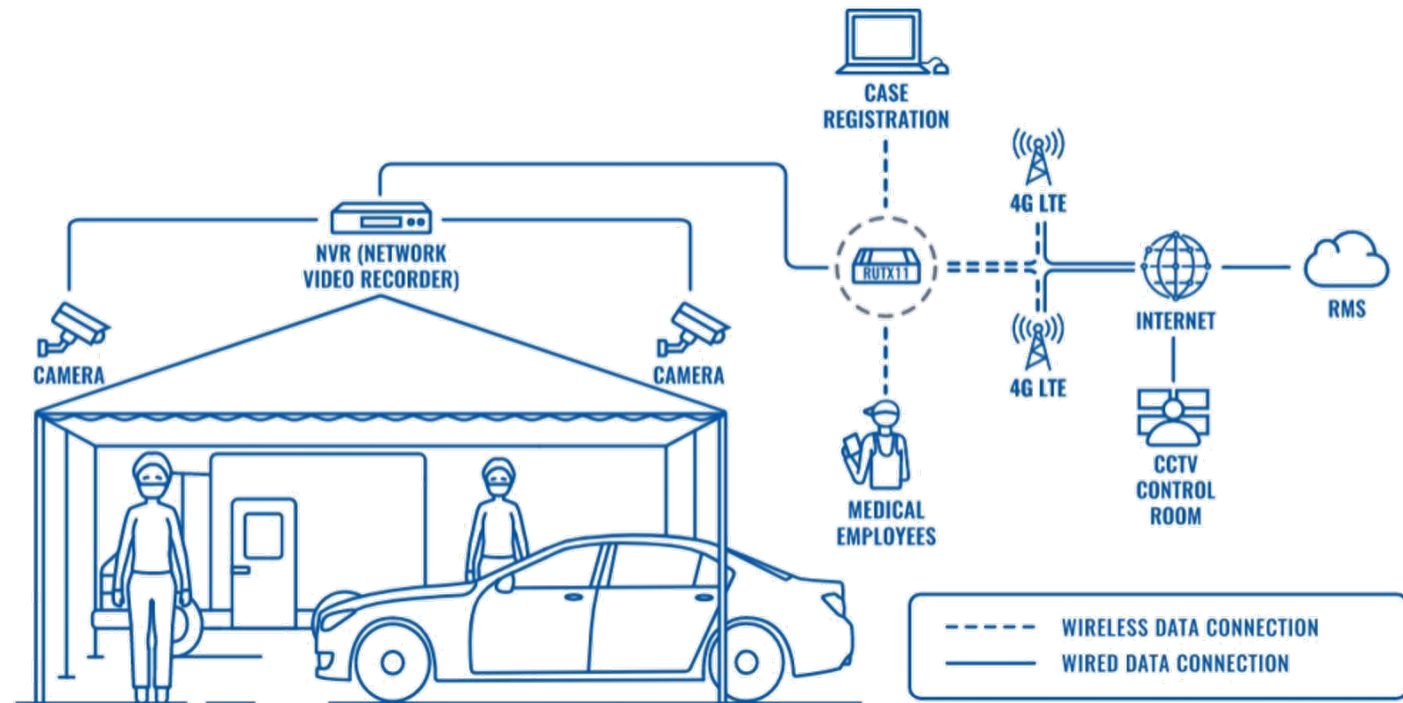# Intelligent In-Vehicle Solutions based on JHC SIGM Series

March 19th, 2021

Market Overview

JHC Products for Intelligent Transportation
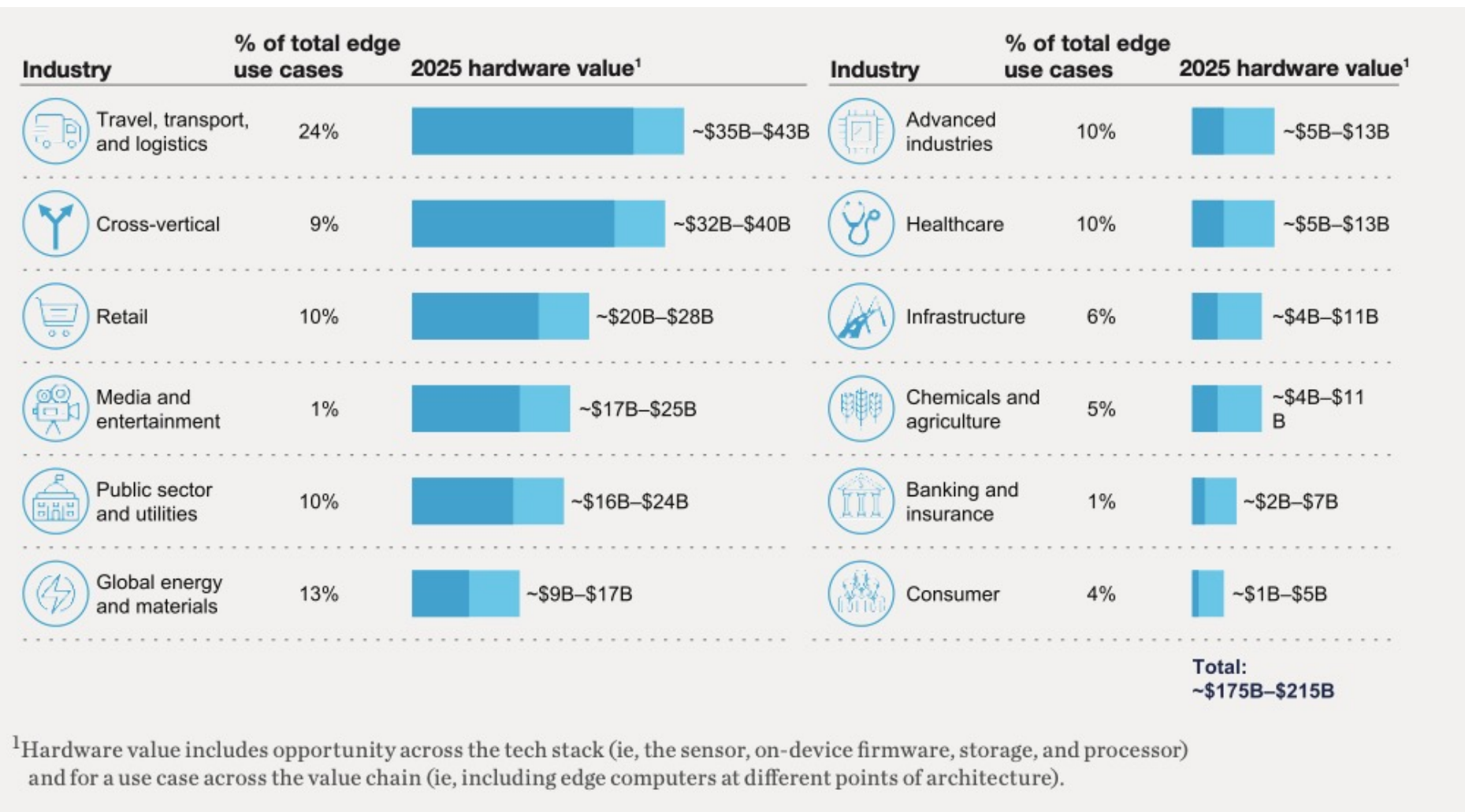
Applications & Case Scenarios

1 Market Trends & Industry Directions

Market Overview

Industry	% of total edge use cases	2025 hardware value[1]
Travel, transport, and logistics	24%	~$35B–$43B
Cross-vertical	9%	~$32B–$40B
Retail	10%	~$20B–$28B
Media and entertainment	1%	~$17B–$25B
Public sector and utilities	10%	~$16B–$24B
Global energy and materials	13%	~$9B–$17B

Industry	% of total edge use cases	2025 hardware value[1]
Advanced industries	10%	~$5B–$13B
Healthcare	10%	~$5B–$13B
Infrastructure	6%	~$4B–$11B
Chemicals and agriculture	5%	~$4B–$11B
Banking and insurance	1%	~$2B–$7B
Consumer	4%	~$1B–$5B

Total: ~$175B–$215B

[1] Hardware value includes opportunity across the tech stack (ie, the sensor, on-device firmware, storage, and processor) and for a use case across the value chain (ie, including edge computers at different points of architecture).

Multi Access Edge Computing

- Video Analytics
- Data Monitoring
- xIox (AIoT; IIoT; IoV etc)
- Data Cashing
- Advanced Analytics
- Location Services
- Optimized local content

Source: JM Chabas, Chandra Gnanasambandam, Sanchi Gupte, and Mitra Mahdavian |McKinsey & Company

Intelligent Vehicle

Detectors of Passenger Analytics

Датчики и контроллеры автоматизированной системы мониторинга пассажиропотока

ADs Monitors

Датчик задымления и повышения температуры ИПК-ТУ 212-114А3-10281

Gas/Fire Detectors

VideoSurvailanceMicrophon

Микрофон системы видеонаблюдения

Alarm Button

Тревожная кнопка

Outside Information Panel

Бортовой навигационно-связной терминал Гранит-навигатор-2.07

ОАО «НИС»

Oil consumption

Датчик уровня топлива ТД-500 «Эскорт»/ Omnicomm LLS 20160

Система видеонаблюдения:
- Видеорегистратор EMV-400/800/1200
- Видеокамеры МВК-0933:
  - переднего вида;
  - наблюдения за водителем
  - салонные (от 4 до 12 в зависимости от вида ТС)
  - заднего вида

3G-модем
Telit 863-3GE

Бортовая навигационно-связная УКВ-радиостанция ТАКТ-201.23 П45

RadioCommunication

Video Survailance
4-12ch

3G modem
Industrial

Internal Data Sensors	External Data Sensors

| Communication | |

| Data collection & Processing | |

JHCTECH

| Data Visualisation | |

V2X = V2G - V2V - V2I – V2N – V2D
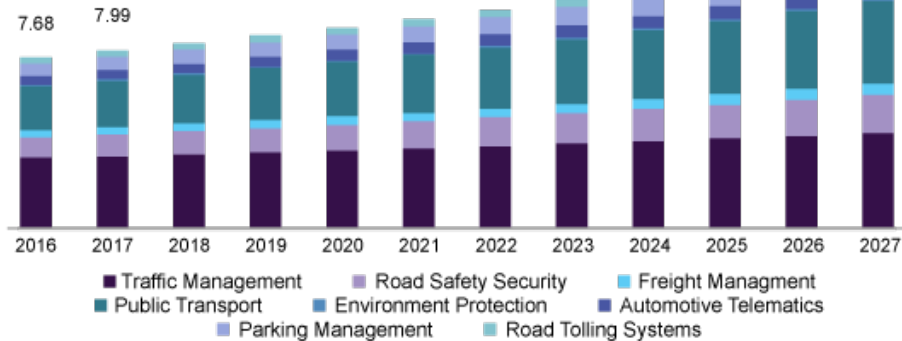
Intelligent Vehicle
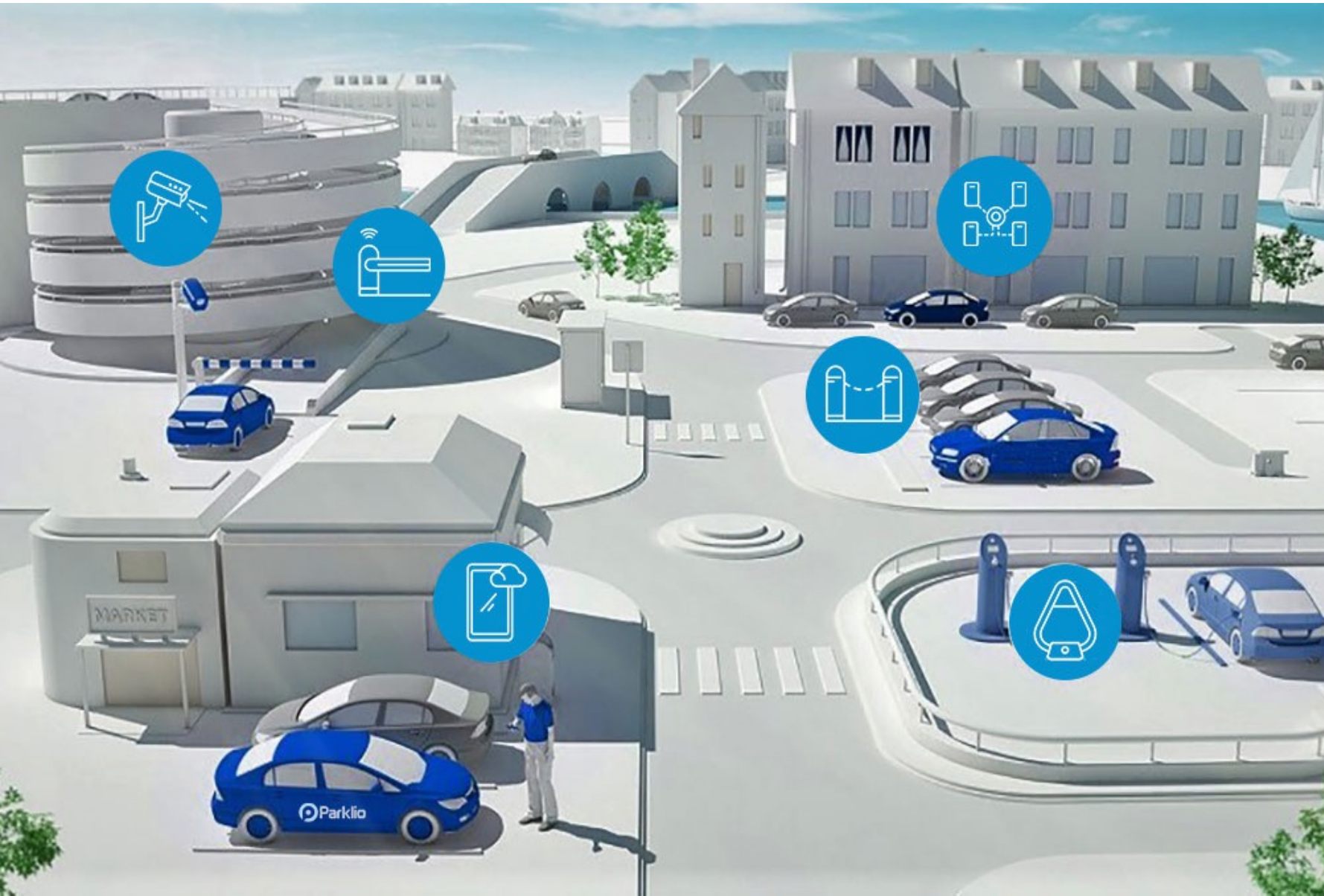
V2D – Vehicle to Device

V2V – Vehicle to Vehicle

V2P – Vehicle to Person

V2G – Vehicle to Grid

V2I – Vehicle to Infrastructure

V2N – Vehicle to Network

- Collect Data
- Compute Data
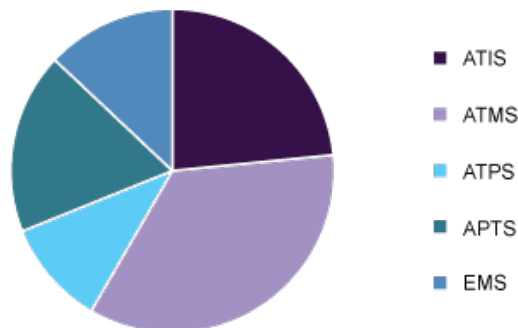- Visualize Data

Image from Parklio.com

www.jhctechnology.cn

Intelligent Transportation Market
Major Trends

U.S. intelligent transportation system market size,
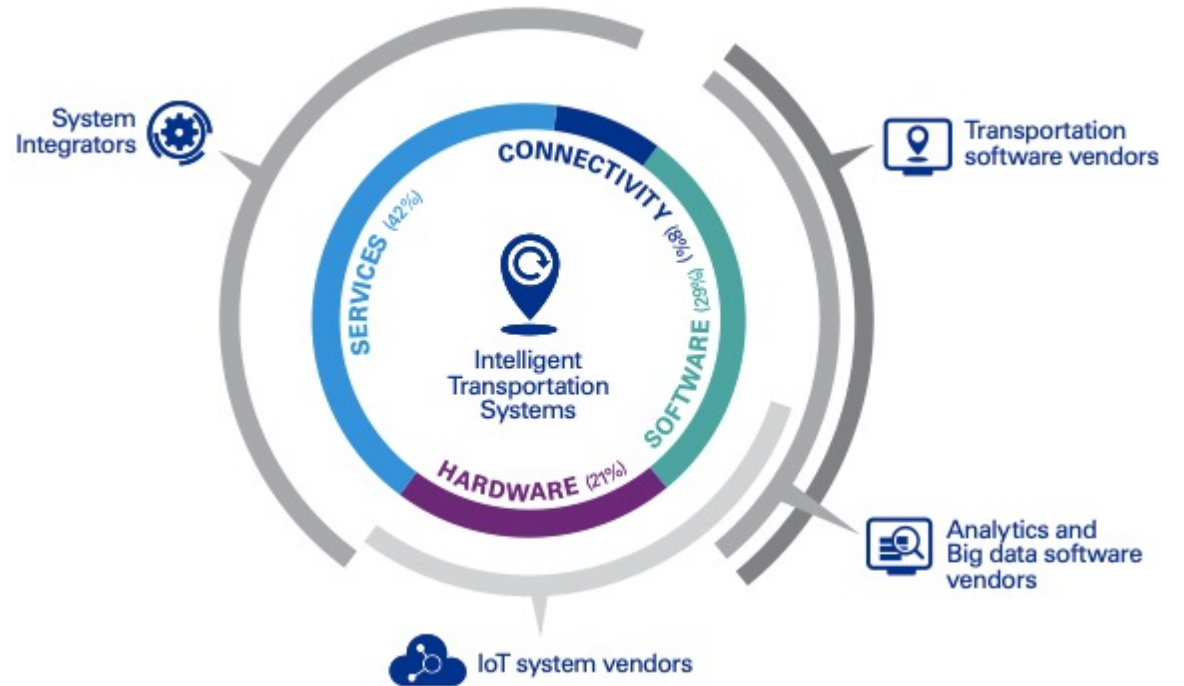by application, 2016 - 2027 (USD Billion)

7.68   7.99

2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027

- Traffic Management
- Public Transport
- Parking Management
- Road Safety Security
- Environment Protection
- Road Tolling Systems
- Freight Managment
- Automotive Telematics

Source: www.grandviewresearch.com

Global intelligent transportation system market share, by type, 2019 (%)

- ATIS
- ATMS
- ATPS
- APTS
- EMS

Source: www.grandviewresearch.com

System Integrators

Transportation software vendors

CONNECTIVITY (8%)

SERVICES (42%)

SOFTWARE (29%)

Intelligent Transportation Systems
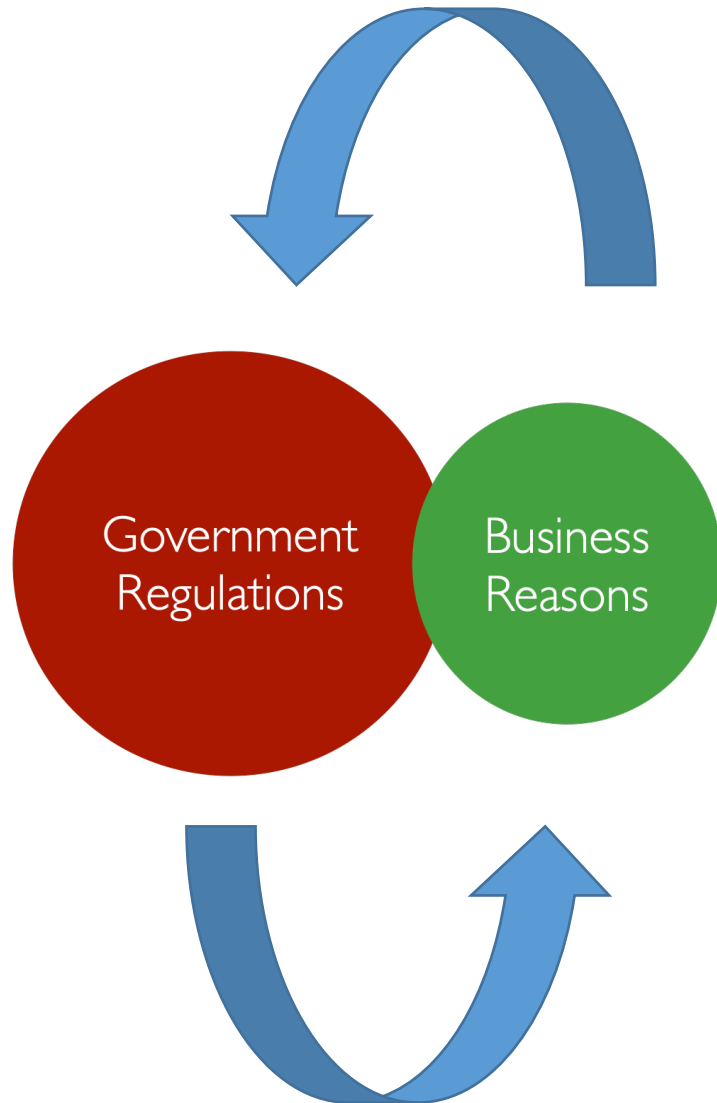
HARDWARE (21%)

Analytics and Big data software vendors

IoT system vendors

Advanced Traveler Information System (ATIS)

Advanced Traffic Management System (ATMS).

Advanced Transportation Pricing Systems (ATPS)

Advanced Public Transportation System (APTS)

Emergency Management System (EMS)

Major Drivers

Government Regulations

Business Reasons

Public Sector – Safety / Un-manned operations / Transparency / Optimization

- Traffic Monitoring System
- Traffic Signal Control Systems
- Parking Convenience Systems
- Traffic Enforcement Cameras
- Accident-Avoidance Systems

Private - Compliance / Cost Reduction (operations) / Automation for scalability

- Fleet Management
- Asset Monitoring (warehousing)
- Logistics

EU Initiative Example

Concept	Framework	Project	Solution

IoT

IoV

IIoT

AIoT

Trust IoT

IoHT

Private

Gov-t

OpenSource

NVIDIA EGX™ AI Platform

JHC Edge Tech

JHC Partnership Ecosystem

European Commission | 5G Cross-border Corridors for Connected and Automated Mobility

— Testing and pre-deployment

— Indicative 5G corridors for CEF funding

☐ Horizon 2020 5G cross-border corridor trial projects

H2020 Project 5G-Blueprint

H2020 Project 5G-Routes

H2020 Project 5GCroCo

H2020 Project 5G MOBIX

H2020 Project 5G CARMEN

H2020 Project 5GMED

H2020 Project 5G MOBIX

Europe boosts investment with €70 million in 5G with strong focus on connected transport by launching 11 new projects
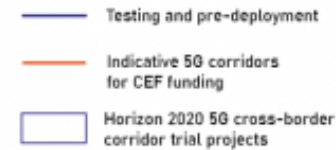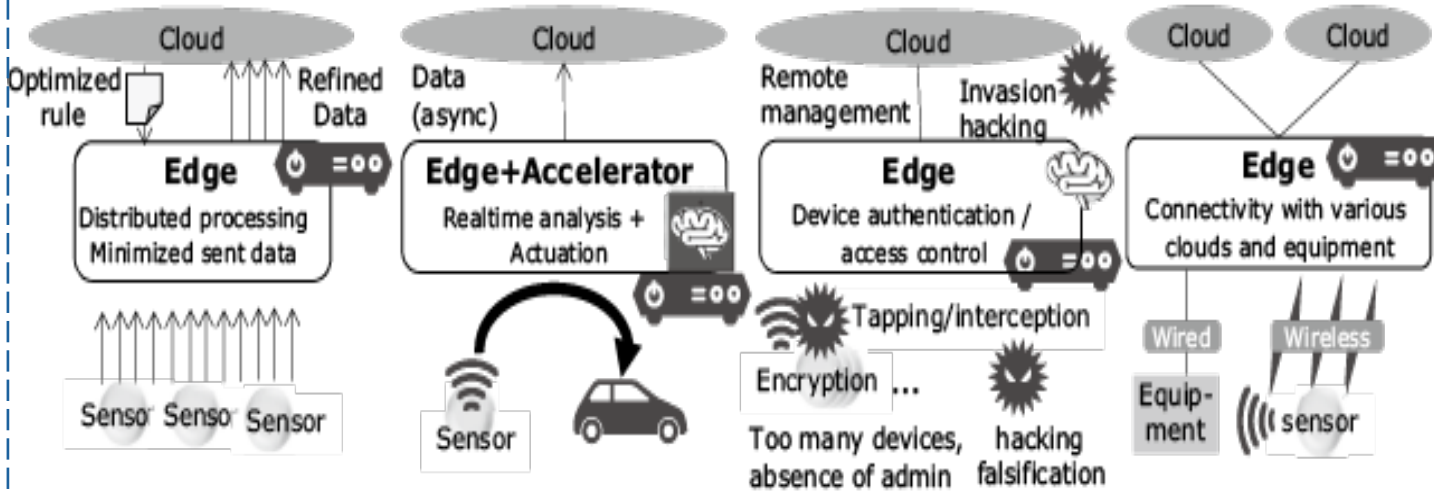
Edge Advantage and Disadvantage

Efficient system resourses use	Real-time actuation	Security & Privacy Protection	Connectivity for High availability

Cloud — Optimized rule — Refined Data

Edge
Distributed processing
Minimized sent data

Senso Senso Sensor

Cloud — Data (async)

Edge+Accelerator
Realtime analysis + Actuation

Sensor

Cloud — Remote management — Invasion hacking

Edge
Device authentication / access control

Tapping/interception
Encryption ...
Too many devices, absence of admin   hacking falsification

Cloud   Cloud

Edge
Connectivity with various clouds and equipment

Wired   Wireless
Equip-ment   sensor

Autonomous distributed coordination technology	Acceleration Technology	IoT Security Technology	Connectivity Technology

Standartization		Security
Deployment & Scalability		Management & Maintanance

Investment (infra + design)

Business Model

2 Product Offering – SIGM Series

SIGM Series Major Features

Extremely rugged fanless product, adaptable to extra harsh conditions

- EN50155, E-mark railway standard certification
- Aluminum alloy + stainless steel reinforced structure, fanless design, wide temperature range -40~70℃
- Onboard CPU and memory, M12 connector, shock-absorbing installation design
- Motherboard + daughter card + isolated power supply + expansion module All-In-One modular design
- Power supply, network port, serial port, DIO anti-surge isolation protection
- Dual 4G LTE router + Gigabit Wifi6, support BDS+GPS dual-mode positioning
- S00X series power supply is DC48/72/110V railway standard specification
- T00X series power supply is DC9~36V wide voltage with ITPS smart switch power supply
- Meet the JHC EIO expansion bus specification, and can flexibly customize functional modules
- Rich IO functions, suitable for differentiated field application requirements

Structural Design for Harsh Conditions

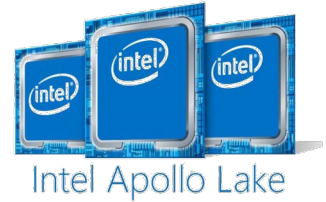**Long Term Stability in Operation**

Design Flexibility for SI needs

SIGM-2650

- Intel® Apollo Lake E3950 CPU

- DDR3L up to 1866MHz, On-board+SODIMM, Up to 8GB

- 1*DP, 1*VGA, 1*Smart Display,3 Display Interface

- 2*GbE LAN with POE（M12）, 5*USB（2*M12）

- 2*Iso.COM, 8-bit Iso. DIO, optional 2*CAN

- 1*2.5"Easy to pull hard drive rack，1*Line out

- 4*Mini PCIe(1 optional mSATA), Support GPS/WiFi/LTE/4G

- EN50155,TPM2.0 security encryption

- DC 9~36Wide voltage power supply ITPS power management

- Optional railway standard power input DC48/72/110V(±40%)

Intel Apollo Lake

EN50155

Structural Design for Harsh Conditions

Long Term Stability in Operation

Design Flexibility for SI needs

SIGM-3250

- Intel® Skylake/Kabylake-U CPU
- 2-Ch DDR4, On-board 4/8GB+SODIMM, up to16GB
- 1*DP, 1*VGA, 1*Smart Display, 3 Display Interface
- 2*LAN(M12）, 4*POE (M12), 5*USB(2*M12), Built-in dongle interface
- 2*Iso.COM, 8-bit Iso. DIO, optional 2*CAN
- 1*2.5"Easy to pull hard drive rack，1*Line out
- 4*Mini PCIe(1 optional mSATA), support GPS/WiFi/LTE/4G
- EN50155, E-Mark certification, support TPM2.0 security encryption,
- Railway standard power input DC 48/72/110V(±40%)
- Optional DC 9~36 wide voltage power supply, with ITPS power management
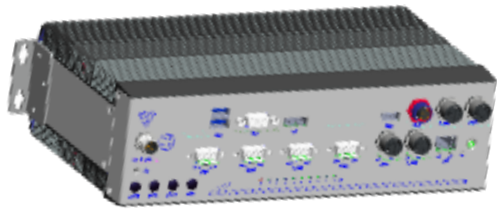
EN50155

E-Mark

Structural Design for Harsh Conditions

Long Term Stability in Operation

Design Flexibility for SI needs

SIGM-3252

- Intel® Skylake/Kabylake-U CPU
- 2-Ch DDR4, On-board 4/8GB+SODIMM, upto 16GB
- 1*DP, 1*VGA, 1*Smart Display, 3 Display Interface
- 2*LAN(M12), 4*POE (M12), 5*USB(2*M12), Built-in dongle interface
- 2*isolated COM, 8-bit Iso. DIO, optional 2*CAN
- 2*2.5" easy-to-draw hard disk rack, 2*Line out
- 4*Mini PCIe (1 optional mSATA), support GPS/WiFi/LTE/4G
- EN50155, E-Mark certification, support TPM2.0 security encryption
- Iron standard power input DC 48/72/110V (±40%)
- Optional DC 9~36 wide voltage power supply, with ITPS power management

intel Skylake

intel Core™ i7

EN50155

E-Mark

Structural Design for Harsh Conditions	Long Term Stability in Operation	Design Flexibility for SI needs

SIGM-3251

- Intel® Skylake/Kabylake-U CPU
- 2-Ch DDR4, On-board 4GB+LPDDR4 4GB
- Onboard AI acceleration chip, AI acceleration computing power 8TOPS (INT8)
- 1*DP, 1*VGA, 1*Smart Display, 3 Display Interface
- 4*LAN(M12), 1*SFP, 6*USB(2*M12), Built-in dongle interface
- 1*2.5"Easy to pull hard drive rack ，1*Line out
- 4*Iso.COM, 10-bit Programmable GPIO with LED
- 4*Mini PCIe(1 optional mSATA), support GPS/WiFi/LTE/4G
- EN50155 certification, support TPM2.0 security encryption,
- Railway standard power input,DC 9-36V wide voltage power supply

EN50155

Structural Design for Harsh Conditions

Long Term Stability in Operation

Design Flexibility for SI needs

3 Railway Focused Applications

Major Applications

DMI

PIS

CCTV

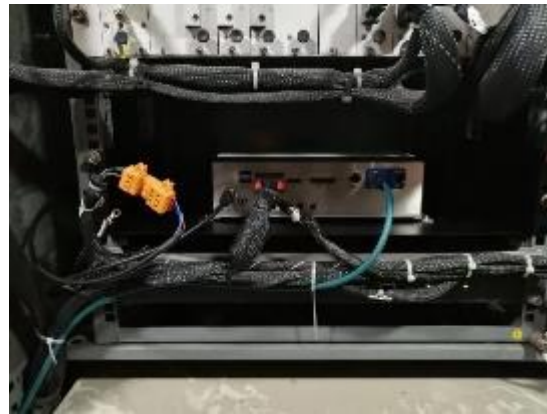**Vehicle monitoring and diagnosis system**

Freight train intelligent identification system

SIGM-2650
Harbin Metro Line 1 PIS System

The Harbin Metro PIS passenger information system project uses JHCTECH SIGM-2650/S002 products as the main control of the play control system.
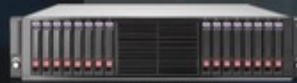

LCD TV   Camera

PIS---Passenger Information System

数据库服务器
Database Server

Display

有线和无线交换机
Switch

WIFI+LAN

SIGM-2650   SIGM-3250

Broadcast

A service system that provides passengers with various types of information in the train. Under normal circumstances, the passenger information system provides real-time dynamic multimedia information such as travel instructions and train schedules. The on-board PIS system provides audio broadcasting platform, video program broadcasting platform, emergency alarm, warning platform and emergency call platform for passengers and the central control room; it is composed of PA broadcasting system, on-board video system, and intelligent video monitoring system.

SIGM-3250
Maglev Train Health Inspection

The maglev train inspection project uses JHCTECH SIGM-3250 product as the track health monitoring and inspection detector.

Sensor

Camera

Collector

SIGM-3250 Wifi+LAN

Control Center

Monitoring And Diagnosis System

Sensor

IP Camera

DAQ

WIFI+LAN

Database Server

Switch

Computer

SIGM-2650   SIGM-3250

Intelligent analysis of the hardware equipment of the whole vehicle, troubleshooting of hardware abnormalities during the operation of rail transit vehicles, instead of manual point-to-point detection, all the investigation data are uploaded to the ground central control room in real time, so as to ensure that the abnormal hardware equipment can be quickly solved.

SIGM-3251
Promote freight trains towards intelligent marshalling

Train number   Camera   Collector

SIGM-3251 AI+Wifi+LAN

The freight train intelligent marshalling project uses JHCTECH SIGM-3251 product as the main control of the freight train intelligent identification system.

Freight Train Intelligent Identification System

IP Camera

Train Code

DAQ

SIGM-3251

Database Server

Switch

Train Recode
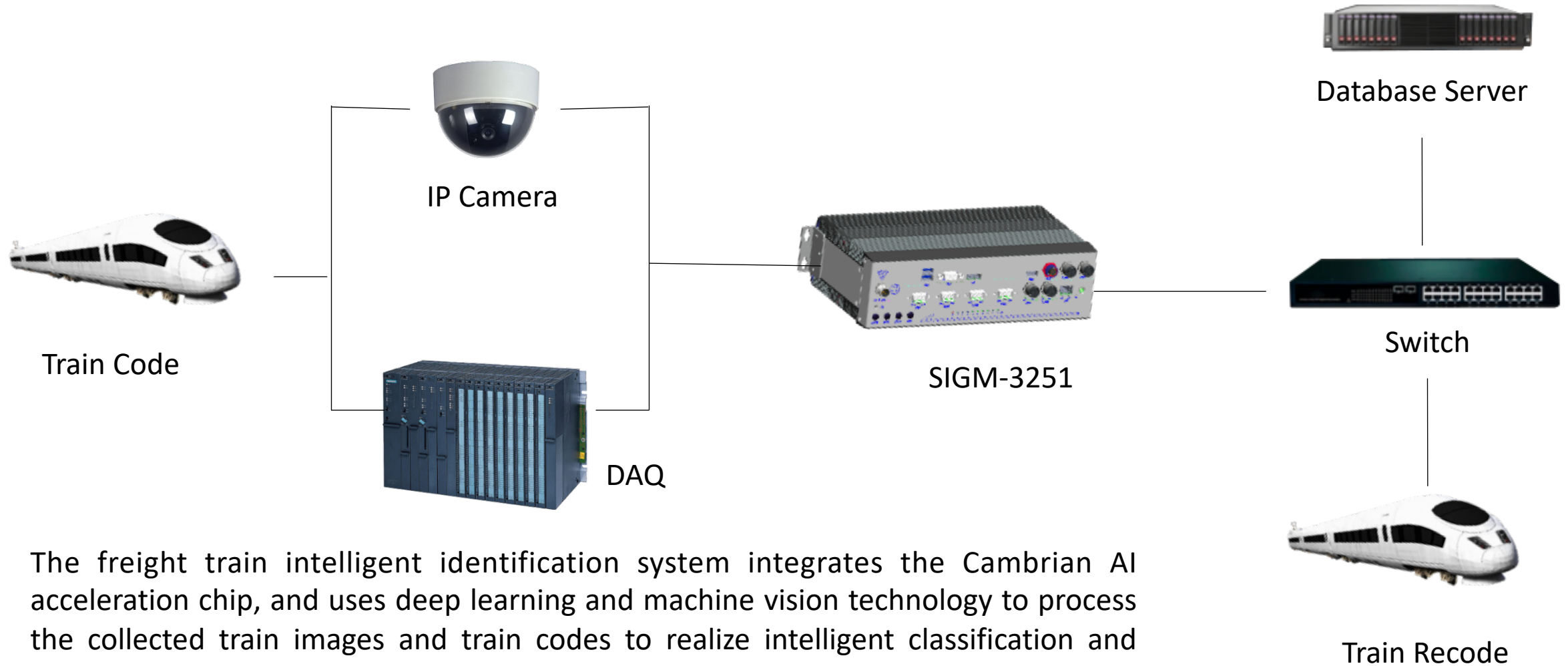
The freight train intelligent identification system integrates the Cambrian AI acceleration chip, and uses deep learning and machine vision technology to process the collected train images and train codes to realize intelligent classification and cutting of train cars, re-code, and check the train status , Form the inspection report to improve the quality and efficiency of the intelligent code reorganization and inspection of freight trains.

www.jhctechnology.cn

SIGM-3252
Promote the rapid development of India's high-speed rail CCTV

The Indian high-speed rail project uses JHCTECH SIGM-3252 product as the main control of the closed-circuit television system.

Camera

SIGM-3252

Wifi+LAN

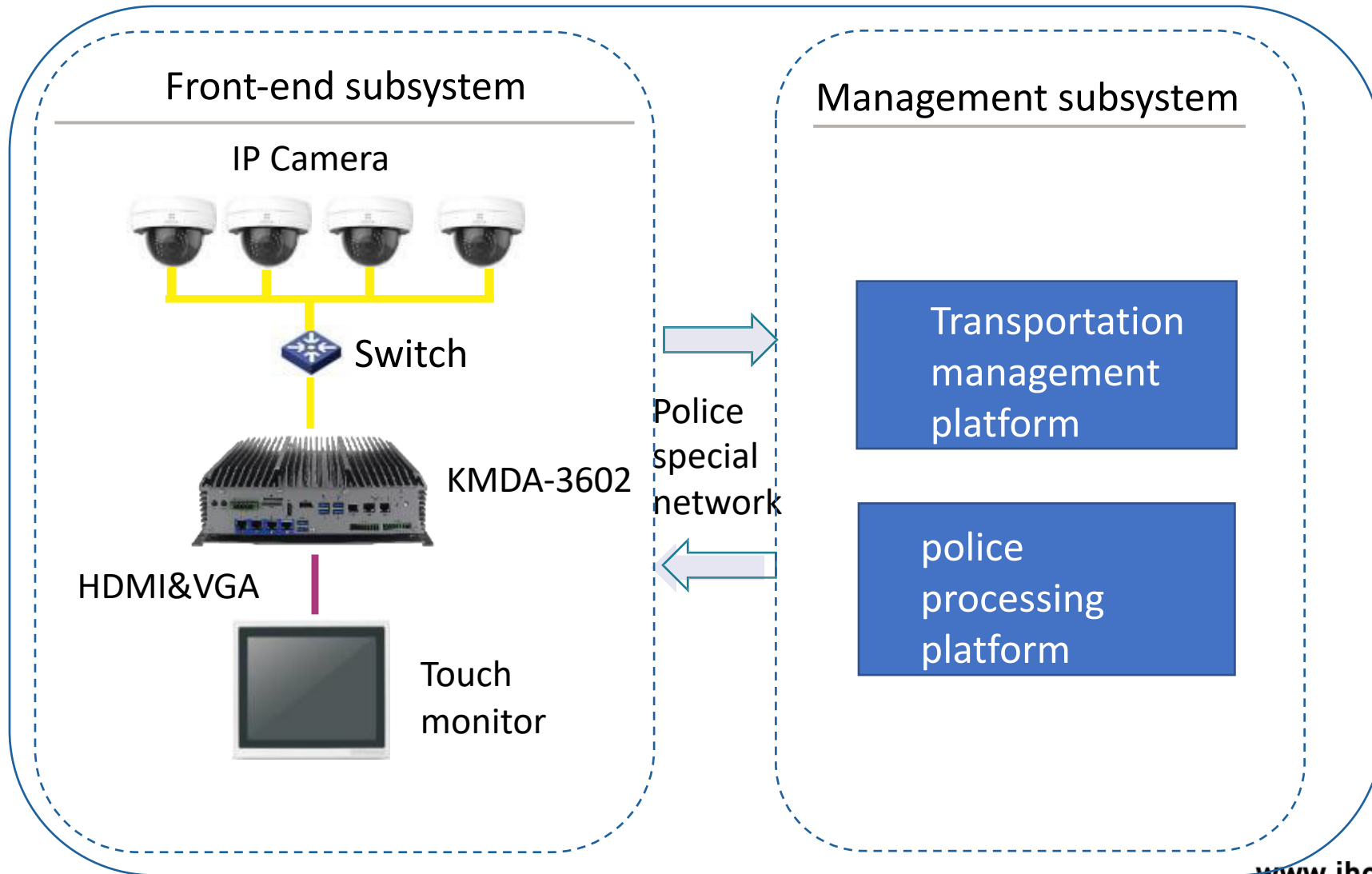Control Center

CCTV----Closed-Circuit Television

Database Server

SIGM-3252

IP Camera

POE

WIFI+LAN

Switch

SIGM-3250

SIGM-2650

IP Camera

IP Camera

Computer

Closed-circuit television (CCTV) provides a comprehensive train internal monitoring system solution to improve the safety of passengers by monitoring the conditions of train cars and cabs. The situation of each carriage can be recorded by an IP camera and directly transmitted to the PC for real-time high-definition display. This allows employees to monitor all train cars in the cab.

IP Camera

**Special
In-Vehicle System**

Police Vehicle
Comprehensive Law Enforcement System

**Optimized for Full range of Police Vehicles**

V2X Driverless Projects
Private (sales can provide more information)

- **Vehicle Violation Monitoring Project on Urban Road Section in Mumbai Phase III, India**

- **The second phase of the intelligent traffic monitoring project for urban roads in Dubai, UAE**

- **Intelligent video law enforcement in-vehicle project for the Los Angeles Police Force**

- **Indra non-stop weighing system**

- **Columbia highway project**

Application Example
Traffic Monitoring and Toll Collecting
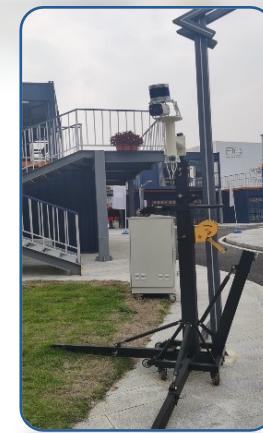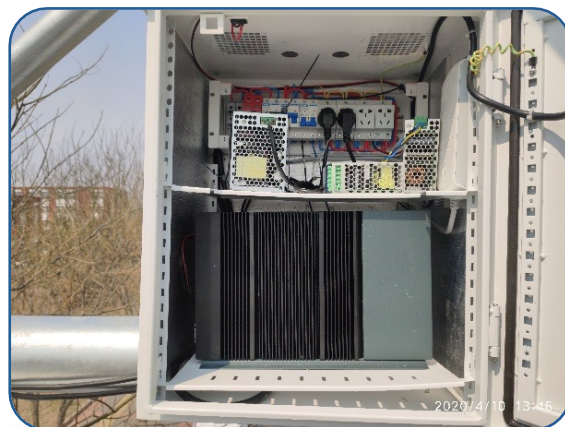
Q & A

Stay in Touch

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