

# SMART PARKING AND



# SMART CITY SOLUTION

# INTRODUCTION

## NEXPA

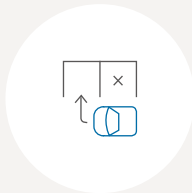
NEXPA System Co., Ltd. is a leading company specializing in smart parking and traffic law enforcement solution with our proprietary video-analytics technology. The company was founded in February, 2004 in Seoul, South Korea. In the early years, NEXPA has focused on developing new technologies. With over 54 video analytic patents now, NEXPA offers comprehensive and market-proven Smart Parking Solutions (from PARCS to PGS and beyond) as well as state of art Smart Traffic Enforcement Systems, making NEXPA global leader in the industries. With great progress, we established our branch office in Singapore in 2015. Today, we have completed several large projects including airports and shopping malls and we are continuously adding global projects to our success stories.

### WE PROVIDE OUR SOLUTION IN THE FOLLOWING AREAS



#### PARCS

Parking Access & Revenue Control Solution (PARCS)



#### VPGS

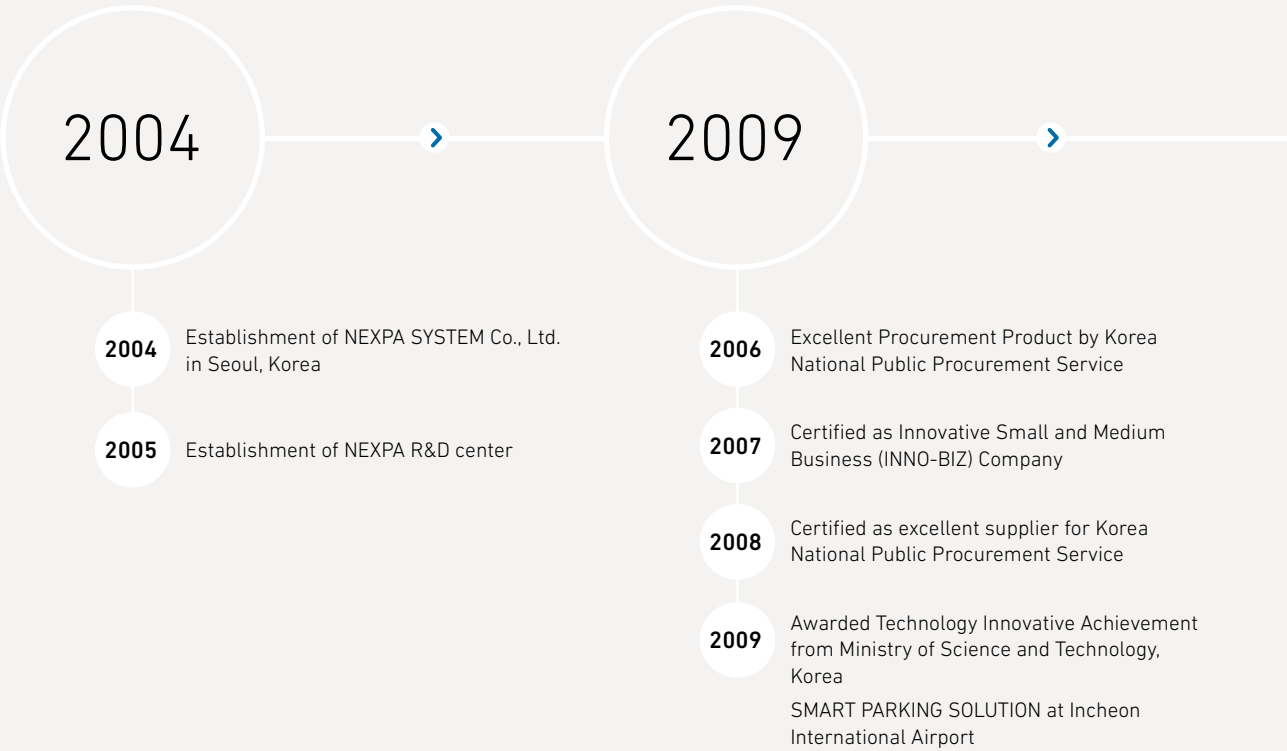
Video-based Parking Guidance System (VPGS) for entire parking lots area



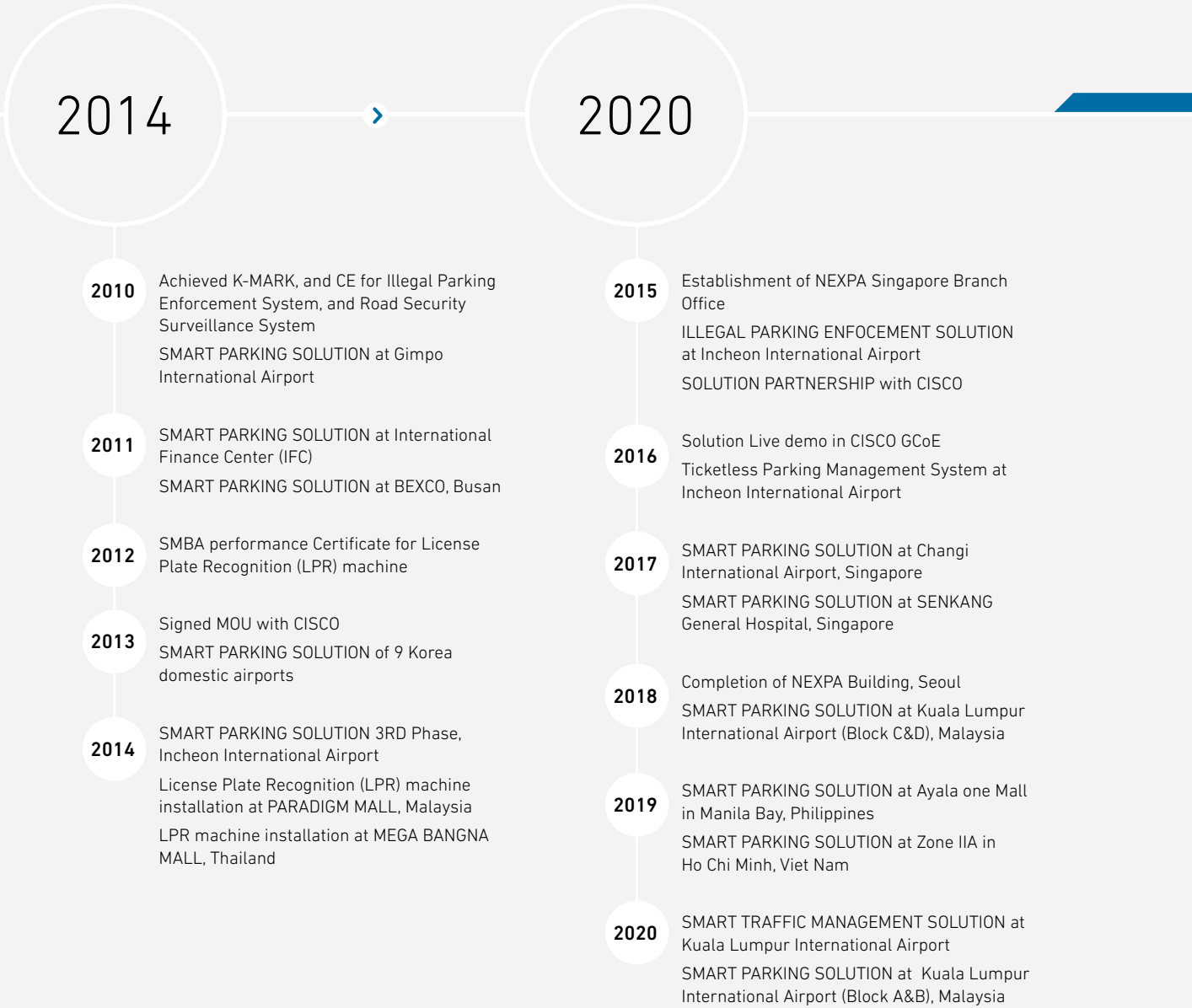
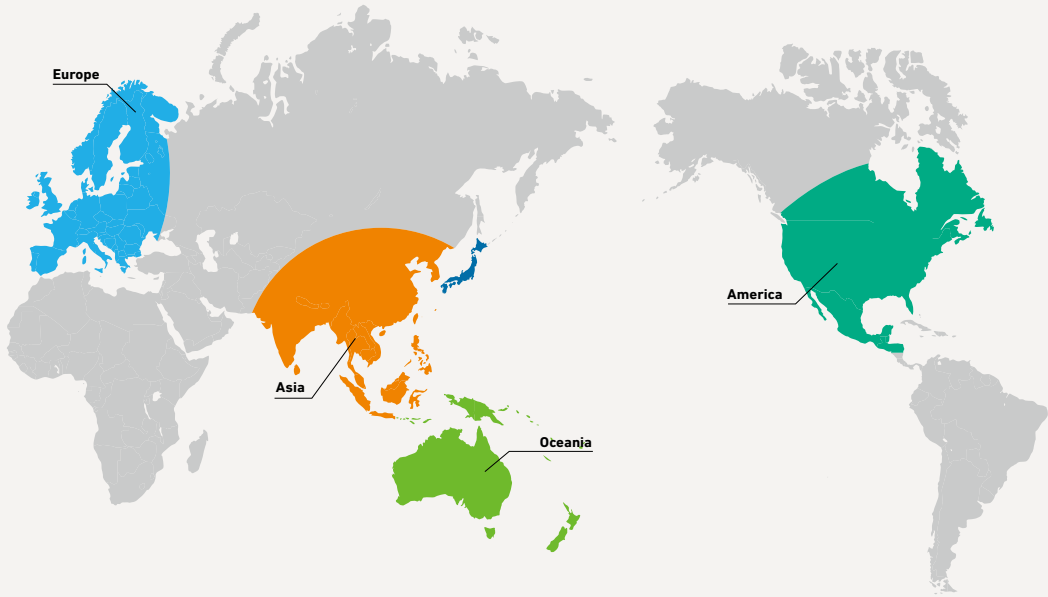
#### TRAFFIC ENFORCEMENT SYSTEM

Traffic Law Enforcement System for public sector

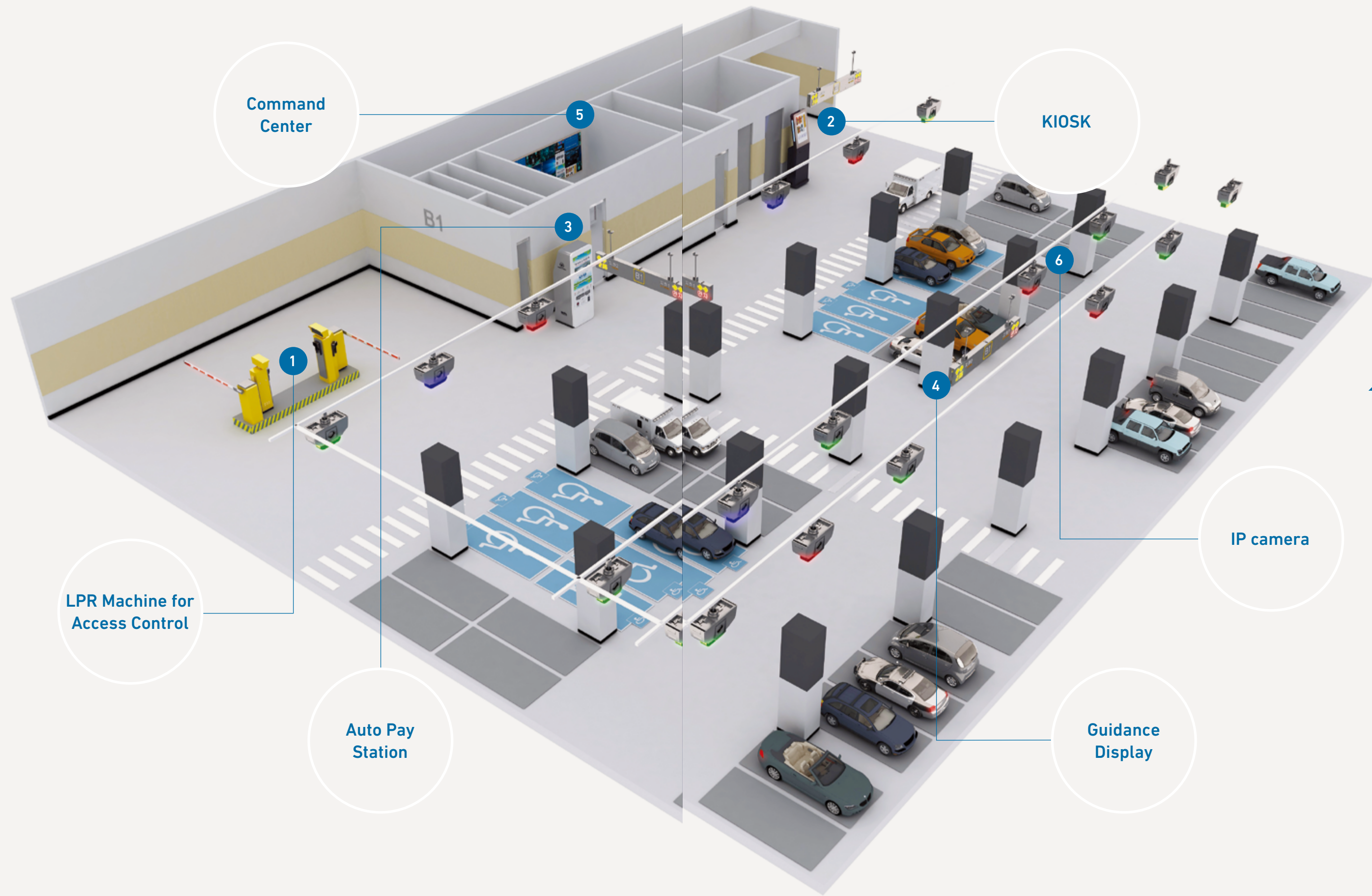
# MILESTONES



# GLOBAL NETWORK



# PARKING SOLUTION OVERVIEW





# PARKING ACCESS & REVENUE CONTROL SOLUTION (PARCS)



## Product line up



### Dual camera LPR Machine

- Recognize front and rear license plates
- Built-in LED display
- IR/White LED light



### Single camera LPR machine

- Recognize front license plates
- Built-in LED display
- IR/White LED light



### Automatic Barrier Gate

- Open/Close gate
- Auto re-bound
- High-brightness LED Bar
- RS232/RS485/Dry-contact



### Gate built-in LPR machine

- Recognize front and rear license plates
- Built-in barrier gate
- Built-in LED display
- IR/White LED light



### Gate built-in LPR machine

- Recognize front and rear license plates
- Built-in barrier gate
- Built-in LED display
- IR/White LED light



### Gate built-in LPR machine (Spin-Type)

- Recognize front and rear license plates
- Built-in damage free barrier gate
- Built-in LCD display
- IR/White LED light



### Mini LPR

- Recognize front or rear license plates
- Designated to restricted installing environment
- IR/White LED light



### Auto Pay Station

- Various payment types : Cash/Card/e-wallet
- Optional Find my Car function with vPGS
- 10.5 / 15 / 21.5 / 42 inches screen size



Access Control



Track and Identify Vehicle Activities



Collect and Display Real-time Availability Data



Improve Security

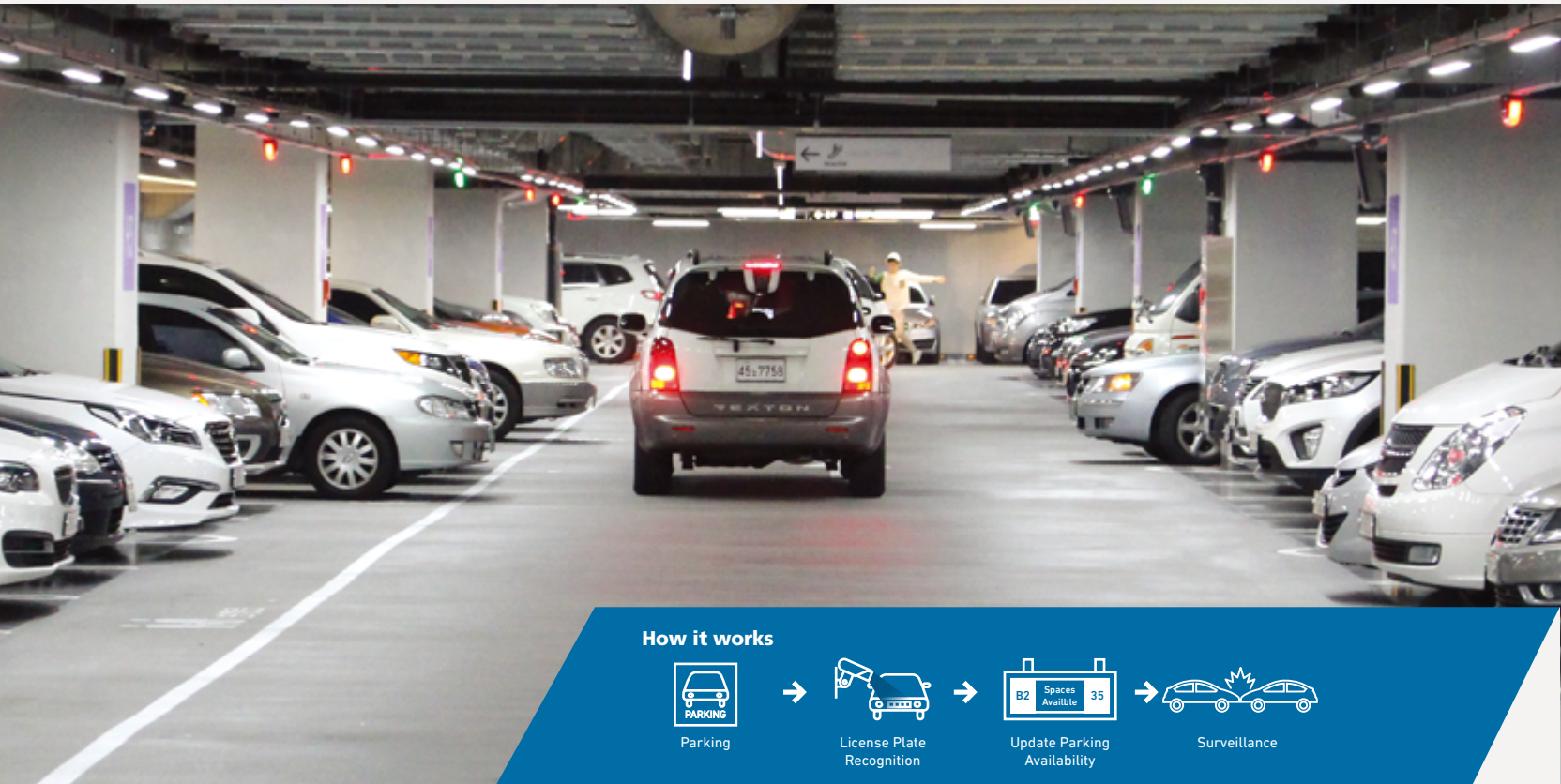
## Parking Access & Revenue Control Solution (PARCS)



NEXPA's LICENSE PLATE RECOGNITION (LPR) based Parking Access & Revenue Control Solution (PARCS) enables parking lots to minimize traffic congestion at the entrance and exit of parking lots by automated non-stop operation and save inefficient expenses, such as surplus labors and consumables. PARCS uses plate numbers as identification method to charge parking fee and security purposes. So that, it implemented fully automated ticketless SMART PARKING SOLUTION.



# VIDEO-BASED PARKING GUIDANCE SOLUTION



## Product line up



- Uni-directional camera**
- Indicate parking availability
  - Detect 3 slots with 1 camera
  - 12 mega-pixel
  - Multi-streaming
  - Built-in 256 color LED indicator



- KIOSK**
- Find my car function
  - 32" touch screen
  - Side LED beam

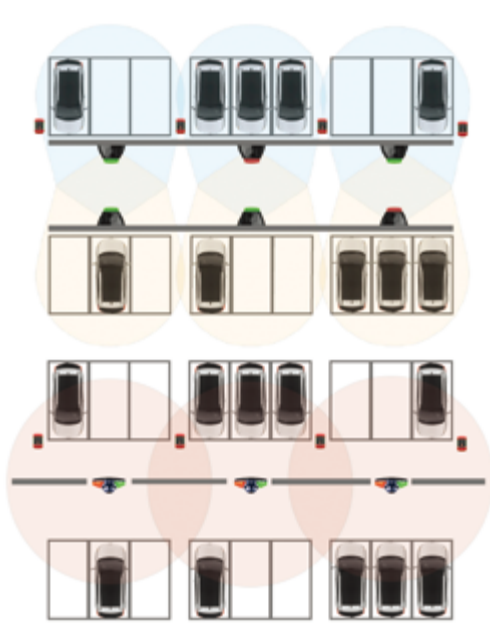


- Omni-directional camera**
- Indicate parking availability
  - Detect 6 slots with 1 camera
  - 12 mega-pixel
  - Multi-streaming
  - Built-in 256 color LED indicator
  - Fish-eye lens



- Guidance Displays**
- Provide optimal parking route
  - Dynamic LED display
  - Customizable design

## Camera view image



License Plate Number is recognized once a car is detected in the coverage area. Images / video from camera streams recording using proprietary NVR technologies. Also it carries out security functions (surveillance) without blind spots recording 12 mega pixel images.



Parking Space Utilization



Efficiently Enforce Parking Policy



Reduce Traffic



Enhance Security

## Video-Based Parking Guidance Solution



NEXPA's IP camera based PARKING GUIDANCE SOLUTION (PGS) enables parking lots to minimize traffic congestion by guide drivers to available spaces efficiently. NEXPA offers comprehensive parking guidance and car park surveillance systems through the single framework and enables virtually unmanned day to day operations. It also forms the basis for "Find My Car" and other kiosk or mobile applications. Through the common interfaces of the Central Car-park Management Server, all data from the sub-components are collected, processed and presented in the form of overall, detailed parking status, reports, graphical representation of the most updated car-park status on the floor maps with different colors.



# vPGS-OUTDOOR SOLUTION



**How it works**



Parking

→



License Plate Recognition

→



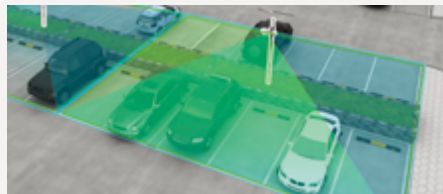
Update Parking Availability

→



Surveillance

## vPGS- Outdoor Solution



Pole type



Gantry type

Outdoor Parking Solution uses Omni-directional and PTZ(Pan Tilt Zoon) cameras installed on the pole to guide and monitor parking lots. The Omni-directional cameras detect cars in parking bays then PTZ cameras recognize the license plate numbers. Each camera also works as surveillance camera for 24/7 without additional CCTV installation.

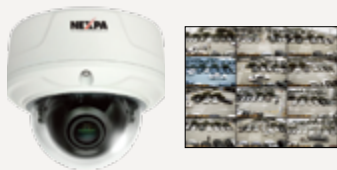
As premium line-up model NEXPA used full cover LED indicator as gantry-type. The indicating light is designated for driver to find available spaces easily, and shows status of whole line parking spaces (RED: Occupied, GREEN: Available)

## Product line up



### Omni-directional camera

- Detect 16 parking slots
- 12 mega-pixel
- Multi-streaming



### PTZ camera

- Recognize License Plate
- 12 mega-pixel
- Multi-streaming
- DOL HDR (Digital Over Lab High Dynamic Range)

# TRAFFIC ENFORCEMENT SYSTEM

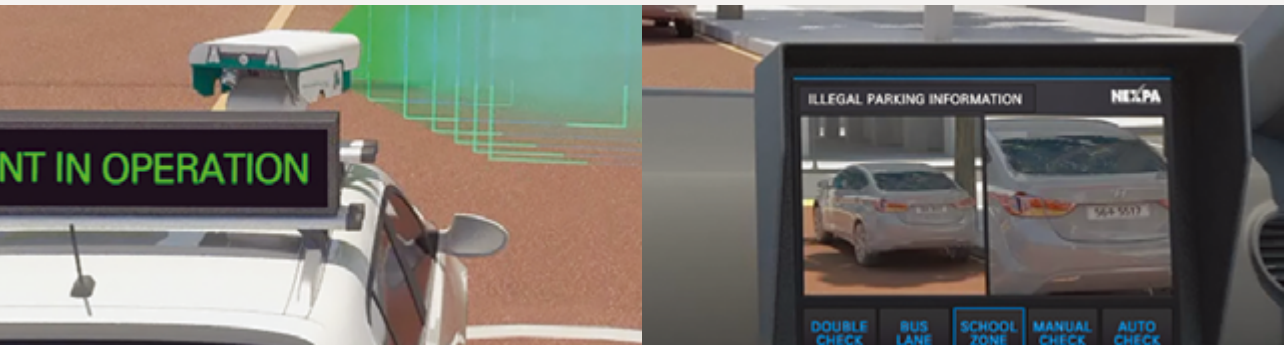
## Illegal Parking Enforcement System

### Pole Type



Pole type illegal parking enforcement solution can be deployed on the road to identify illegal parking. Information on the occurrence, location, and time of traffic violation will be delivered to the center and saved on the data base. The recorded image and the recognized license plate number can be used as evidence.

### Car-mounted Type



Car-mounted illegal parking enforcement solution is to identify illegal parking while driving to solve traffic congestion with high mobility. Waterproof and anti-vibration housing helps to improve performance in moving condition.

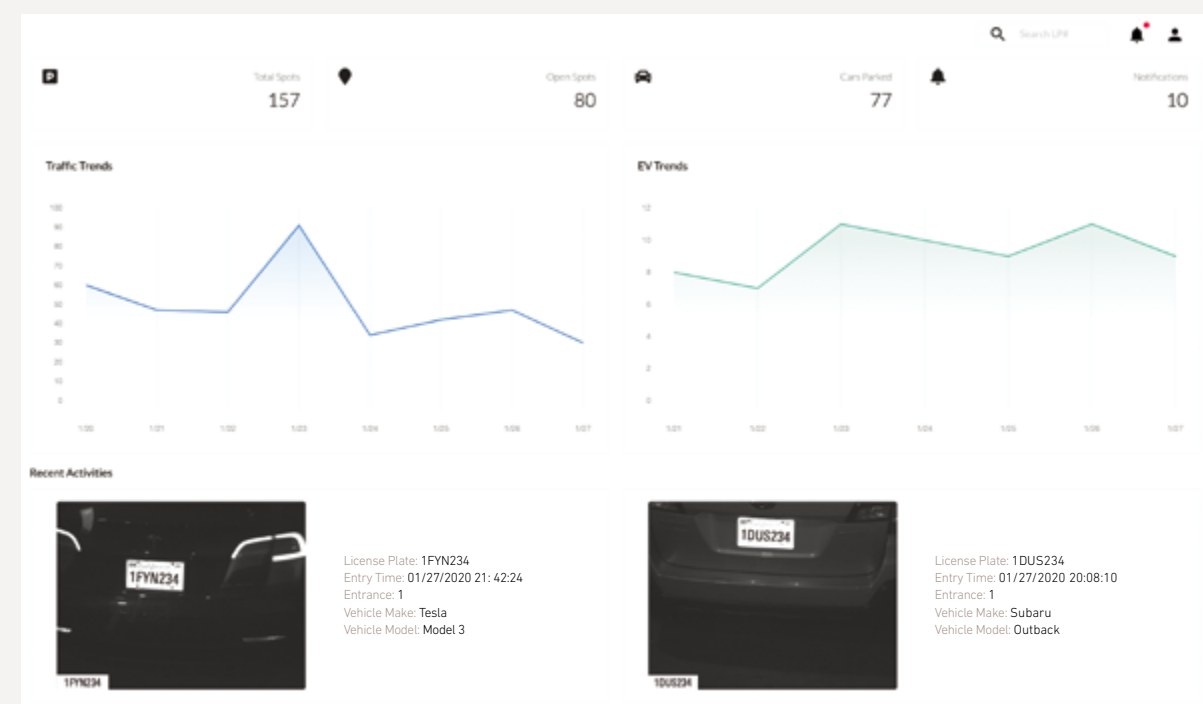
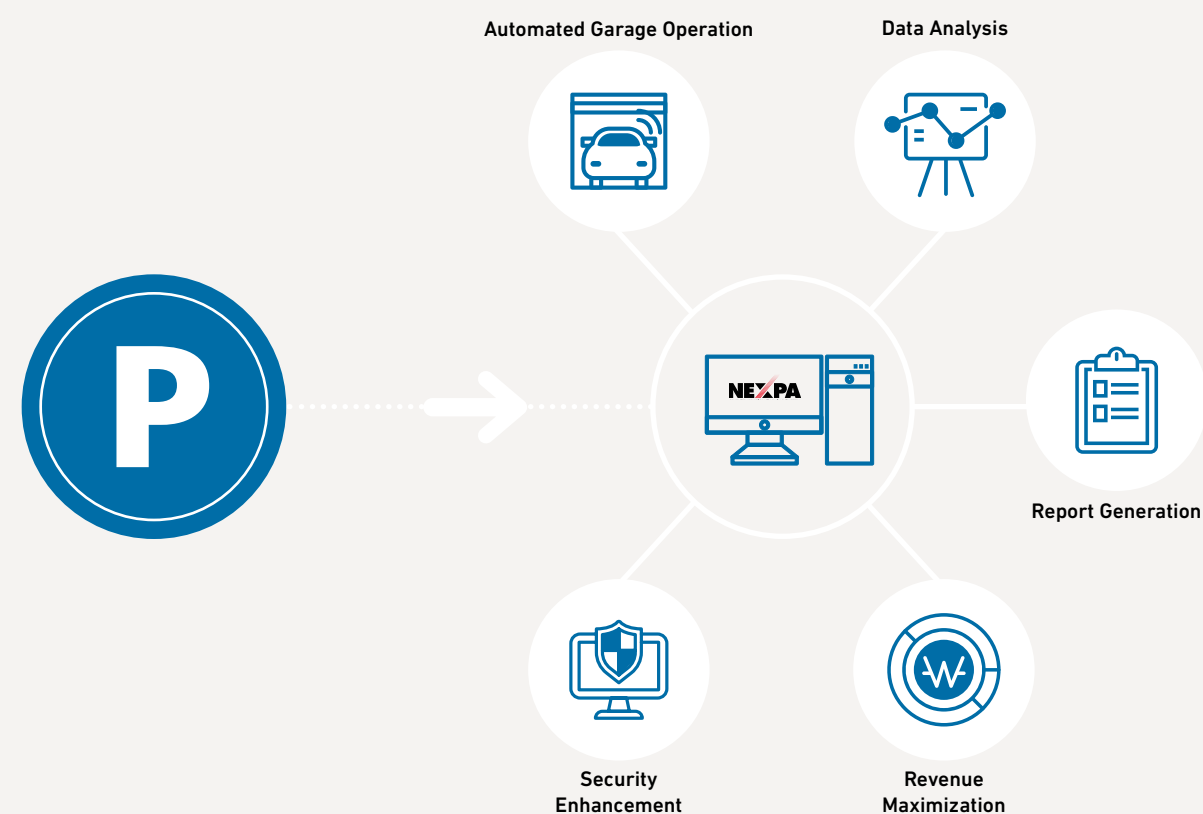
## Road Security System



Pole type road security solution is to detect security threats and prevent any crimes. The system recognizes the license plate number of crime-related vehicles and gives an alert to the center automatically. It enables collection of evidence, tracking of the route and allows for a prompt action that will lead to more effective corrective measures.



# CLOUD-BASED PARKING MANAGEMENT SOLUTION



We deliver a solution that tightly integrates parking hardware system and software platform that is capable of aggregating and distributing data for smart cities.

## Future-proof your garage space with our data-driven solution

### Efficient

- Eliminate any manual labor or paperwork
- Accurately evaluate current operation through data
- Aggregate data beyond parking for future developments
- Reduce traffic in garages and streets

### Profitable

- Increase inventory utilization
- Significantly lower operational cost
- Adopt different types of parking. From monthly to transient parking and event parking depending on live data without any additional cost
- Apply dynamic pricing
- Attract more vehicles through data distribution to popular navigation & parking apps

### Future-proofed

- Update existing infrastructures for both today and tomorrow
- Accommodate all vehicles from level 0 to 5 autonomy
- Be the leader in creating the smart city infrastructure
- Become the hub that connects vehicles, users, and various on-demand vehicle services



# GLOBAL LANDMARK REFERENCES





# CASE STUDY



## Singapore Changi Airport & Changi Jewel Mall

The best airport in the world and its unique shopping mall 'Changi Jewel' became one of the most attractive major aviation hub in the Asia-Pacific. The Changi Jewel receives over 300,000 visitors a day. Changi Airport Group selected NEXPA SMART PARKING SOLUTION for Changi Jewel and its airport terminal 1, 2, and 3 to provide premium parking experiences to their visitors. Based on NEXPA's advanced technology, Changi Jewel provides Find My Car service through user-friendly KIOSK everywhere in shopping mall.

### PROJECT SCALE

No. of parking bay : **Total 6,646 bays**

- Terminal 1 : 1,021 bays
- Terminal 2 : 1,321 bays
- Terminal 3 : 1,718 bays
- Jewel : 2,586 bays



### PROJECT DETAILS

- Uni-Directional IP Camera
- Individual LED Indicator
- License Plate Recognition Machine
- Mobile Application Integration
- Find My Car Kiosk
- EPS Integration



## Kuala Lumpur International Airport

Kuala Lumpur International Airport (KLIA) is the largest and the busiest airport in Malaysia and one of major airports in Southeast Asia. The airport is operated by Malaysia Airports (MAHB) and MAHB selected NEXPA's SMART PARKING SOLUTION for KLIA one Parking lots. KLIA conceived to become the world best airport. As the part of becoming the world best airport, KLIA adopted the most advanced technology for its parking lots.

### PROJECT SCALE

No. of parking bay : **Total 5,810 bays**

- Block A & B : 3,082 bays
- Block C & D : 2,728 bays

### PROJECT DETAILS

- Omni-Directional IP Camera
- Dynamic LED Display
- License Plate Recognition Machine
- Find My Car Kiosk
- PARCS Integration





# CASE STUDY



## Incheon International Airport

Incheon International Airport is No. 2 ranked airport in the World's top 100 Airports 2019 and has won ASQ Awards for 12 consecutive years. Incheon International Airport considers parking lots service is one of the important factors to give a good impression to the customers and improve their loyalty. The parking lots in Incheon International Airport has been innovated every year reflecting the technology development.

### PROJECT SCALE

No. of parking bay : **Total 30,982 bays**

- Terminal 1 : 22,919 bays
- Terminal 2 : 8,063 bays

### PROJECT DETAILS

- Uni-Directional IP Camera
- Individual LED Indicator
- License Plate Recognition Machine
- Mobile Application Integration
- Find My Car Kiosk
- High Pass EXIT System
- Valet Parking



## Ayala Malls Manila Bay

Ayala Malls Manila Bay is the largest Complex mall in the Philippines, and one of the biggest in the world. Ayala Malls Manila Bay is owned by Ayala Land Inc. under the Ayala Malls brand. They selected NEXPA's SMART PARKING SOLUTION for their convenient operation of large parking bay. SMART PARKING SOLUTION implemented transformed the mall into one of the first SMART PARKING enabled sites in the country.

### PROJECT SCALE

No. of parking bay : **Total 3,896 bays**

### PROJECT DETAILS

- Uni-Directional IP Camera
- RFID Integration
- License Plate Recognition Machine
- Find My Car Kiosk
- Auto Payment Station
- Mobile Parking Reservation







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