

Smart Tracking

Engineering Survey Guide for Smart PTZ Dome Cameras



Revision History

Date	Version	Description
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1 Principles of Engineering Survey

1.1 Functions of Smart PTZ Dome Camera

The functions of the smart PTZ dome camera can be divided into the following by rule type: cross line, intrusion and auto tracking, among which, three services involve tracking. Tracking includes two types: triggered tracking and panoramic tracking. Triggered tracking is used with smart service: when smart service is triggered, the camera starts to track the moving object that triggered the service. Panoramic tracking scans the entire area and starts to track any moving object that appears in the scene.

- 1) **Cross line detection:** The camera starts tracking when any object crosses a virtual line in the scene (in one direction or both).
- 2) **Intrusion detection:** The camera starts tracking when a moving object is in motion for a certain length of time in a set area in the scene.
- 3) **PTZ auto tracking:** Other smart services are disabled when this function is enabled. The tracking time and zoom ratio are configurable. The detection area is the entire screen. When a moving object is detected, it will be marked with a red box and tracking begins. This service is different from the above: tracking begins when a moving appears in the scene.

1.2 Mounting Requirements

- 1) Height: 6 to 10 meters. A 6-meter standing pole is recommended.
- 2) Location: should be mounted in an open place with clear view. Closed places like indoor should be avoided.
- 3) Stabilization: the camera should not shake when rotating at the highest speed.
- 4) Safety: Water-proof measures must be taken to prevent electrical leak.

1.3 Considerations for Scene Selection

1) Illumination and interference of light

Smart service is suitable for daytime only, because erroneous capture and tracking will occur due to image noises, interference of light, and low illumination during nighttime.

2) Conditions for cross line detection and intrusion detection

The minimum object size in images should be 64*64 pixels (W*H). For example, the camera mounting height is 6 meters, and the object to detect is a pedestrian who is 1.7-meter tall. The camera cannot detect the person at 1x zoom ratio when the object is 30 meters away (horizontal distance); but when the distance is within 30 meters, the object is detected properly. For different devices at different zoom ratios, the maximum distance a pedestrian can be detected can be calculated in accordance with the following table. But if the zoom ratio reaches 3x, a slight movement of the camera will cause unstable images and thus false alarms. Therefore, 1x zoom ratio is recommended for a preset, 3x max.

3) Degree of background complexity

Calculation takes more time in complicated scenes. Also, too much interference is likely to cause a lost object during tracking. Therefore, scenes that are too complicated should be avoided.

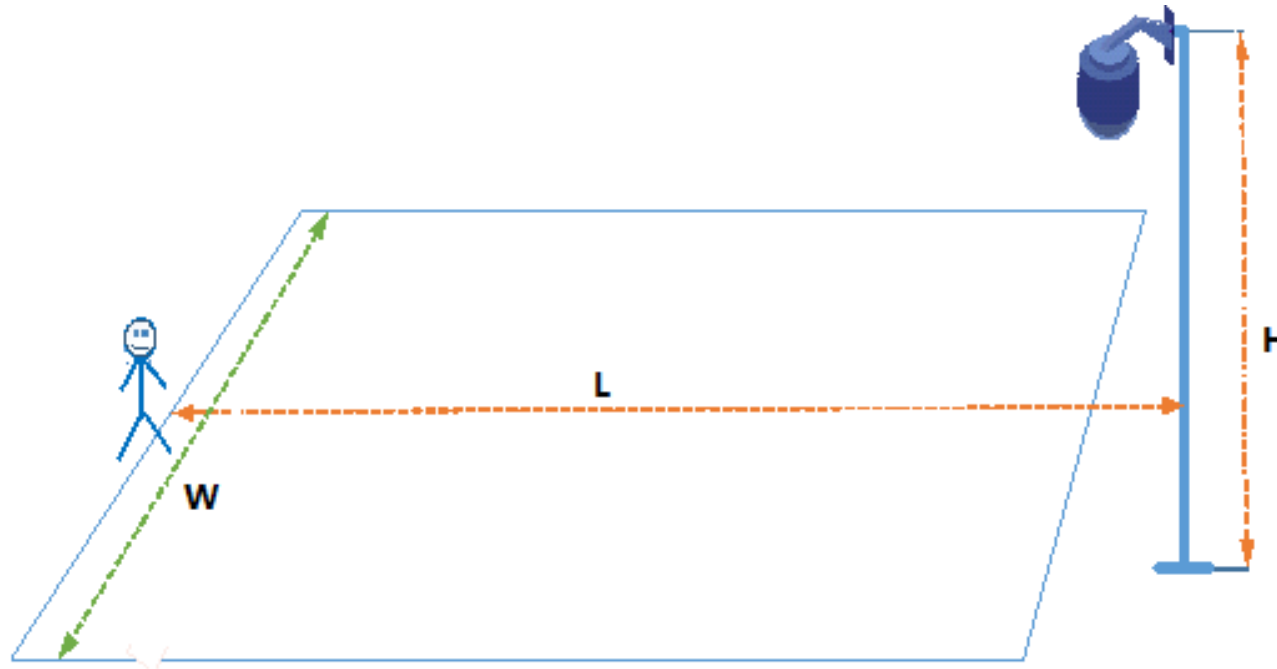
Surveillance distance with different mounting heights and focal lengths can be calculated using this form.

Camera Model	Mounting Height(m)	Zoom(x)	Focal Length (mm)	Max. vertical distance detected(m)	Max. horizontal distance detected (m)
xx	7	2	13	104.00	24.00
x dome sensor pixel size (um)	Width of Object(cm)				
3.00	40				



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Note: The above form only provides the max. surveillance distance without the min. surveillance distance because we can adjust the min. surveillance distance by rotating the PTZ unit. But ensure a minimum distance of one meter between the object and the camera; otherwise, the camera is likely to lose the object during tracking when rotating at the maximum vertical degree. Input the sensor pixel size, size of object, mounting height, and zoom ratio to obtain the result.



H: Mounting height

L: Max surveillance distance

W: Width of surveillance area

4) Blocking objects

The real object should not be blocked by other objects during tracking; otherwise, it will be lost.

5) Moving speed of the object

The object should move slowly enough so the camera can follow, such as a pedestrian. Tracking will fail if the object moves at 20km/h or faster. (20km/h is an estimation. The actual situation varies with the zoom ratio and angle of surveillance.)

6) How many moving objects in the surveillance area

Too many moving objects in the scene (e.g., public square in front of a train station) will cause interference and lose of object.

7) Interference of shadows

When the object enters shadow, the camera is likely to lose it because distinction between the object and the shadow is lowered.

8) Interference of weather such as wind, snow, and rain

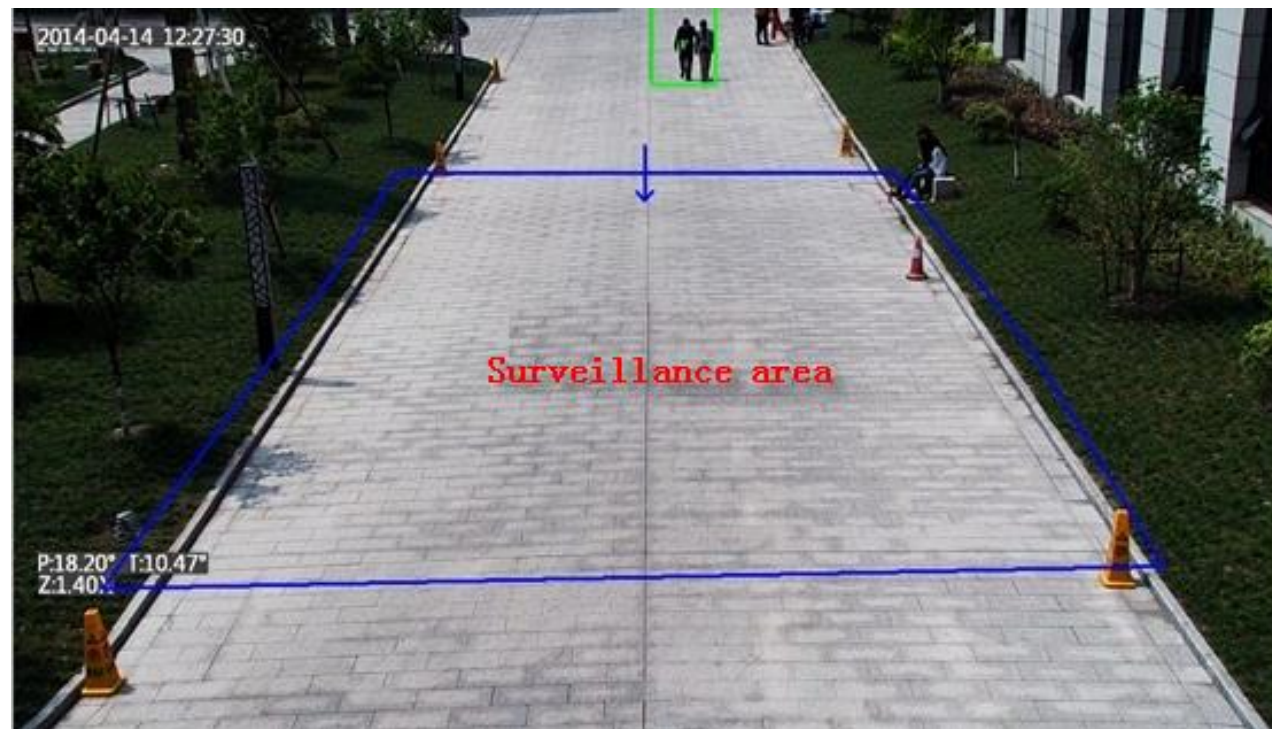
Flakes, rain and swaying trees may cause false alarms.

2 Typical Scenes

2.1 Recommended Scenes

2.1.1

(1) Scene 1

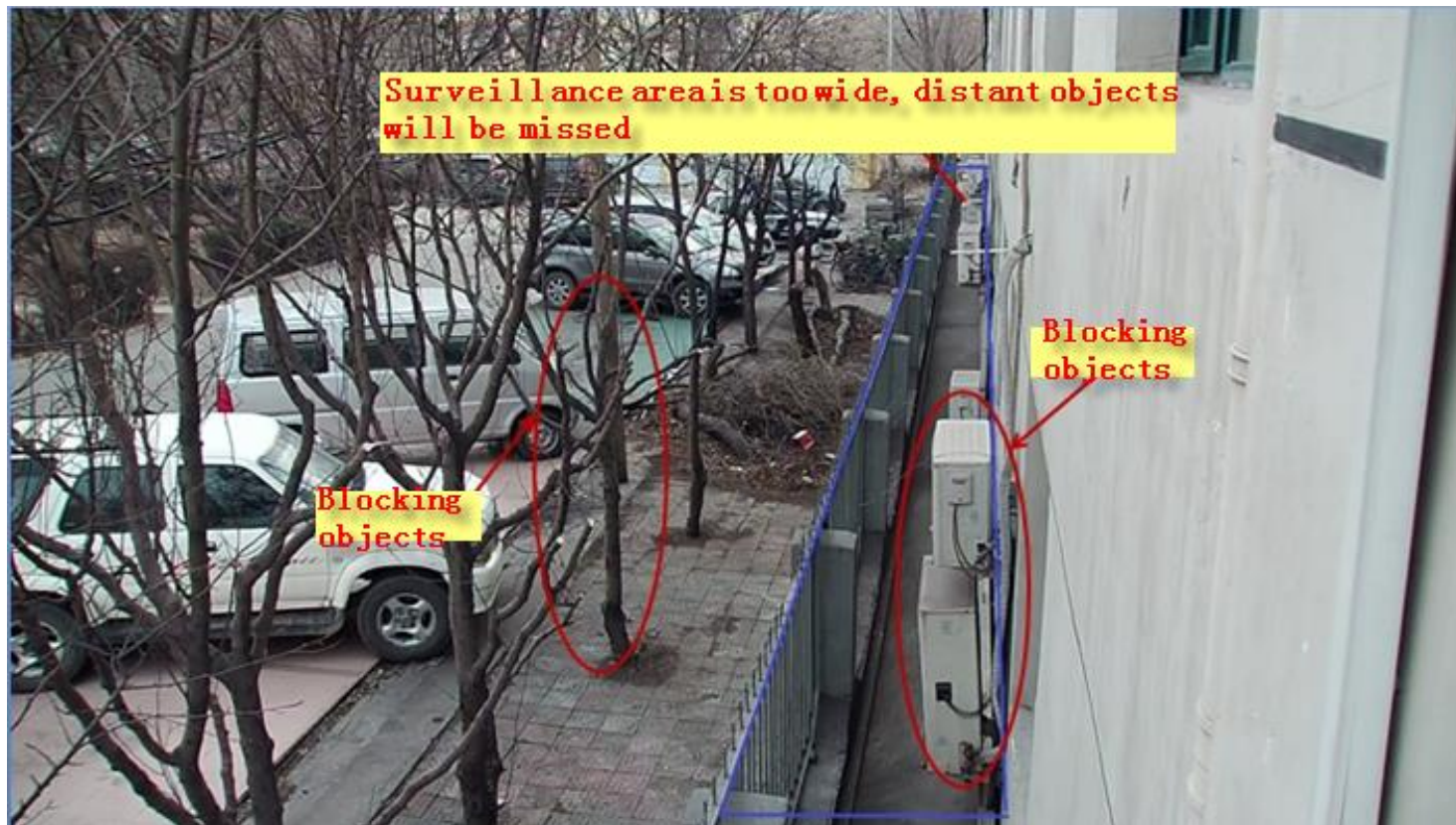


(2) Scene 2



2.2 Scenes That Are Not Recommended

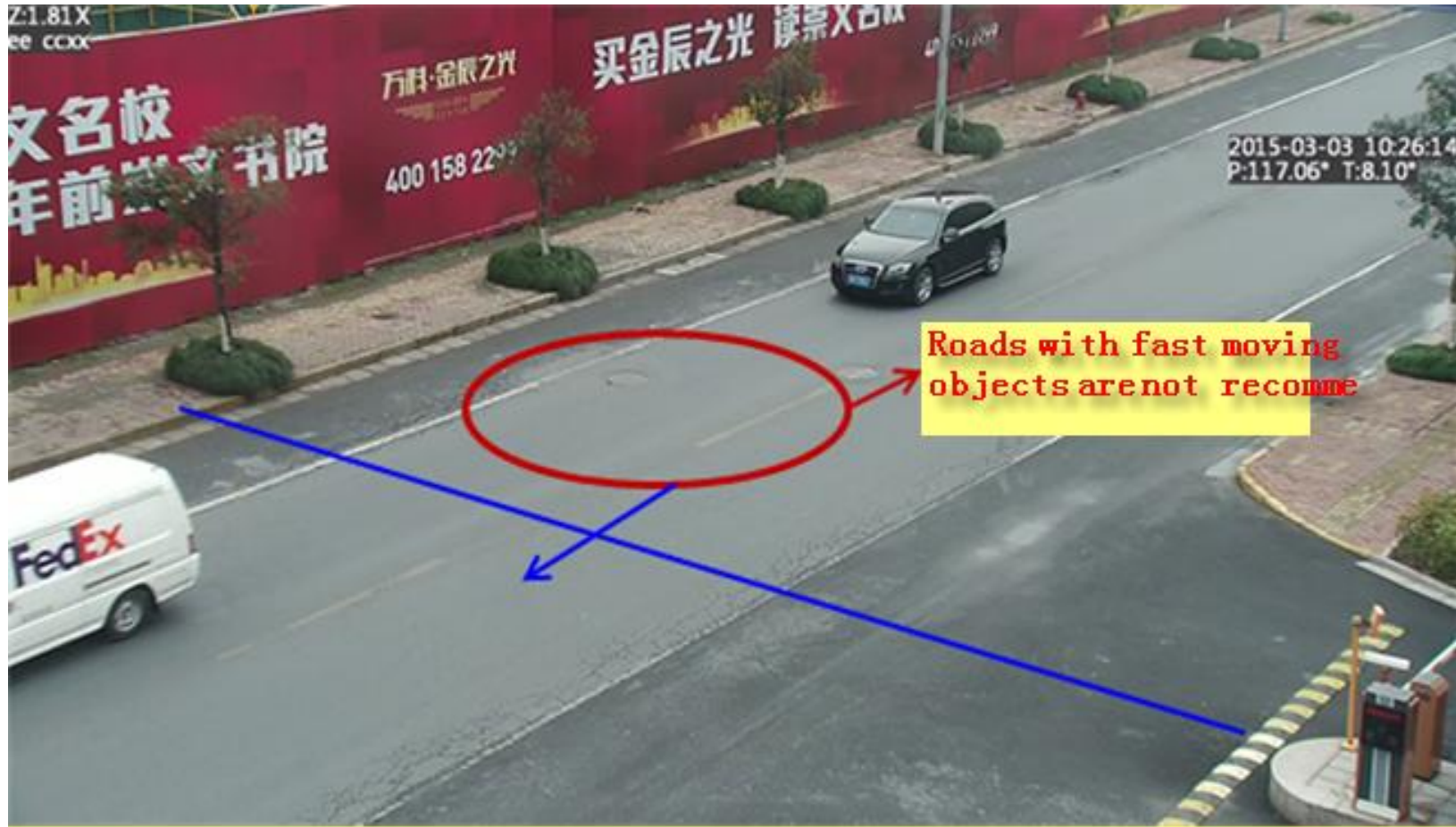
(1) Scene 1



(2) Scene 2



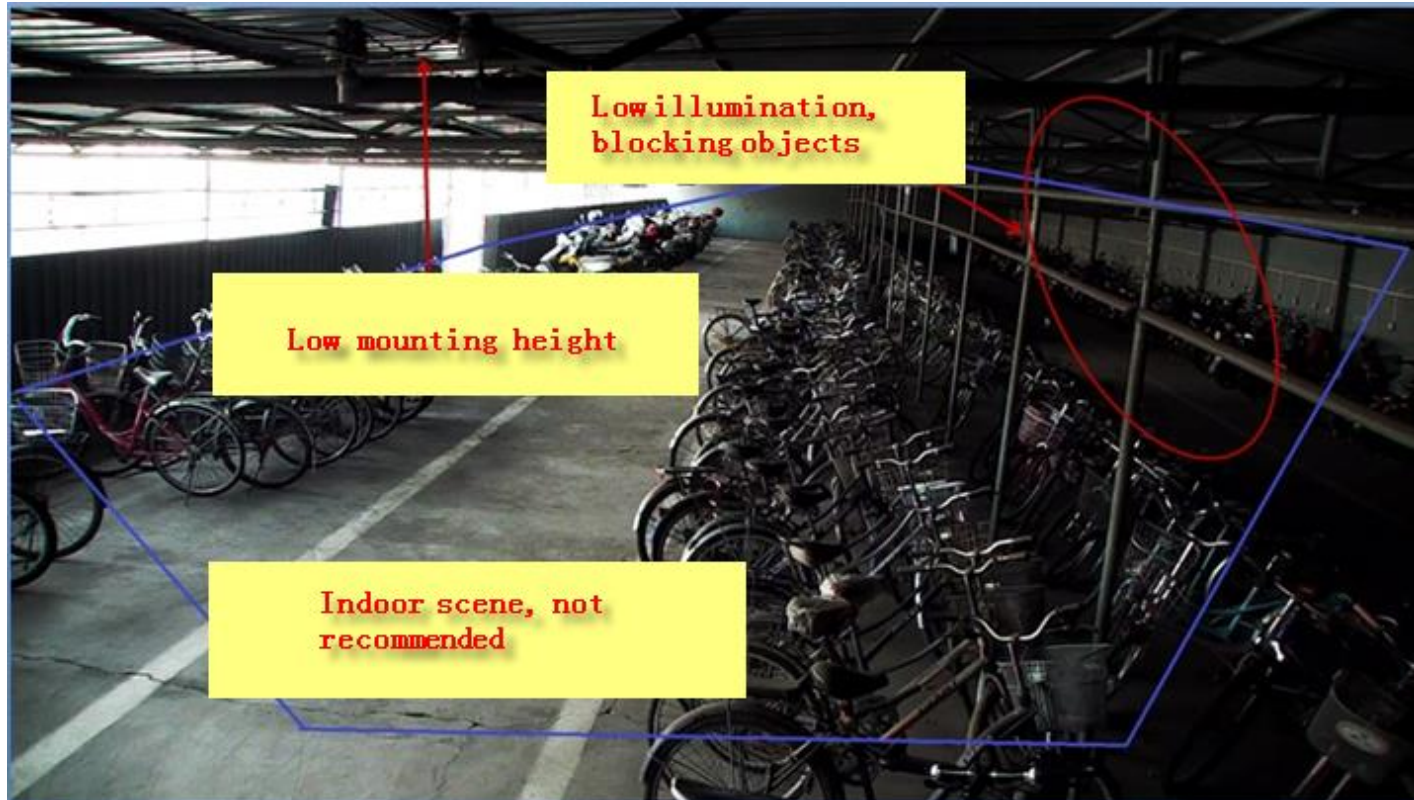
(3) Scene 3



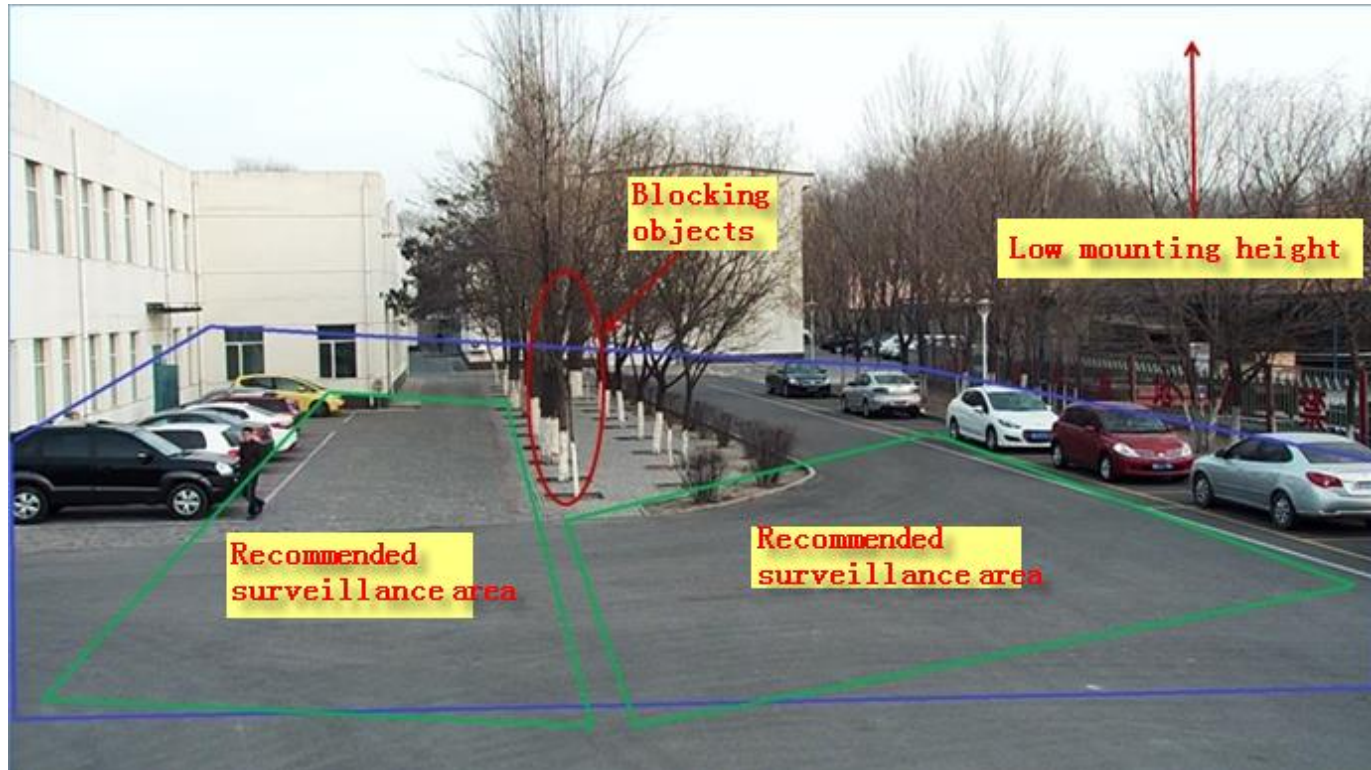
(4) Scene 4



(5) Scene 5



(6) Scene 6



(7) Scene 7



(8) Scene 8



(9) Scene 9




(10) Scene 10



Note: This guide cannot cover all scenes. If the surveyor at site is not sure whether the scene is ideal for the smart PTZ dome camera, please send us relevant data for further analysis.

3 Engineering Survey at Site

Project implementation for smart PTZ dome cameras has high demands in engineering. The purpose of engineering survey is to confirm site information in order to achieve optimal application results. Therefore, the following data should be acquired from the site and recorded in detail during survey to avoid problems such as incomplete data or discrepancy between the collected data and the actual scene.

Survey Location			Surveyor		Date of Survey		
No.	Spot Name	Surveillance Object Type	Camera Mounting Height (m)	Depth of Surveillance Area (m)	Width of Surveillance Area (m)	Smart Function Enabled During	Remarks
Photo Taken at Site							
							

Attachment:



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