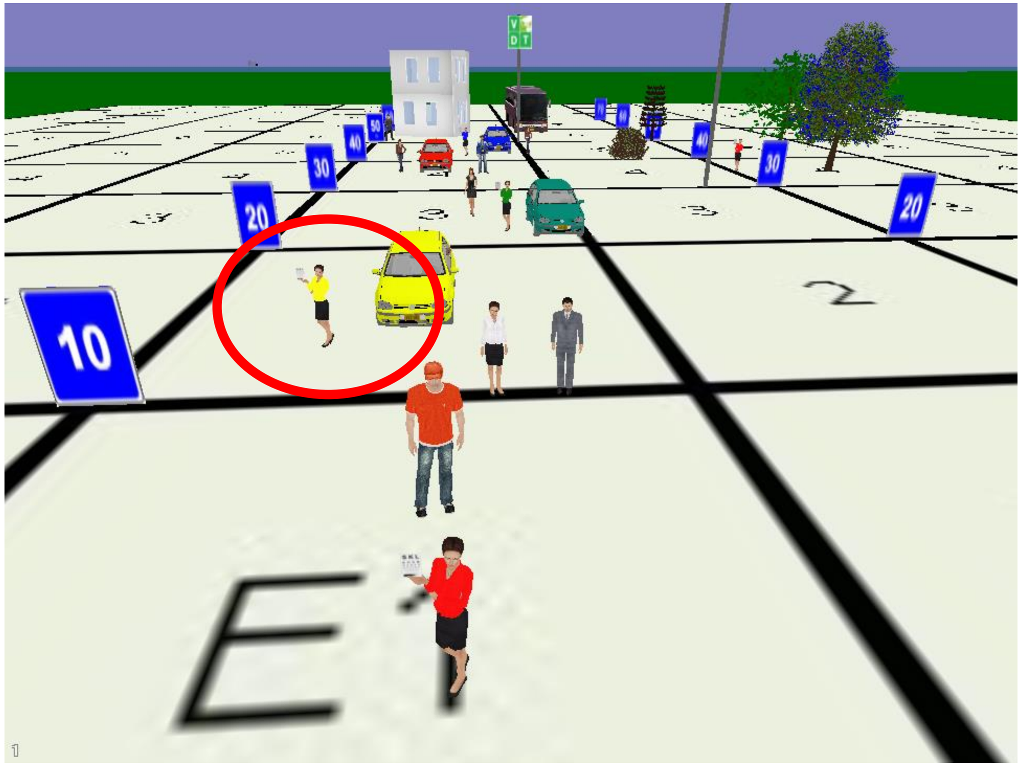


For each camera the question is:

- What is the **size of scene** I want to see? (Height x Width)
- What is the **level of details** I want to have?
- **How far** I want to see?

CHOOSING YOUR CAMERAS

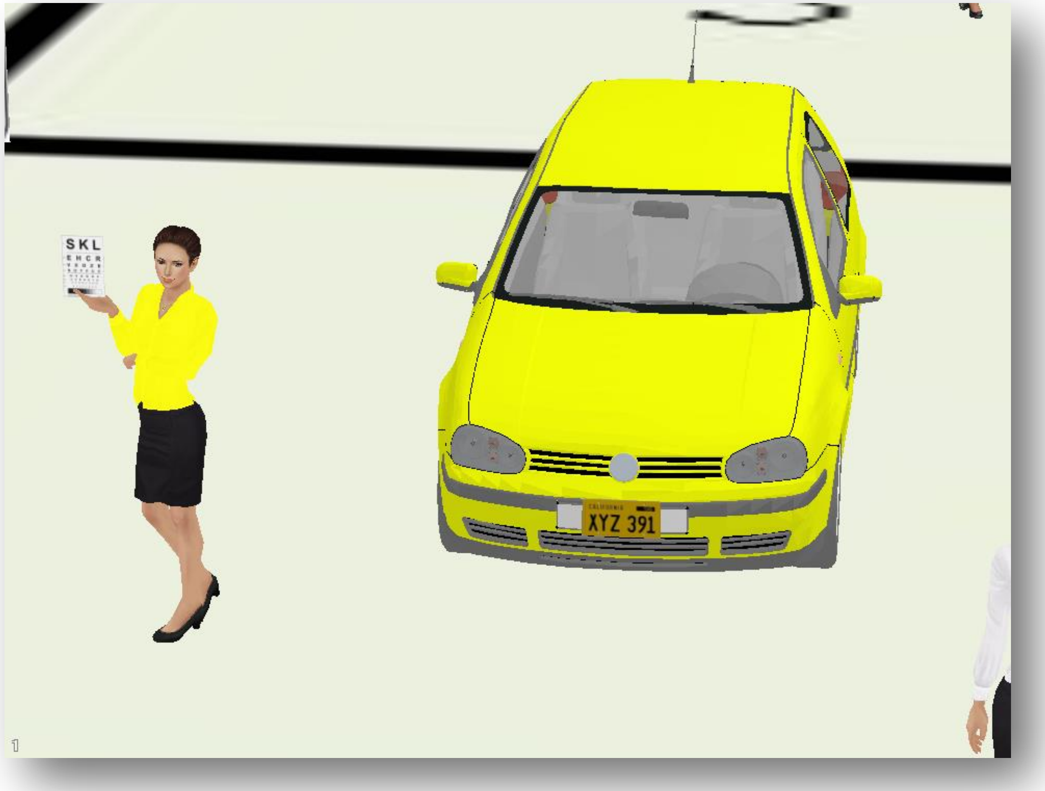
In some cases, we need to have a wider field of view…



In this example we can have a wider field of view, however, the camera loses most details. It can’t provide a good level of details to identify the girl in yellow.

CHOOSING YOUR CAMERAS

In some cases, we need to have more details for identification…



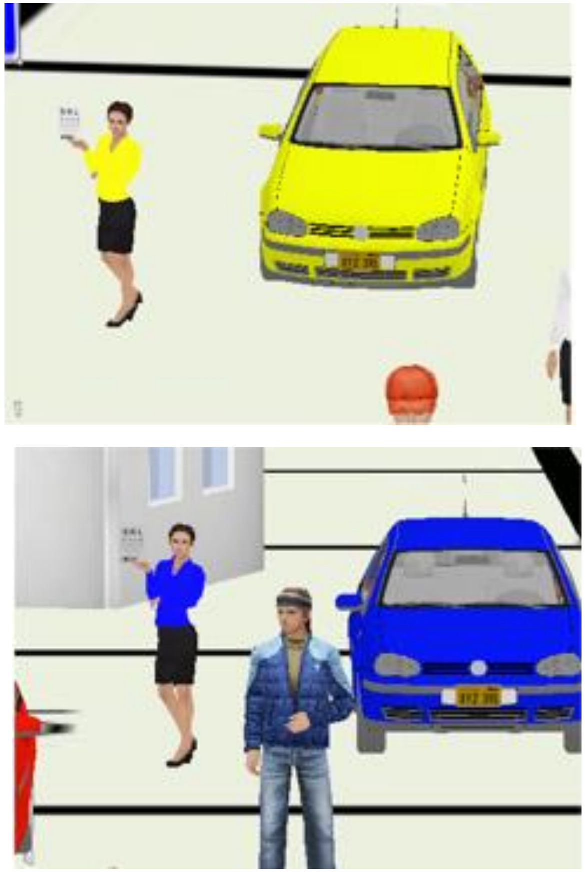
With 16 mm lens, we can get more details

and even can read the car plate.

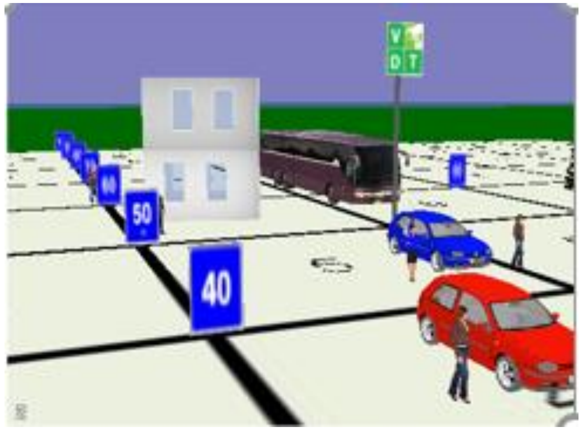
However, the field of view becomes narrower.

CHOOSING YOUR CAMERAS

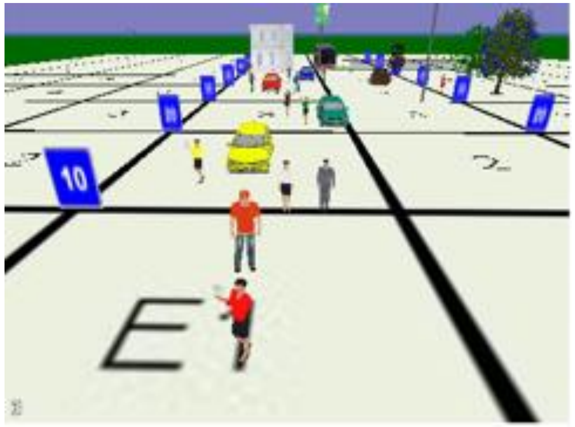
IDENTIFICATION



RECOGNITION



DETECTION



Luminosity (Lux)

1 Lux = a candle light in a dark room at 1 meter

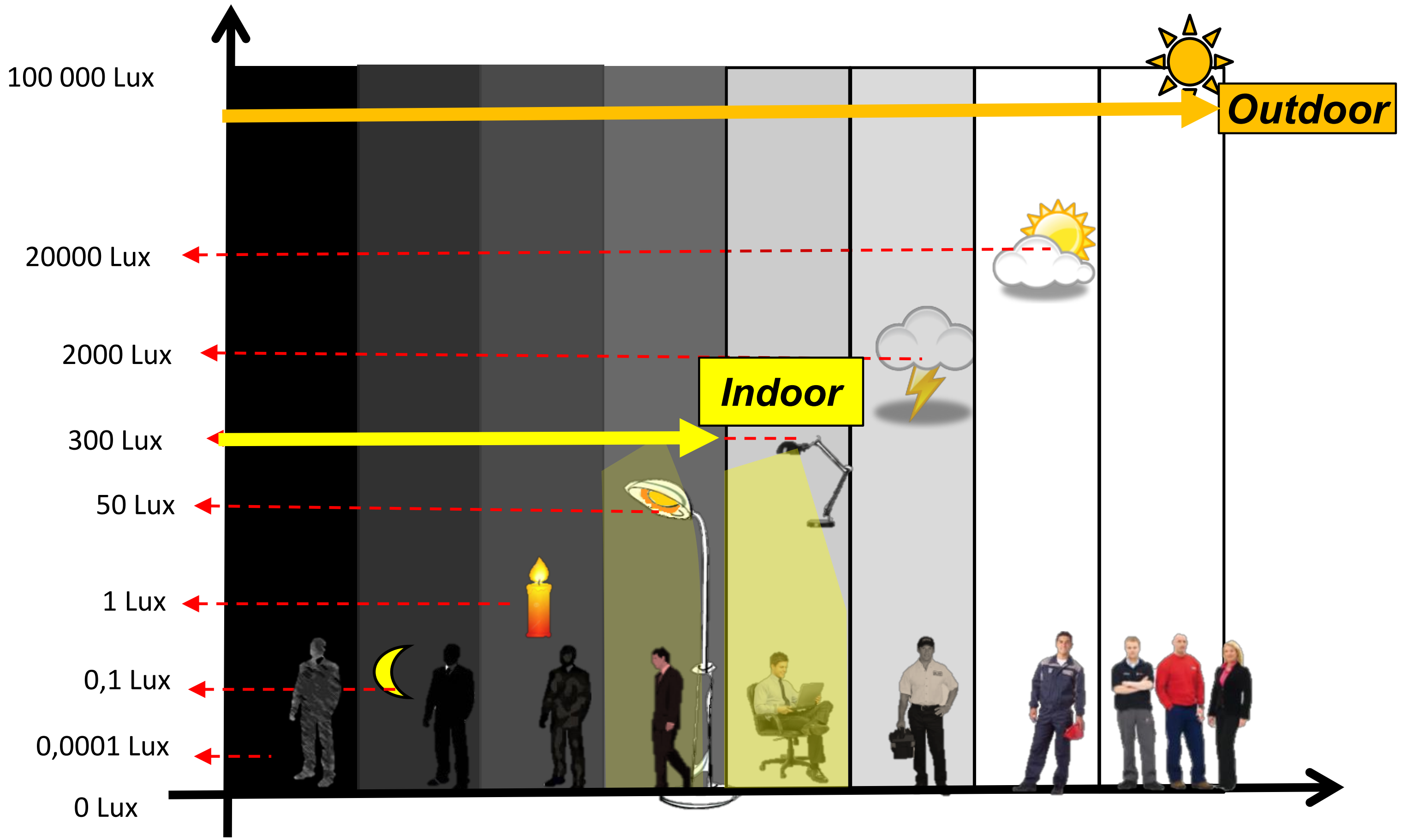
Luminosity (Lux)

e.g., Light is 100 lux in this image 0 to 1 meter the lux level remains same

1 to 2 meters the lux level will reduce to ¼ i.e., 100 lux/ 4 = 25 lux

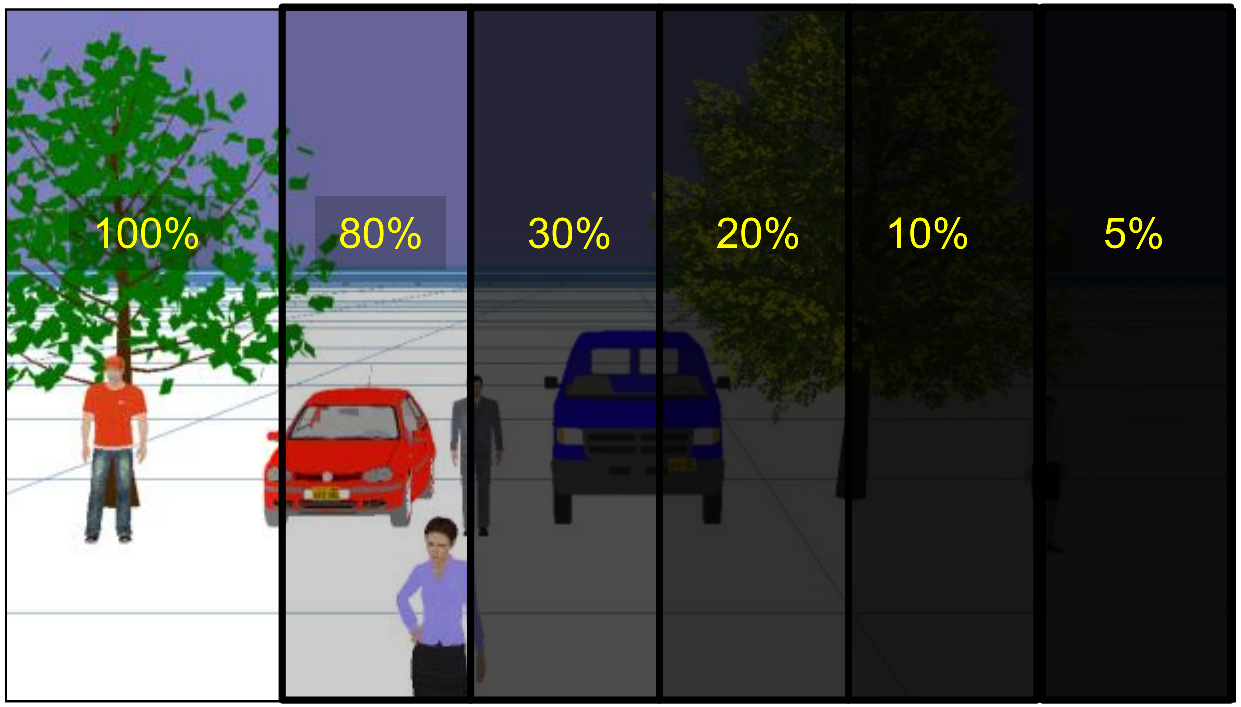
2 to 4 meters the lux level will reduce to ¼ i.e., 25 lux/ 4 = 6.25 lux

Light variation during the day


100 000 Lux
20000 Lux
2000 Lux
300 Lux
50 Lux
1 Lux
0,1 Lux
0,0001 Lux
0 Lux
Outdoor
Indoor

Luminosity issues

- Under low luminosity environment and without additional light, the noise will increase.
- Noise increase -> bandwidth consumption increase

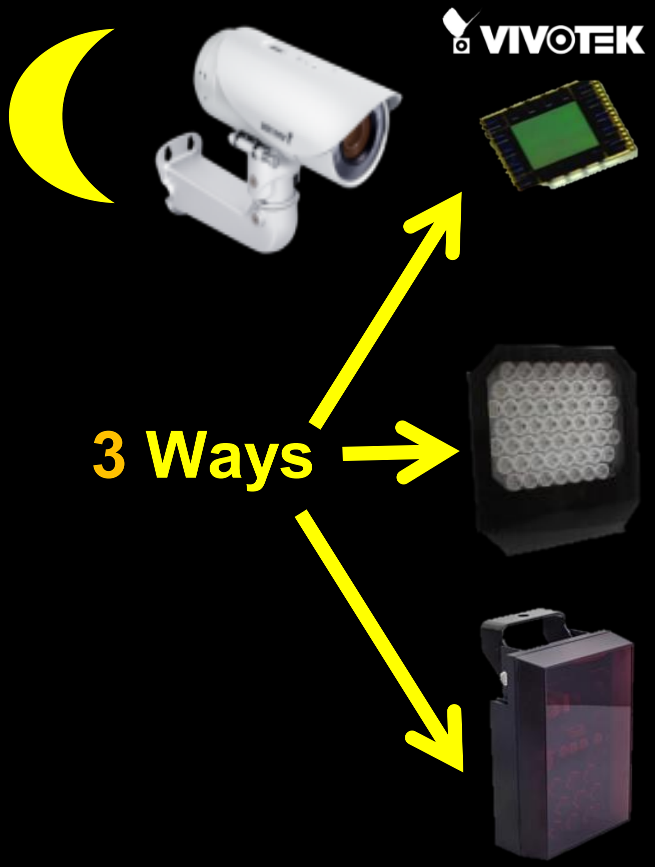


If the object is moving we have a motion blur image

DIFFERENT TYPES OF CAMERAS

	Type	Characteristics
	Day camera	• **Indoor** camera without IR cut filter • Usually use fixed iris • IR light cannot help make image brighter
	Day/ Night camera	• **Outdoor** camera with an IR cut filter • Use IR cut filter at night • 3DNR tech is recommended at night
	Day/ Night camera with IR LED	• Day/ night camera with IR cut filter and with **built-in IR LED**
	Day/ Night camera for LPR solution	• 2MP Camera (IP816A-LPC) with special firmware/Hardware (IR Pass Filter), specially design for license plate recognition.

How can we improve image quality at night?



VIVOTEK Supreme Night Visibility (SNV)

(Low lux sensor)

- Capture more details and colors without IR LED
- Might have motion blur effect it the object moves quickly
- 3DNR is recommended to reduce noise

White LED Light

- Keep colors and with less noise
- LED is cheaper now
- Need PIR for object detection
- Hard to cover long distance

Infrared LED (built-in or external)

- Black and white cover vision
- Losing colors
- Less noise
- Easy to set up with a night profile
- Recommended for LPR solution

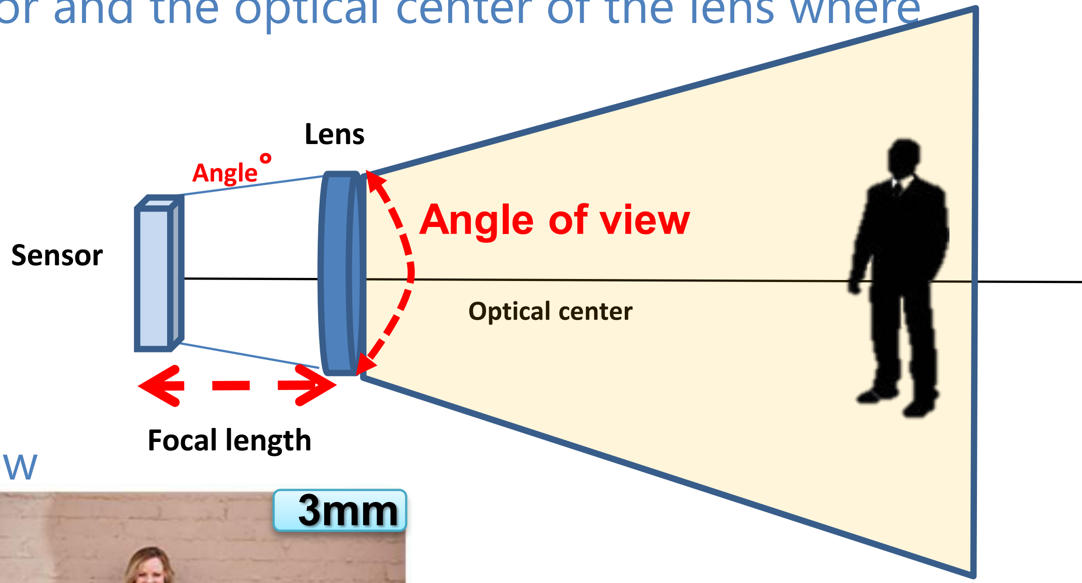
Camera’s basic concept!

1. Focal length
2. Field of view
3. Different types of iris
4. Depth of field
5. Resolution and pixel density

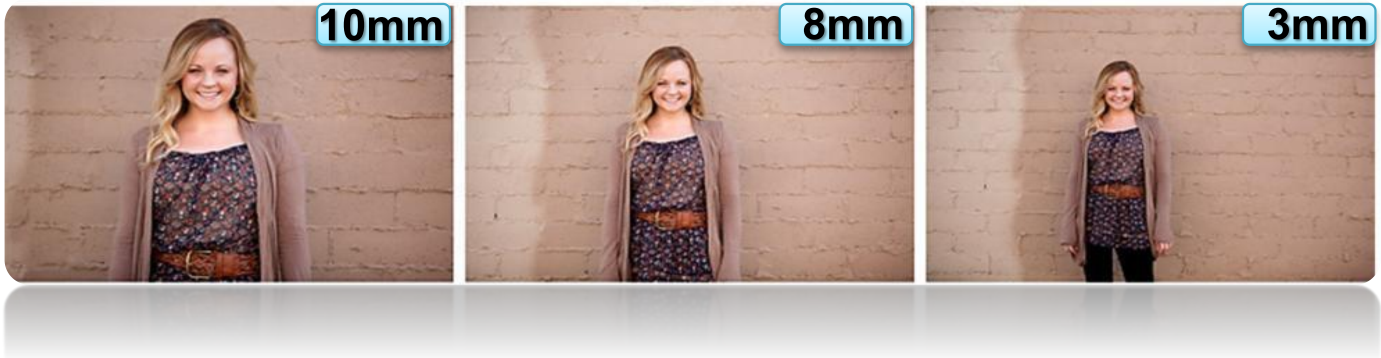
FOCAL LENGTH

- Focal length: The distance between the sensor and the optical center of the lens where the image forms

f=2.8mm


Lens
Angle°
Sensor
Angle of view
Optical center
Focal length

- Focal length decides the camera angle of view


10mm
8mm
3mm

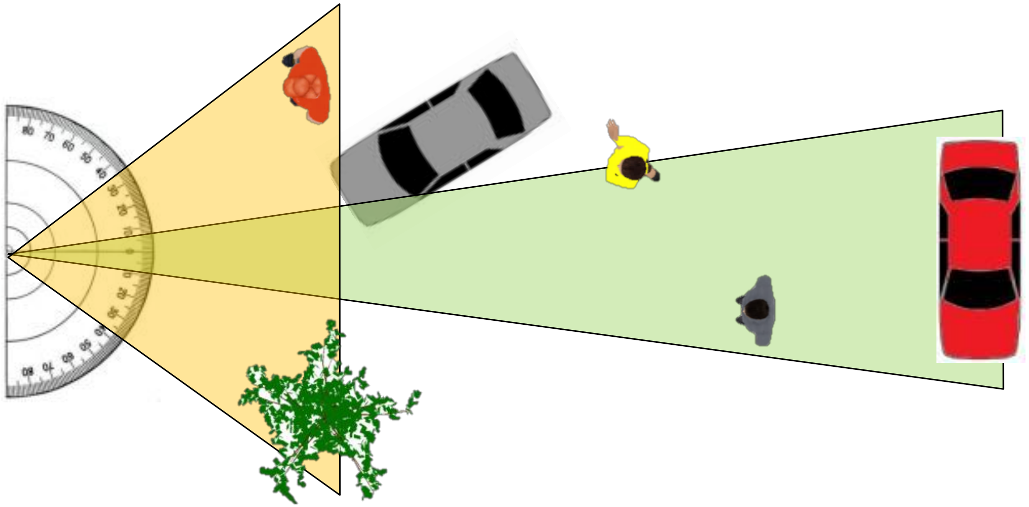
- Some cameras have fixed focal length, and some have vari-focal length

Fixed lens

Focus
Tele/Wide
Vari-focal lens

FOCAL LENGTH

- The viewing angle is determined by the focal length.
- **Short focal length** -> **wide angle of view (zoom-out)**
- **Long focal length** -> **small angle of view (zoom-in)**



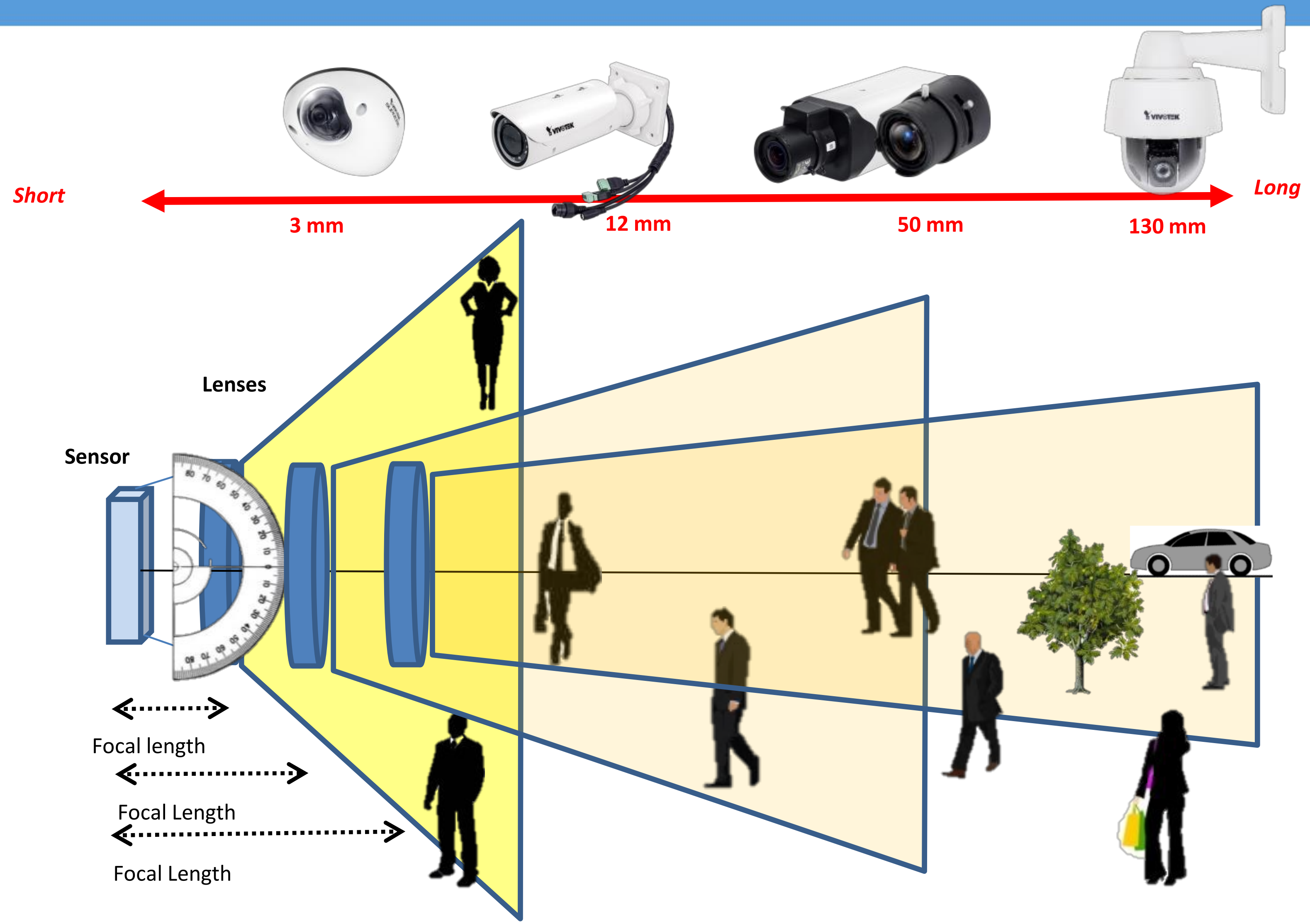
Short Focal

Wide Angle

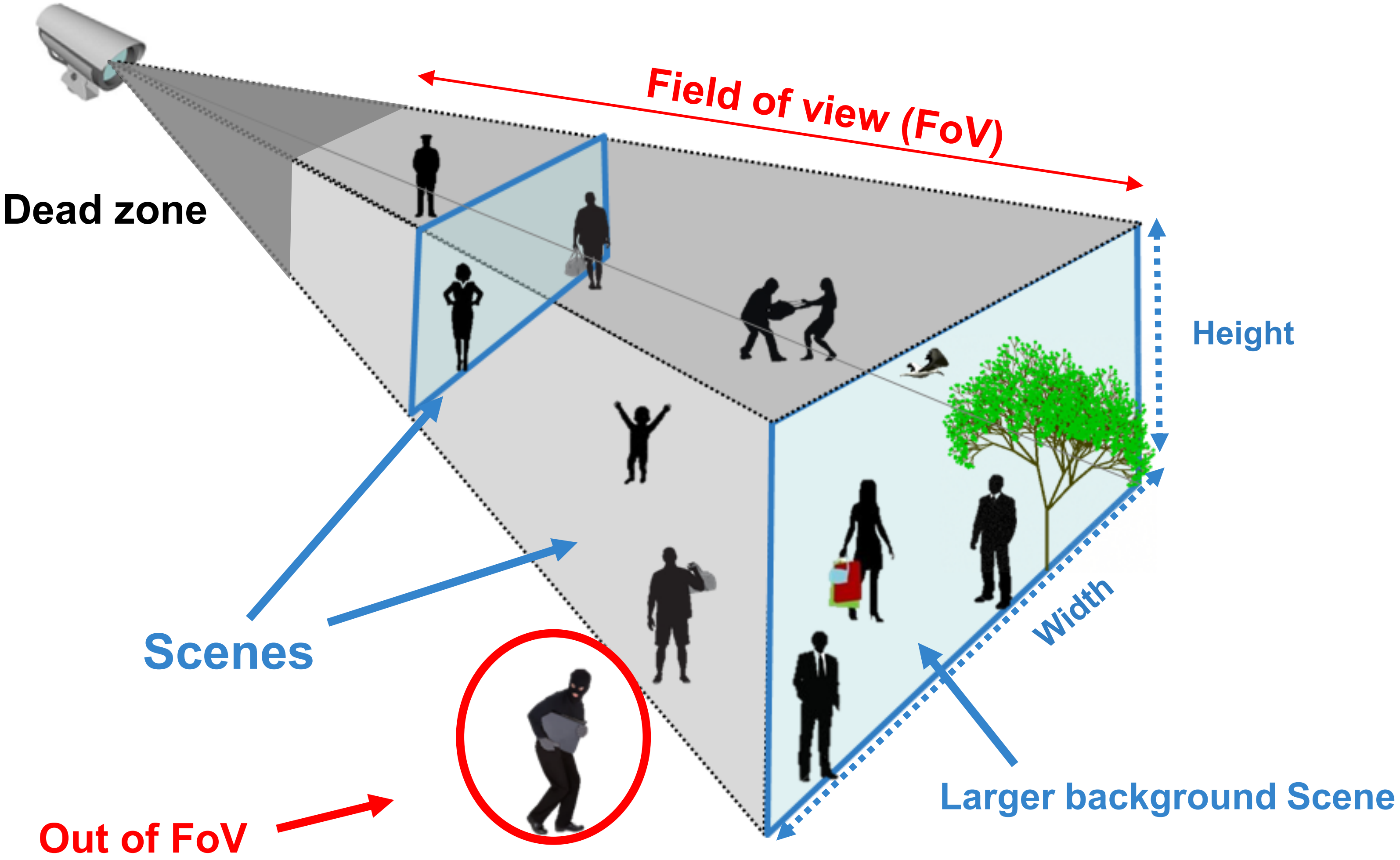
Long Focal

Small Angle

FOCAL LENGTH AND ANGLE OF VIEW


Short
Long
3 mm
12 mm
50 mm
130 mm
Lenses
Sensor
Focal length
Focal Length
Focal Length

FIELD OF VIEW = WHAT YOU CAN SEE



Field of view (FoV)

Dead zone

Height

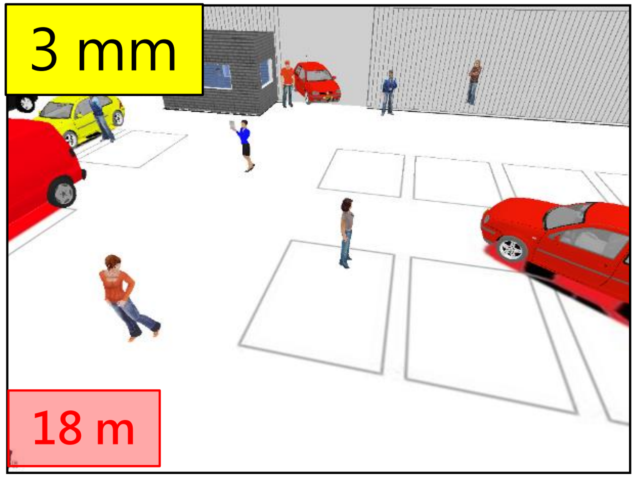
Width

Scenes

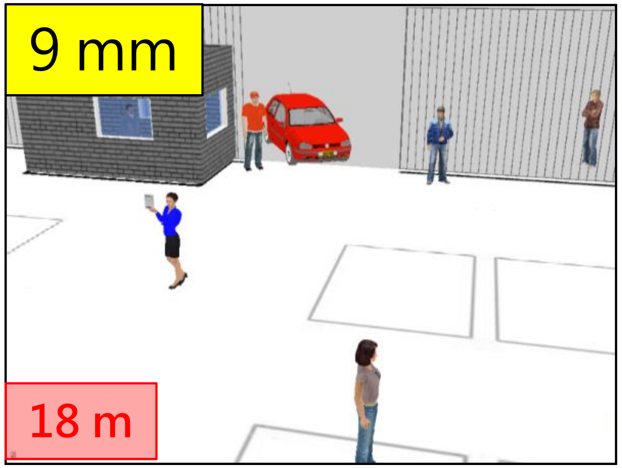
Larger background Scene

Out of FoV

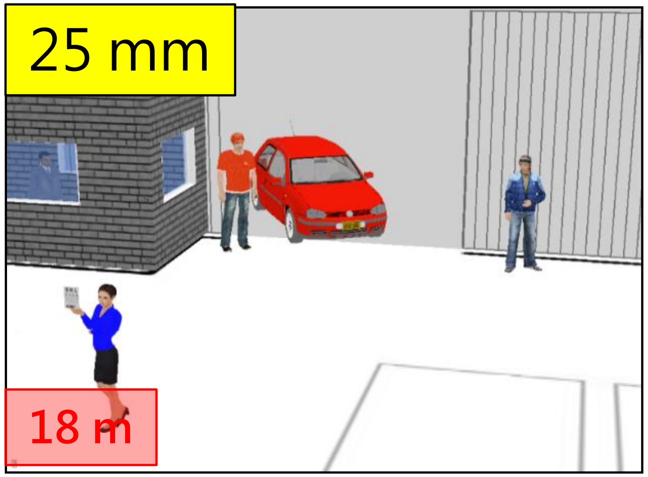
FOCAL LENGTH AND ANGLE OF VIEW



- If we want to cover the parking area to detect objects, 3mm could be enough.



- May still hard to read the car plate.



- To read the plate and identify people 25mm would be much better.

FOCAL LENGTH AND ANGLE OF VIEW

FD9367-HTV

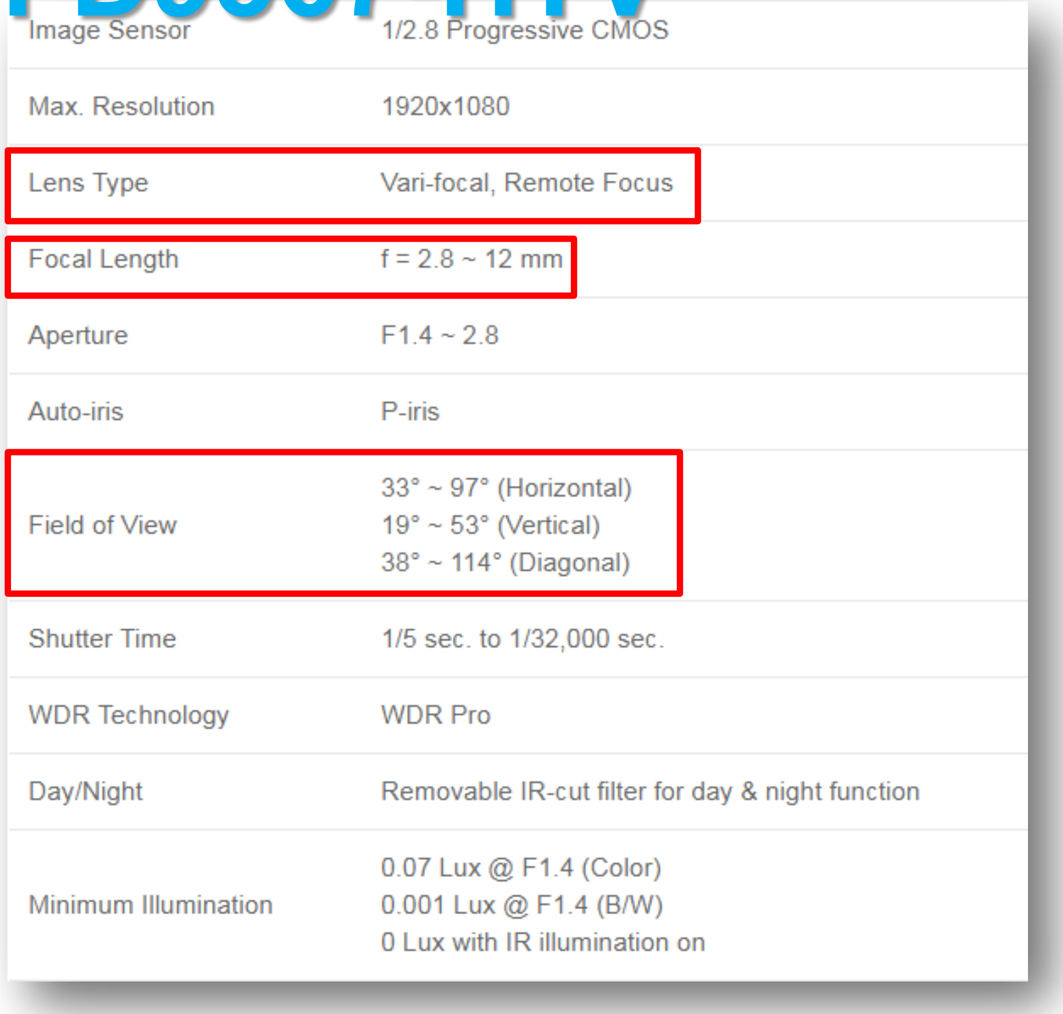


Image Sensor	1/2.8 Progressive CMOS
Max. Resolution	1920x1080
Lens Type	Vari-focal, Remote Focus
Focal Length	f = 2.8 ~ 12 mm
Aperture	F1.4 ~ 2.8
Auto-iris	P-iris
Field of View	33° ~ 97° (Horizontal) 19° ~ 53° (Vertical) 38° ~ 114° (Diagonal)
Shutter Time	1/5 sec. to 1/32,000 sec.
WDR Technology	WDR Pro
Day/Night	Removable IR-cut filter for day & night function
Minimum Illumination	0.07 Lux @ F1.4 (Color) 0.001 Lux @ F1.4 (B/W) 0 Lux with IR illumination on

FD9367-HV

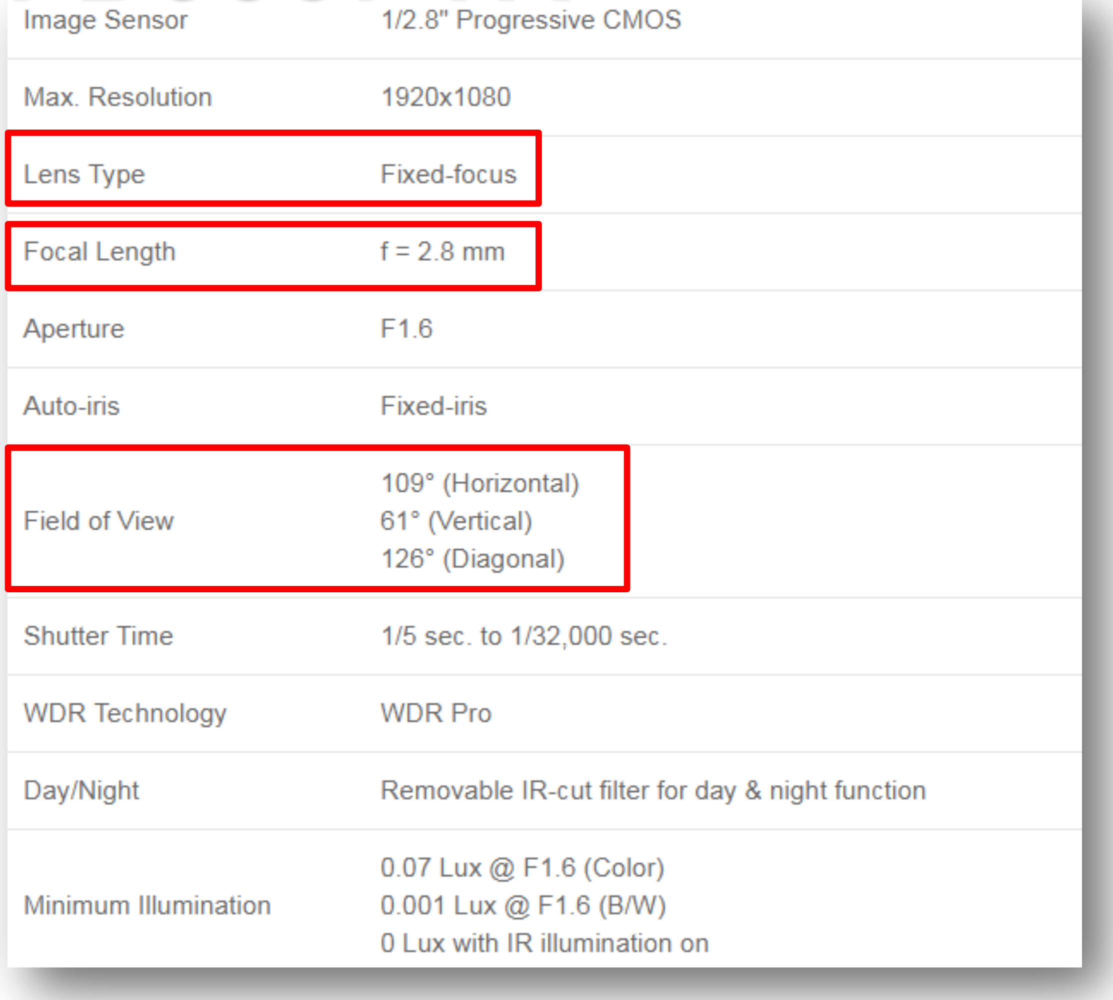
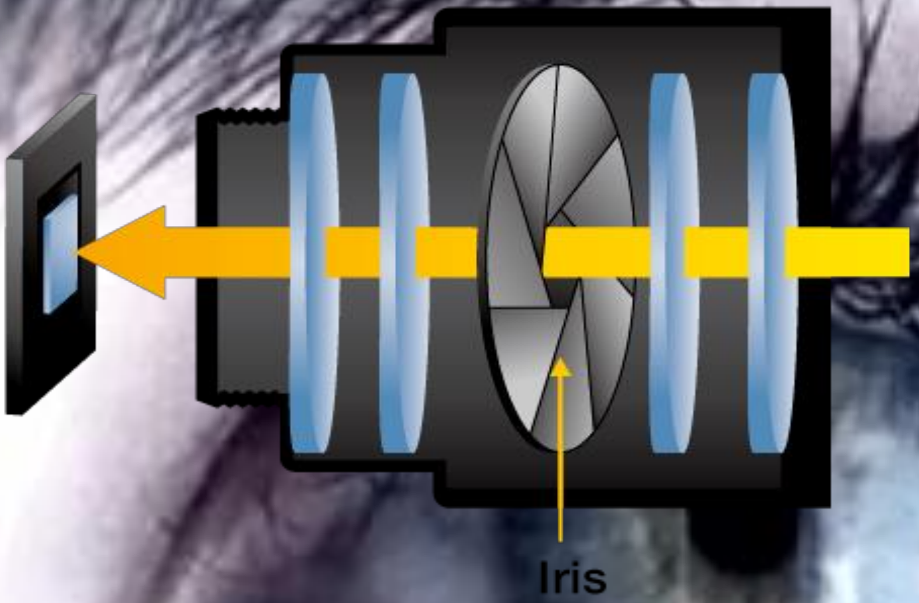
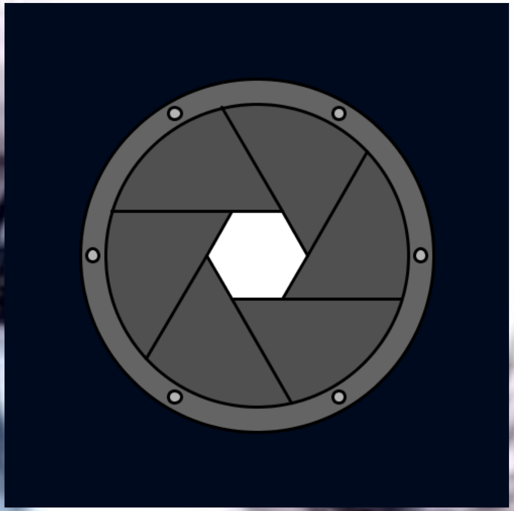
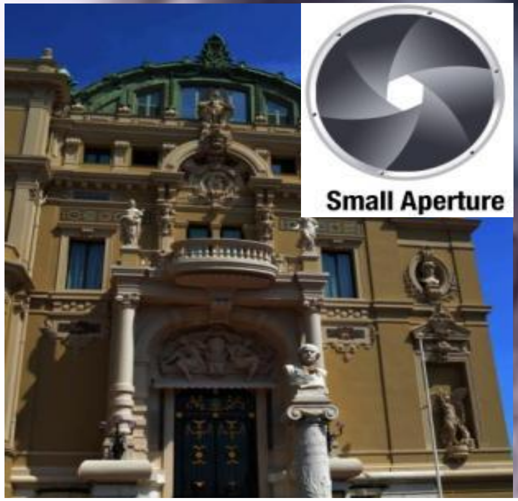


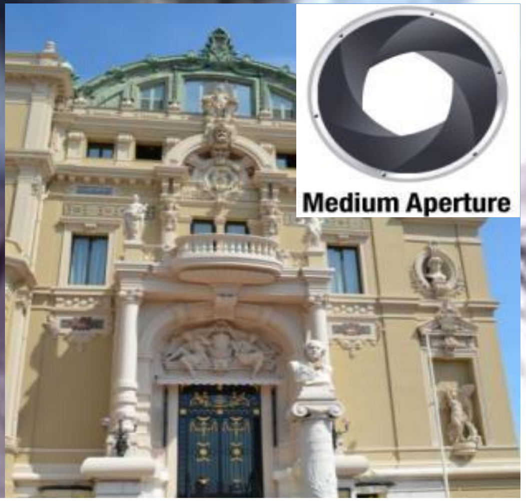
Image Sensor	1/2.8" Progressive CMOS
Max. Resolution	1920x1080
Lens Type	Fixed-focus
Focal Length	f = 2.8 mm
Aperture	F1.6
Auto-iris	Fixed-iris
Field of View	109° (Horizontal) 61° (Vertical) 126° (Diagonal)
Shutter Time	1/5 sec. to 1/32,000 sec.
WDR Technology	WDR Pro
Day/Night	Removable IR-cut filter for day & night function
Minimum Illumination	0.07 Lux @ F1.6 (Color) 0.001 Lux @ F1.6 (B/W) 0 Lux with IR illumination on

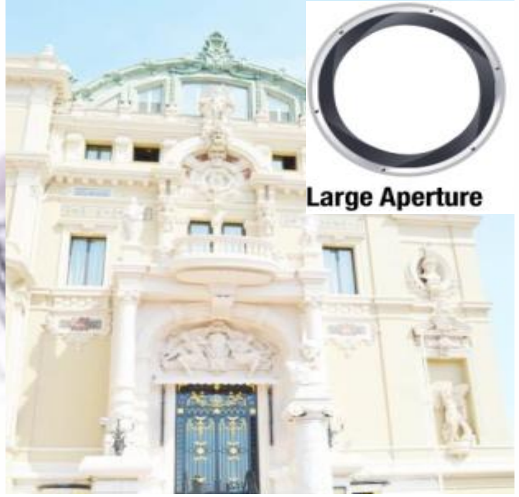
Aperture (F-Number)



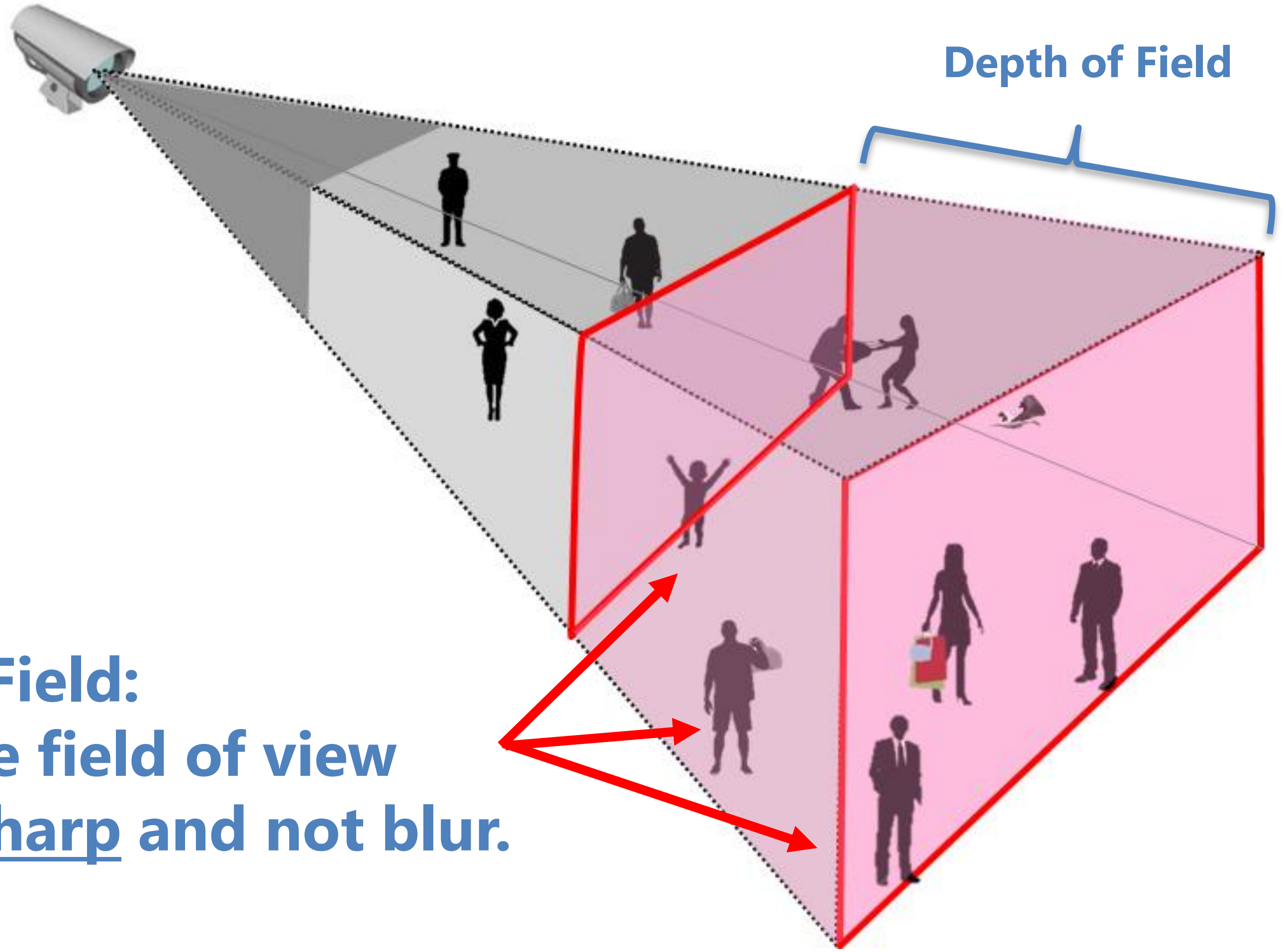



Small Aperture


Medium Aperture


Large Aperture

Depth of Field (DoF)


Depth of Field

- **Depth of Field:**
  Part of the field of view which is sharp and not blur.

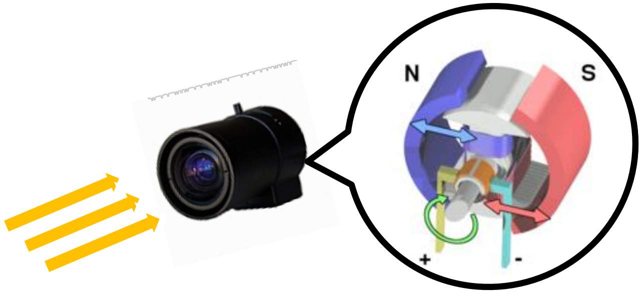
DIFFERENT TYPES OF IRIS

Fixed Iris:

- The iris opening cannot be adjusted.
- Adapted to **indoor** cameras which don't handle strong luminosity changes.

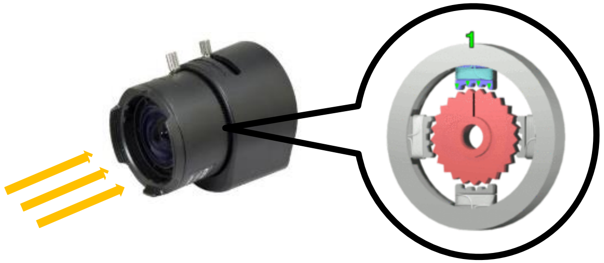
Auto iris control:

- DC iris:
  - ✓ Economic solution to manage the iris size with motor control signal in **outdoor**.



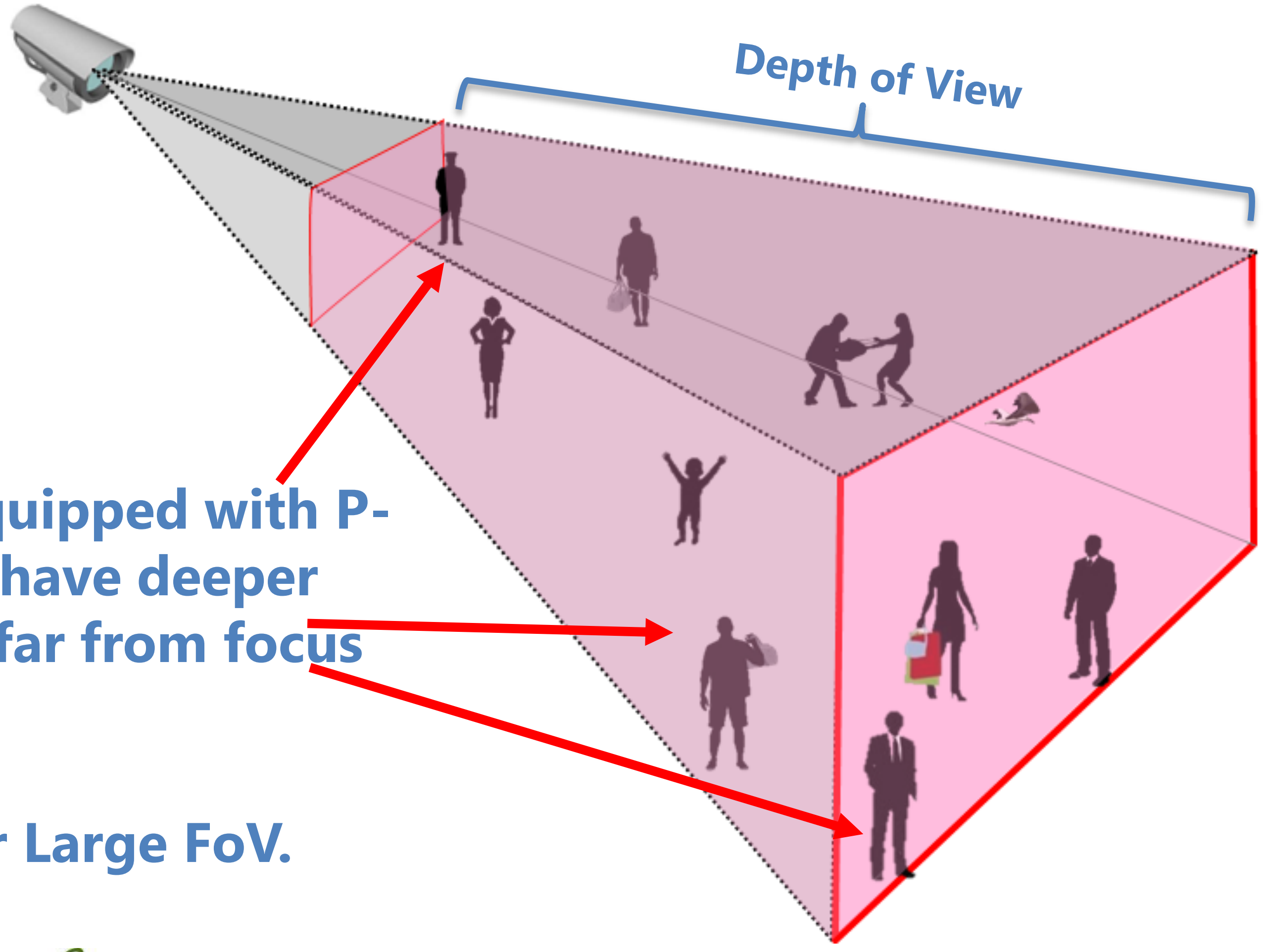
DC motor

- **P-Iris (Precise iris)**
  - ✓**Outdoor**
  - ✓Keep the iris at optimal size
  - ✓Higher contrast and sharpness
  - ✓Better depth of field
  - ✓Reduce diffraction

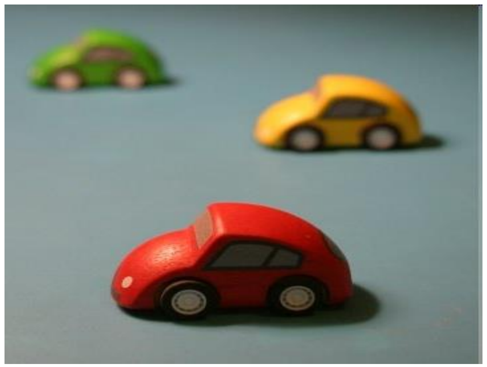


Stepper motor

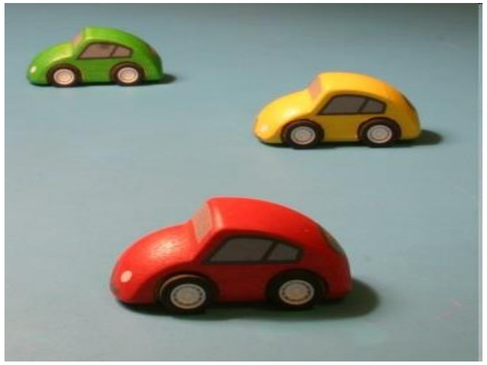
Depth of Field (DoF) with P-Iris



- Camera equipped with P-Iris lenses have deeper FOV even far from focus point.
- Perfect for Large FoV.



DC-iris



Precise iris

Vivotek has a large range of cameras equipped with P-Iris

Iris (F-number)

FD9367-HTV

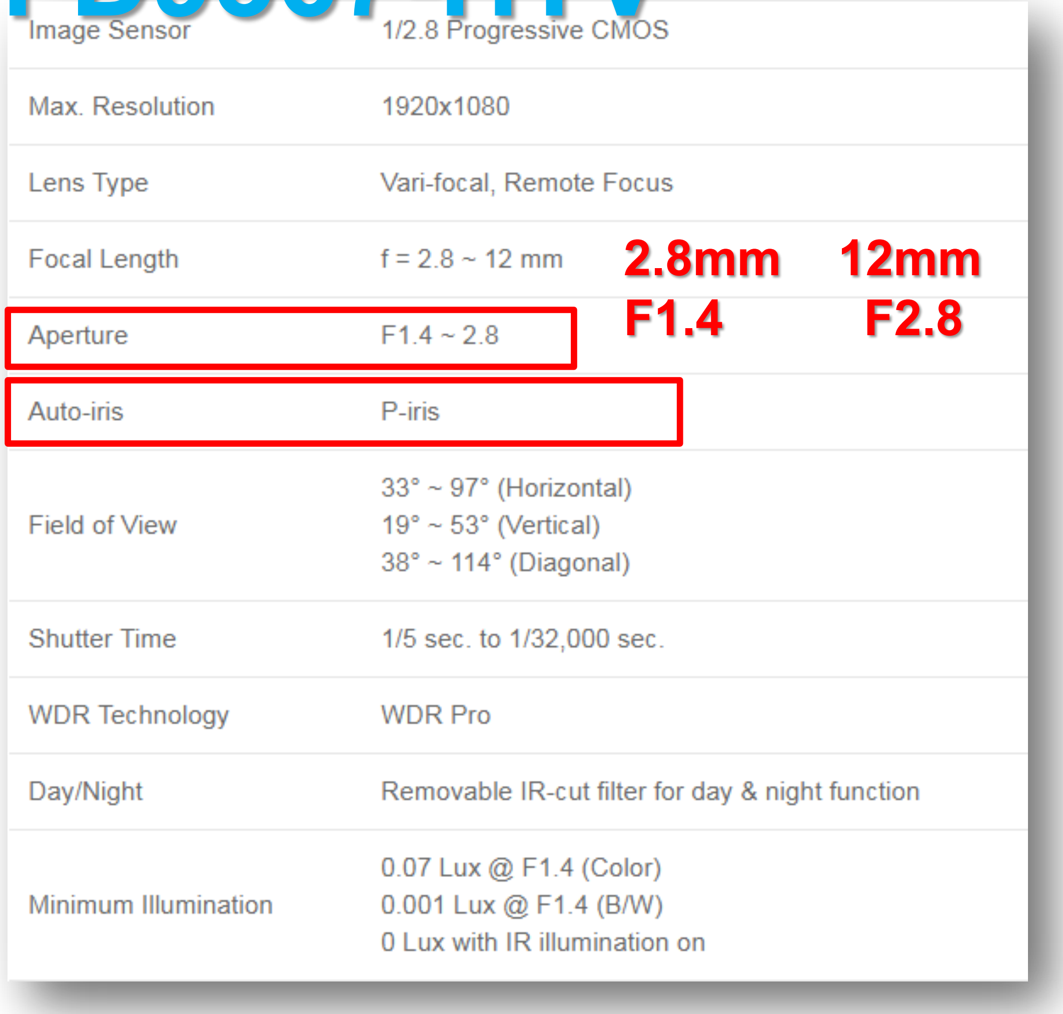


Image Sensor	1/2.8 Progressive CMOS
Max. Resolution	1920x1080
Lens Type	Vari-focal, Remote Focus
Focal Length	f = 2.8 ~ 12 mm
Aperture	F1.4 ~ 2.8
Auto-iris	P-iris
Field of View	33° ~ 97° (Horizontal) 19° ~ 53° (Vertical) 38° ~ 114° (Diagonal)
Shutter Time	1/5 sec. to 1/32,000 sec.
WDR Technology	WDR Pro
Day/Night	Removable IR-cut filter for day & night function
Minimum Illumination	0.07 Lux @ F1.4 (Color) 0.001 Lux @ F1.4 (B/W) 0 Lux with IR illumination on

2.8mm F1.4

12mm F2.8

FD9367-HV

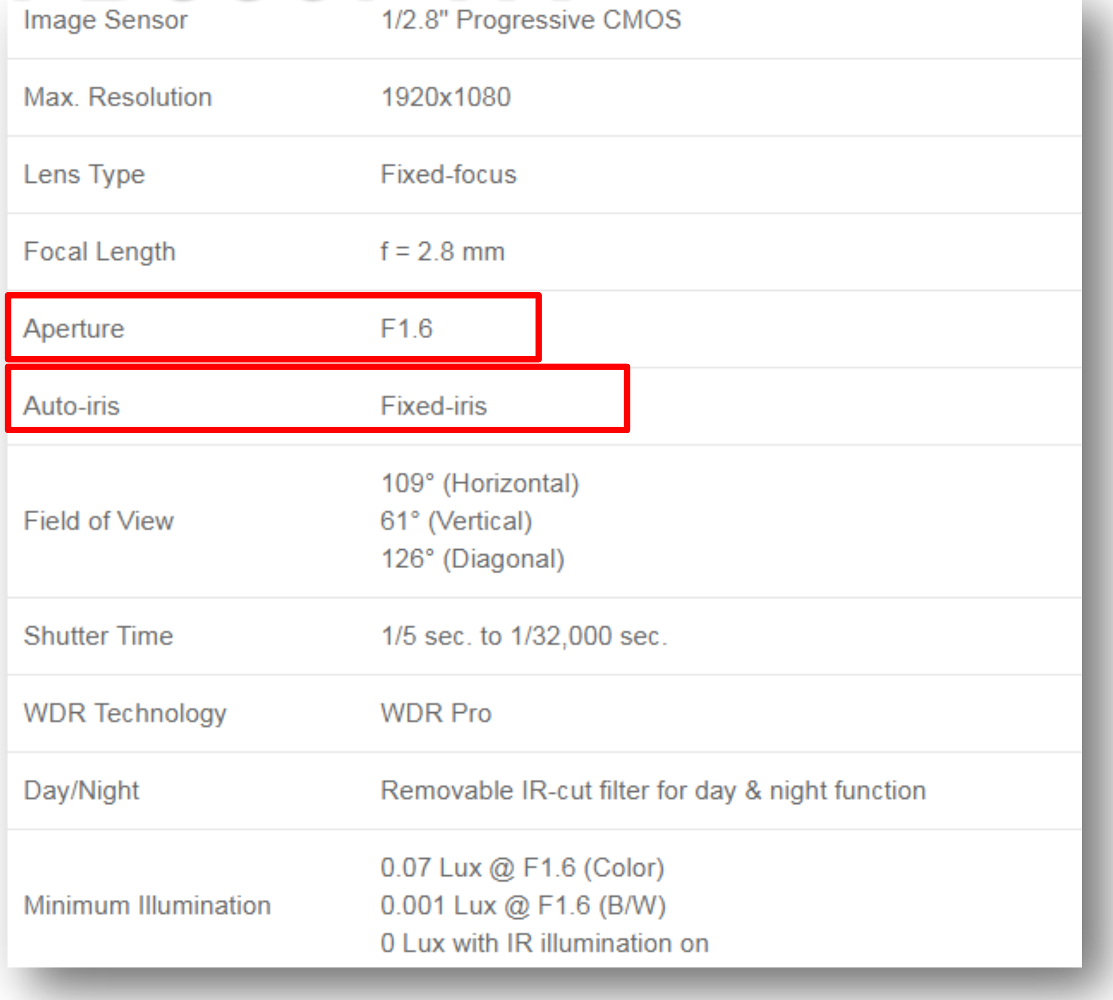


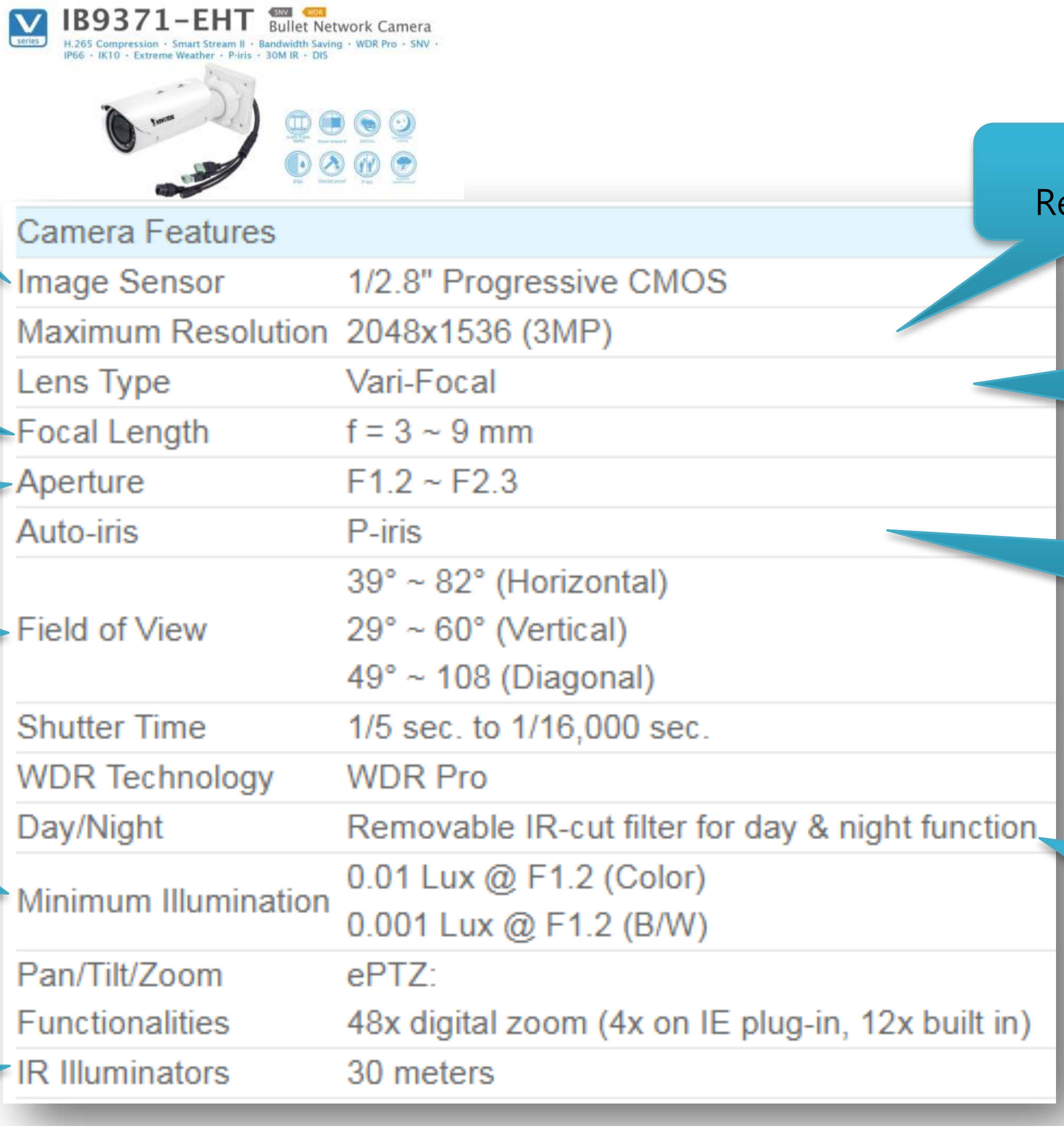
Image Sensor	1/2.8" Progressive CMOS
Max. Resolution	1920x1080
Lens Type	Fixed-focus
Focal Length	f = 2.8 mm
Aperture	F1.6
Auto-iris	Fixed-iris
Field of View	109° (Horizontal) 61° (Vertical) 126° (Diagonal)
Shutter Time	1/5 sec. to 1/32,000 sec.
WDR Technology	WDR Pro
Day/Night	Removable IR-cut filter for day & night function
Minimum Illumination	0.07 Lux @ F1.6 (Color) 0.001 Lux @ F1.6 (B/W) 0 Lux with IR illumination on

Reminder – Some optical concepts

- What we can see through the lenses?
  - focal Length
  - angle of view
  - field of view (FoV)
  - aperture
- Short focal length -> wide angle of view (zoom-out)

  Long focal length -> small angle of view (zoom-in)
- **Depth of Field** is the part of the View which is clear and sharp (focused)
- **P-Iris** lenses can provide better depth of view

VIVOTEK camera spec example



IB9371-EHT Bullet Network Camera

H.265 Compression · Smart Stream II · Bandwidth Saving · WDR Pro · SNV · IP66 · IK10 · Extreme Weather · P-iris · 30M IR · DIS

Camera Features	
Image Sensor	1/2.8" Progressive CMOS
Maximum Resolution	2048x1536 (3MP)
Lens Type	Vari-Focal
Focal Length	f = 3 ~ 9 mm
Aperture	F1.2 ~ F2.3
Auto-iris	P-iris
Field of View	39° ~ 82° (Horizontal) 29° ~ 60° (Vertical) 49° ~ 108 (Diagonal)
Shutter Time	1/5 sec. to 1/16,000 sec.
WDR Technology	WDR Pro
Day/Night	Removable IR-cut filter for day & night function
Minimum Illumination	0.01 Lux @ F1.2 (Color) 0.001 Lux @ F1.2 (B/W)
Pan/Tilt/Zoom Functionalities	ePTZ: 48x digital zoom (4x on IE plug-in, 12x built in)
IR Illuminators	30 meters

Sensor Size

Focal Length

Aperture
(Iris)

FoV
3 mm: 82°
9 mm: 39°

Illumination
(Lux)

IR

Max
Resolution

Lens Type

Iris Type

Day&Night

VIVOTEK’s unique solution of camera’s form type

BOX & BULLET TYPE CAMERAS

BULLET TYPE CAMERAS

−

- Easy Tearing
- Easy to Misalign
- **Clear pointing direction**

+

- All in one / IR
- Easy Install
- Motorized focal
- Sun Shield
- Low lux

BOX TYPE CAMERAS

+

- EIS
- Auto Back Focus
- Low lux
- **Removable lenses**

−

- Have to add outdoor housing and heater
- Need to use external IR LED

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FIXED DOME & FISHEYE CAMERAS

Has the shortest focal

FISHEYE CAMERAS

−

- Identification
- Light sensitivity

+

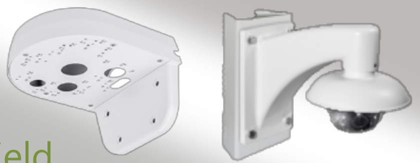
- 360 degree FOV
- Traffic monitoring
- Detection and recognition

FIXED DOME TYPE CAMERAS

+

- All in one / IR
- More Discrete
- Motorized focal
- Vandal proof
- Easy Maintenance
- Low lux
- Hide Pointing Direction (Smoked Cover)

−



- No Sun Shield
- **Susceptible to rain & dirt in wall position**

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SPEED DOME CAMERAS

−

- Need an operator
- Higher maintenance costs

+

- Auto focus
- Long distance zoom capability
- Patrol mode

PTZ CAMERAS

(Speed Dome)

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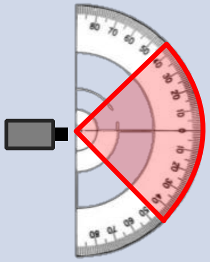
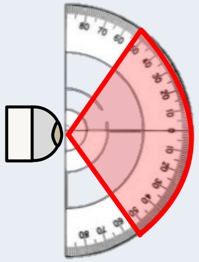
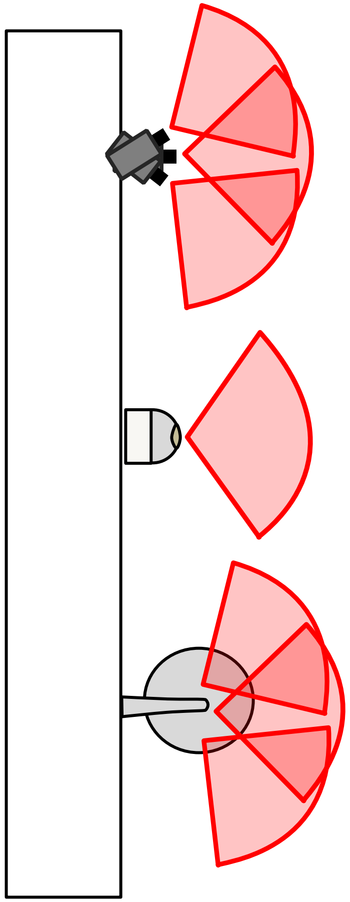
Fix Dome vs Bullet

	Model	RES	FOV	Wider Angle
	IB9371-HT	3 MP	3 – 9 mm 82° – 39°	
	FD9371-HT	3 MP	3 – 9 mm 86° - 41°	

Normally we select a longer focal length for bullet

Fix dome with same resolution have natively wider FoV

Mounting: Fix Dome vs Bullet



Bullet and Box

Easy pan and tilt.

Fix Dome in
wall position

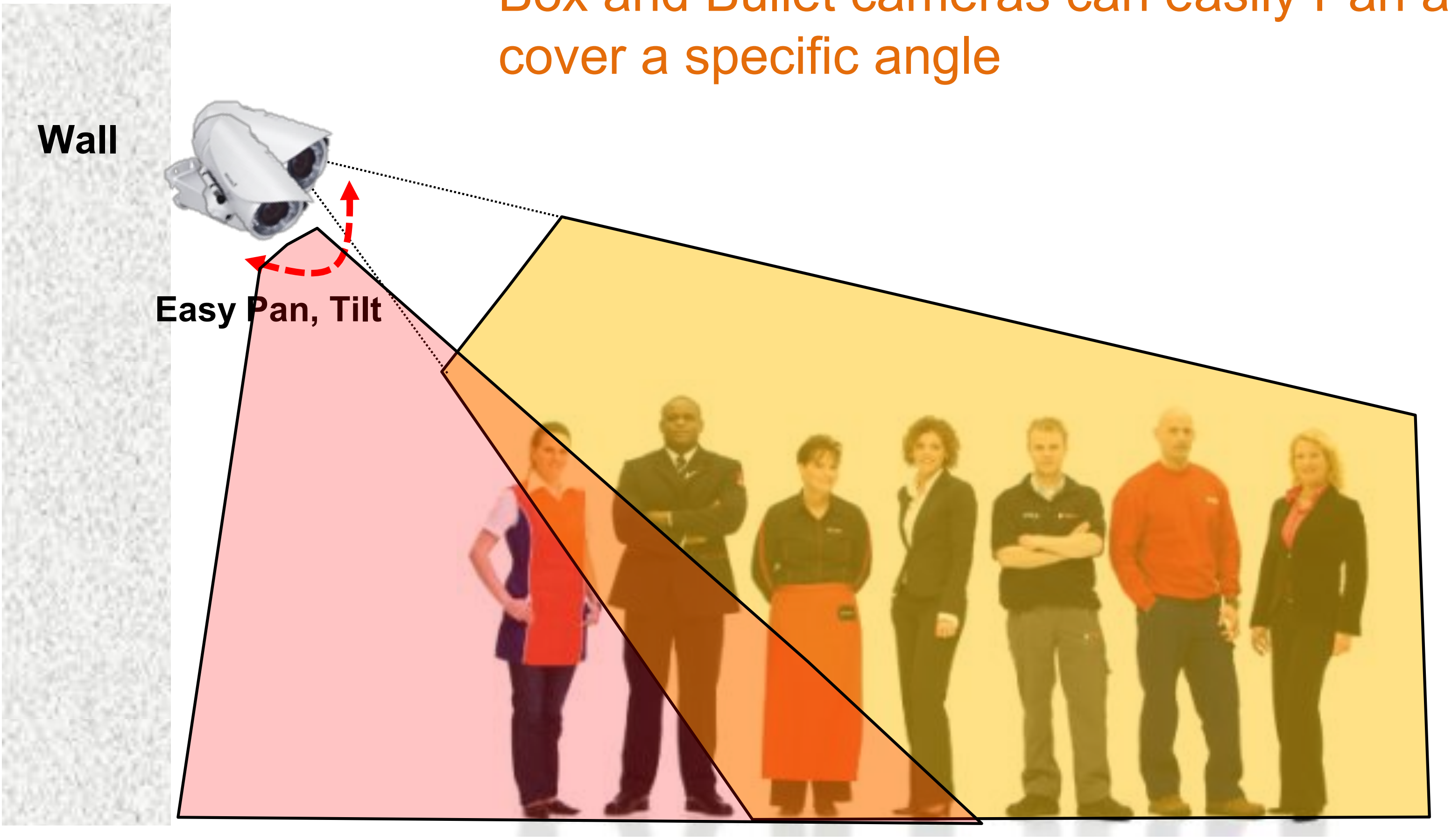
Tilt angle depends on IR limitations given by model to avoid reflectivity.
→ Limited viewing angles.

Fix Dome in
pendant position

Easy pan and tilt.
→ Tilt angle depends on IR limitations

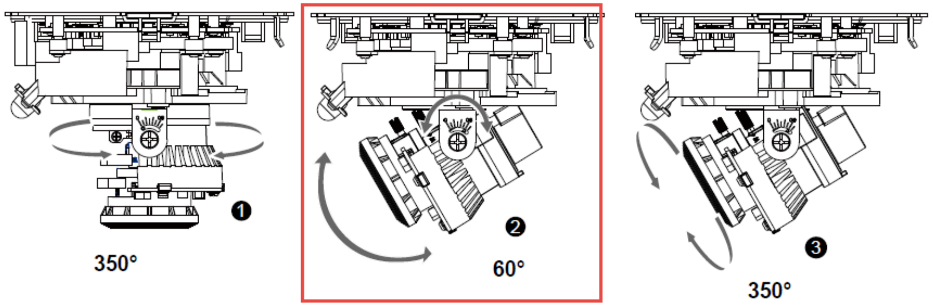
Mounting: Box and Bullet

- Box and Bullet cameras can easily Pan and Tilt to cover a specific angle

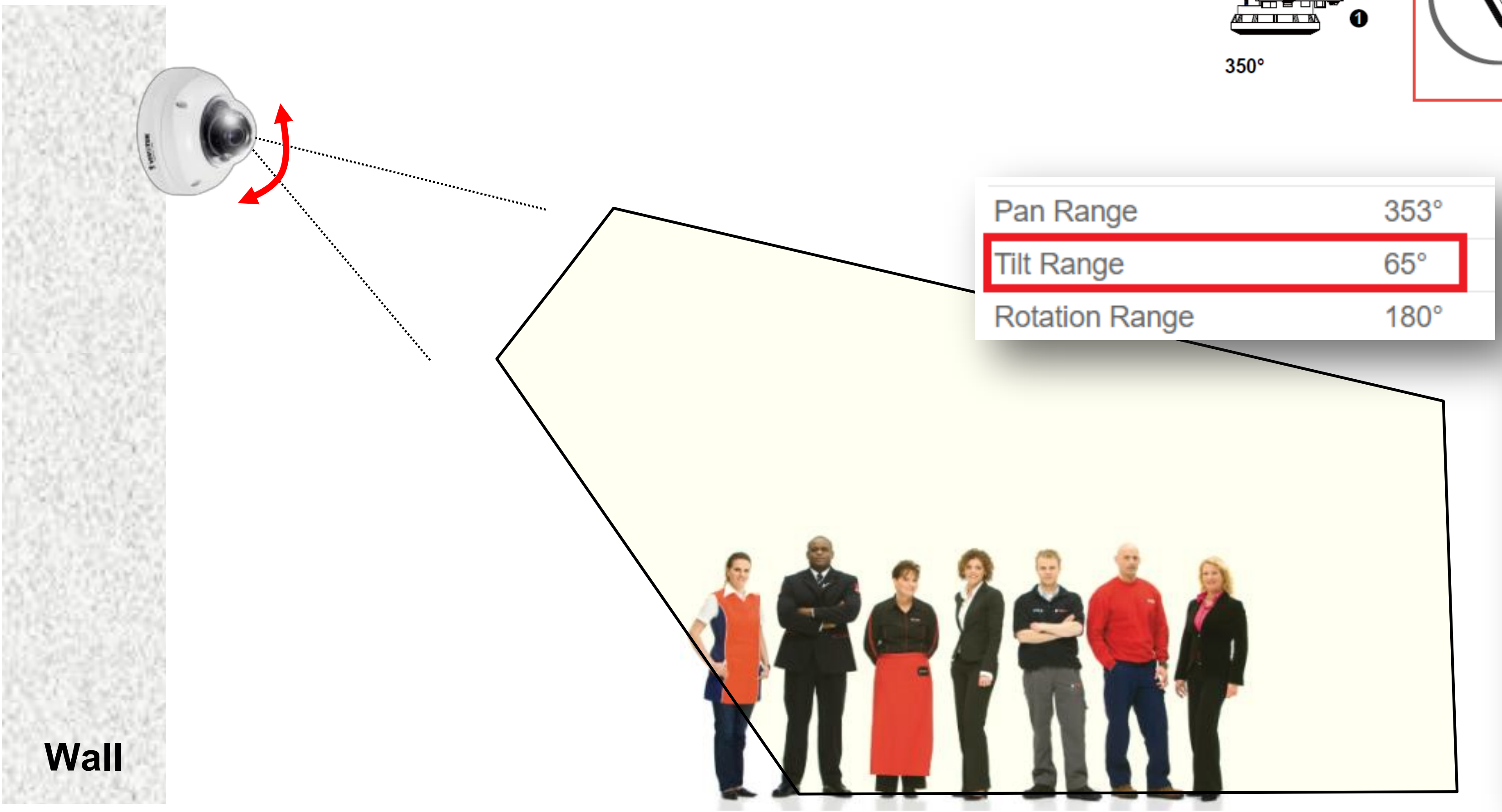

Wall
Easy Pan, Tilt

Mounting: Fixed Dome in wall position

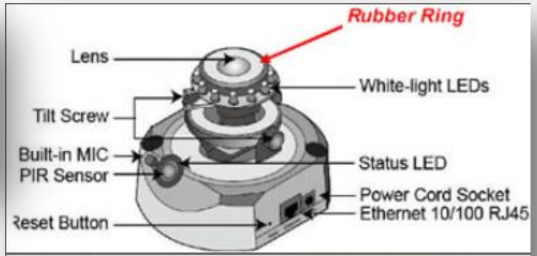
- Tilt angle limited to avoid IR reflectivity.
- Susceptible to rain & dirt and sun glare problem



❶
350°
❷
60°
❸
350°



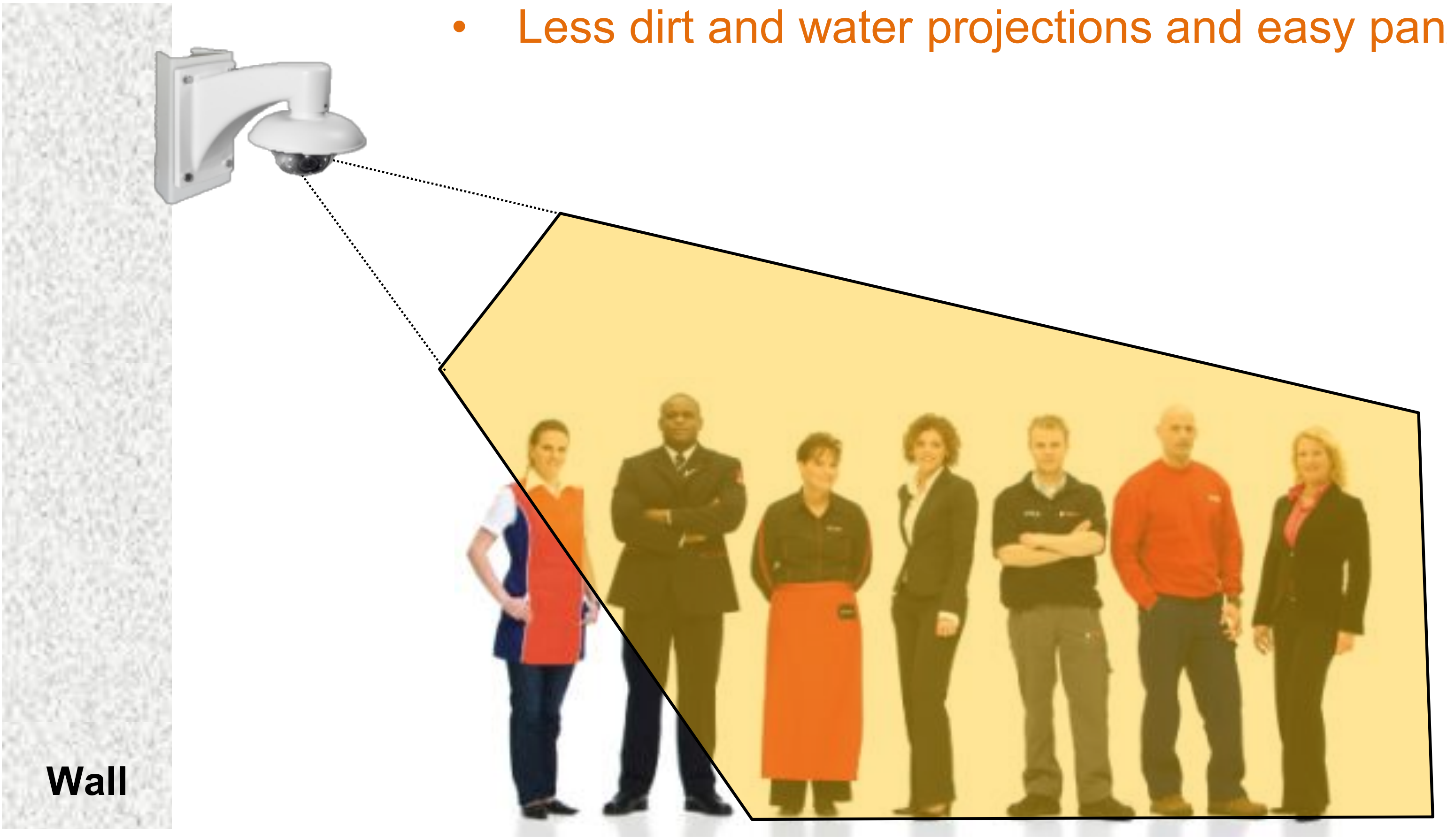
Pan Range	353°
Tilt Range	65°
Rotation Range	180°



Rubber Ring
Lens
White-light LEDs
Tilt Screw
Built-in MIC
PIR Sensor
Status LED
Power Cord Socket
Ethernet 10/100 RJ45
Reset Button

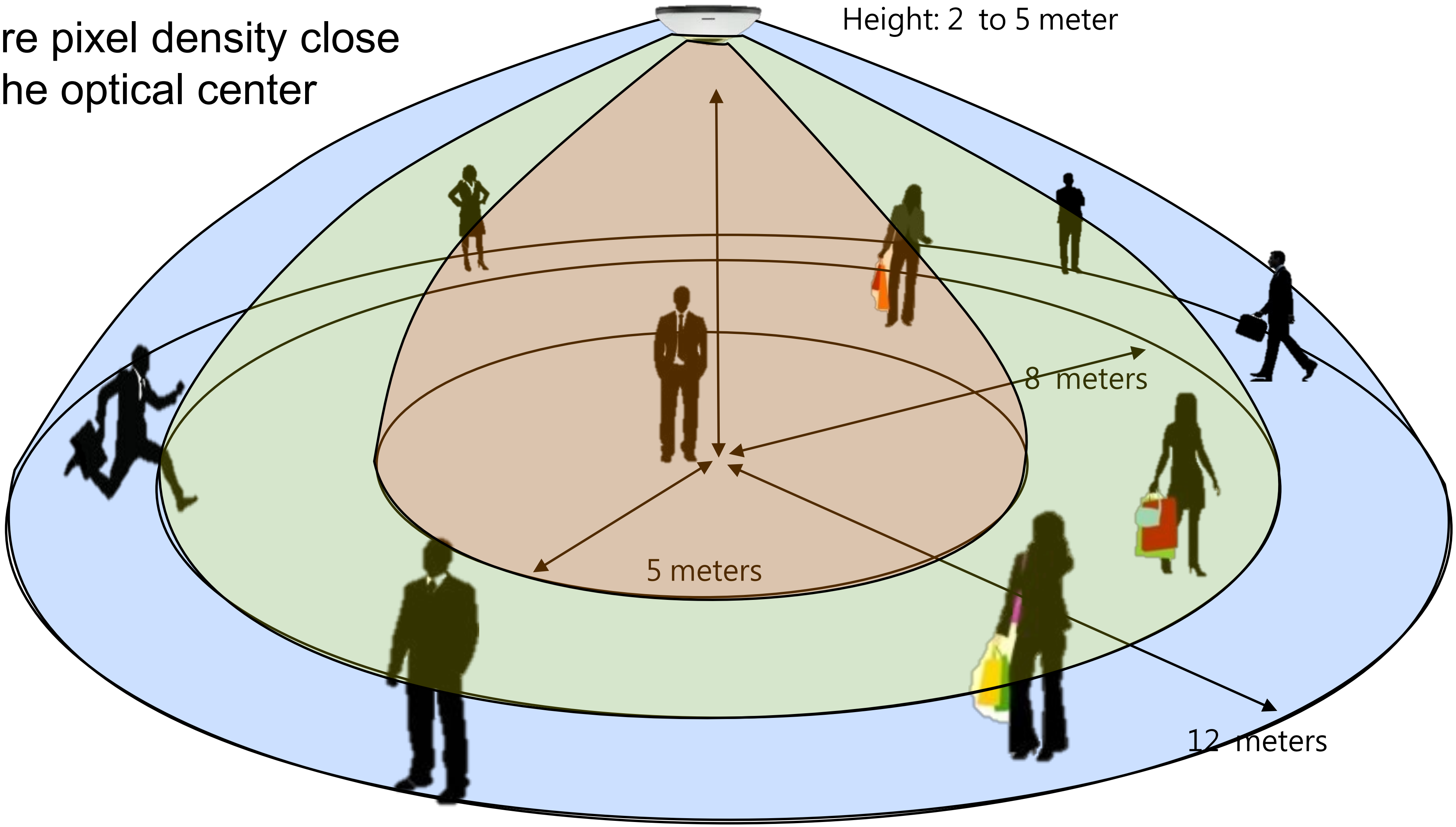
Mounting: Fixed Dome in pendant position

- Pendant mounting decrease maintenance costs.
- Less dirt and water projections and easy pan/tilt.



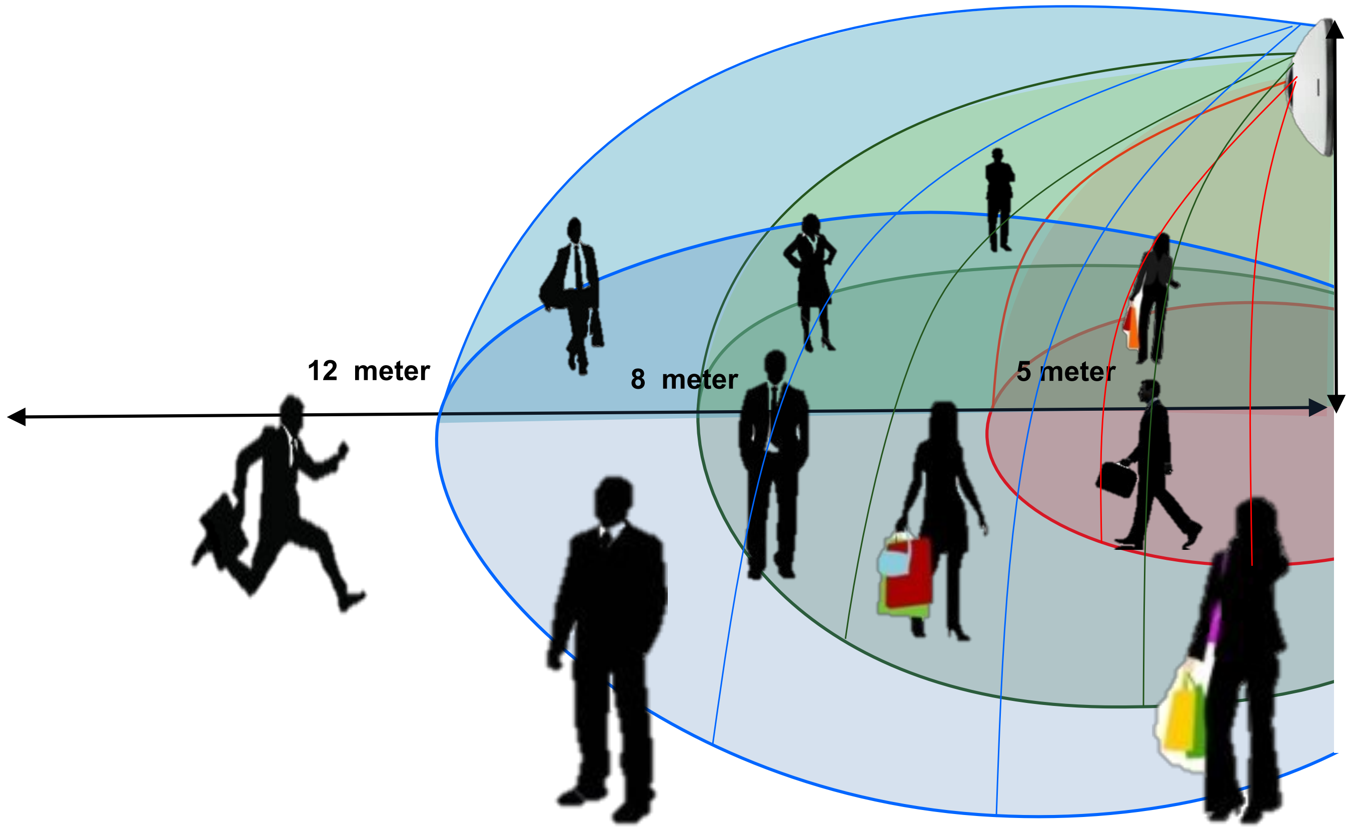
360° panoramic in ceiling /pendant position

- More pixel density close to the optical center


Height: 2 to 5 meter
8 meters
5 meters
12 meters

Fisheye in Wall position: 180°

More pixel density close to the optical center


12 meter
8 meter
5 meter

Height: 2 to 5 meter

Panoramic Cameras

2MP

CC8160
(Indoor)

NEW!

3MP

CC8371-HV
(In/ outdoor)

5MP

FE9381-EHV
In/outdoor

NEW!

5MP

FE9190-H
(Indoor)

5MP

FE9382-EHV
In/outdoor with IR

NEW!

12MP

FE8391-EV
In/outdoor with IR

VIVOTEK Specific form type panoramic cameras

12MP

MS8391-EV

2MP

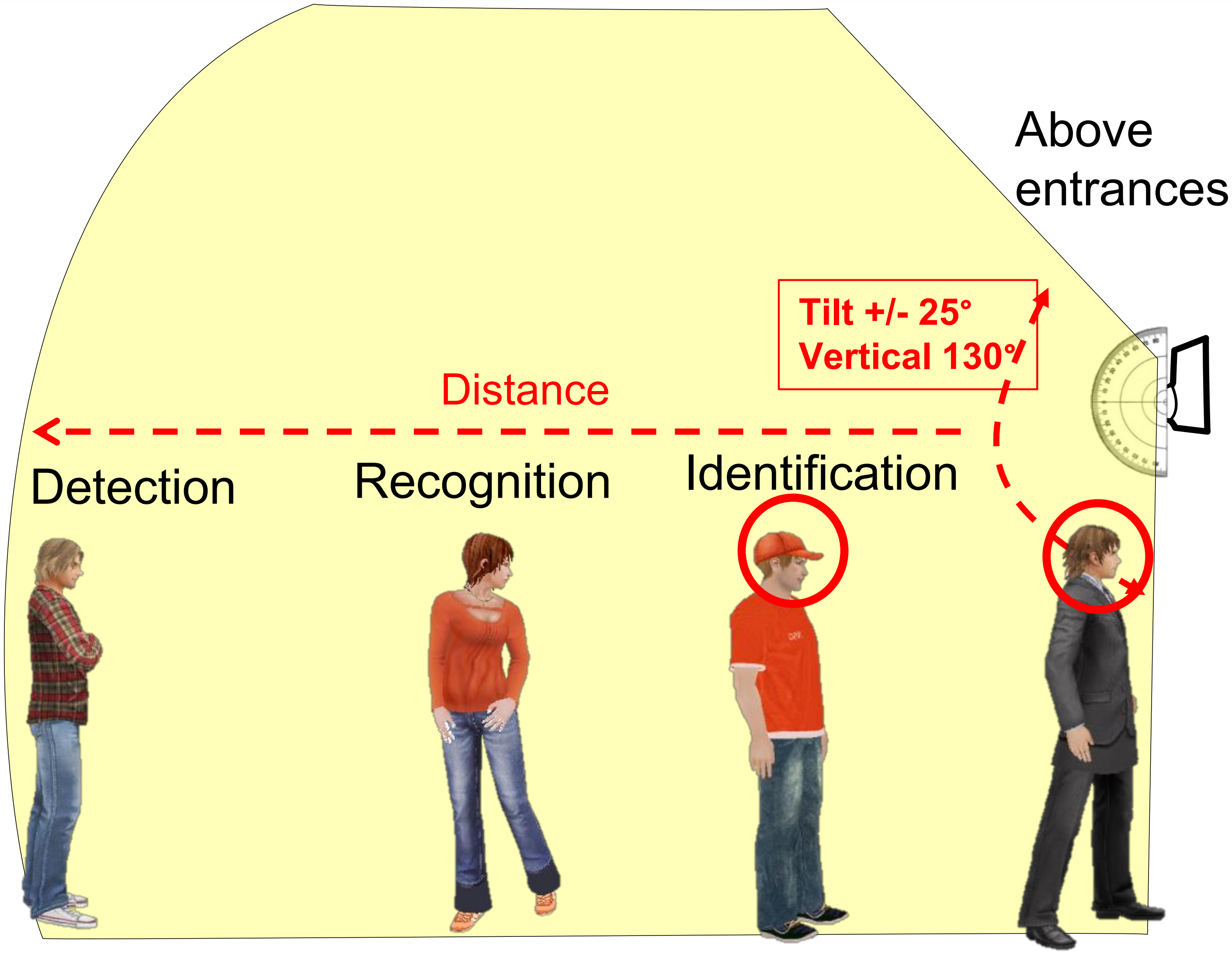
VC8101

5MP

FE8182

180° application types

Above entrances



Tilt +/- 25°
Vertical 130°

Distance

Detection

Recognition

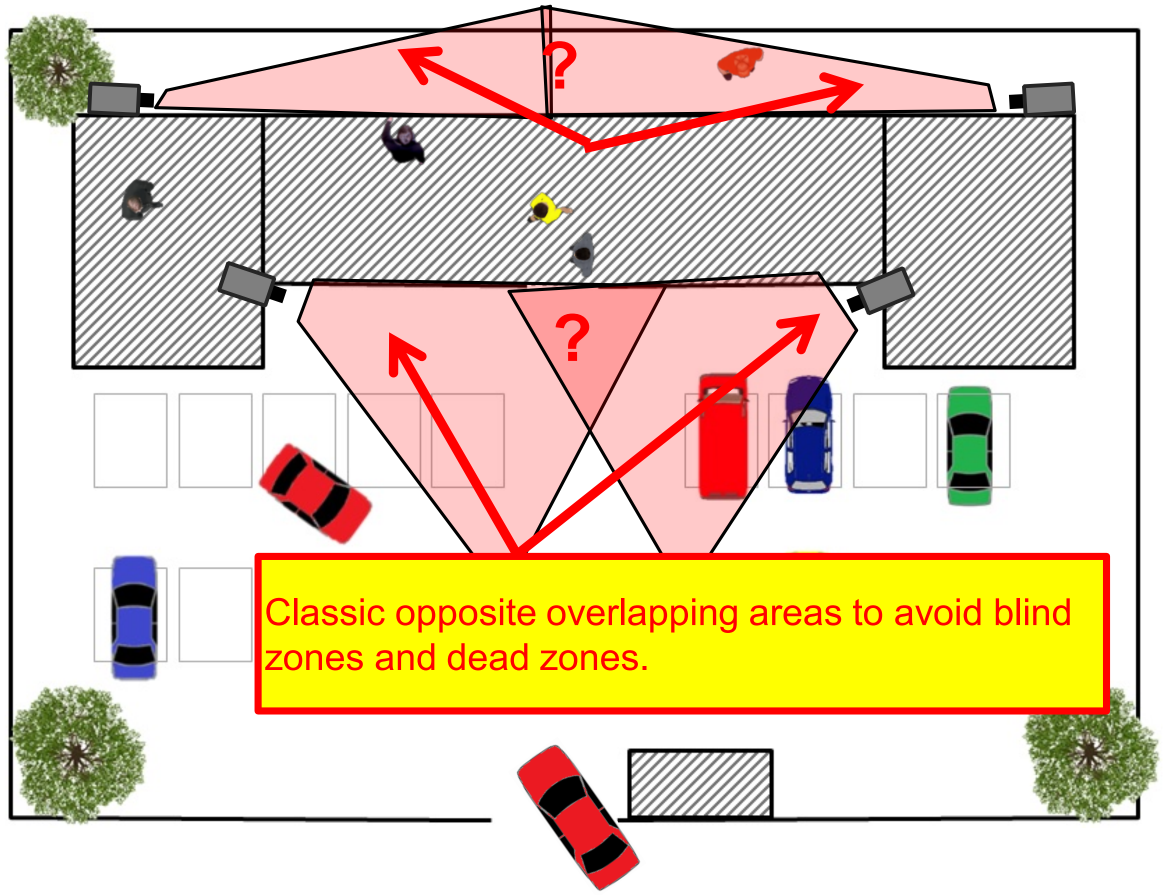
Identification

CC8370-HV

CC8371-HV

Applications Types

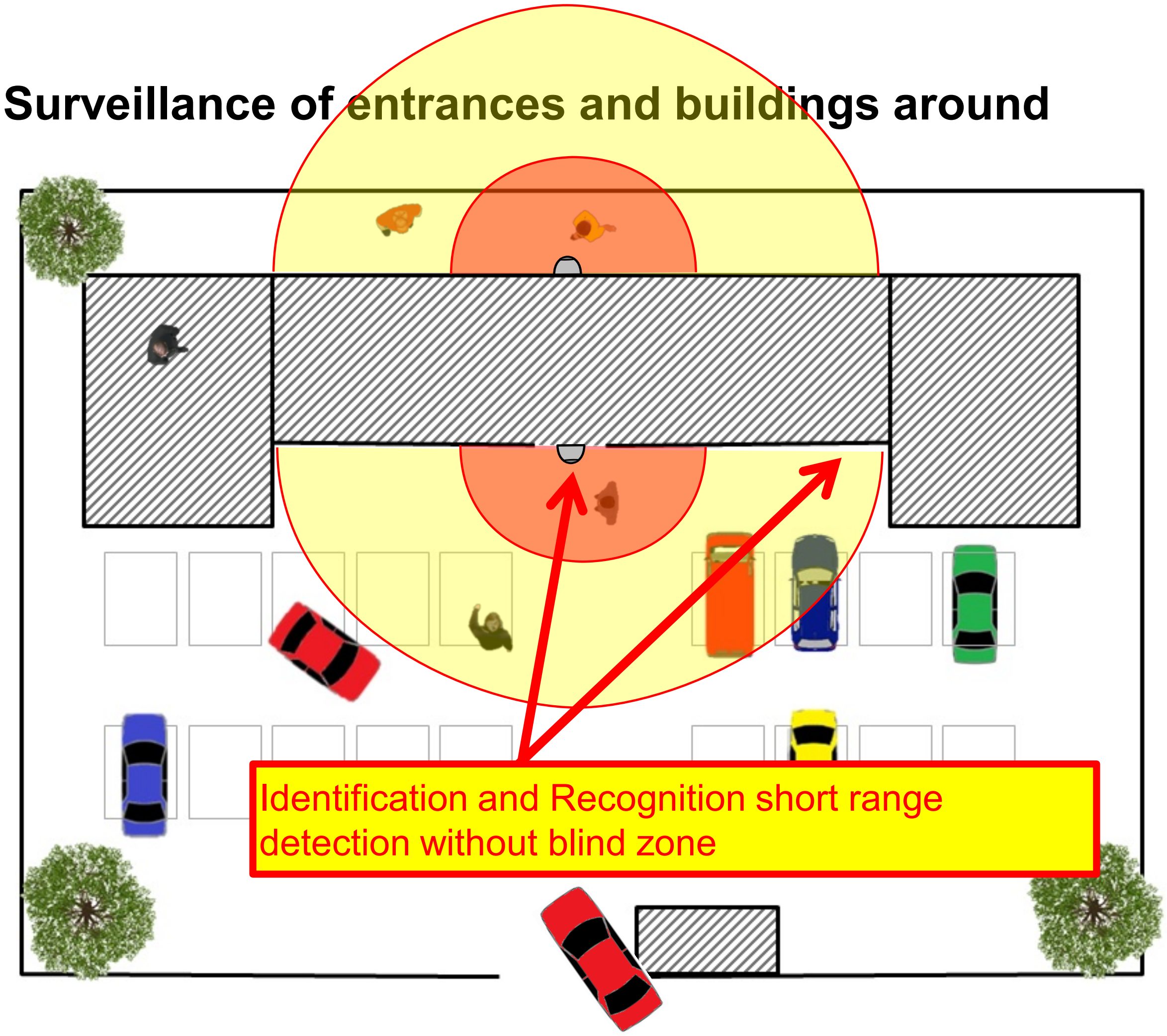
Traditional Surveillance of entrances and buildings around



Classic opposite overlapping areas to avoid blind zones and dead zones.

Applications Types

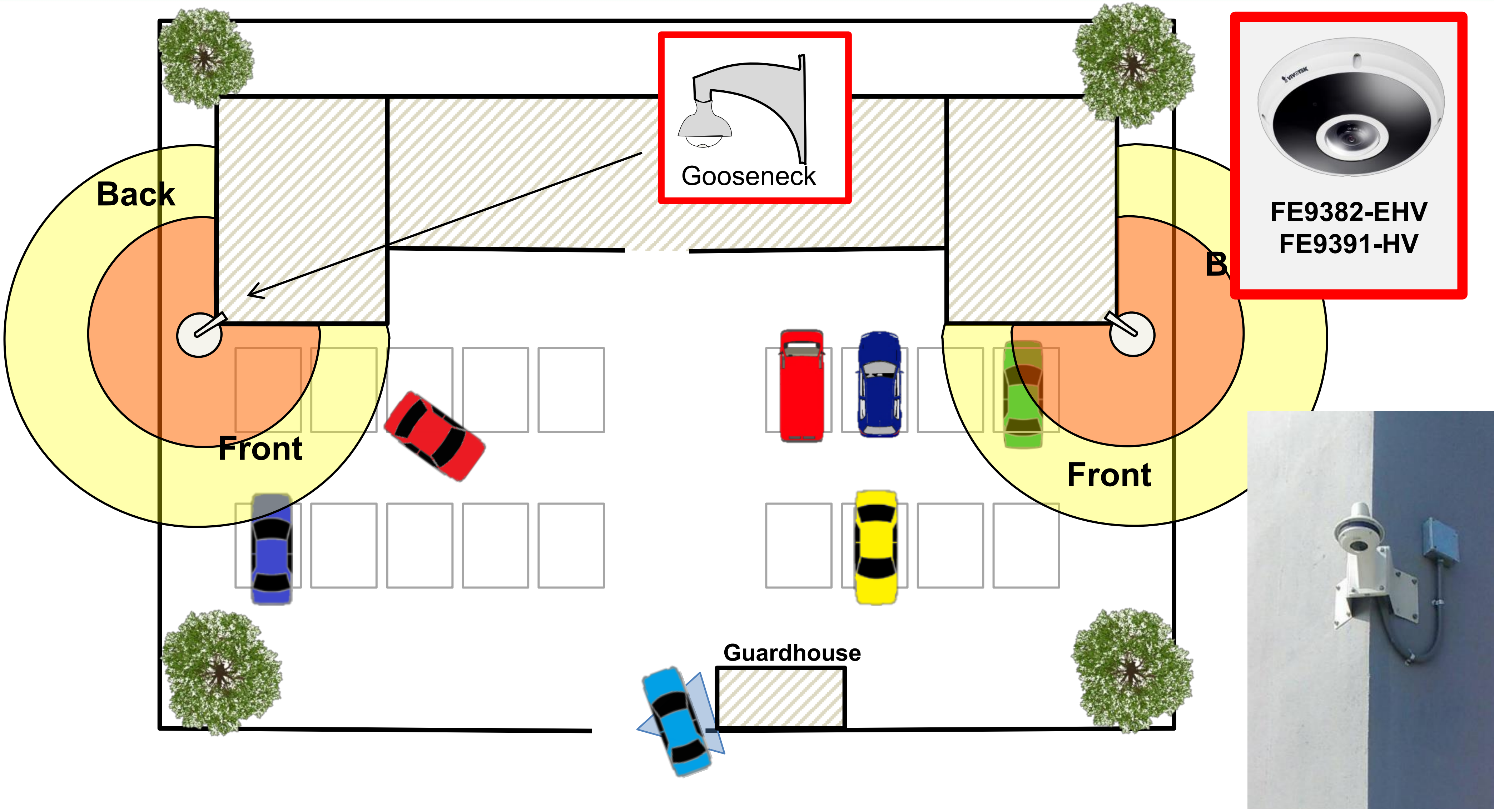
Surveillance of entrances and buildings around



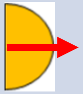
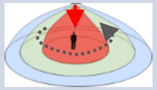
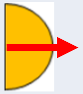
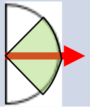
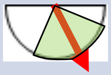
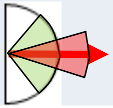
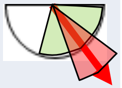
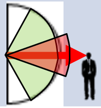
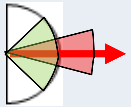
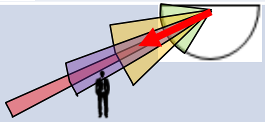
Identification and Recognition short range detection without blind zone

MS8391-EV

Outdoor Front/back Parking Surveillance


Gooseneck
Back
Front
Front
B
Guardhouse
FE9382-EHV
FE9391-HV

Camera models and angle of vision

Models	Design	focal	View angles	Field of View
FE9381-EHV		1.47 mm	180°/360°	**Wall**  **Ceiling Pendant** 
CC8160 **MS8391-EV**		1.66 mm 4 x 6mm	180°	**Wall** 
FD8166A		2.8 mm	113°	**Wall**  **Ceiling** 
FD9367-HTV		2.8 - 12 mm	P-Iris 33°- 97°	**Wall**  **Ceiling Pendant** 
IP9171-HP **IP816A-LPC**		2.8 – 8 mm 12.0 – 40 mm	P-Iris 51°-114° P-Iris 10.2° - 30°	**Wall** 
IB9371-HT		3 - 9 mm	3MP P-Iris 39°- 82°	**Wall** 
SD9362-EH		4.3-129 mm	FHD DC-Iris 2.3°- 64°	**Ceiling Pendant** 

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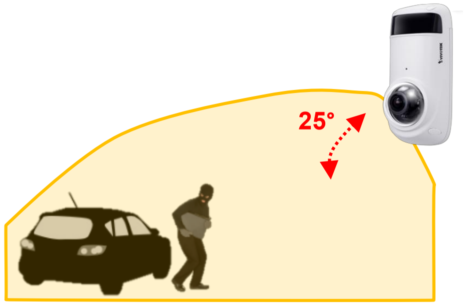
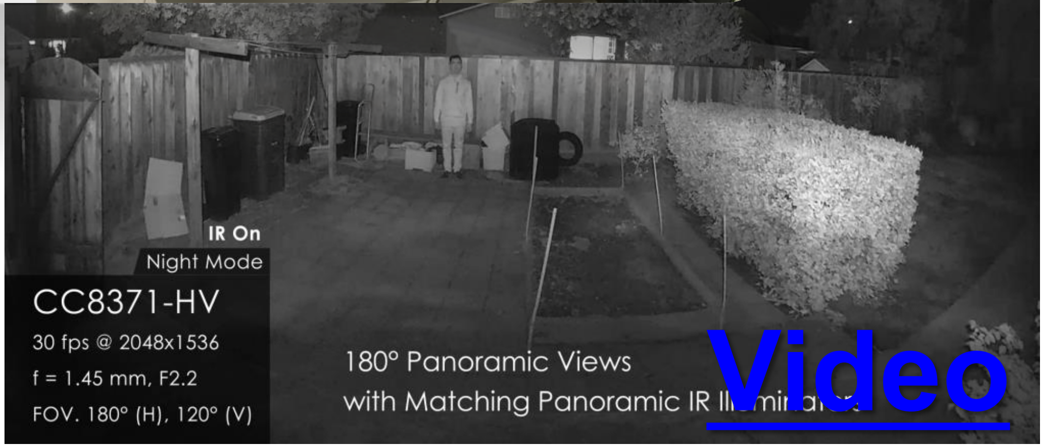
VIVOTEK Professional Panoramic Camera, CC8371-HV



CC8371-HV

- Anti-Ligature Design
- 180° IR illuminators up to 15 meters
- WDR Pro (100dB)
- SNV (Supreme Night Visibility)
- ±25 ° Tilt Lens
- Built-in Microphone
- IP66 / IK10

VIVOTEK
Indoor Footage


IR On
Night Mode
CC8371-HV
30 fps @ 2048x1536
f = 1.45 mm, F2.2
FOV. 180° (H), 120° (V)
180° Panoramic Views
with Matching Panoramic IR Illuminators

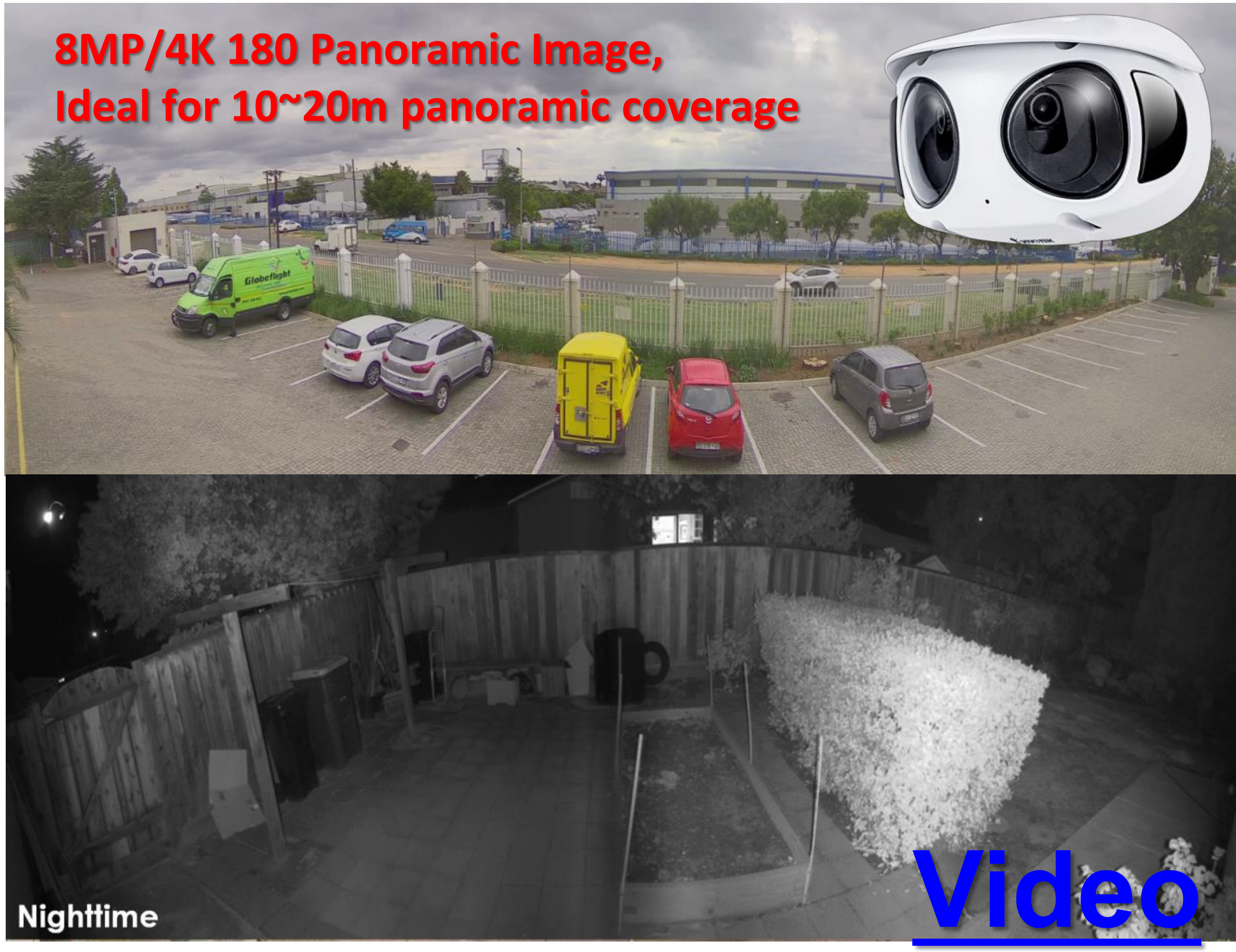
Video

https://www.youtube.com/watch?v=d9SRM2XInU8

Multi Sensor Panoramic Camera, MS9390-HV

VIVOTEK

- H.265 8MP/4K, 30fps @ 4512x1728
- 2 x 2.8mm lenses with 20° vertical tilt
- 180° IR illuminators up to 20 meters
- WDR Pro (100dB)
- SNV (Supreme Night Visibility)
- Smart Stream III
- Built-in Microphone
- IP66 / IK10



8MP/4K 180 Panoramic Image,
Ideal for 10~20m panoramic coverage

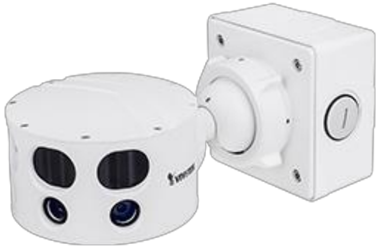
Video

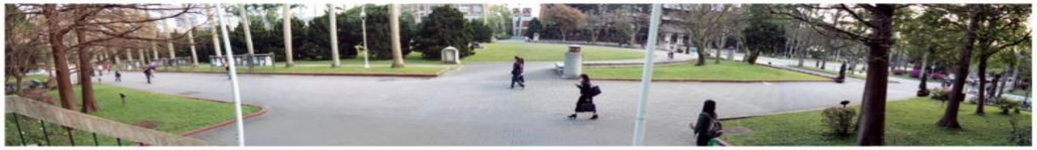
https://www.youtube.com/watch?v=WEY41ohO_nY

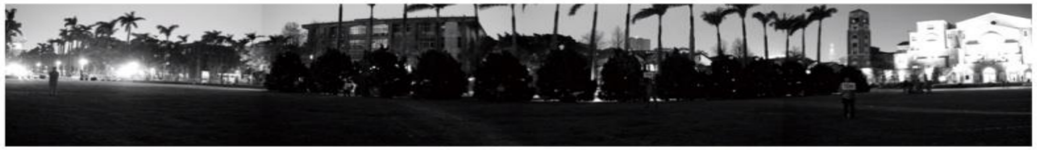
Multi Sensor Stitching Camera, MS9391-EV

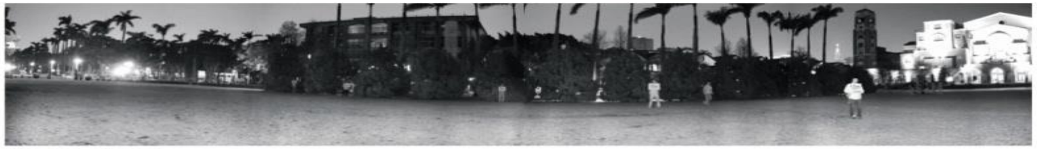
VIVOTEK

- 12-Megapixel Resolution
- 180° Panoramic View
- 7 fps @ 7552x1416
- Video Alignment to Have a Seamless Picture
- Built-in IR Illuminators, Effective up to 30 Meters
- Smart Stream to Optimize Bandwidth Efficiency
- Weather-proof IP66-rated and Vandal-proof IK10-rated Housing




Day View


Night View (IR Off)


Night View (IR On)

https://www.youtube.com/watch?v=hKLevJ6LQeQ

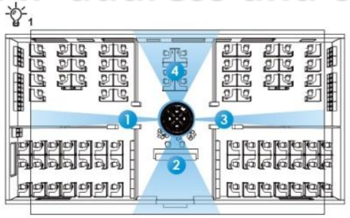
Multi-Adjustable Sensor Dome Camera, MA9321-EHTV

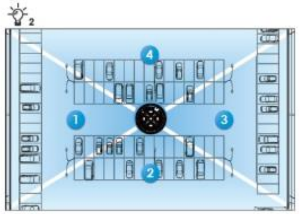
VIVOTEK

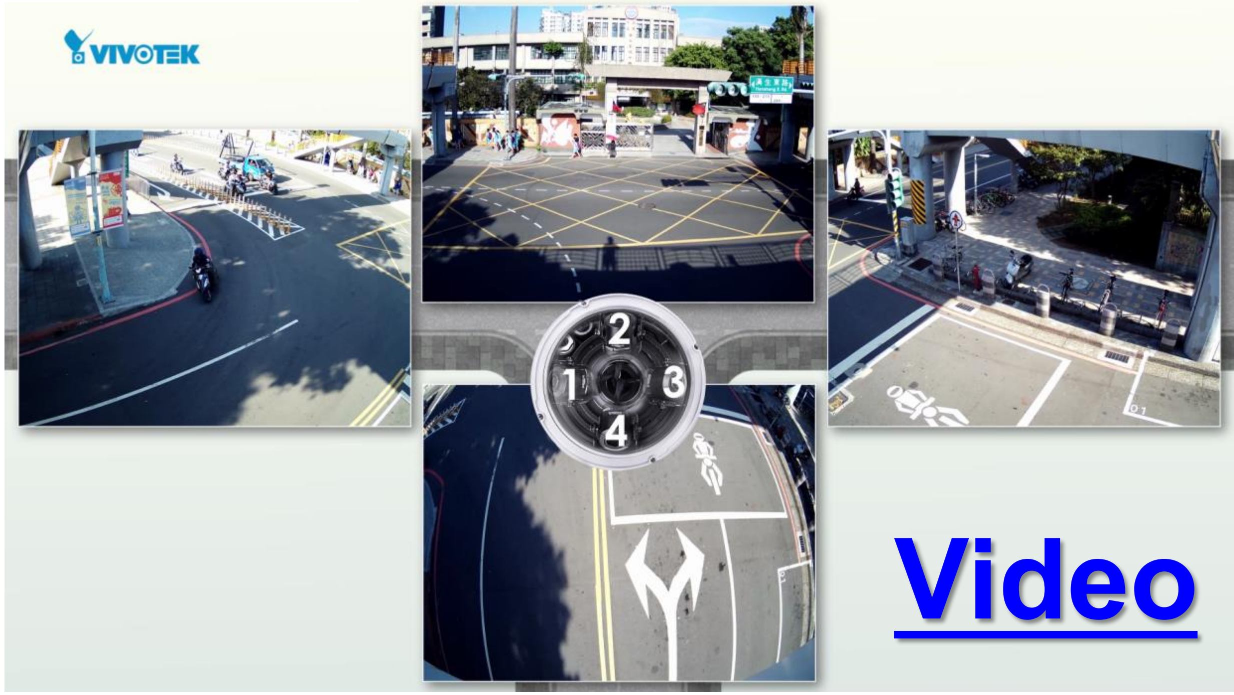
- 4 x 3MP Sensors (non-stitched)
- 2.8 ~ 8mm remote focus lenses
- 7 fps @ 2048x1536 max per lens
- Lens adjust position via Rotation/Tilt/Pan on camera's 360 ° track independently
- Smart Stream II
- Built-in Microphone
- IP66 and IK10
- Working temperature -40˚C ~ 50˚C

4 Independent sensor for multi-adjustable views

1 IP address and camera installation







Video

https://www.youtube.com/watch?v=JdWmN2ampog

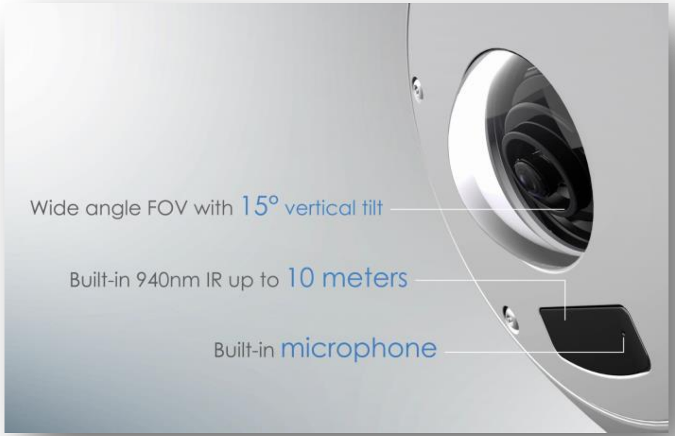
VIVOTEK IR Speed Dome Camera, SD9366-EH

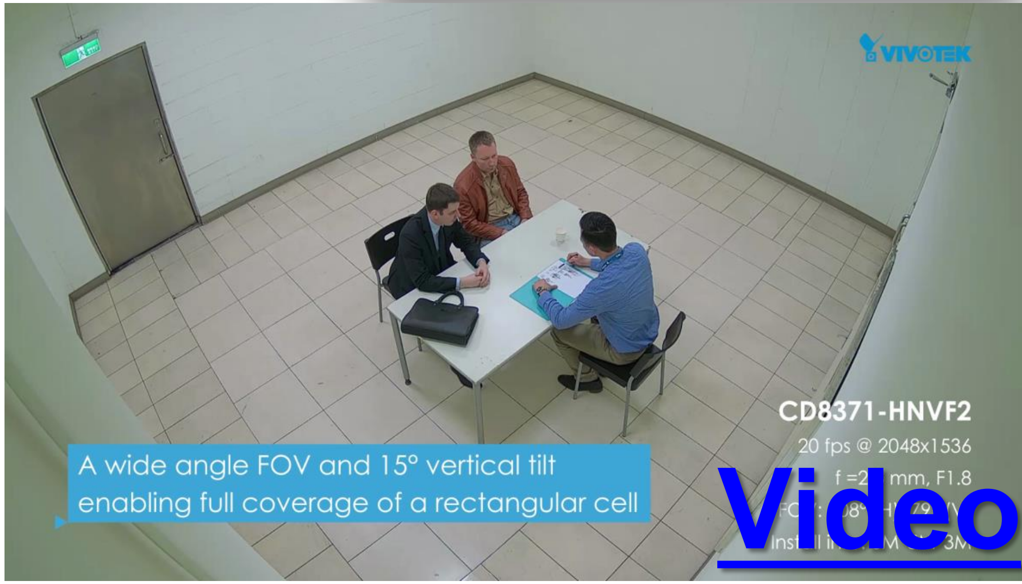
- Real-time H.265, H.264 and MJPEG Compression
- 60 fps @ 1080p Full HD
- 30x Zoom Lens, 250 M IR with WIPER
- VAIR (Vari-Angle IR)
- 360° Continuous Pan and 220° Tilt
- WDR Pro
- IP66, IK10 and NEMA 4X
- -50°C ~ 55°C
- Smart Stream II
- Defog and EIS

https://www.youtube.com/watch?v=NP9V4CjEJmY

Corner Camera, CD8371-HNTV

- 3-Megapixel CMOS Sensor
- 20 fps @ 2048x1536
- Anti-Ligature Design, Corner Dome Camera
- IP67 and IK10+ rated housing
- 108° HFOV, 79° VFOV → no blind spots
- Built-in Invisible 940nm IR Illuminators up to 10 Meters
- WDR Pro (100dB) and SNV
- Shock Detection (G-Sensor)


Wide angle FOV with 15° vertical tilt
Built-in 940nm IR up to 10 meters
Built-in microphone


VIVOTEK
CD8371-HNVF2
20 fps @ 2048x1536
f =2 mm, F1.8

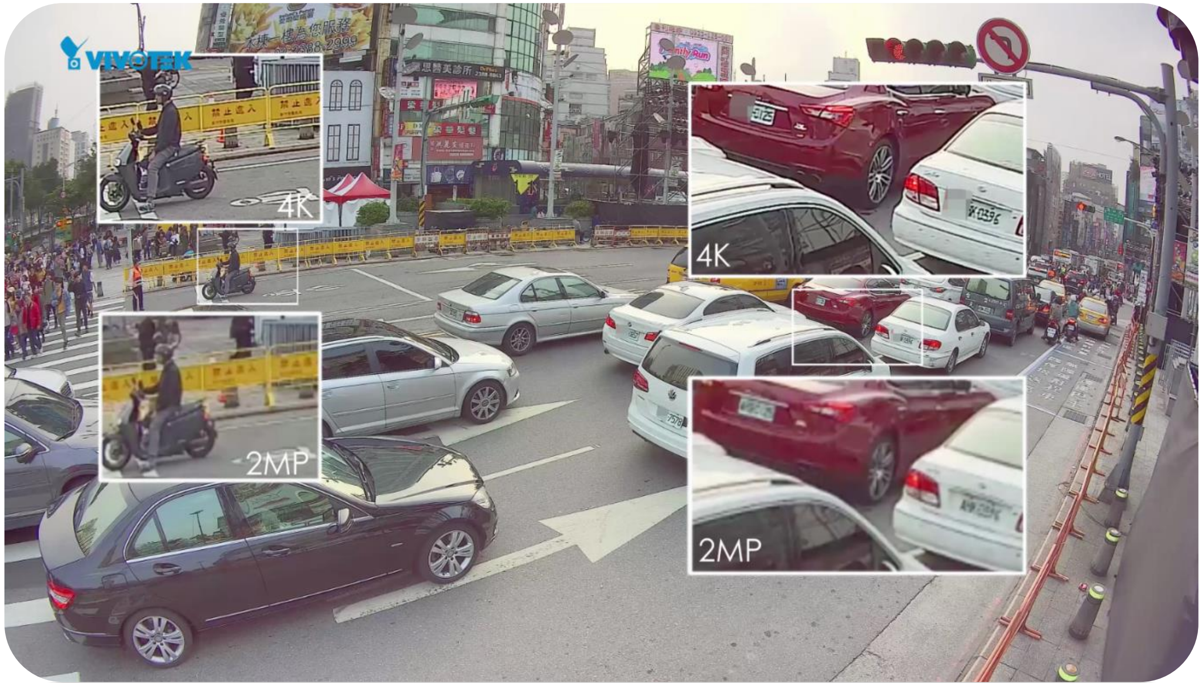
A wide angle FOV and 15° vertical tilt enabling full coverage of a rectangular cell

Video

https://www.youtube.com/watch?v=Z_sZZtQBRTQ

VIVOTEK 4K Series Camera

- **H.265**, **H.264, and MJPEG Compression**
- **30 fps @ 3840x2160 (WDR Pro on)**
- **120 fps @ 1920x1080 (WDR Pro off)**
- **Smart Stream III**
- **SNV (Supreme Night Vision)**
- **WDR Pro**
- **Remote Back Focus** (IP9191-HP)
- **50M IR, Smart IR II** (IB/FD9391)
- **Smart Motion Detection** (IB/FD9391)

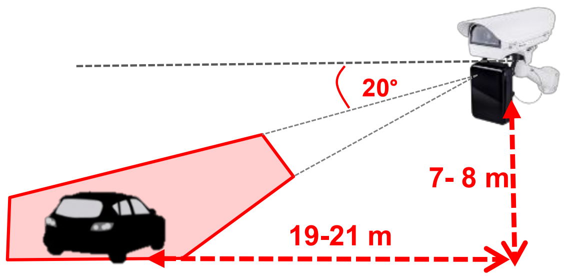

VIVOTEK
4K
2MP
4K
2MP

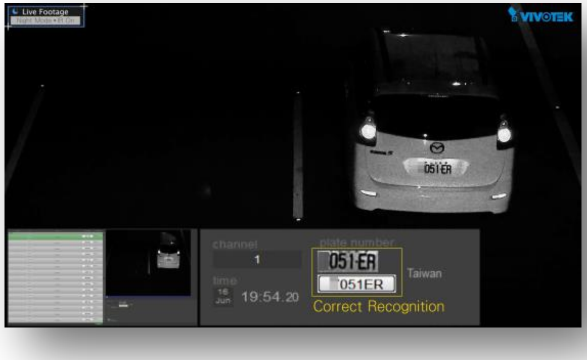
Video

FD9391-EHTV

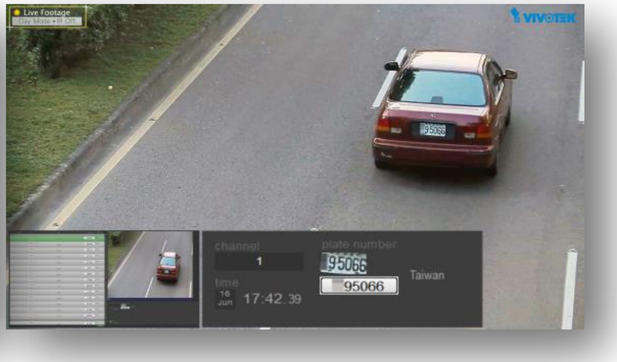
https://www.youtube.com/watch?v=4dekwC8Hc4U

VIVOTEK LPC solution, IP9165-LPC Kit


20°
7- 8 m
19-21 m


Live Footage
VIVOTEK
051ER

channel 1
plate number 051ER 051ER Taiwan
time 16 Jun 19:54.20
Correct Recognition


Live Footage
VIVOTEK
95066

channel 1
plate number 95066 95066 Taiwan
time 16 Jun 17:42.39

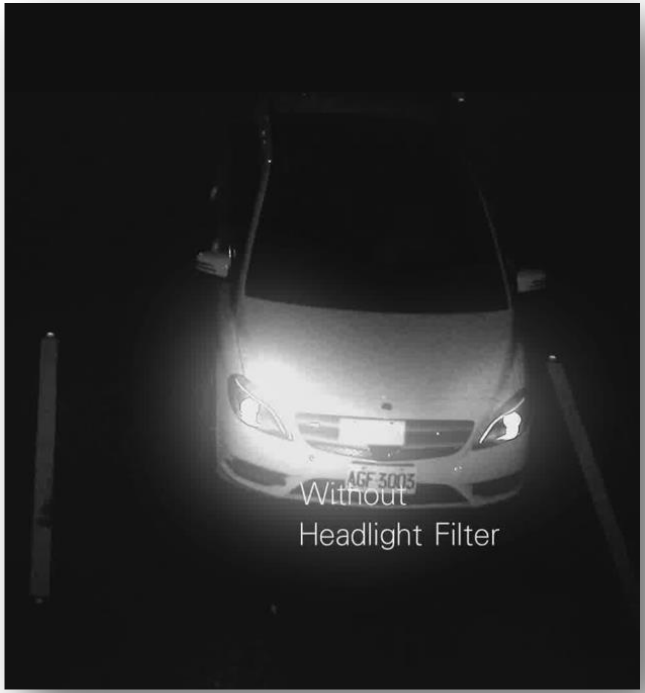
- H.265 , 60fps@2MP
- Remote Back Focus and DIS
- Capture license palate up to180km/h speed.
- Wide coverage for Dual Lanes
- WDR ProII (140dB)
- Headlight filter for brilliant night image

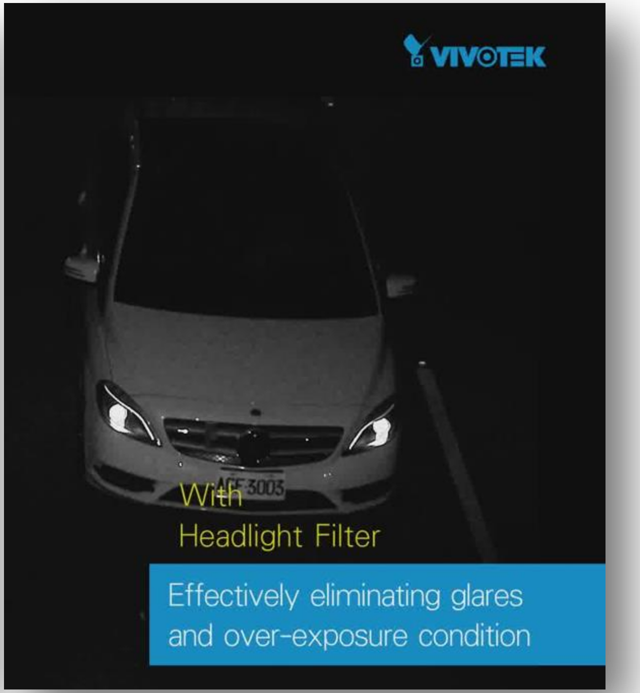
VIVOTEK
IP9165-LPC Kit
License Plate Capture Solution

Video

https://www.youtube.com/watch?v=Hsix3Si2NbA

LPC Solution (IP816A-LPC、IP9165-LPC)

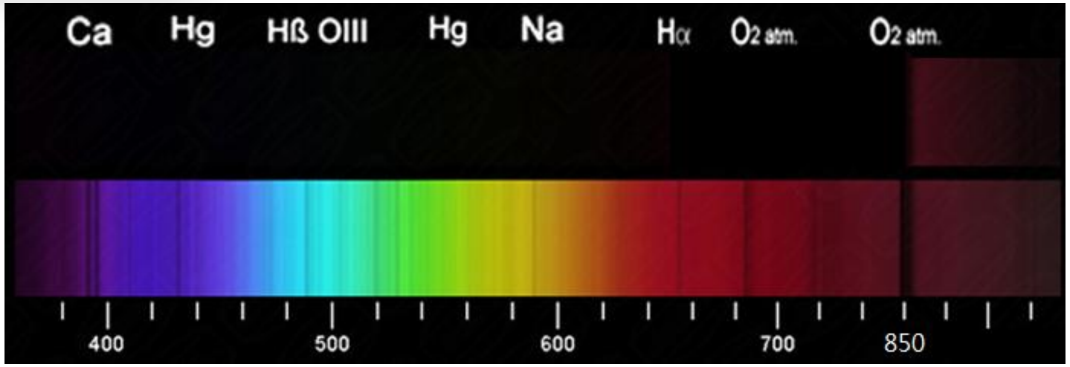

AGF 3003
Without
Headlight Filter


VIVOTEK
AGF 3003
With
Headlight Filter
Effectively eliminating glares
and over-exposure condition

140km with Headlight filter

Only let 850nm wavelength pass

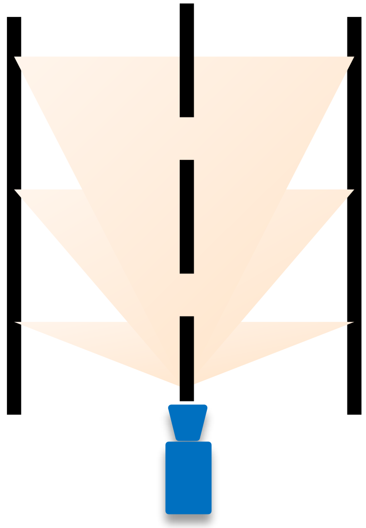
Use IR Pass filter



CVA Technology in CaMate IR Illuminator

CVA Tech - Continuous Variable Angle Technology

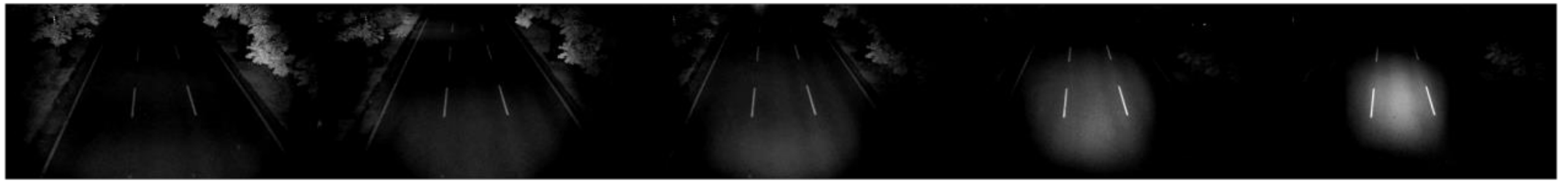
Advantage 1 - Flexible installation adaptability



Tele angle for **long distance**

Wide angle for **short distance**

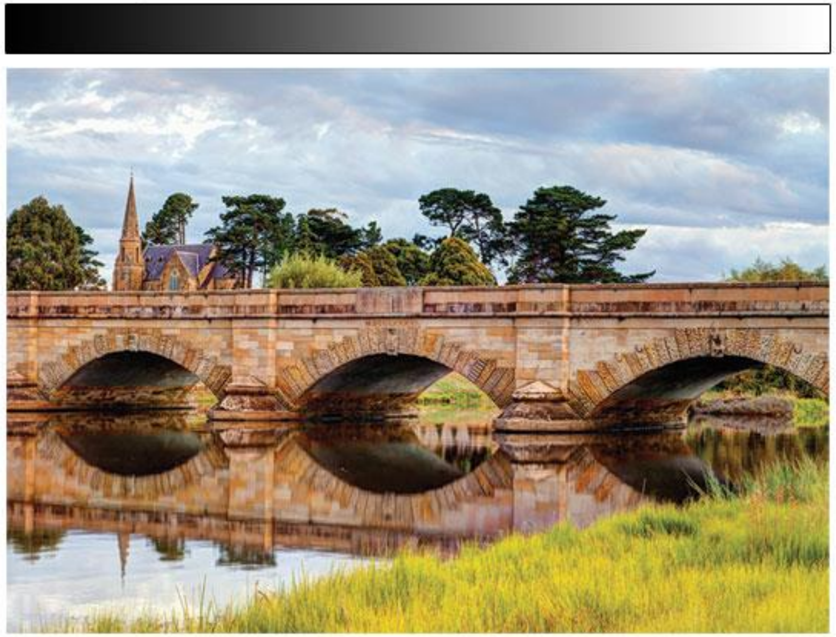
Adjustable beam angle



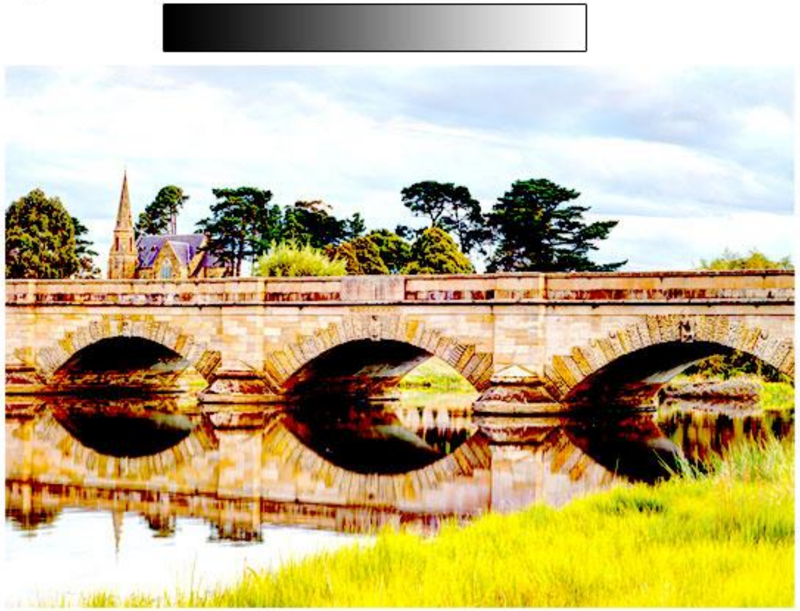
LPR solution with CVA Tech can fulfill one to three lanes.

Dynamic Range

- the range of a sensor can sense the darkest and brightest part of the scene



Human eye

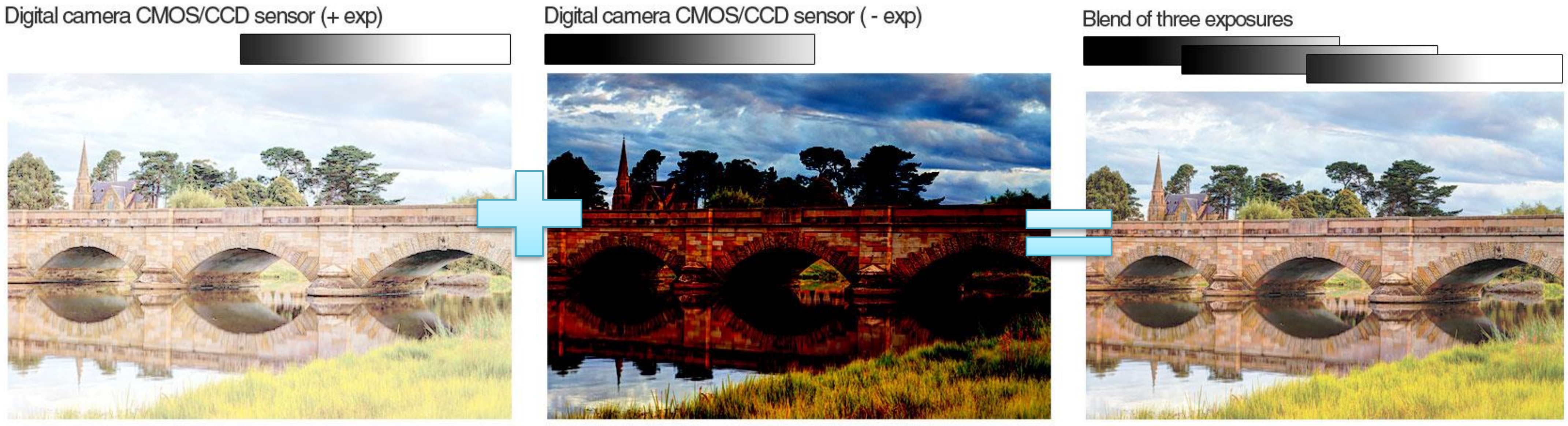


Digital camera CMOS/CCD sensor

VIVOTEK WDR TECHNOLOGY

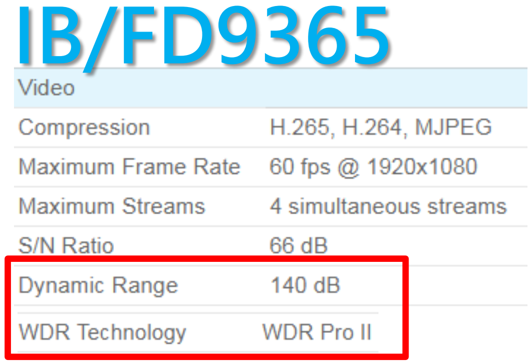
Wide Dynamic Range (WDR)

- Using different exposure time image and blending to correct exposure result


Digital camera CMOS/CCD sensor (+ exp)
Digital camera CMOS/CCD sensor (- exp)
Blend of three exposures

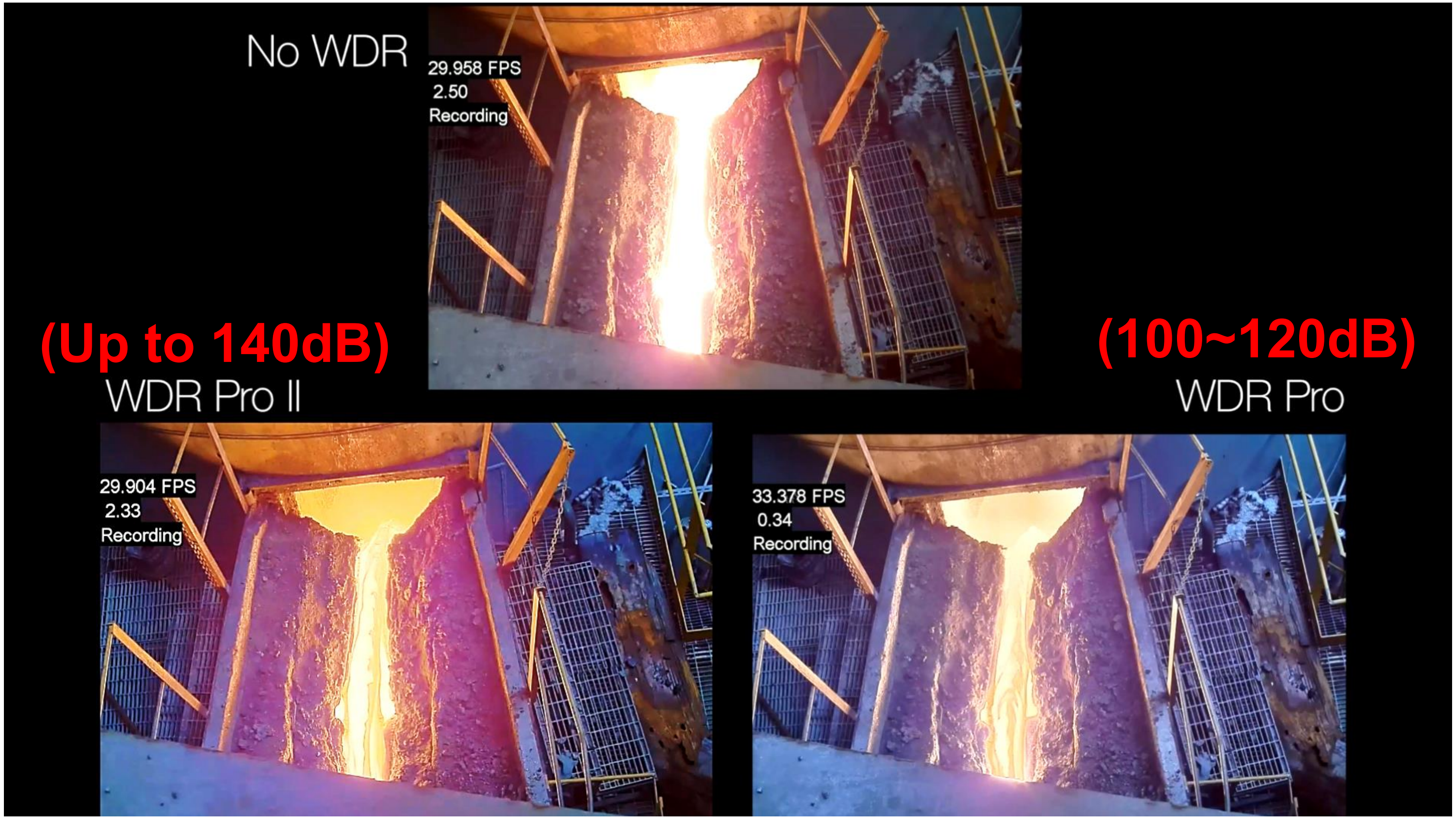
VIVOTEK WDR TECHNOLOGY

- WDR Enhanced => Using software
- WDR Pro / Pro II => Using different exposure time

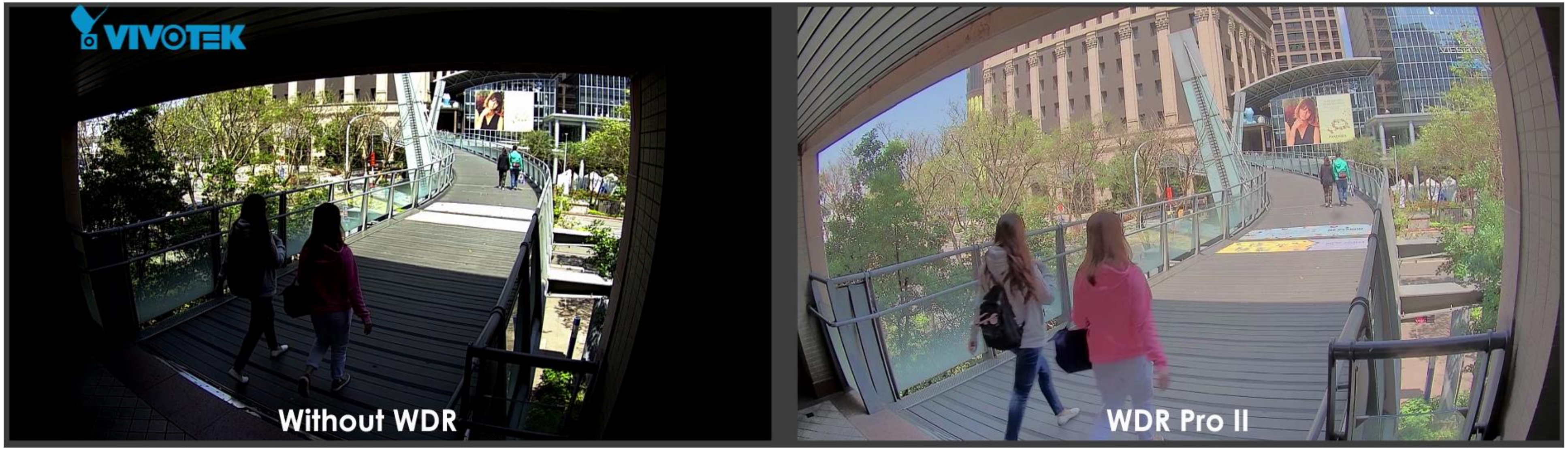


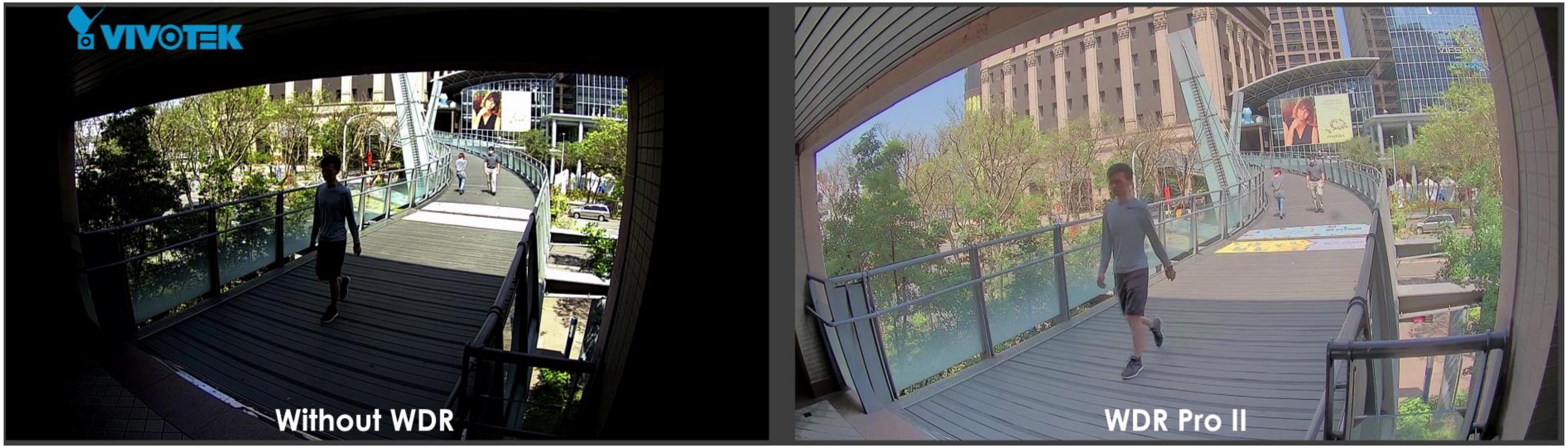
IB/FD9365

Video	
Compression	H.265, H.264, MJPEG
Maximum Frame Rate	60 fps @ 1920x1080
Maximum Streams	4 simultaneous streams
S/N Ratio	66 dB
Dynamic Range	140 dB
WDR Technology	WDR Pro II

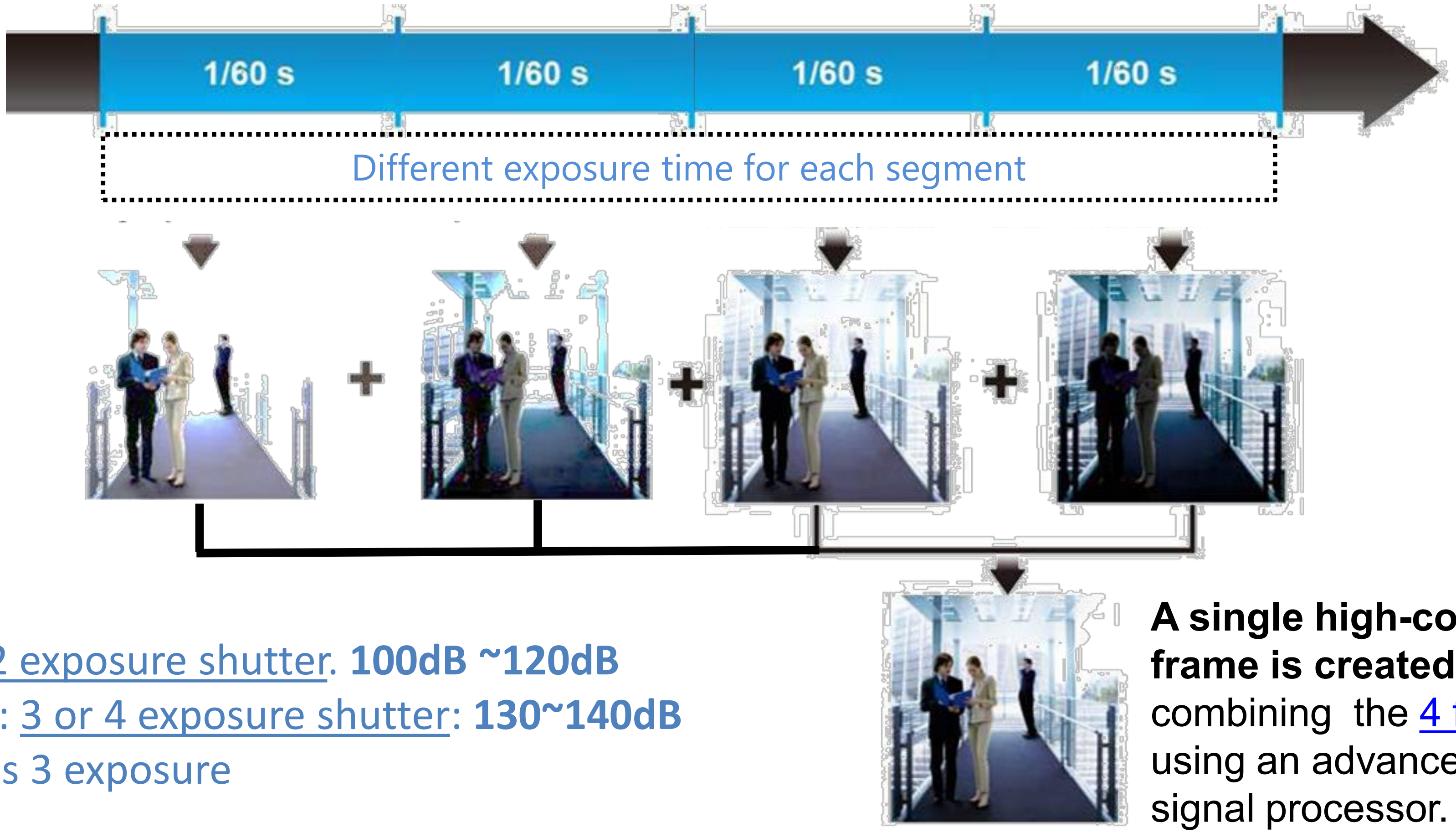

No WDR
29.958 FPS
2.50
Recording
(Up to 140dB)
WDR Pro II
29.904 FPS
2.33
Recording
(100~120dB)
WDR Pro
33.378 FPS
0.34
Recording

VIVOTEK WDR TECHNOLOGY


VIVOTEK
Without WDR
WDR Pro II


VIVOTEK
Without WDR
WDR Pro II

HOW DOES VIVOTEK ACHIEVE 140db WDR?

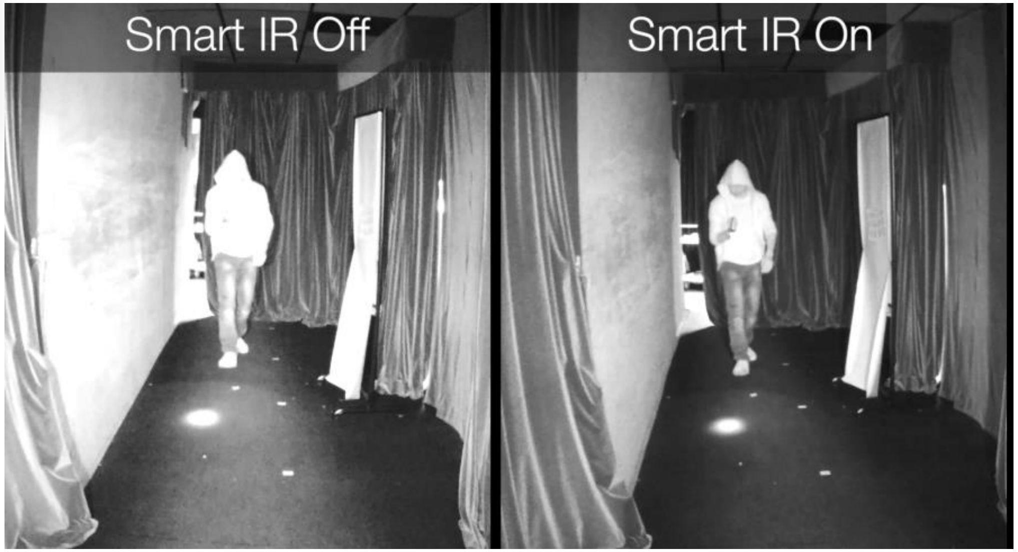

1/60 s
1/60 s
1/60 s
1/60 s
Different exposure time for each segment
+
+
+

A single high-contrast frame is created by combining the 4 frames using an advanced image signal processor.

- **WDR Pro**: 2 exposure shutter. **100dB ~120dB**
- **WDR Pro II**: 3 or 4 exposure shutter: **130~140dB**
  ex. 65 series 3 exposure

SMART IR

THE IMAGE WILL OVEREXPOSURE IF AN OBJECT IS TOO CLOSE TO THE LED

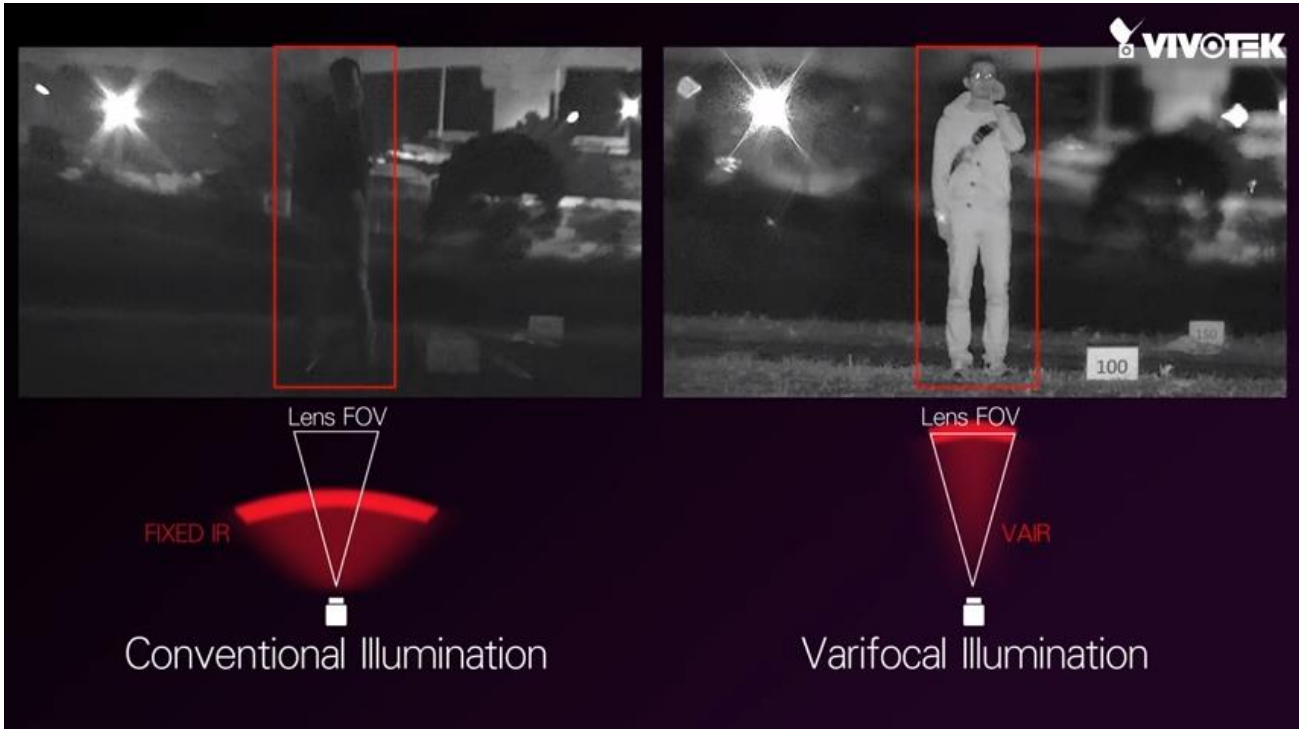

Smart IR Off
Smart IR On

Video

SMART IR II > VAIR

VIVOTEK’s latest IR technology – VAIR

- VIVOTEK's **VAIR (Vari-Angle IR)** provides smooth **vari-angle adjustment** of the IR illuminators, allowing broad coverage FOV and highly uniform IR.

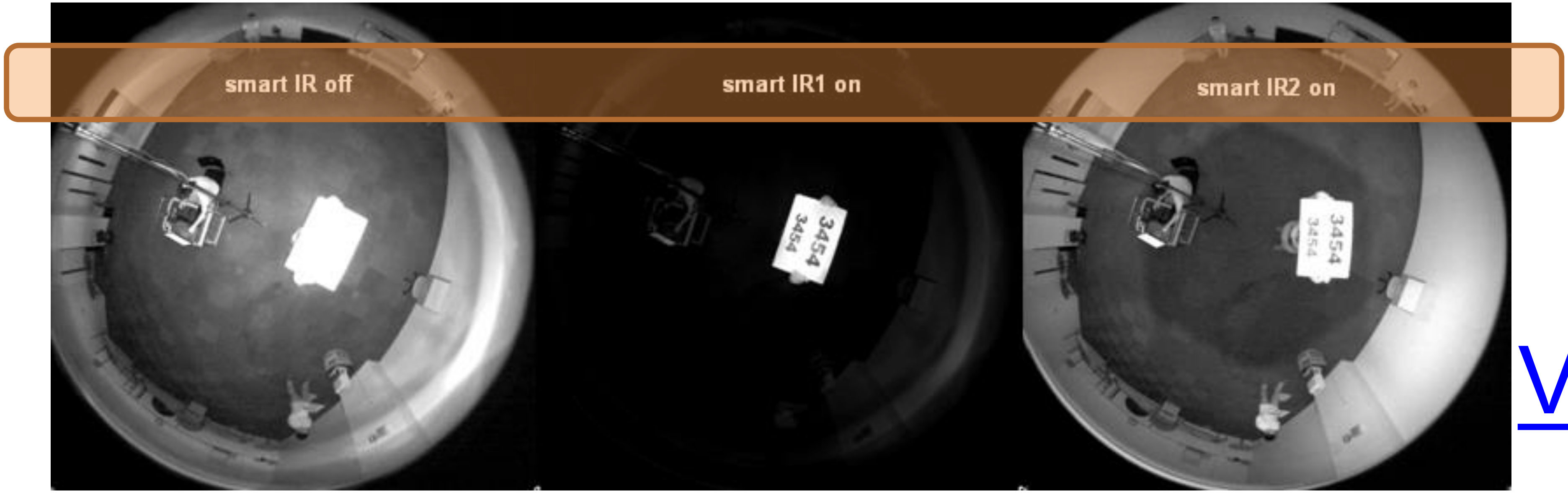

VIVOTEK
100
Lens FOV
FIXED IR
Conventional Illumination
Lens FOV
VAIR
Varifocal Illumination

Video

SMART IR II > ADIR

New IR technology – Adaptive IR (ADIR)

- VIVOTEK's **ADIR (Adaptive IR)** divides image planes into multiple sections, with each section equipped with an **independent IR control** lighting device for regional illumination.
- By **automatically dimming** lighting on a near subject, we avoid over-illumination while ensuring consistent overall brightness of all background.


smart IR off
smart IR1 on
smart IR2 on
3454
3454
3454
3454

Video

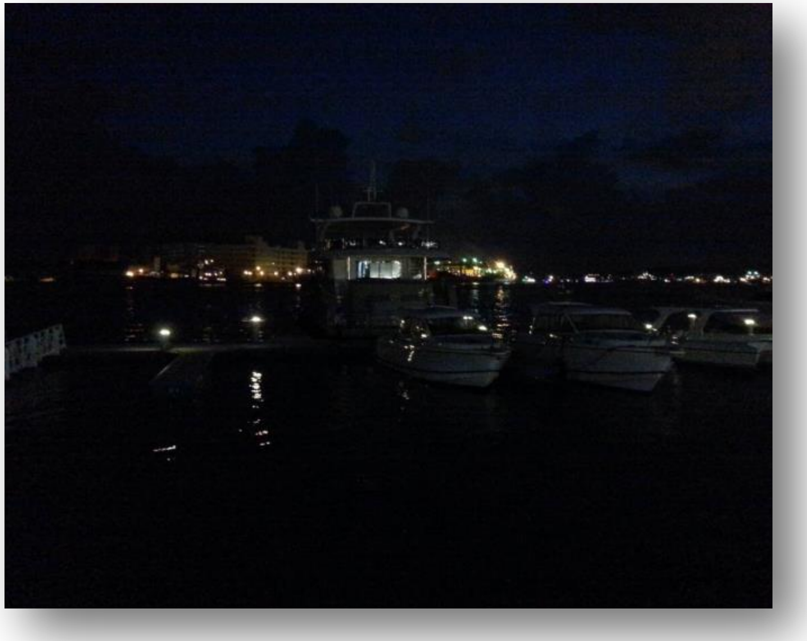
WHAT IS SNV FOR?

- The camera enables the IR and it changes the image as black /white to avoid color shifting and noise issue

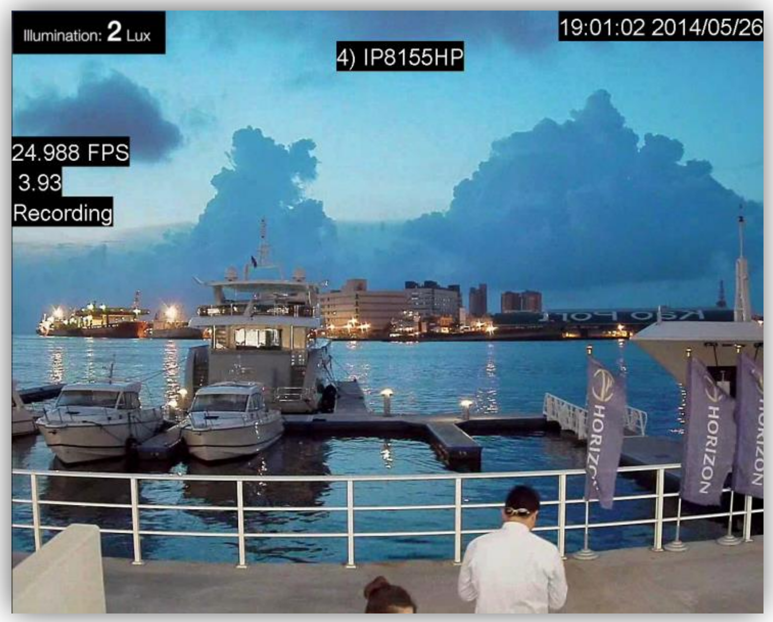
- In most case, the color may offer the best hope of eventual identification

CRIME SCENE

SNV (SUPREME NIGHT VISIBILITY)



- Picture shot from a cellphone. Because of insufficient light, you barely see anything.


Illumination: 2 Lux
4) IP8155HP
19:01:02 2014/05/26
24.988 FPS
3.93
Recording
HORIZON
HORIZON

- VIVOTEK's camera features with SNV

SNV II - IB9365-HTV

- New **9X65 series:** Provide ultra-low light performance with SNV II Technology

Holy night
Happy hills

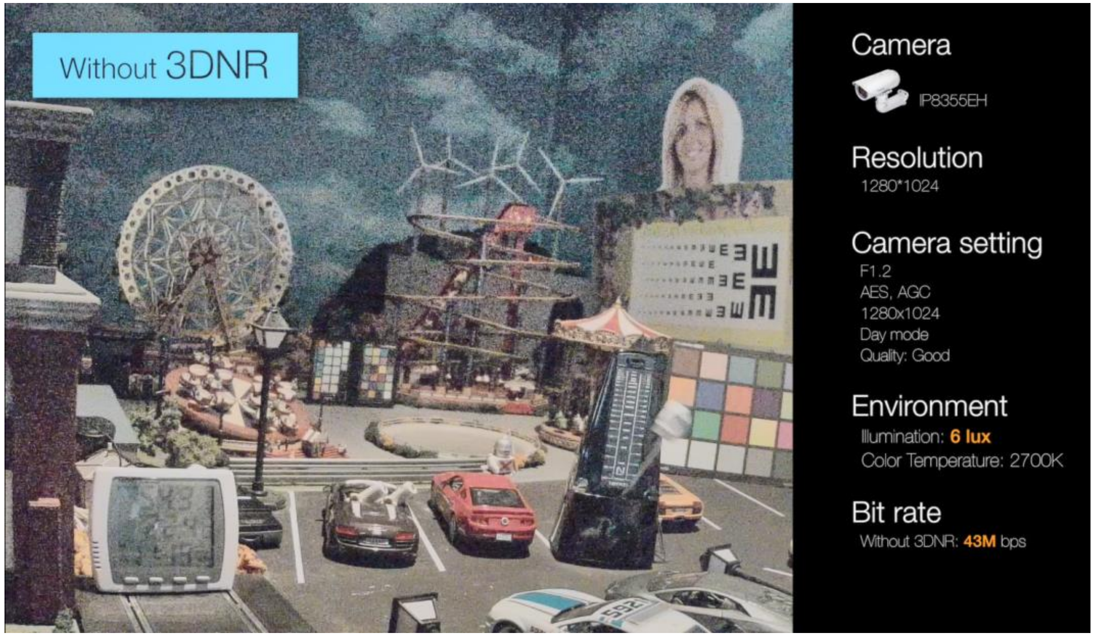
IB9365-HT

Video

IP9165-LPC

Video

3D NOISE REDUCTION



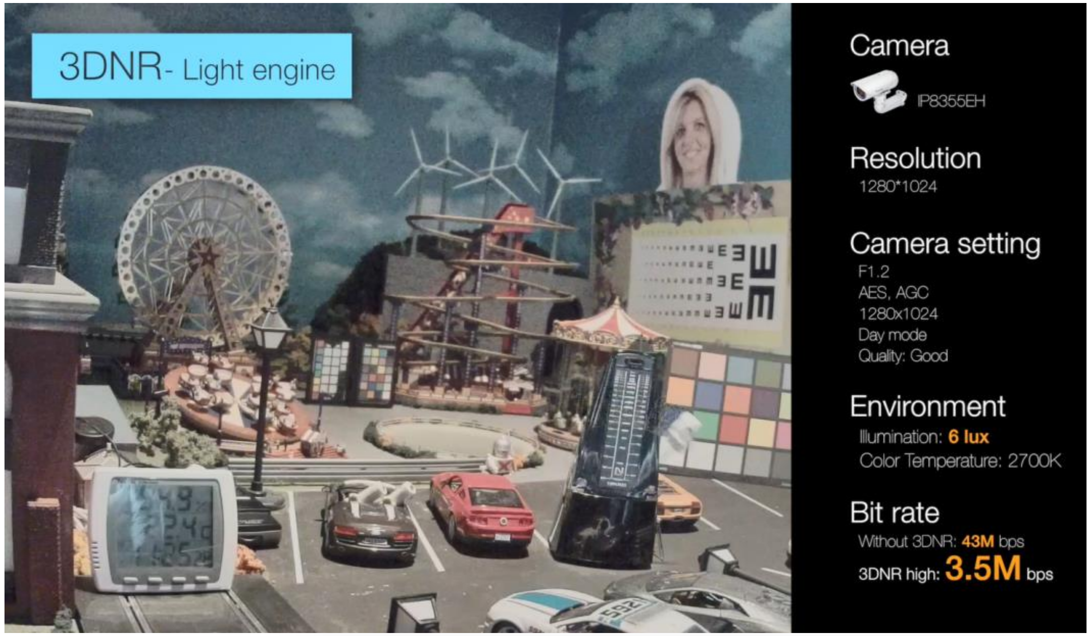
Camera
IP8355EH

Resolution
1280*1024

Camera setting
F1.2
AES, AGC
1280x1024
Day mode
Quality: Good

Environment
Illumination: **6 lux**
Color Temperature: 2700K

Bit rate
Without 3DNR: **43M** bps



Camera
IP8355EH

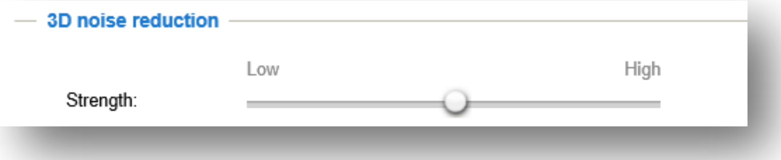
Resolution
1280*1024

Camera setting
F1.2
AES, AGC
1280x1024
Day mode
Quality: Good

Environment
Illumination: **6 lux**
Color Temperature: 2700K

Bit rate
Without 3DNR: **43M** bps
3DNR high: **3.5M** bps

Video


3D noise reduction
Strength:

Disadvantages of 3DNR:
Sometimes if the 3DNR is too strong, then a problem very similar to motion blur will happen.

Thank you

for your attention

The End

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