
# 南京智慧交通的探索与实践
# Smart Traffic Exploration and Practice in Nanjing

南京市发展和改革委员会 , Nanjing Development and Reform Commission
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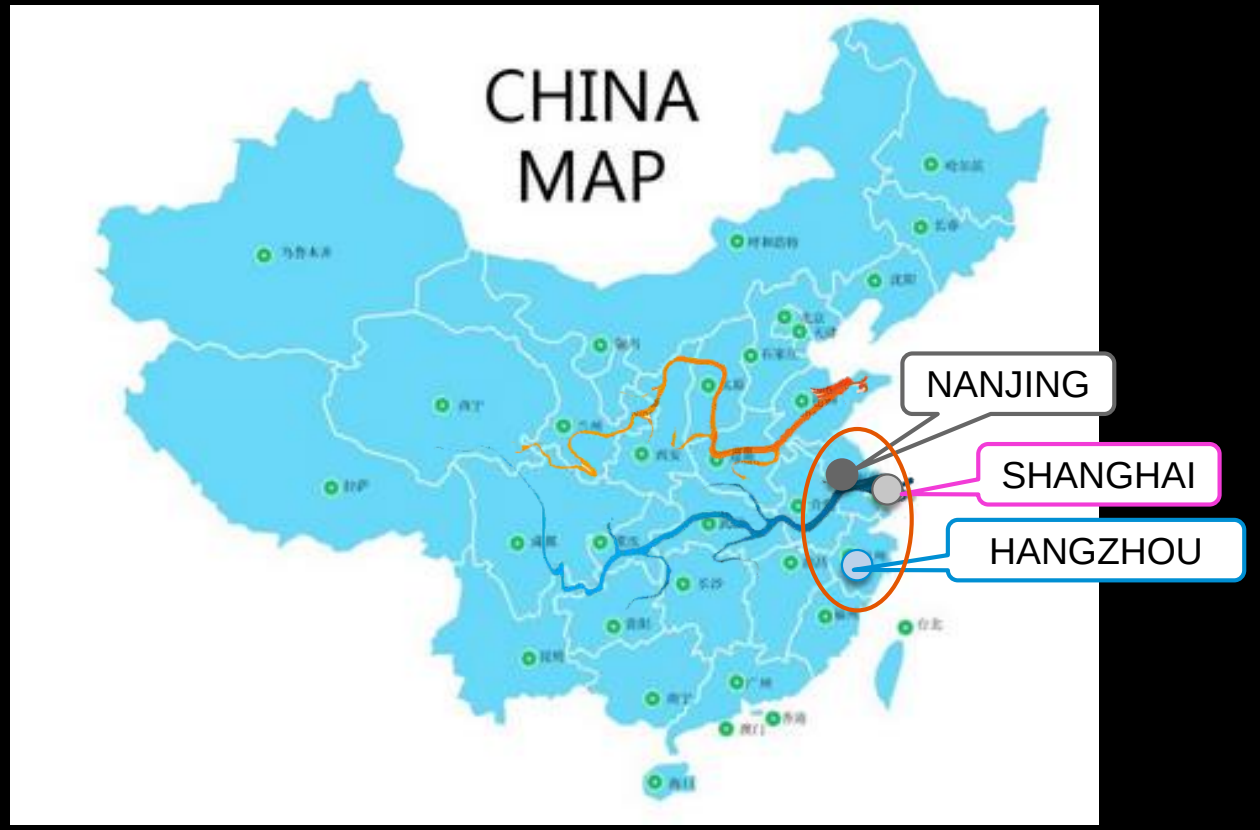
PUBLIC

SAP Run Simple

# 南京概况 – 地理位置
# Introduction to Nanjing: location

南京位于中国经济最发达的长江中下游地区，毗邻上海，杭州，人口827万，是中国东部重要的中心城市。

Nanjing is located in the eastern part of China, downstream of the Yangtze River and adjacent to Shanghai, with a population of 8.27 million. It is an important central city in eastern China.



# 南京概况 – 产业经济
# Introduction to Nanjing: industrial economy


区域经济：
地区生产总值1600亿美元，列中国第11位；
人均地区生产总值在中国大城市中排名第三;
中国区域中心城市竞争力评估第三。

Nanjing’s regional GDP reached US$160 billion in 2016 and ranked 11th in China.


特色产业：
南京软件产业发达，有软企1600多家;
软件业务收入超500亿美元，居中国第四；
离岸服务外包70亿美元，居中国城市之首。

With more than 1,600 software companies, and a software business income of 350 billion RMB in 2016, Nanjing ranks fourth in China.

# 南京概况 – 国际合作
# Introduction to Nanjing: international cooperation


近100家世界500强企业在南京设立了分公司或研发机构

Nearly 100 Fortune 500 companies have set up branches or R&D institutions in Nanjing.

# 南京概况 – 交通枢纽
# Introduction to Nanjing: transportation hub

高速公路网密度位
居中国第一

Highway network density ranked No.1 in the country


南京南站是亚洲
最大高铁站

Asia's largest high-speed rail station


禄口国际机场,
150条国内国际航线

Nanjing Lukou International Airport, with over 150 flight routes

南京港是亚洲
最大港口之一

Nanjing Port, one of the largest ports in Asia

# 南京概况 – 绿色之都
# Introduction to Nanjing: green city

梧桐掩映

Trees

山水城林融为一体,江河湖泉相得益彰

Mountain and river integrated with the city

# 南京概况 – 发展目标
# Introduction to Nanjing: development goal

# 数据汇聚整合
# Data convergence and integration

## 实施汇聚整合，奠定信息资源基础优势

Convergence and integration create the foundation for exploiting information resources.

## 南京市民卡

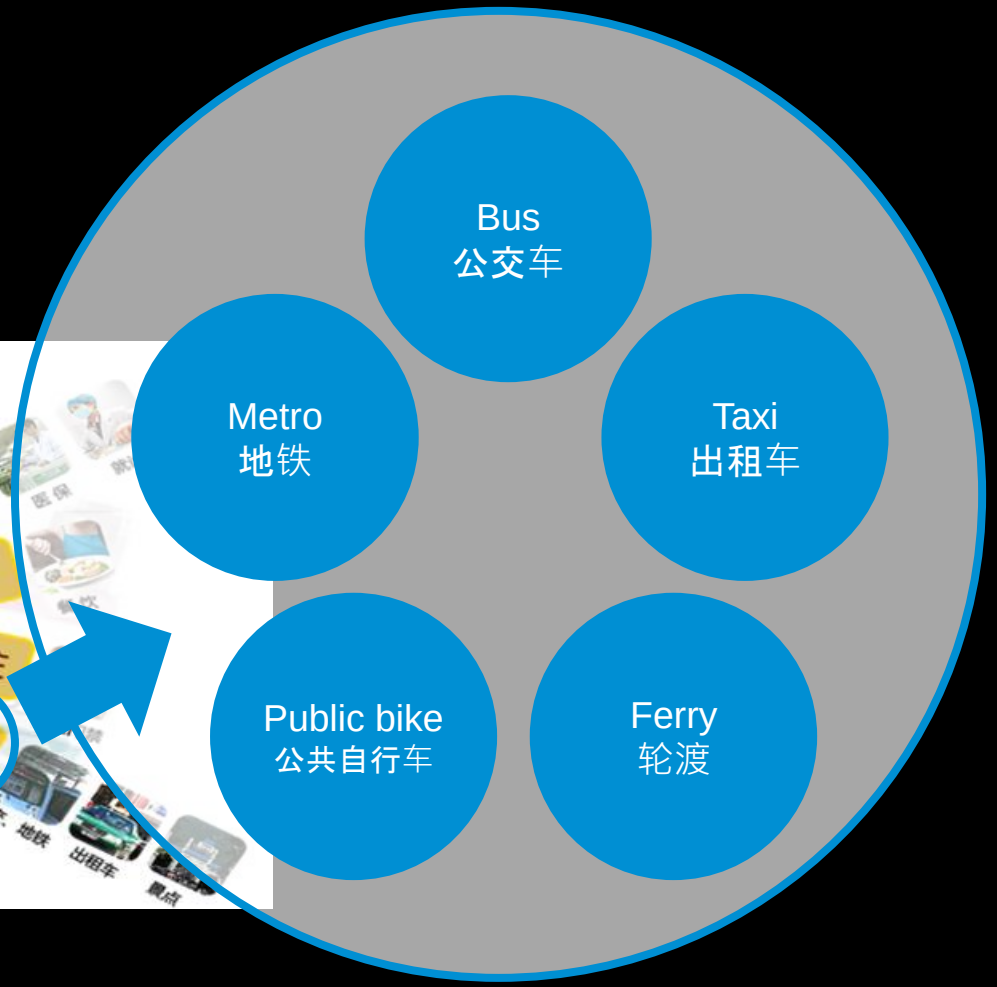
*Nanjing citizen card*

### 1. 多卡合一，一卡多用

Combine multiple cards into one; one card can be used in multiple scenarios.

### 2. 居民全覆盖

Cover all citizens

# 数据汇聚整合
# Data convergence and integration

## 实施汇聚整合，奠定信息资源基础优势

Convergence and integration create the foundation for exploiting information resources.

### 南京车辆智能卡

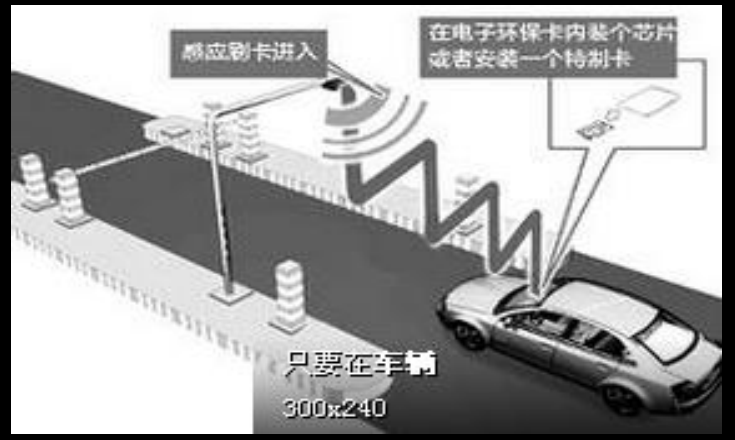
Nanjing vehicle smart card

1. 基站600余座，道路全覆盖

Combine multiple cards into one; one card can be used in multiple scenarios. More than 600 video camera stations cover all roads.

2. 发卡量190余万张，车辆全覆盖

1.9 million cards issued, which cover all vehicles.


# 数据汇聚整合
# Data convergence and integration

## 实施汇聚整合，奠定信息资源基础优势

Convergence and integration create the foundation for exploiting information resources.

### “我的南京”手机应用

“My Nanjing” mobile application

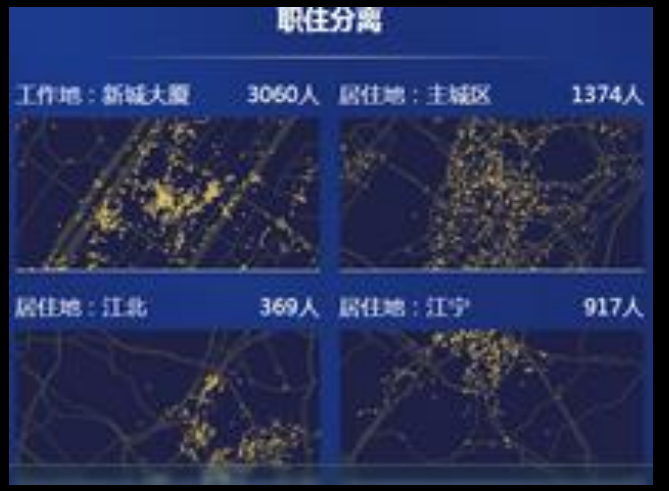
1. 实名用户200万

Over 2 million individual users

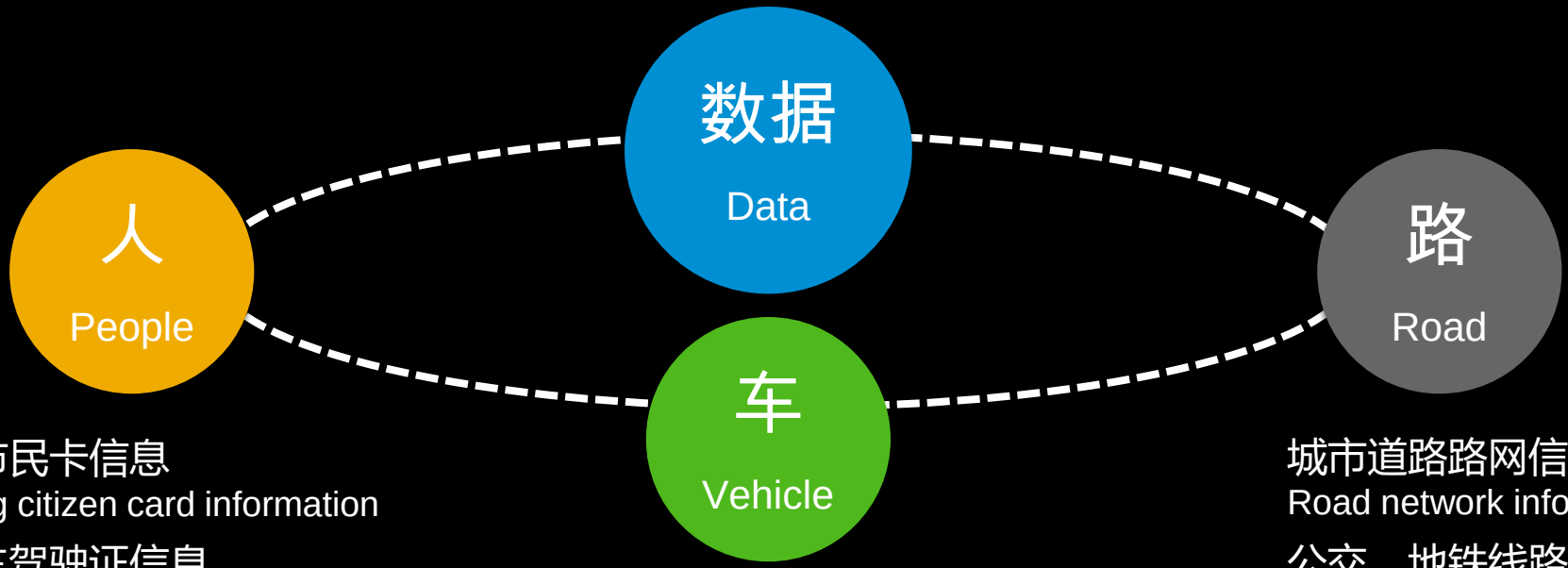
2. 归集海量交通行为信息

Gather tremendous amounts of traffic behavior data





# 实现主要交通类信息资源大汇聚
# Traffic data convergence and integration




南京市民卡信息
Nanjing citizen card information

机动车驾驶证信息
Vehicle driver's license information

机动车车主信息
Vehicle owner information

公交刷卡 220万记录/天
Bus card: 2.2 million records/day

地铁刷卡 100万记录/天
Metro card: 1 million records/day

320基站过车 1000万记录/天
Video camera station data: 10 million records/day

出租车GPS 5000万记录/天
Taxi GPS data: 50 million records/day

公交车GPS 5000万记录/天
Bus GPS data: 50 million records/day

车辆牌号信息 200万记录等
Vehicle plate number data: 2 million records

城市道路路网信息
Road network information

公交、地铁线路、站点信息
Bus/metro route and station information

公共自行车站点、320基站位置信息等
Public bike station, video camera station information

# 着力数据服务，提升行业应用服务水平
# Focus on data service, enhance the level of application services


## 缓解拥堵
## 路况监测服务

Reduce congestion: traffic monitoring service

功能1：路段及其关联路段实时状况

Functionality 1: Road network traffic status

功能2：路段指标实时统计

Functionality 2: Real-time traffic KPI

成效：实时的拥堵分析

Achievement: Real-time congestion analysis

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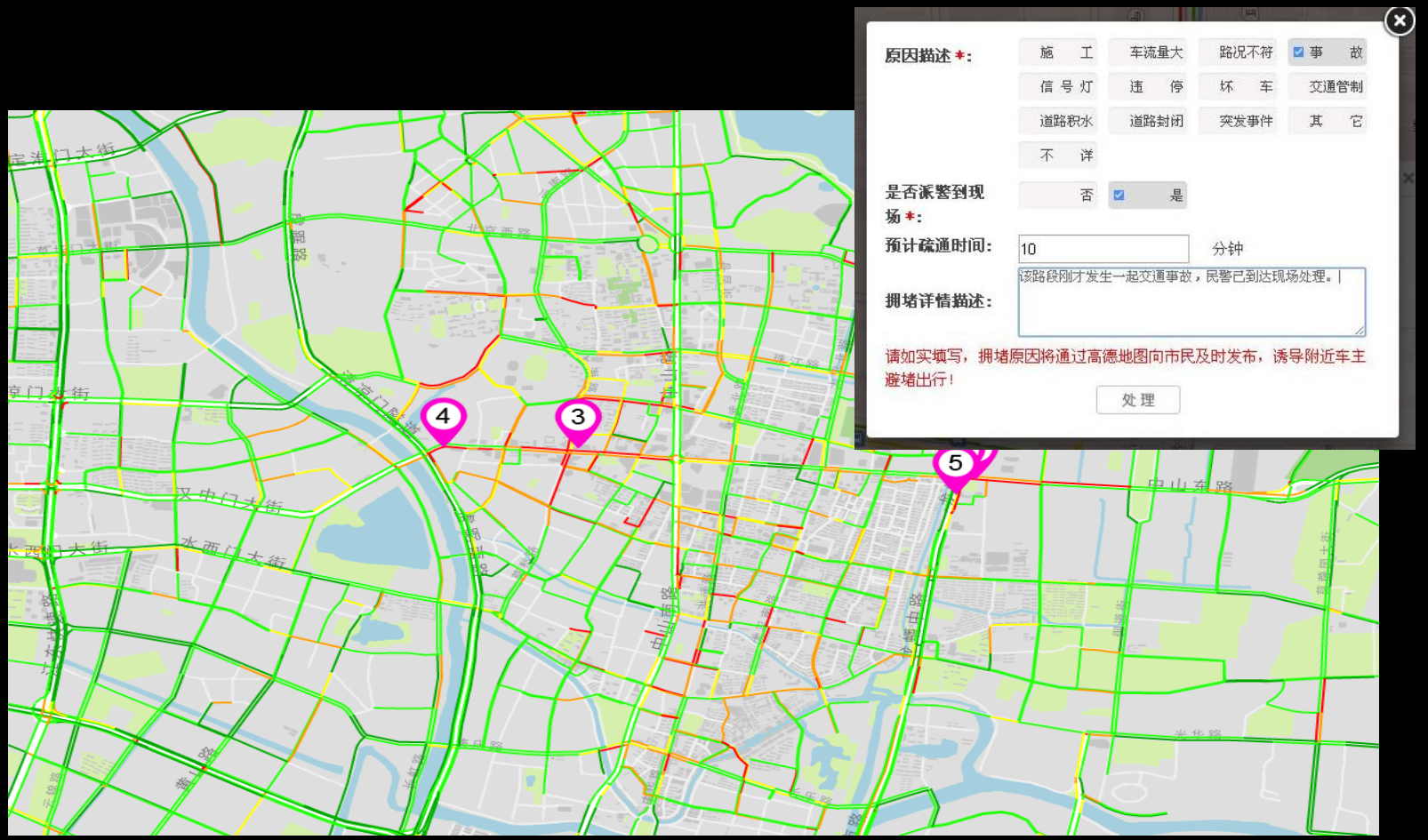


## 缓解拥堵
## 拥堵监测处置服务

Reduce congestion: traffic monitoring service

功能：异常识别、即席调度、成因反馈

Functionality: Abnormal identification, real-time scheduling, root-cause feedback

成效：异常拥堵到场 < 10 分钟

Achievement: Arrival on-site despite abnormal congestion in less than 10 minutes

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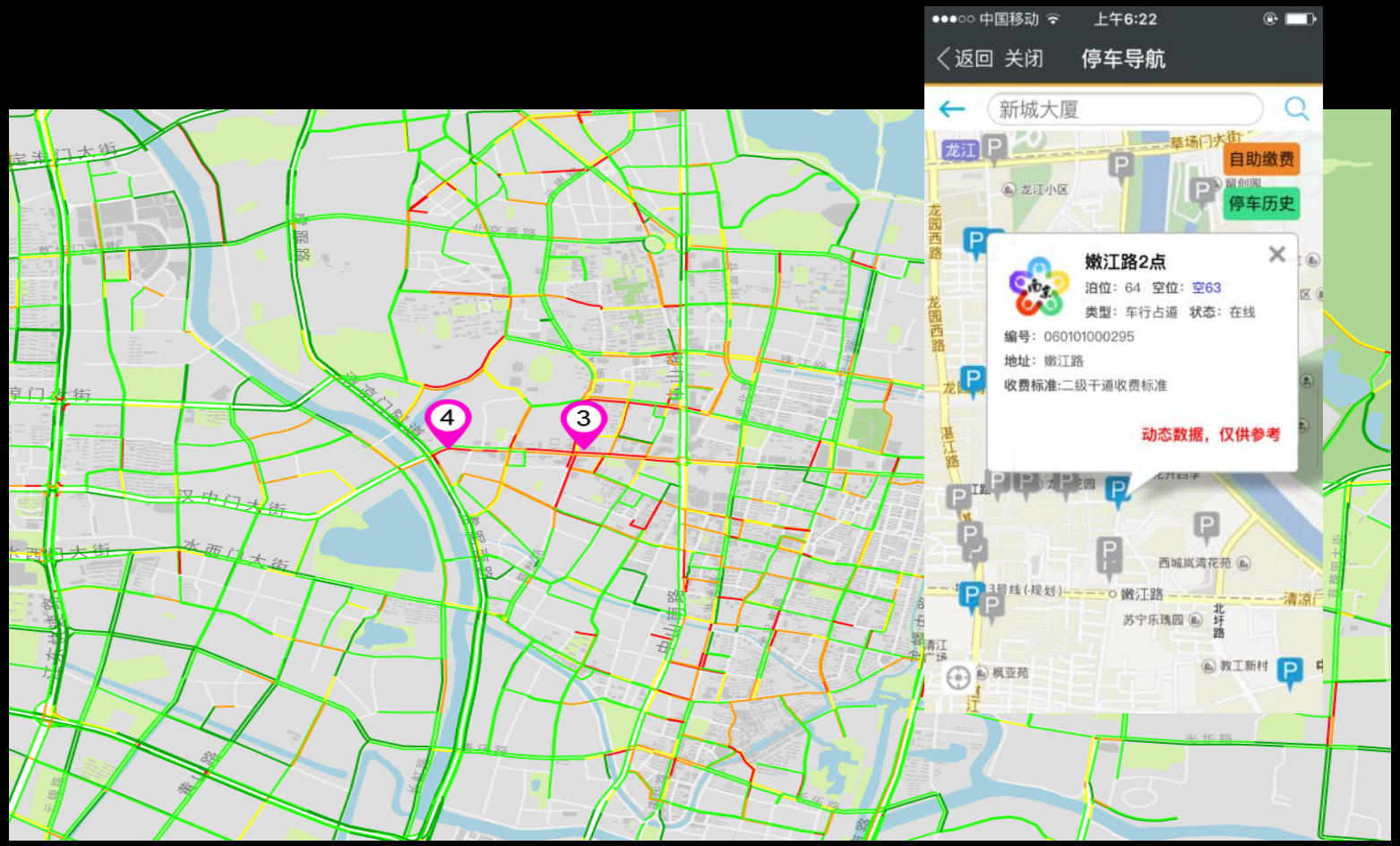


## 缓解拥堵
## 停车场实时空位服务

Reduce congestion: parking lot vacancy service

功能：提供停车场位置、实时车位等信息

Functionality: Provide location and real-time vacancy of parking lot information

成效：有效缓解停车难

Achievement: Effectively resolve the difficulty of car parking

# 着力数据服务，提升行业应用服务水平
# Focus on data service, enhance the level of application services

## 公交优先 - 强化公共交通基础设施建设

**Prioritize public transportation (PT)** Enhance PT infrastructure construction

**已开通线路7条地铁线，营运里程258公里（中国第4，世界第12）**

Seven metro lines running in Nanjing, which cover 258 kilometers (ranked 4th in China and 12th worldwide)


**公交专用道：300公里**

300 kilometers of dedicated bus lanes

**公共自行车2000多个站点，6万余辆**

More than 2,000 public bike stations and over 60,000 bicycles in place


**新能源公交车2017年末预计占比80%**

New energy buses are expected to account for 80% by the end of 2017.

# 着力数据服务，提升行业应用服务水平
# Focus on data service, enhance the level of application services

## 公交优先

## 公交运行监测

**Prioritize public transportation (PT)**

PT service monitoring system



**功能**：实时掌握公交车当前位置、运行速度及站点上车人数等**信息**

Functionality: Know the real-time location of the buses, the speed of the bus, and the number of passengers who get on the bus at each station.

**成效**：优化**班次**调度

Achievement: Optimize bus scheduling

# 着力数据服务，提升行业应用服务水平
# Focus on data service, enhance the level of application services

## 公交优先

公交信号优先

**Prioritize public transportation (PT)**

Prioritize traffic lights for PT


功能：依托信号灯联网与北斗定位技术，实现公交信号优先

Functionality: By connecting all the traffic lights, Nanjing has started the implementation of prioritizing traffic lights for buses.

成效：交叉口停车时间平均减少15%

Achievement: Reduce 15% of waiting time in crossings

# 着力数据服务，提升行业应用服务水平
# Focus on data service, enhance the level of application services

## 公交优先

公交线网运行评价

**Prioritize public transportation (PT)**

PT service performance evaluation

驾车路况
Taxi speed

**Versus**

**公交路况**
Bus speed

**功能**：对比公交路况与驾车**路况**
Functionality: Compare taxi speed with bus speed

**成效**：评估公交都市建设成果，为公交专用道设置提供科学依据
Achievement: Provide data support to see if the setup of the dedicated bus lane is effective

# 数据汇聚整合
# Data convergence and integration

## 我的南京APP “资源整合、统一门户、惠民便民”

“My Nanjing” mobile app “Integrated Resource, Unified Platform, Benefit Citizens”



实名用户200万

Over 2 million individual users

**涵盖交通、健康、文化、政务、公益、财富等领域**

Provide over 100 services including traffic, health, culture, public service, and welfare

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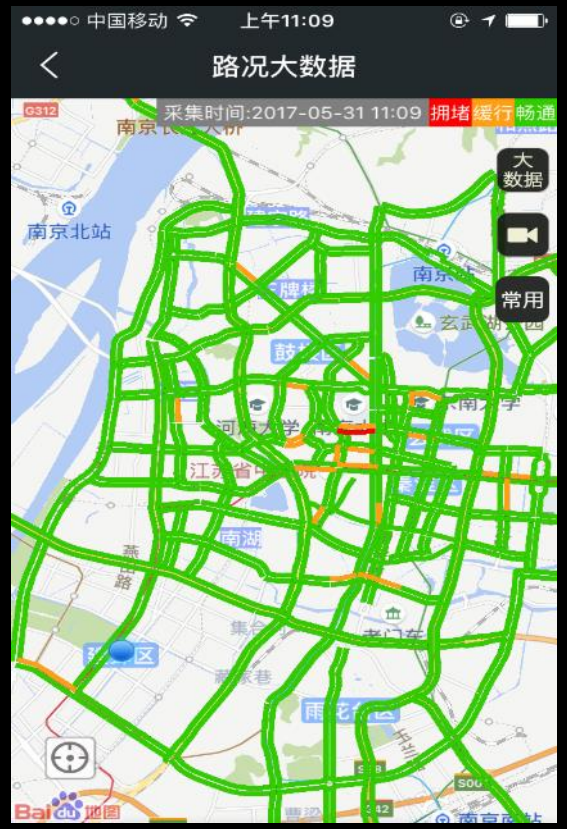



**路况大数据**：提供精确到分钟的实时路况，**支持**视频查看，**便于市民**规划出行。

**Traffic condition**: Provide the real-time traffic condition, which updates every minute. In addition, the citizens can see live feeds from video camera stations along the city's main roads to check the real-time traffic flow in order to plan travel more conveniently and intelligently.

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**公共自行车服务**：可定位和查询公共自行车的可借还情况，还可扫码免卡借车，促进绿色出行。

**Public bike service** tells citizens the location and availability of public bikes. It also provides a barcode scan feature that allows citizens to use the bikes for free. All of this encourages citizens to travel in a “greener” manner.

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**公交出行服务**：可查询路线、站点，并提供实时到站距离、预计时间等信息服务。此外，支持车内乘客共享发布车内拥挤度等信息。

Bus services let the citizens query the nearby sites, select the appropriate bus routes, and check the bus distance and arrival time. In addition, we’ve added the Internet+ flavor to let the passengers share the crowd level in a certain bus.

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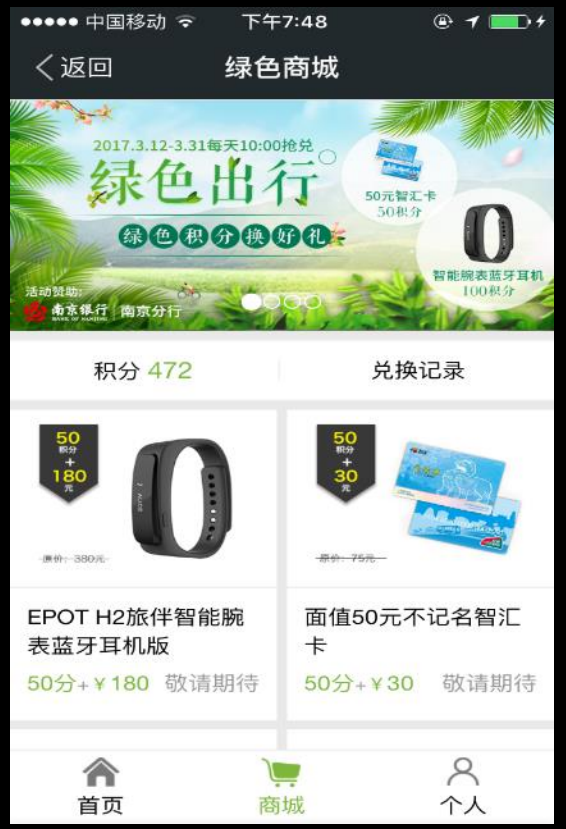



**绿色出行积分服务**：整合了公交、地铁、公共自行车**等乘客刷卡数据，乘用者可据相关行**为申领相应积分，积**分可在**电子**商城内**兑换**健身礼品或礼券。在鼓励市民更多**选择绿色低碳出**行方面**发挥引导作用。

Green travel points service: When citizens choose to travel by bus, metro, public bike, or on foot, they can accumulate green points. They can then redeem these points at the mall for fitness gifts or health services. All of this encourages the public to choose green low-carbon travel.

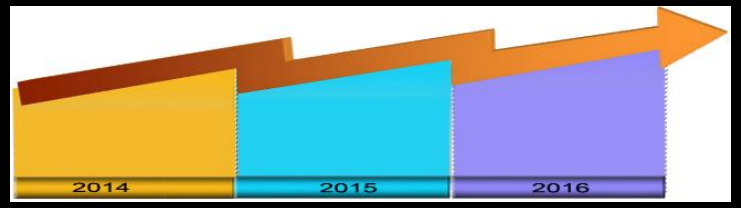
# 着力数据服务，提升行业应用服务水平
# Focus on data service, enhance the level of application services

## 使用SAP智慧交通解决方案后的成效 - 交通状况明显改观

Achievement after using the “smart traffic” solution based on SAP software: Nanjing's traffic situation has improved significantly

**交通指数**：通常低于3，城市交通状态总体良好。

Traffic performance index is lower than 3 in Nanjing, which indicates that the entire city traffic status is good.




**60%**

**公交机动化出行分担率**：逐年持续上升，2016年达60%

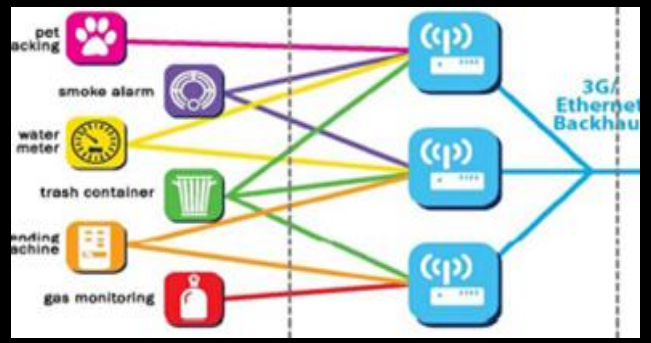
Use of Nanjing public transportation has been continuously increasing in the past three years.

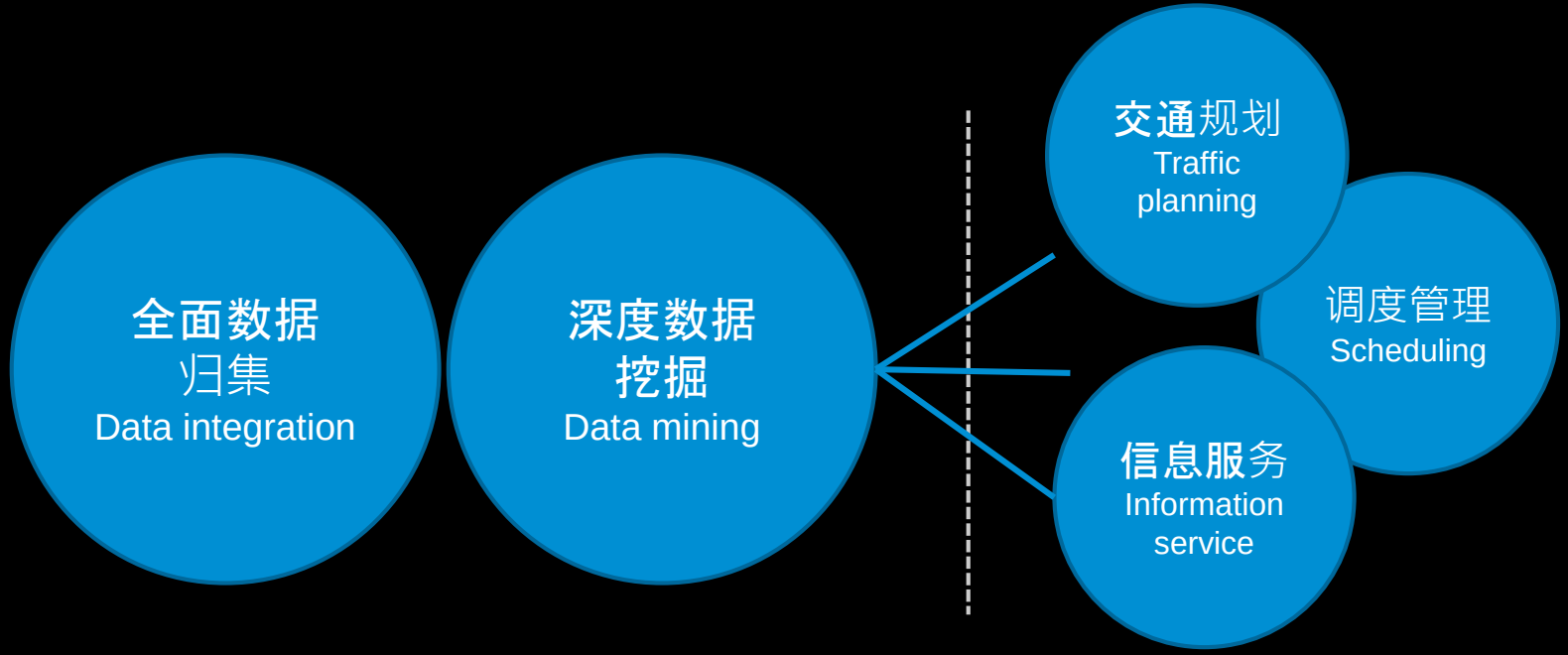
| 排名 | 城市名称 | 环比变化率 | 高峰拥堵延时指数 | 高峰平均车速 |
|---|---|---|---|---|
| 1 | 济南 | -8.9% | 2.136 | 20.18 |
| 2 | 哈尔滨 | -16.0% | 1.929 | 23.43 |
| 3 | 呼和浩特 | -11.1% | 1.910 | 23.68 |
| 4 | 北京 | -14.1% | 1.884 | 24.82 |
| 5 | 佛山 | -5.4% | 1.841 | 23.95 |
| 6 | 重庆 | -11.1% | 1.802 | 26.33 |
| 7 | 昆明 | -8.1% | 1.793 | 27.21 |
| 8 | 郑州 | -8.0% | 1.787 | 27.78 |
| 9 | 合肥 | -7.4% | 1.786 | 24.95 |
| 10 | 南宁 | -6.0% | 1.769 | 24.36 |
| 11 | 海口 | -4.6% | 1.763 | 21.92 |
| 12 | 济宁 | -4.6% | 1.758 | 25.28 |
| 13 | 淄博 | -4.5% | 1.758 | 25.48 |
| 14 | 上海 | -9.5% | 1.756 | 28.13 |
| 15 | 洛阳 | -5.8% | 1.752 | 22.29 |
| 16 | 广州 | -10.4% | 1.749 | 25.75 |
| 17 | 长沙 | -6.1% | 1.745 | 25.62 |
| 18 | 长春 | -10.7% | 1.745 | 23.16 |
| 19 | 南昌 | -6.0% | 1.738 | 24.75 |
| 20 | 南京 | -8.4% | 1.735 | 27.84 |
| 21 | 大连 | -10.1% | 1.735 | 24.79 |
| 22 | 兰州 | -2.6% | 1.734 | 23.04 |
| 23 | 唐山 | -0.7% | 1.714 | 24.69 |
| 24 | 烟台 | -5.2% | 1.712 | 27.31 |
| 25 | 青岛 | -11.3% | 1.711 | 25.79 |

**拥堵排名**：2017年1季度高德全国城市交通拥堵排名第20位。

Congestion ranking: According to the recent national traffic congestion ranking data of the first quarter of 2017, Nanjing is ranked No. 20.

# 研创智能应用，促进城市管理模式创新
# Research on smart applications and urban management innovation




**传感采集**
Sensor data collection

**大数据分析**
Big Data analysis

**智能应用**
Smart application

# 研创智能应用，促进城市管理模式创新
# Research on smart applications and urban management innovation

**交通建设规划方面**：构建基于大数据的替代传统人工抽样调查的交通规划**模型体系**，**提高**规划科学合理性。

To use Big Data to scientifically support traffic planning instead of a traditional people survey to make the planning more reasonable

| 方案一 | | | | 方案二 | | | |
|---|---|---|---|---|---|---|---|
| 征收时段 | 收费标准（元/半小时） | | | 征收时段 | 收费标准（元/半小时） | | |
| | 一类区域 | 二类区域 | 三类区域 | | 一类区域 | 二类区域 | 三类区域 |
| 工作日（7:00-21:00） | 6 | 4 | 2 | 工作日（全天） | 5 | 3 | 2 |
| 非工作日（7:00-21:00） | 3 | 2 | 1 | 非工作日（全天） | 3 | 2 | 1 |
| 平均车速测试 | 比现状上升 13% | | | | 比现状上升 12% | | |
| 碳排放测试 | 比现状下降 22% | | | 碳排放测试 | 比现状下降21.50% | | |

主城区停车收费标准评估

Parking fee evaluation

**宏观模型**：评估停车、限购、限行、拥堵收费等政策实施效果。

Macro model: assessment of parking, limit of purchase, limit of passing, congestion charges, and other policy implementation effect

# 研创智能应用，促进城市管理模式创新
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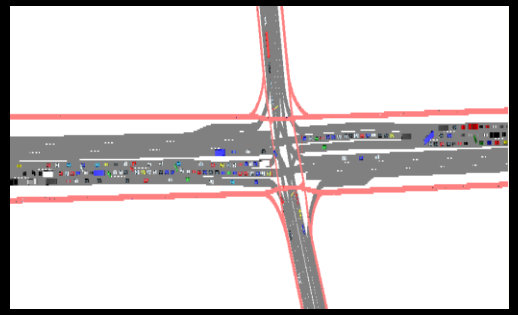

节点组织评估

Node assessment

站台设施评估

Facility assessment

噪音污染评估

Noise pollution assessment

**中观模型**：评估节点运行效率、人流密度、环境污染等，支持路、桥、轨等重大设施决策。

Moderate model: to assess the efficiency of decision making for node operation, population density, environmental pollution, support road, bridge, rail, and other major facilities

# 研创智能应用，促进城市管理模式创新
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**交通建设规划方面**：**构建基于大数据的替代**传统人工抽样调查的交通规划**模型体系**，**提高**规划科学合理性。

To use Big Data to scientifically support traffic planning instead of a traditional people survey to make the planning more reasonable

项目周边交通影响评价
*Traffic impact assessment*

枢纽项目内部人流组织仿真
*Internal flow simulation*

**微观模型**：评估项目建设区域的交通可达性、周边交通状况。

Micro-model: to simulate the project construction area of traffic accessibility and the surrounding traffic conditions

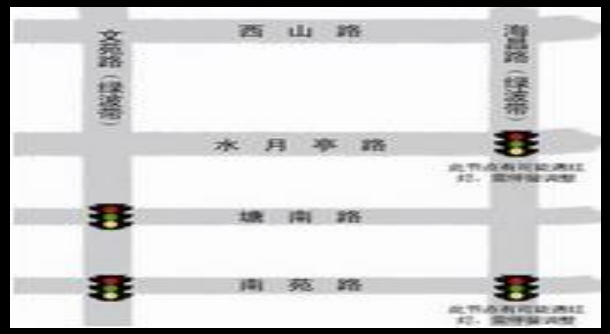
# 研创智能应用，促进城市管理模式创新
# Research on smart applications and urban management innovation

**交通调度管理方面**：**构建以精准**实时路况感知为支撑的交通信号灯自动配时系统，进一步提升道路通行效率。

To build accurate real-time traffic awareness to trigger automatic traffic signal adjustment to further improve the traffic efficiency

**精准**实时路况

Accurate real-time traffic condition




**信号灯**联网

Connected traffic light

**信号灯自**动配时

Automatic traffic signal adjustment

# 研创智能应用，促进城市管理模式创新
# Research on smart applications and urban management innovation

**交通信息服务方面**：构建基于各种出行方式（公交、地铁、公共自行车）静态、动态信息联动混搭的智能导航，为公众提供更人性化的综合出行信息服务。

To build smart navigation services based on multiple travel methods (bus, metro, and public bike) and static information (location) and dynamic information (frequency, location), to provide a more personized guide for citizens to travel smarter


Start → Walk → Bus → Metro → Train → End

# 谢谢

# Thank you.

Contact information:

**F name L name**
Title
Address
Phone number

Run Simple

南京市发展和改革委员会
Nanjing Municipal Commission of Development & Reform

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