



ESVISION

Smart Public Transportation System

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1

Background

Public Transport Development Overview, Project Demands

Project Demands



Improving Bus Sharing Rate

Bus Companies

Improving the level of operation and service

- "Live" like managing
- Real-time monitoring
- Security guarantee
- Increase bus satisfaction and bus sharing
- Value-added services

Citizens

Travel safely, fast, and comfortably

- Arrival information
- Travel guidance
- Diversified bus services
- Humanized services



2

Overall Design

Overall Solution, Objectives, Structure, Project Scope

Overall Solution



Policy



Demands

Transportation Master Plan

Improving the level of operation and service

Dispatch

Intelligent
Dispatching
Scheduling

Real-time
Dispatching

Operation

Security
Management

Operational
Monitoring

Passenger
Statistics

Service

Information
Releasing

Smart Travel

Unified data

System
interconnection

Objectives



By developing the ***Intelligent Bus Operation & Management Platform*** and the ***Intelligent Travel Information Service Platform***, improving operation, management, and service quality, and providing citizens with safe and efficient bus services.

✓ Operation management

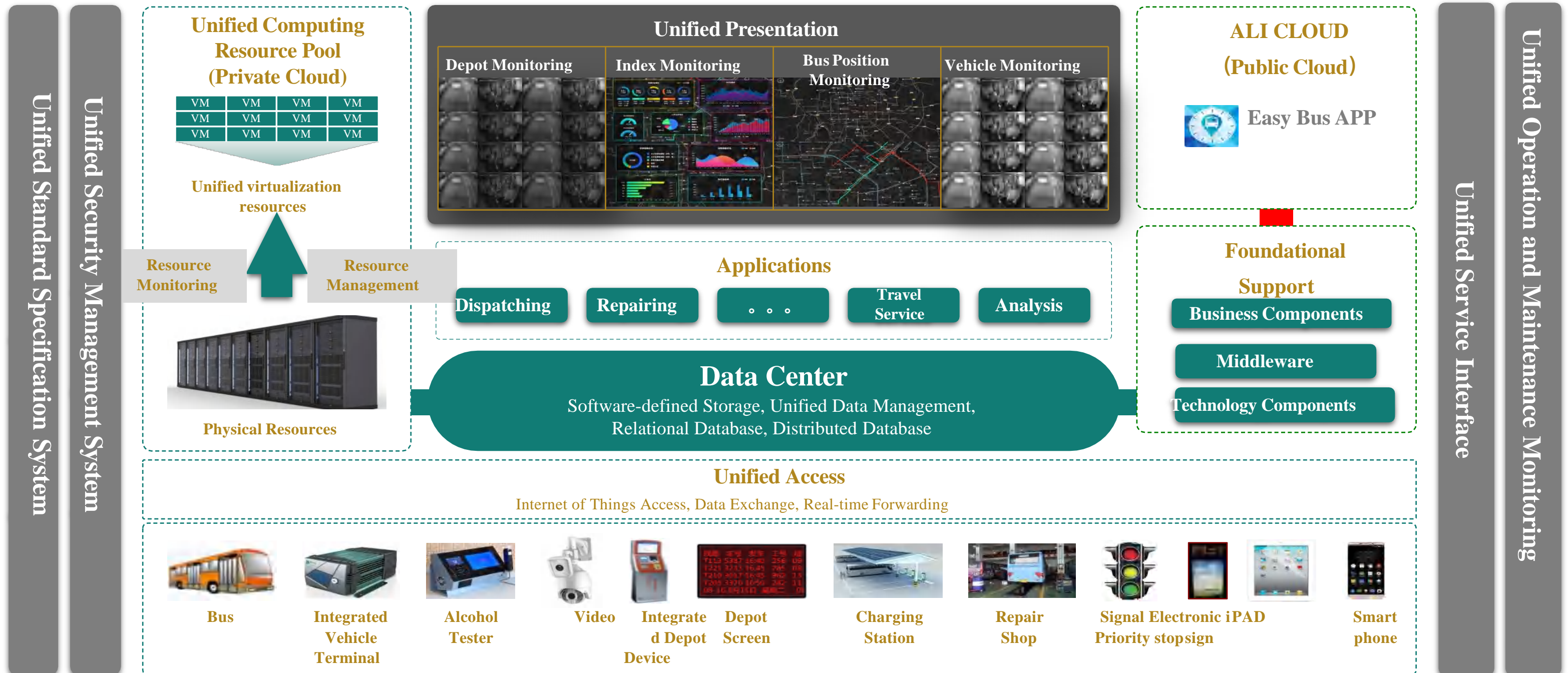
- Intelligent dispatching
- Operational monitoring
- Travel safety

✓ Travel Service

- Information service
- Diversified travel service

Structure

Establish the information infrastructure including software & hardware resource and internet security system by developing a “Cloud Platform”. By integrating software & hardware resource platform, business integration platform, and unified visualization platform into a “Public Transportation Cloud”, a fundamental support is provided to the four parts of information network and security, data center, integrated services, and comprehensive display.



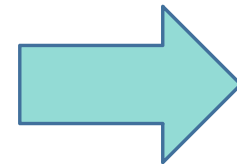
Project Scope:

Consulting, System Design & Development, and Implementation & Support



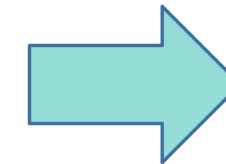
Consulting

- Diagnosis
- Demand Analysis
- Targeted Solutions



System Design & development

- Intelligent Terminals
- Vehicle Terminals
- Depot Devices
- Platform Devices
- Foundational Support
- Internet of Buses
- Software & Hardware Resource
- Core Applications
 - Enterprise Resource Management
 - Enterprise Strategy Management
 - Passenger Service
- Overall Development and Implementation Plan



Implementation

- Installation & Deployment
- Technical Support



3

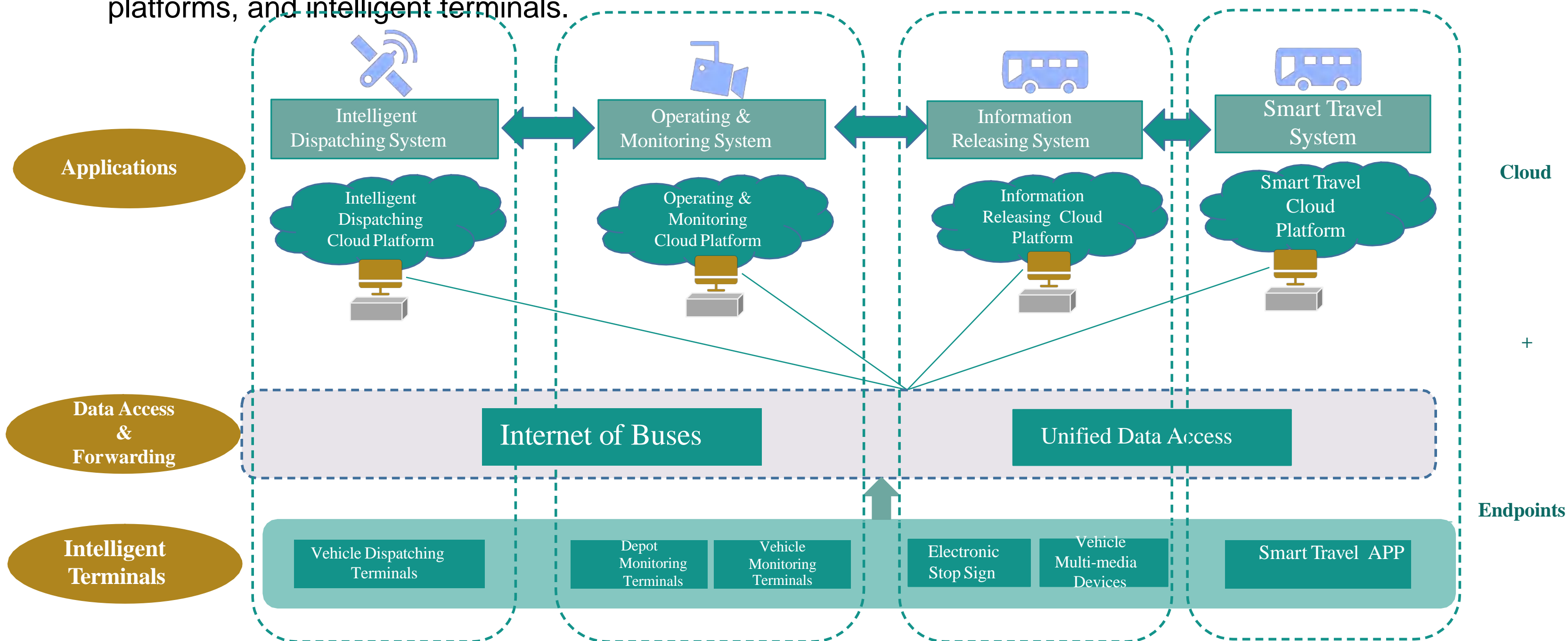
Application System Design

System Composition, Intelligent Dispatching System, Operating & Monitoring System, Information Releasing System, Smart Travel System



System Composition:

The intelligent bus system consists of an intelligent dispatching system, an operating & monitoring system, an information releasing system, and a smart travel system. Each system uses a **cloud + endpoints** structure, including software applications, data access and forwarding platforms, and intelligent terminals.

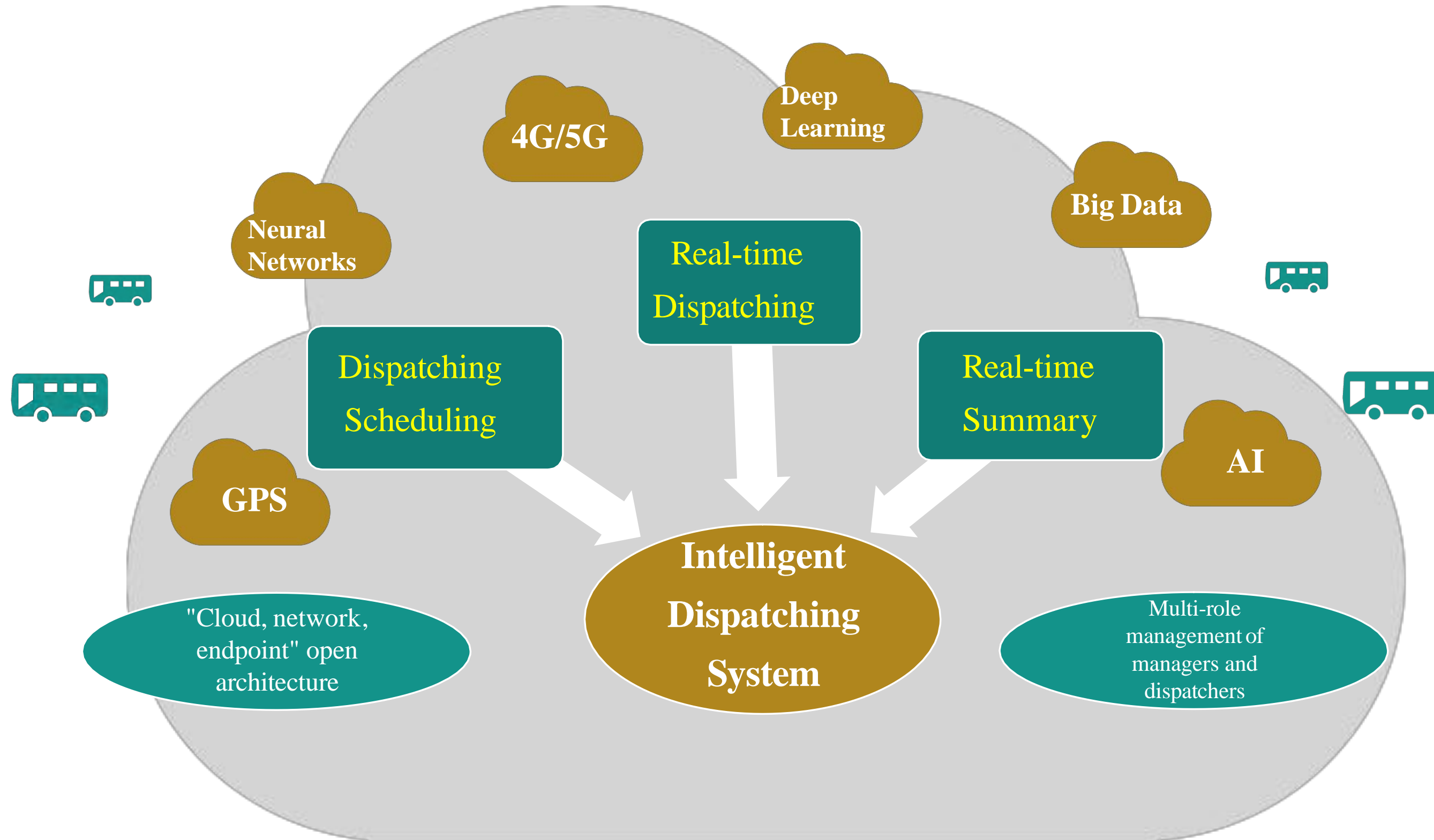


Intelligent Dispatching System:

Providing intelligent, "live" like dispatching management



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Intelligent Dispatching System:

Composition

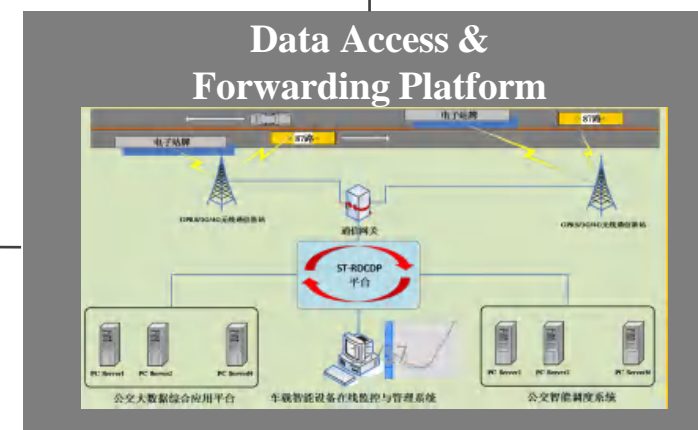
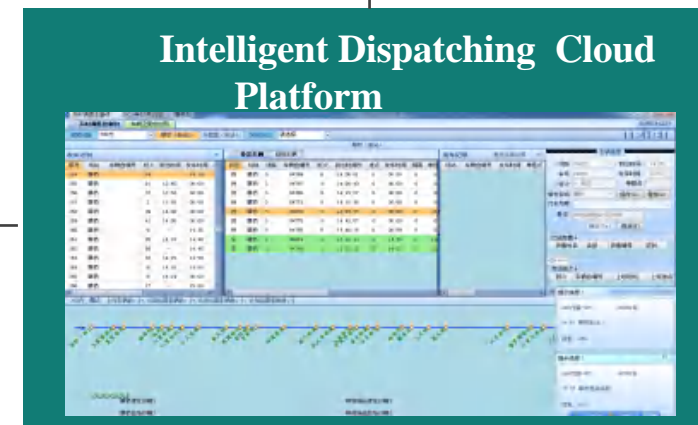
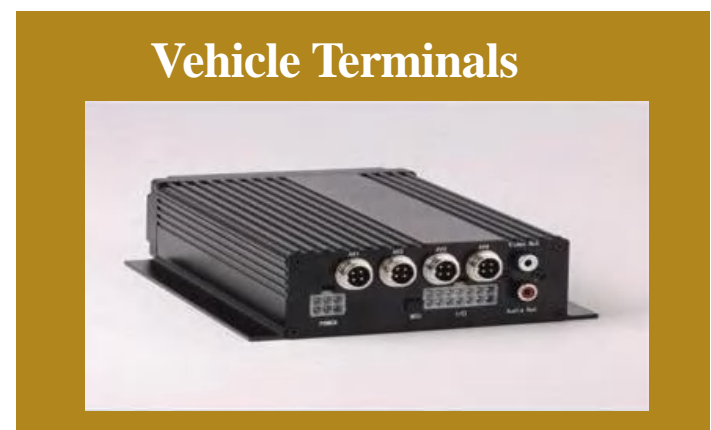


 Core Business System

 Support System

 Terminals

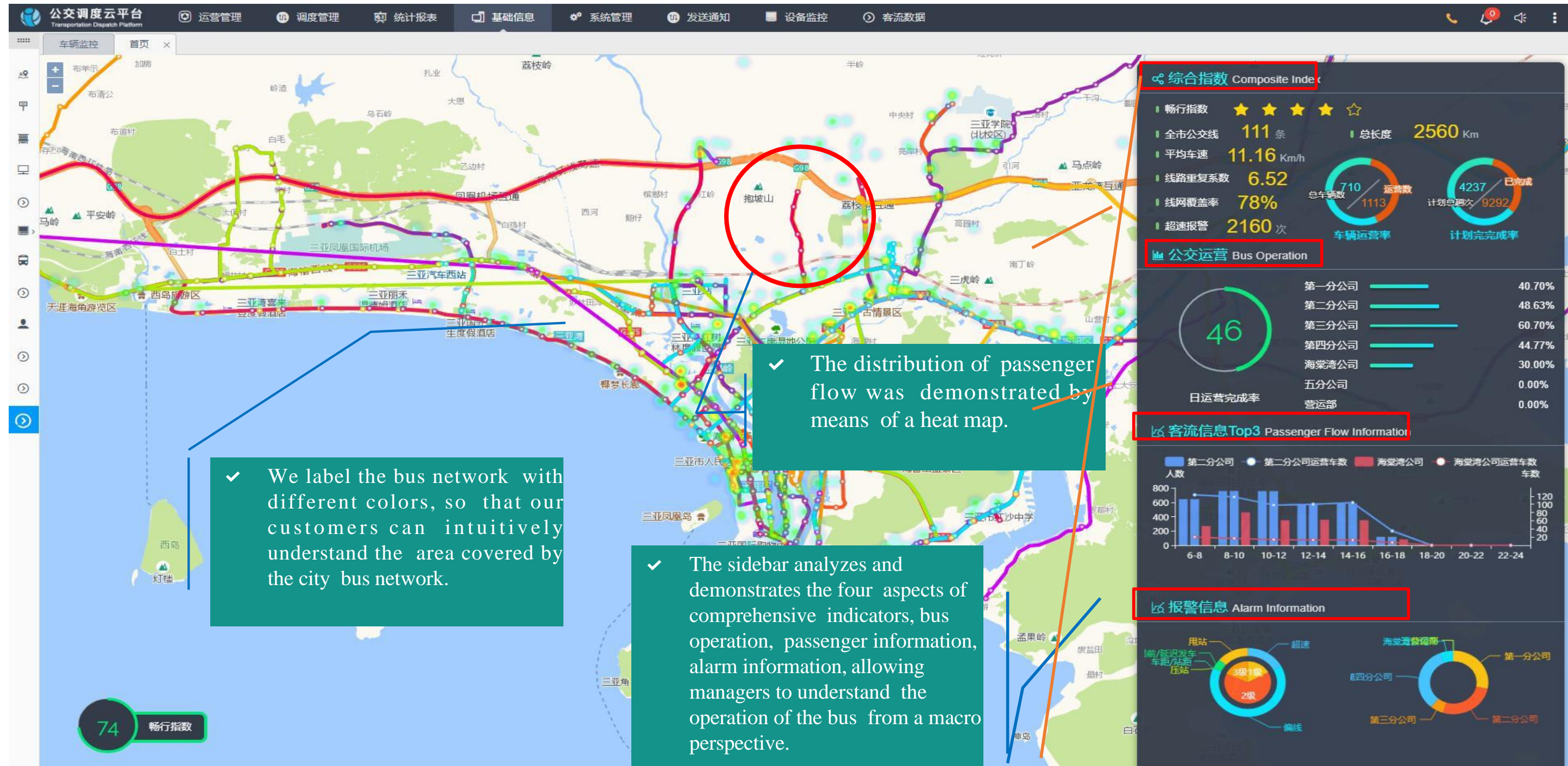
 Data Flow



 Servers

Intelligent Dispatching System:

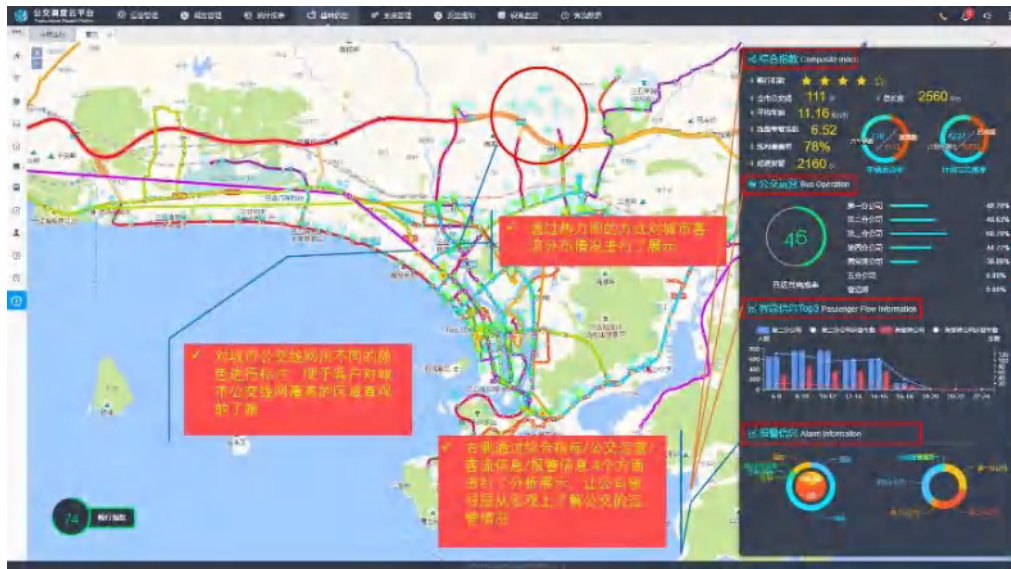
Real-time Monitoring, visual analysis



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Intelligent Dispatching System:

Dispatching scheduling, real-time dispatching



Real-time Dispatching



Resource Distribution



Line Operation



Remote Monitoring



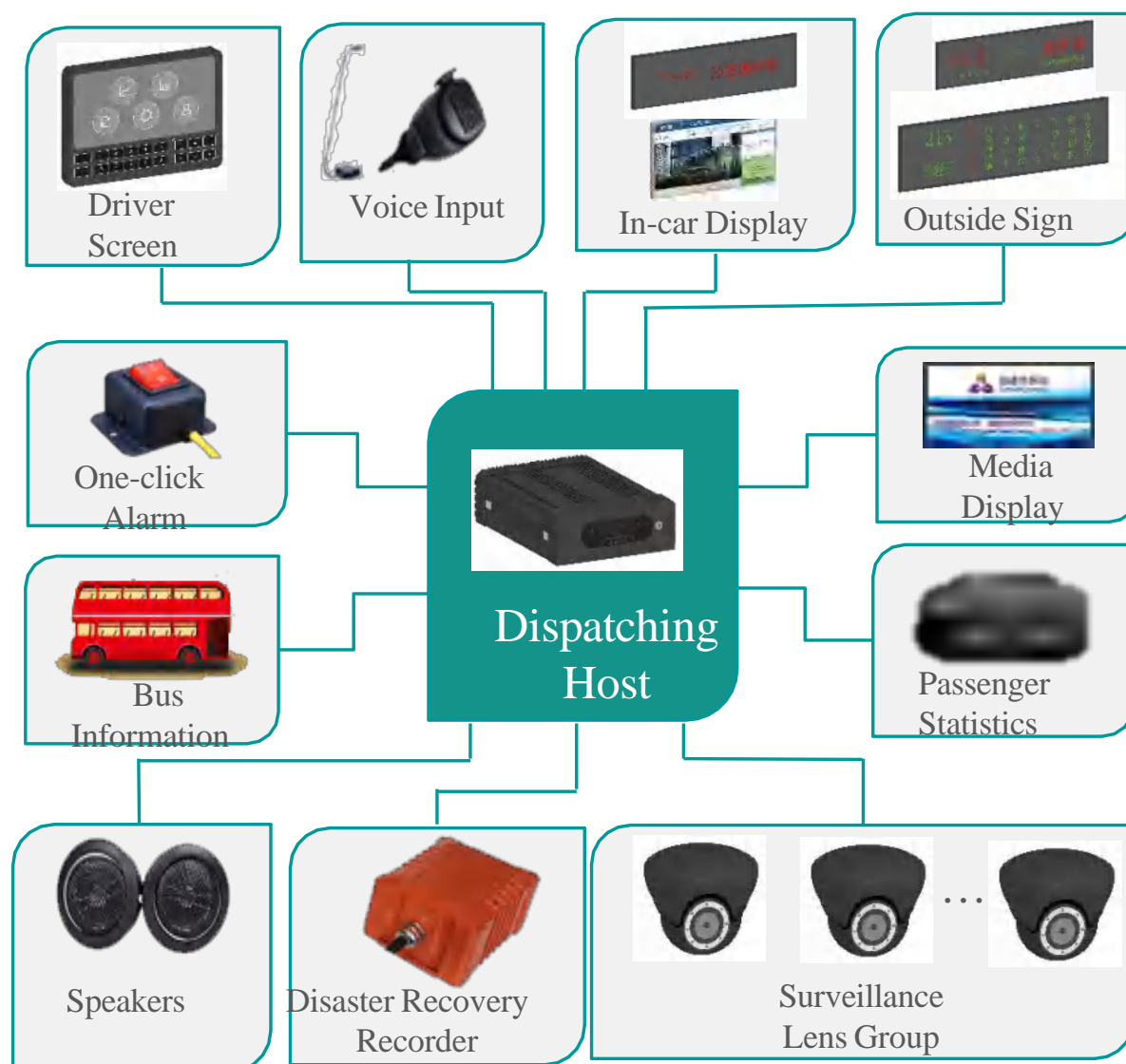
Index Monitoring



Guarantee for Events

Intelligent Dispatching System: Terminals

Dispatching host, driver screen, surveillance lens group, one-click alarm, voice input, and speaker.



Dispatching Host:

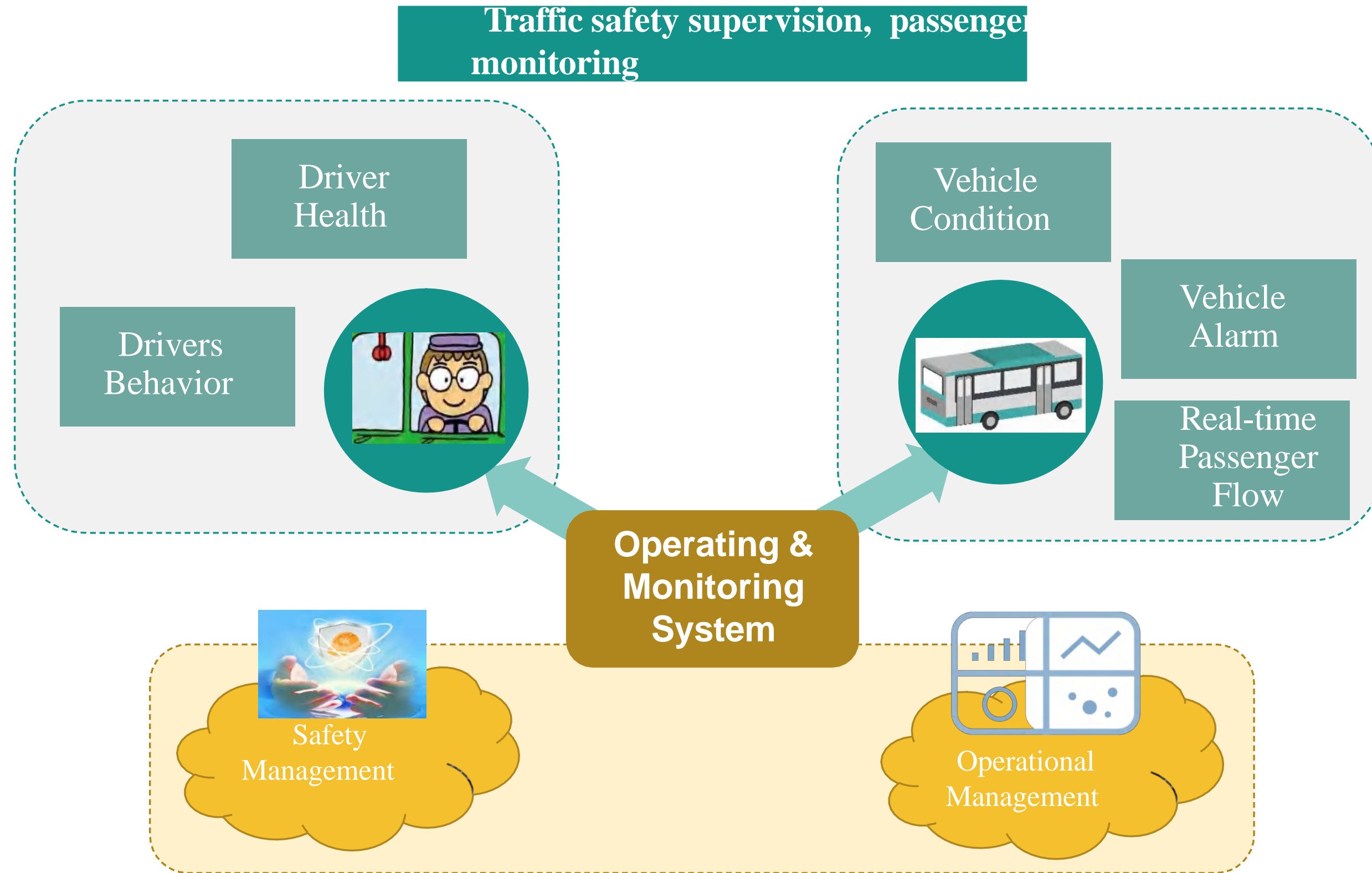
- High-speed processor and embedded operating system;
- Using video compression / decompression technology, 4G and WIFI network technology, GPS / BDS technology;
- Multi-channel analog surveillance video, automatic station reporting, intelligent dispatch and high-definition video, car driving records and wireless data uploading;
- Modular product design with high reliability, safety and flexibility, and easy to maintain.

Driver Screen:

- Station reporting;
- Direct picture connection;
- Direct reversing image connection;
- SMS and prompt voice reading;
- Voice calls.

Operating & Monitoring System:

Real-time operational data monitoring and comprehensive safety monitoring

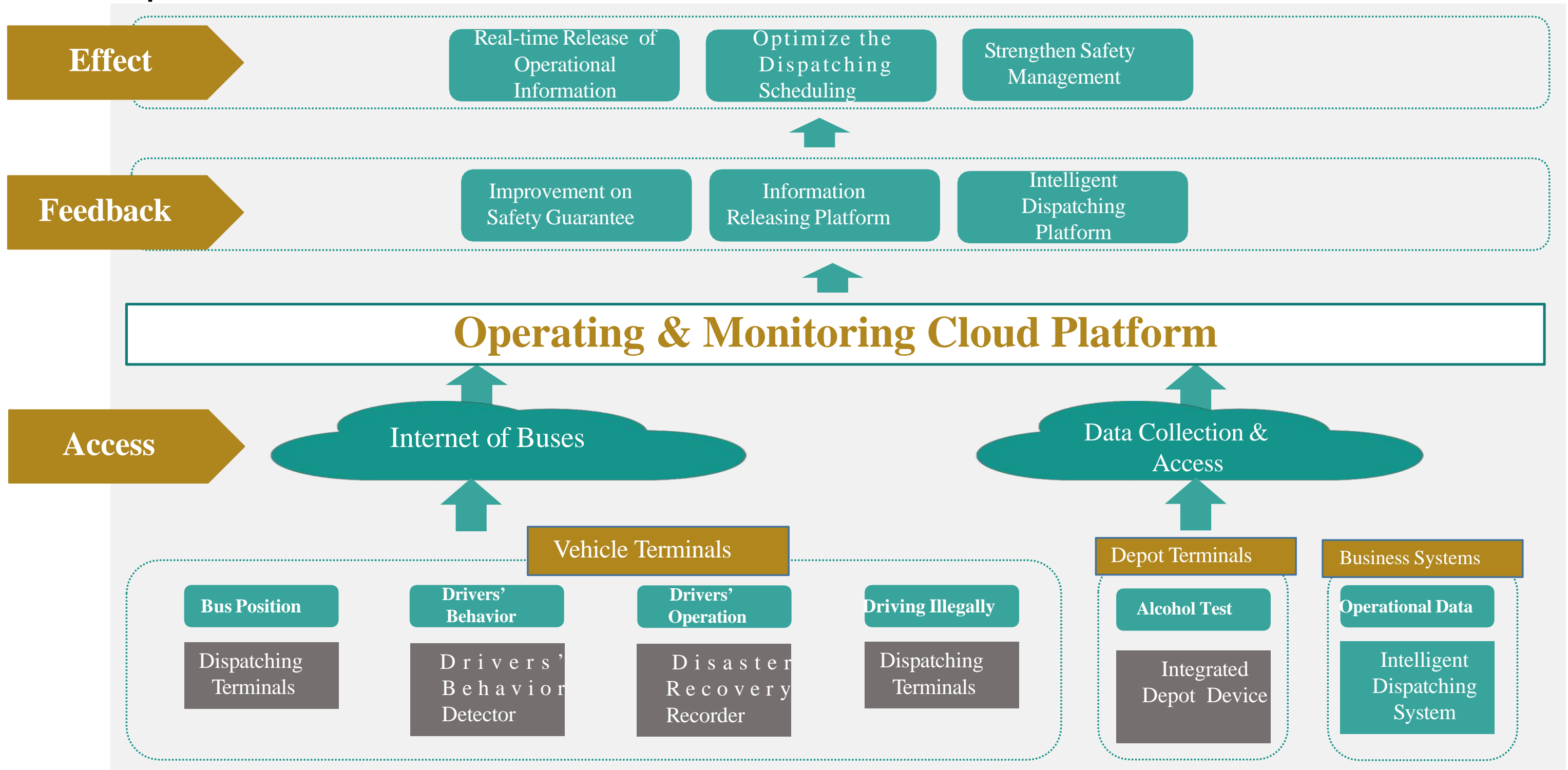


Operating & Monitoring System:

Composition



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Operating & Monitoring System:

Real-time monitoring to ensure the safety of people and vehicles, as well as monitor operational data



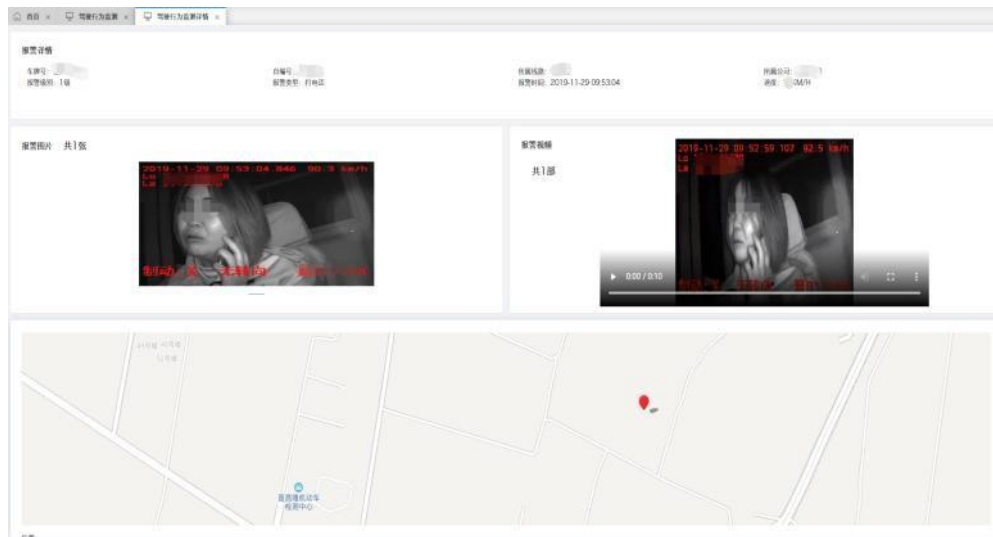
Vehicle Monitoring

机构	线路	员工姓名	检测时间	检测地点	检测时间	检测时间	检测时间	检测时间	检测时间	检测时间
公交三公司	003路	李国强	2019-05-13 06:17:55		2019-05-13 06:18:05	正常	0	正常	正常	正常
公交二公司	009路	张	2019-05-13 06:15:26		2019-05-13 06:17:40	正常	0	正常	正常	正常
公交三公司	003路	李	2019-05-13 06:17:26		2019-05-13 06:17:41	正常	0	正常	正常	正常
公交三公司	003路	李	2019-05-13 06:15:05		2019-05-13 06:17:24	正常	0	正常	正常	正常
公交三公司	003路	刘	2019-05-13 06:21:50		2019-05-13 06:17:23	异常	12	异常	异常	异常

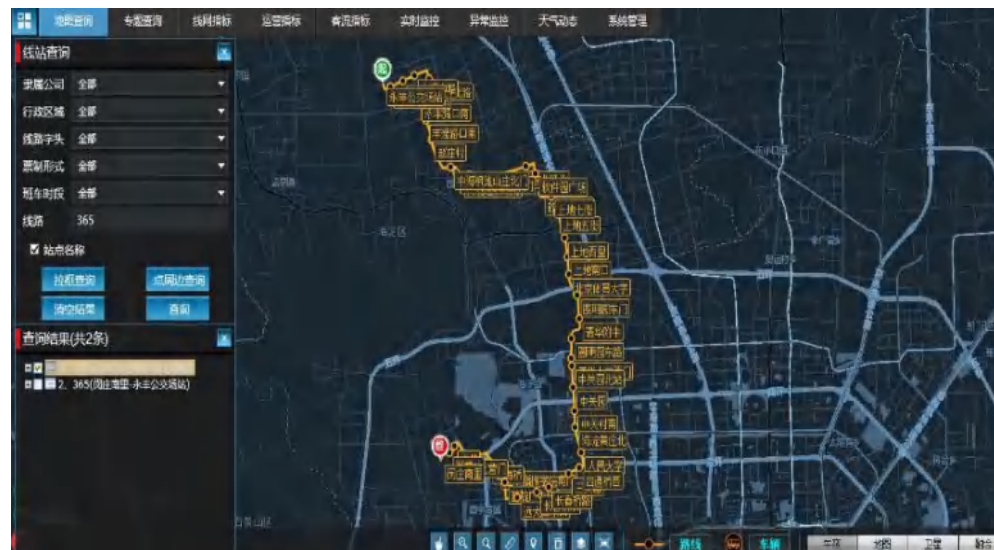
Alcohol Test



Operational Index Monitoring



Drivers' Behavior Monitoring



Operating Monitoring



Passenger flow Monitoring

Operating & Monitoring System: Terminals



Passenger flow statistics analyzer, 360 panoramic viewer, integrated driving behavior detector, DVR, vehicle disaster recovery data recorder, and integrated depot device.



Passenger Flow Statistics Analyzer

Video capture, passenger flow statistical analysis, passenger flow data transmission



360 Panoramic Viewer

360 panorama seamless stitching, automatic screen switching



Integrated Driving Behavior Detector

Early warning of dangerous driving behavior, and early warning of dangerous road environment



DVR

Analog + HD input, multiple camera lenses



Vehicle Disaster Recovery Data Recorder

CAN data and vehicle audio and video recording of vehicle work
Fire and other disaster protection



Integrated Depot Device

Driver attendance, alcohol test

Information Releasing System:

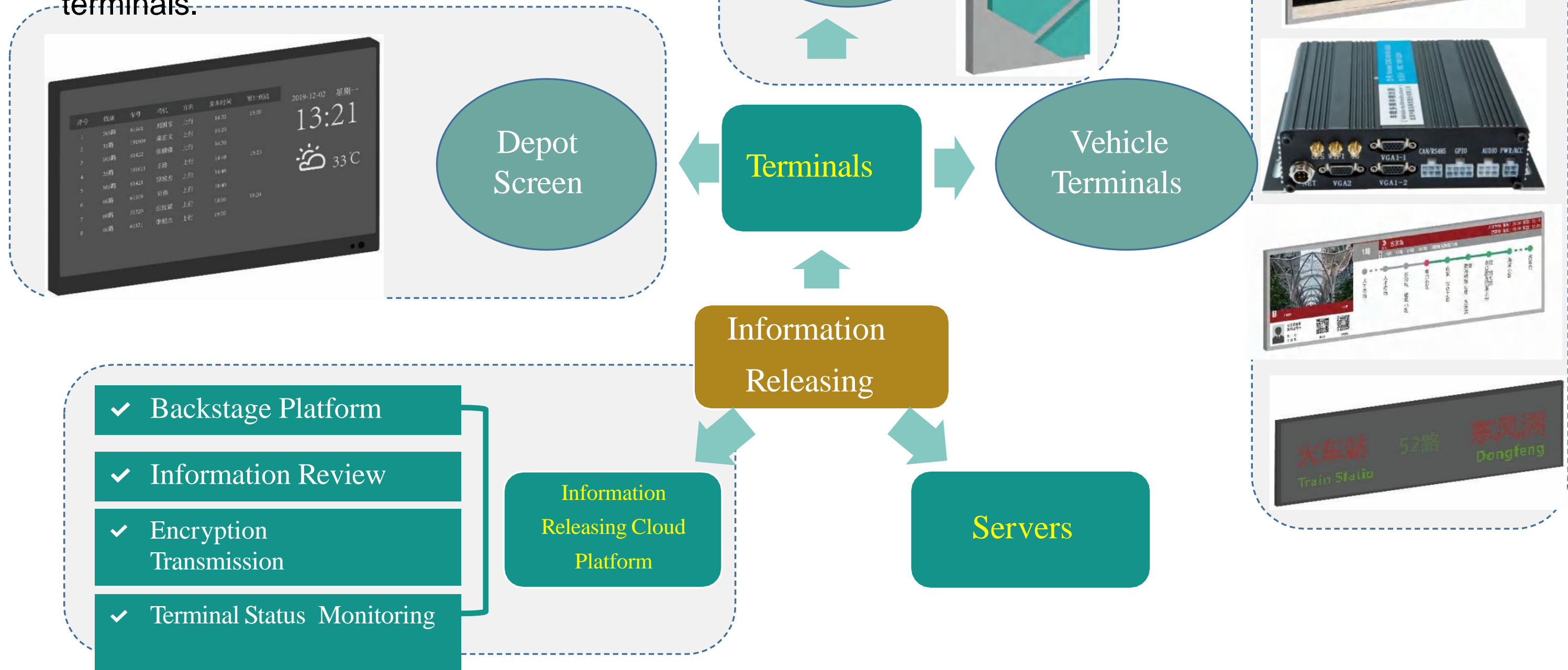
Provide accurate and real-time dispatch and travel information for bus companies and passengers





Information Releasing System

The information releasing system consists of a bus information releasing cloud platform, terminals, and a server. The terminals include depot screens, electronic stop signs, and a various of vehicle information publishing terminals.



Depot Screen

Terminals

Vehicle Terminals

Information Releasing

Servers

Information Releasing Cloud Platform

- ✓ Backstage Platform
- ✓ Information Review
- ✓ Encryption Transmission
- ✓ Terminal Status Monitoring



Information Releasing System: Scenario



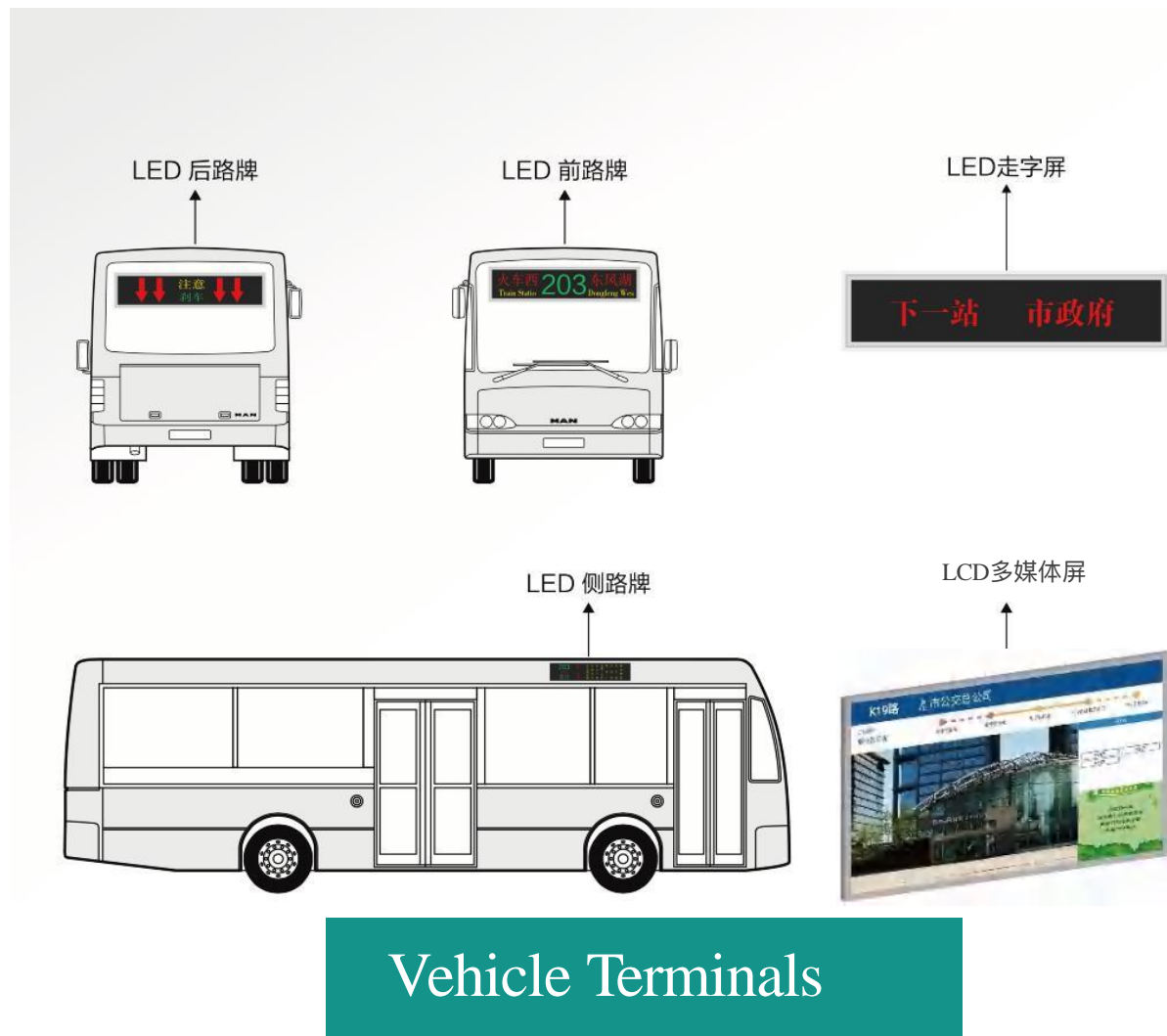
Electronic stop sign



Vehicle information publishing screen

Information Releasing System: Terminals

Vehicle terminals, electronic stop sign, and depot screen.



Electronic stop sign:

- ▶ Real-time arrival forecast;
- ▶ Instant massaging;
- ▶ Advertising;
- ▶ Intelligent video surveillance;
- ▶ Remote intercom



Depot Screen:

- ▶ Automatic update of schedule information;
- ▶ Instant information release;
- ▶ Weather and time information release

Smart Travel System

Provide passengers with a variety of Internet-based public transport services.



✓ Flexible resource dispatching to improve operational efficiency



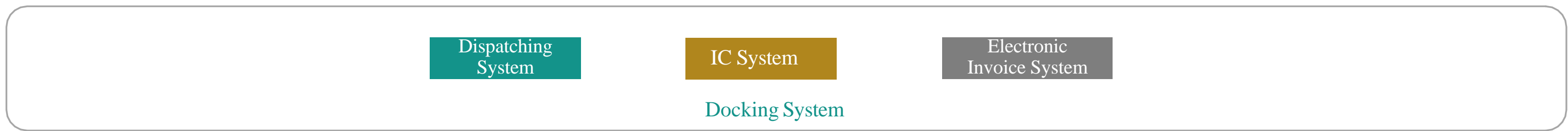
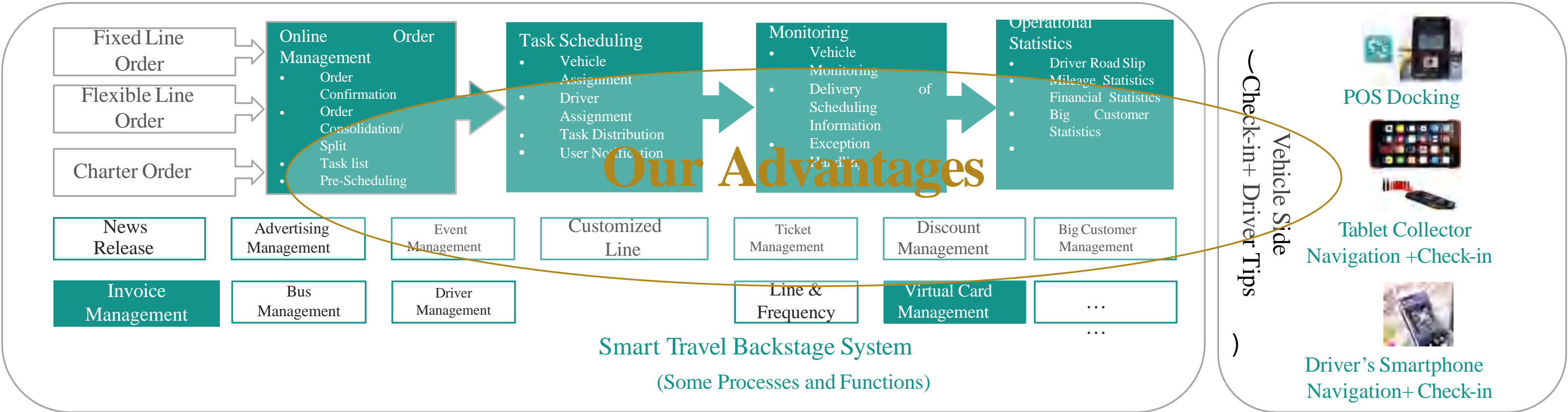
✓ Provide diversified travel services and increase bus sharing



✓ APP + Backstage, adapting to the mobile internet trend

Smart Travel System: Composition

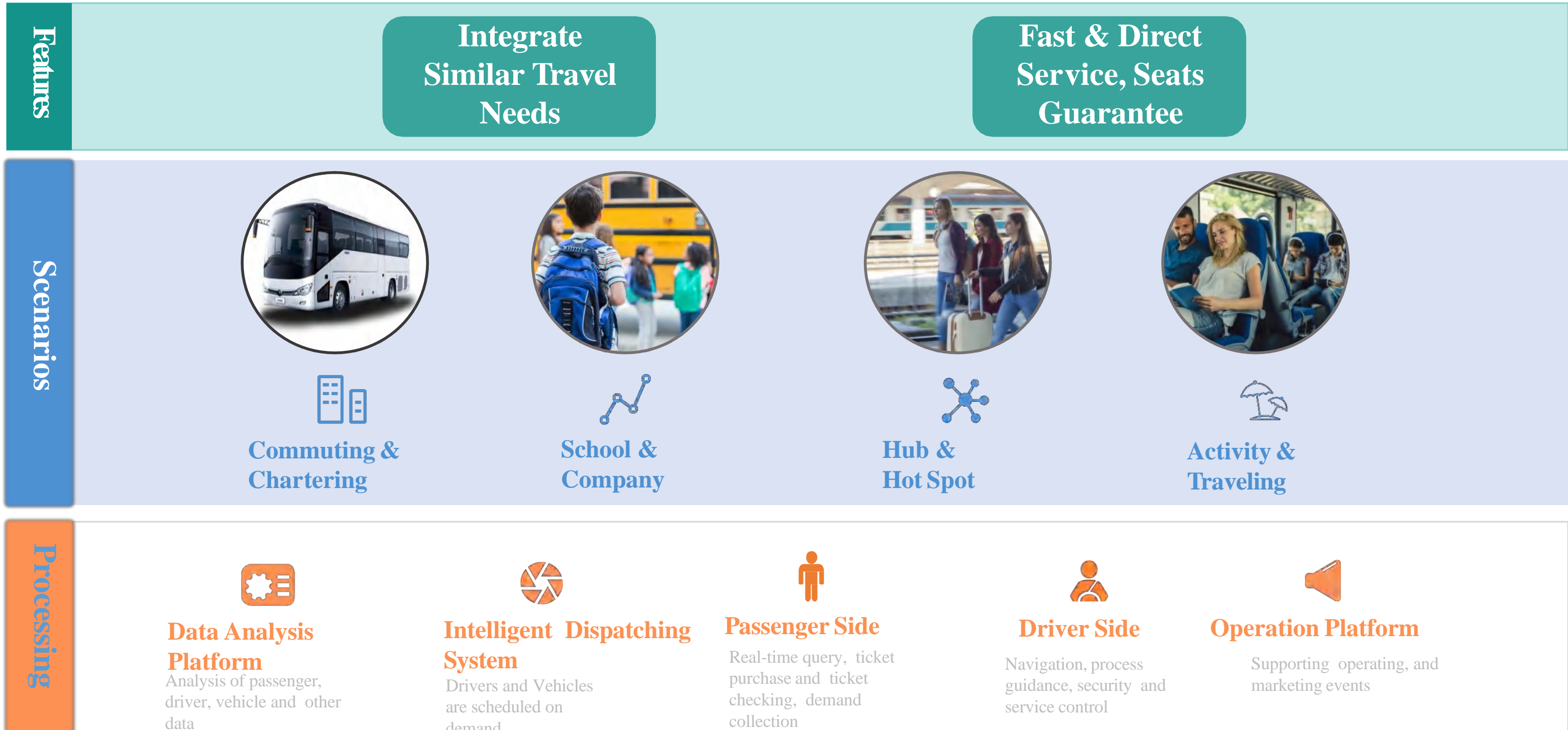
The System consists of backstage management system docking with other systems, as well as passenger side and vehicle side.





Smart Travel System: Customized bus

Adapting to various types of group travel scenarios, integrating similar travel needs, thus providing passengers with comfortable and fast “O to D” bus services .



Smart Travel System: Real-time bus service



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By retrieving dispatching data, the system provides real-time bus arrival information.

Passenger Needs

Poor information

Wait Blindly

Functions

Retrieve Dispatching Data

APP Display



Real-time Info

✓ Stop, line information

✓ Transfer query

✓ Bus location

✓ Estimated arrival time

✓ Arrival reminder

✓ Bus rating

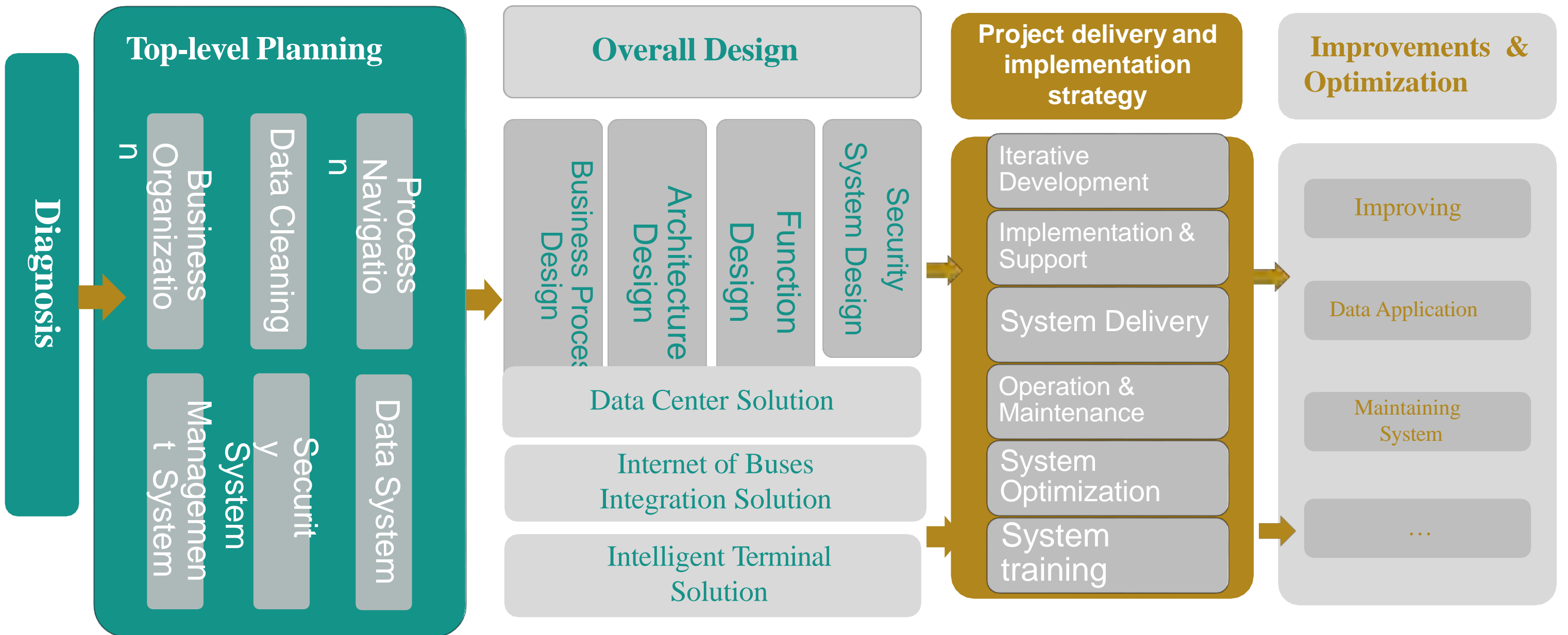
✓ Announcement

4

Implementation Strategy

Implementation Strategy, Implementation List

Implementation Strategy: Methodology



Implementation List



Subsystem	Genre	Name	Quantity
Intelligent Dispatching System	Software	Intelligent Dispatching Cloud Platform	1
	Hardware	Vehicle Terminals(Dispatching Host, Driver Screen, etc.)	To be confirmed
Operating & Monitoring System	Software	Operating & Monitoring Cloud Platform	1
	Hardware	Passenger Flow Statistics Analyzer	To be confirmed
	Hardware	360 panoramic viewer	To be confirmed
	Hardware	Integrated Driving Behavior Detector	To be confirmed
	Hardware	DVR	To be confirmed
	Hardware	Vehicle Disaster Recovery Data Recorder	To be confirmed
	Hardware	Integrated Depot Device	To be confirmed
Information Releasing System	Software	Information Releasing Cloud Platform	1
	Hardware	Depot Screen	To be Confirmed
	Hardware	Electronic stop sign	To be Confirmed
	Hardware	Vehicle Information Publishing terminal	To be Confirmed
Smart Travel System	Software	Smart Travel APP	1
Support	Software	Internet of Buses Platform	To be Confirmed
	Hardware	VAN Router	To be Confirmed
	Hardware	Servers	To be Confirmed

5

Our Advantages

Our Advantages, Informatization Project Cases

Our Advantages



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Industry Advantages

- Focus on smart bus industry for more than 10 years
- As an advocate and practitioner, we are the first to propose Smart Bus 3.0 in the industry
- The most complete solution system

Business Advantages

- Rich in the knowledge of the industry and the business
- Rich in the experience of smart bus system development
- Industry Expert Database: Expert team from Beijing Jiaotong University, Beijing University of Technology, Tsinghua University

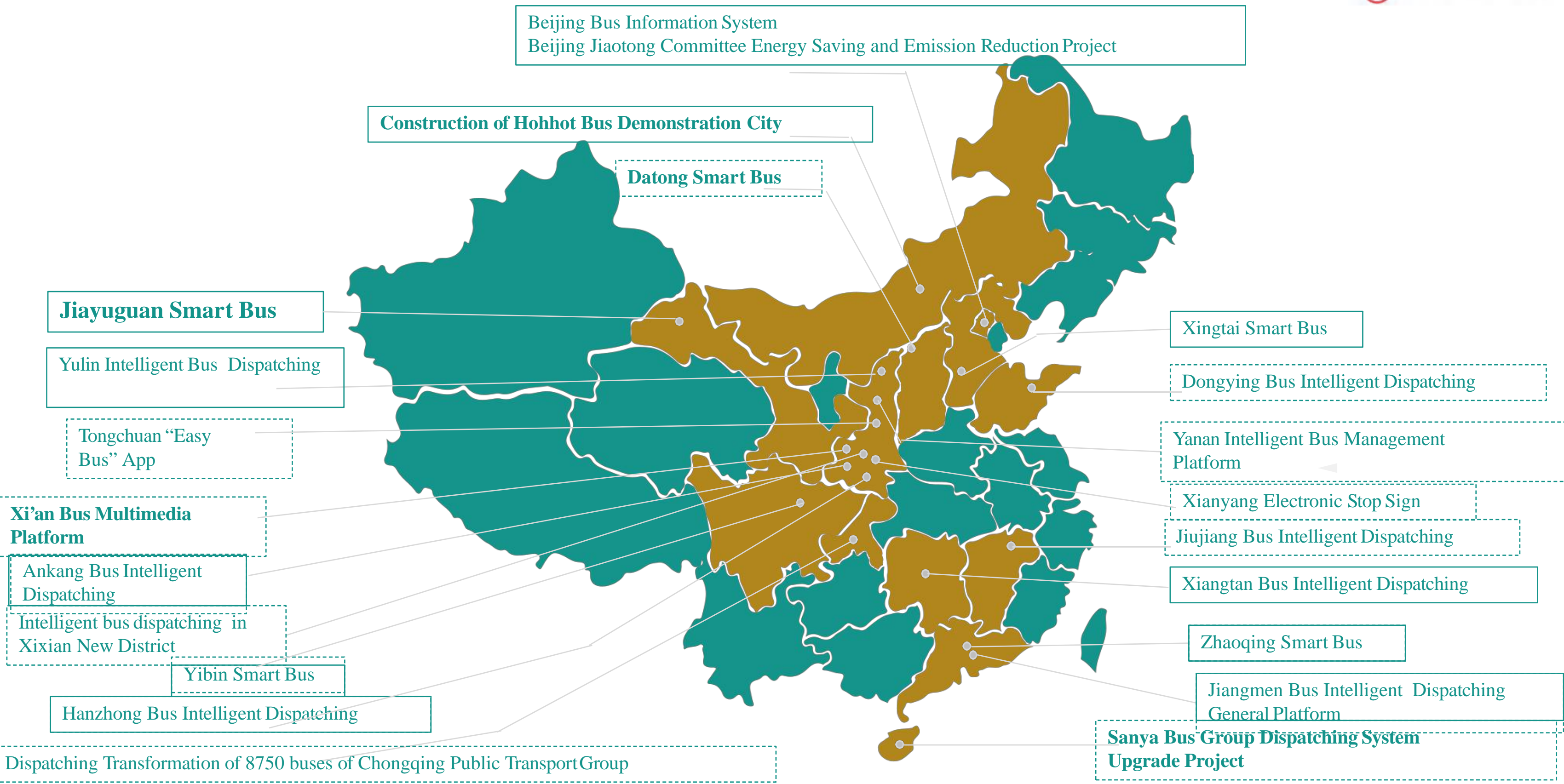
Project Experiences

- Experience and qualifications for undertaking projects with investment exceeding 100 million RMB
- Undertook the construction of intelligent systems for more than 60 bus companies of different sizes, including, Xi'an, Datong, and Xingtai
- Methodology for the development of a Smart Bus System from rich experiences
- Experience in customized services for bus companies of different sizes

Features

- Have participated in a number of key industry projects, and are able to grasp future development trends and policy directions
- Have a deep understanding of the development of smart bus systems and future development trends

Informatization Project Cases





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Power Humanity with AI