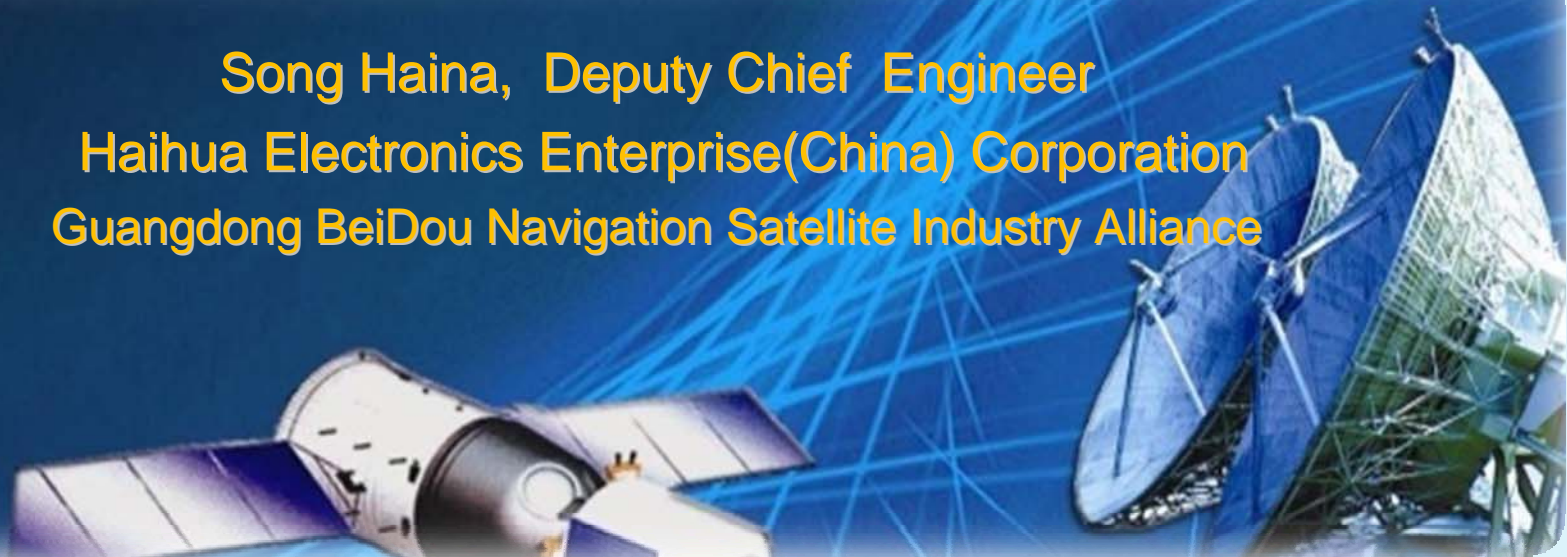




International Committee on
Global Navigation Satellite Systems

The Application of GNSS in the Management of the Government Vehicles

Song Haina, Deputy Chief Engineer
Haihua Electronics Enterprise(China) Corporation
Guangdong BeiDou Navigation Satellite Industry Alliance





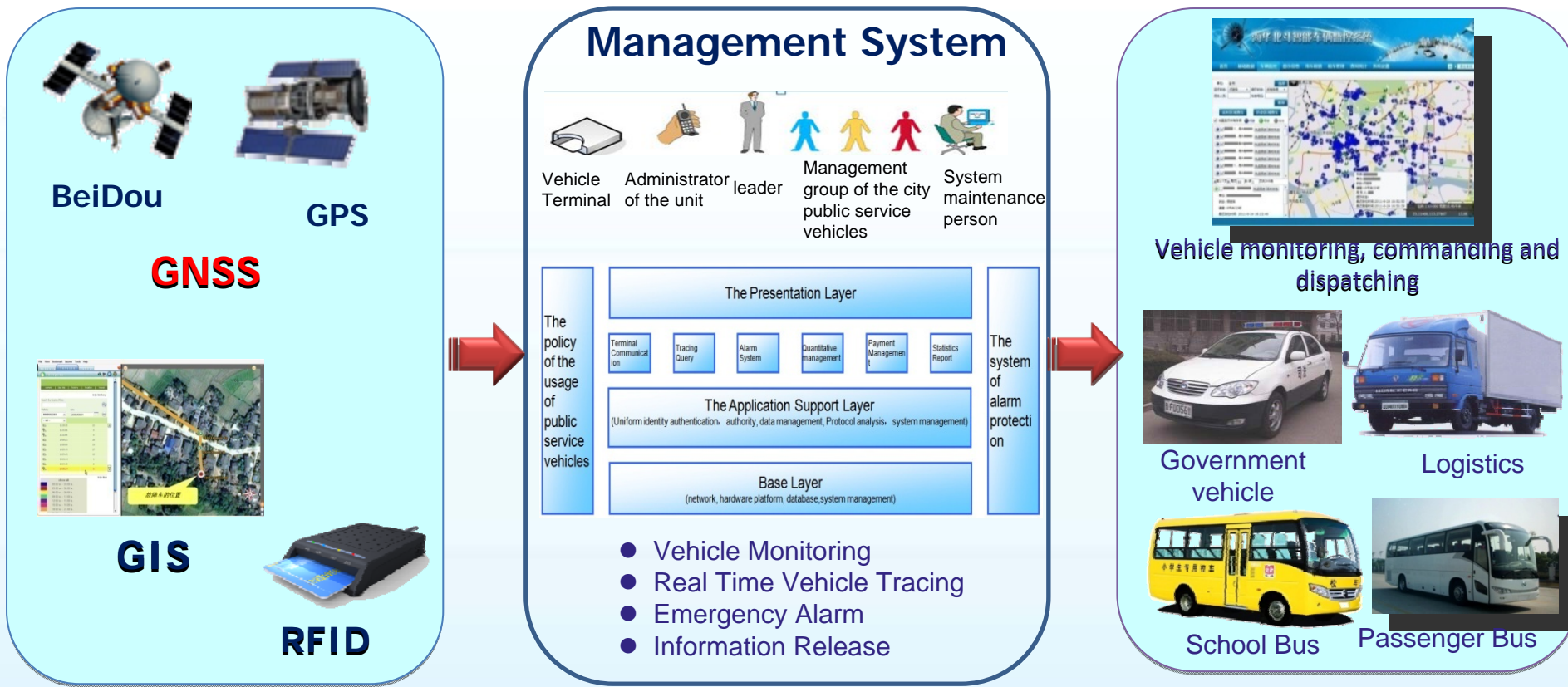
Application Background



- **Government Vehicles Management has become more and more important for the government to improve public service ability.**
- **The former management lacks effective supervision, and in urgent needs of information methods.**



Government Vehicle Management Solution based on GNSS



Wireless Communication Network



Internet



Public Wireless Network(2G/3G)



Government Vehicle Management Solution based on GNSS



广州市公务用车使用管理信息系统

欢迎登录系统: 市监控中心管理员 今天是 2011年8月24日 星期三

首页 基础数据 车辆监控 提示信息 用车核销 用车公示 租车管理 查询统计 系统设置 特定监控 退出系统

单位: 全市

运行状态: 行驶车

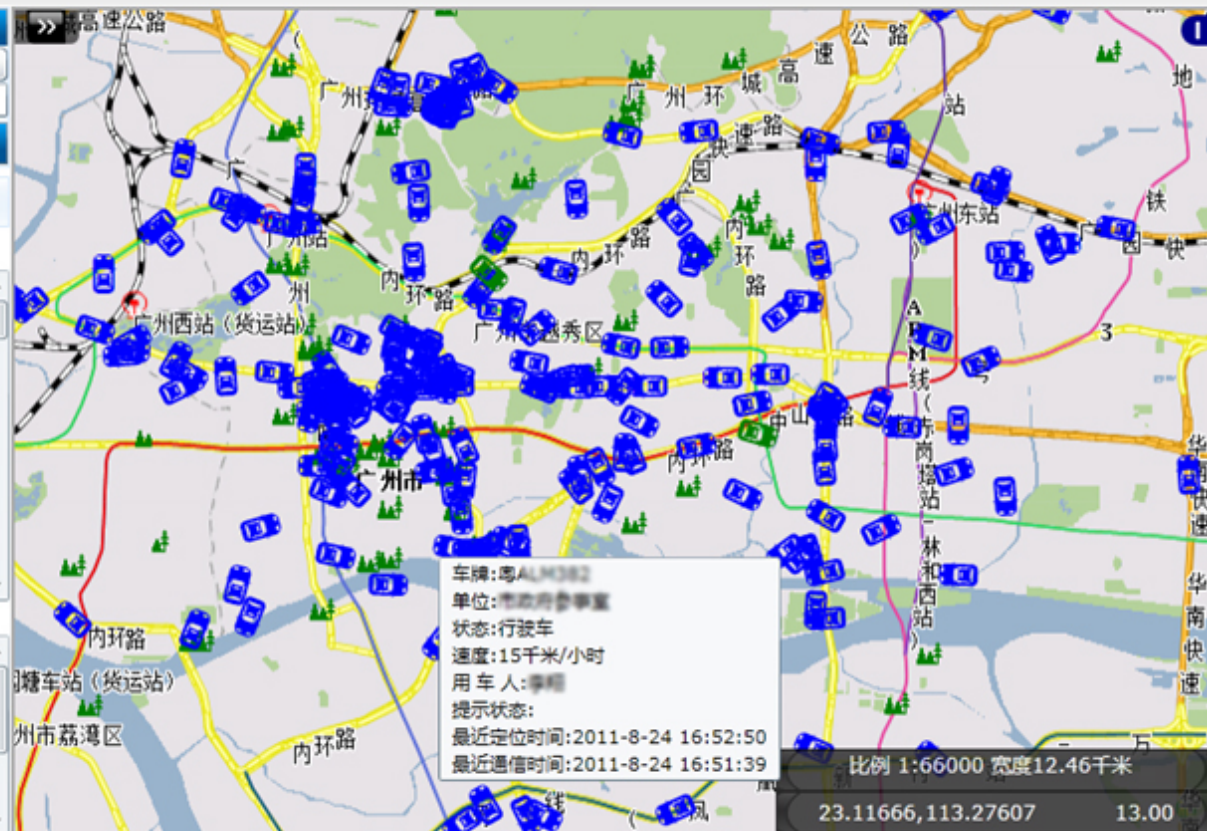
用车人员: 车牌号码:

实时区域查车 历史区域查车

- 地图显示所有车辆 行驶 停驶 离线
- 市纪委 (粤A11935)
 - 广州市委 (粤A199P5)
 - 市检察院 (粤A9038)
 - 番禺区法 (粤A00190)
 - 市政协机关 (粤A12009)
 - 市纪委 (粤A88689)
 - 市人力资 (粤A208EV)

第1/7页 每页 50 条 共 349 条

- 市对外经 (粤A11908)
- 单位: 市对外经济贸易合作局机关
 状态: 停驶车
 速度: 0千米/小时
 最近定位时间: 2011-8-24 16:22:46



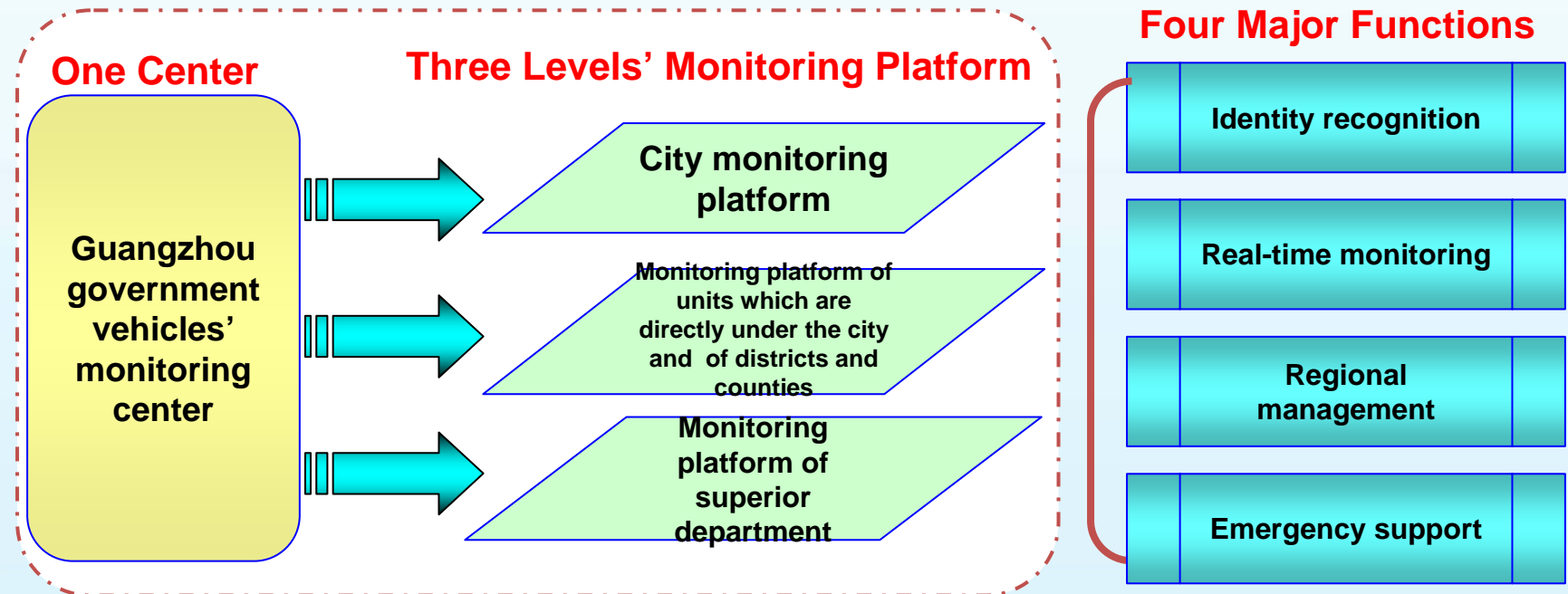


Government Vehicle Management Solution based on GNSS



The management information system of Guangzhou government vehicles

- Base on combined **BeiDou/GPS** navigation
- Monitoring the vehicle's route、 parking places , avoiding uneconomic running , clamping down illegal government vehicle usage



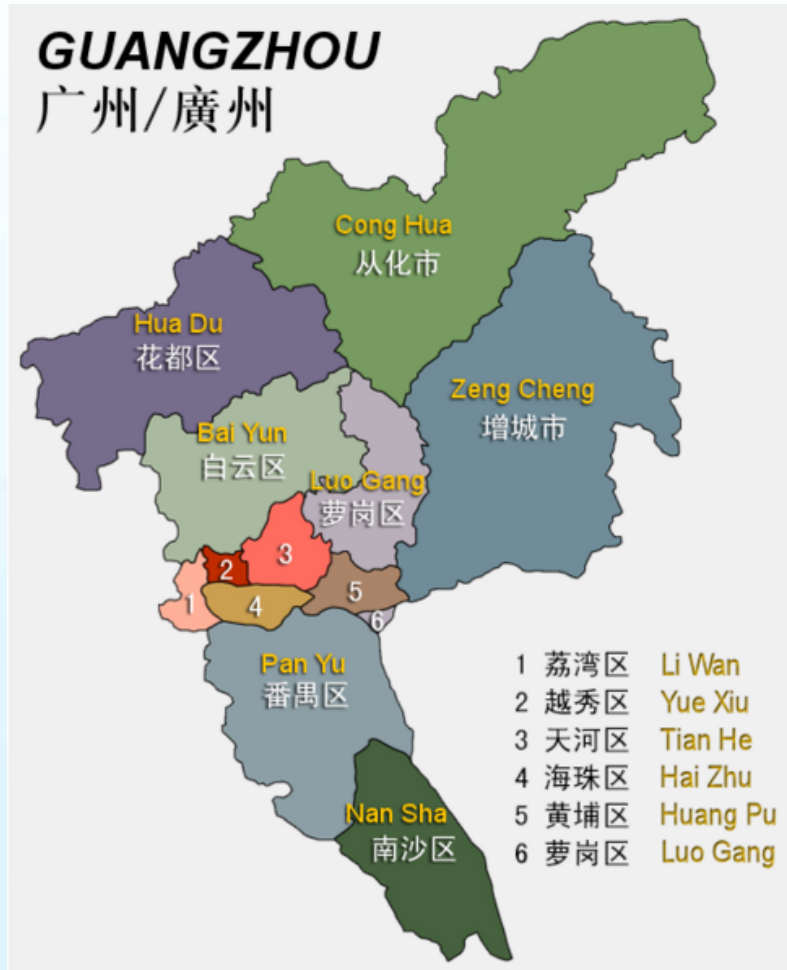


Government Vehicle Management Solution based on GNSS



The management information system of Guangzhou government vehicles

Monitor Objective	Guangzhou government vehicles
Driving Area	Ten districts, two cities, and a few other regions
GNSS Application Mode	Positioning Velocity Measurement
Positioning Mode (could be set)	BeiDou+GPS BeiDou GPS

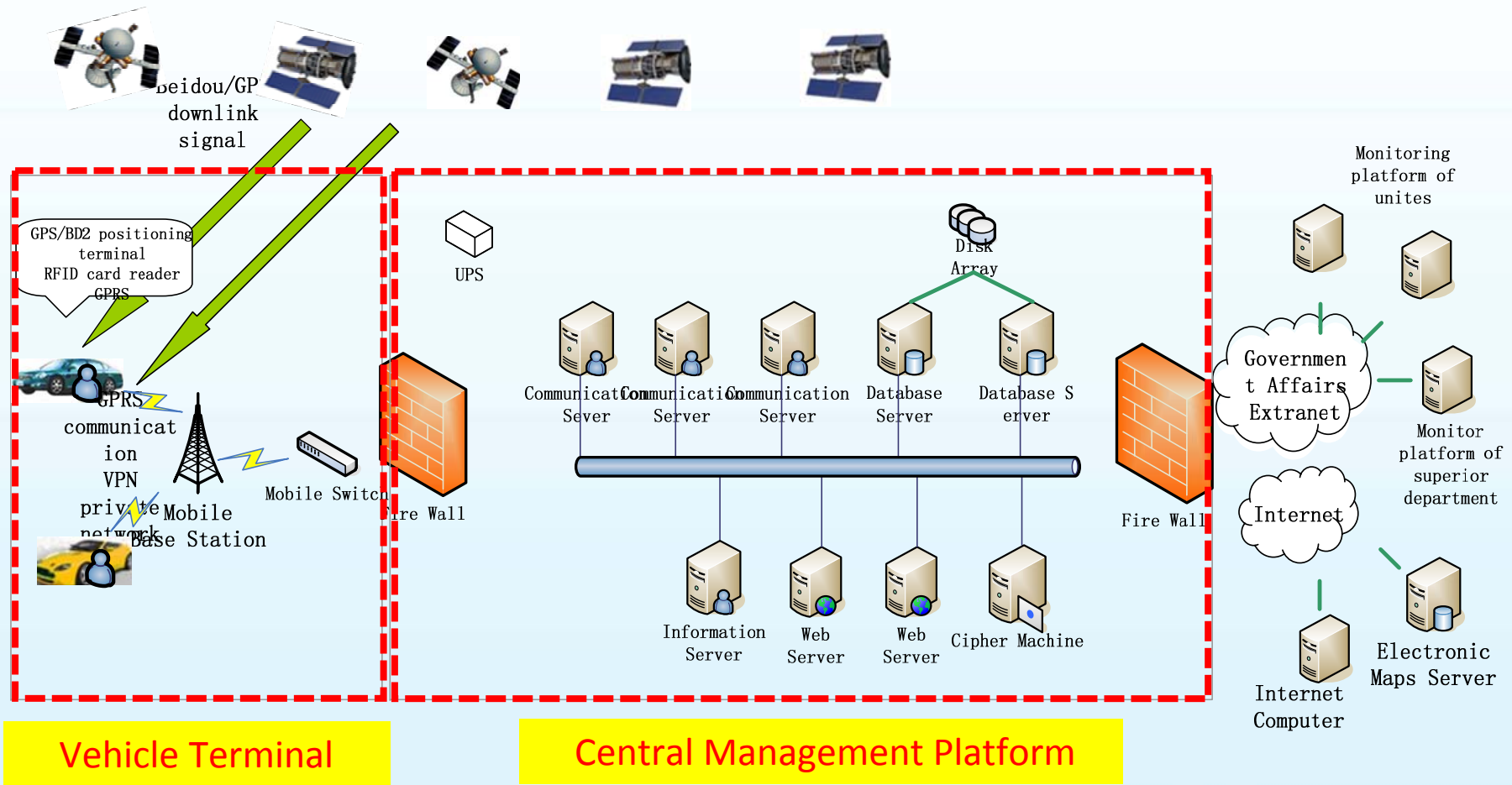




Government Vehicle Management Solution based on GNSS

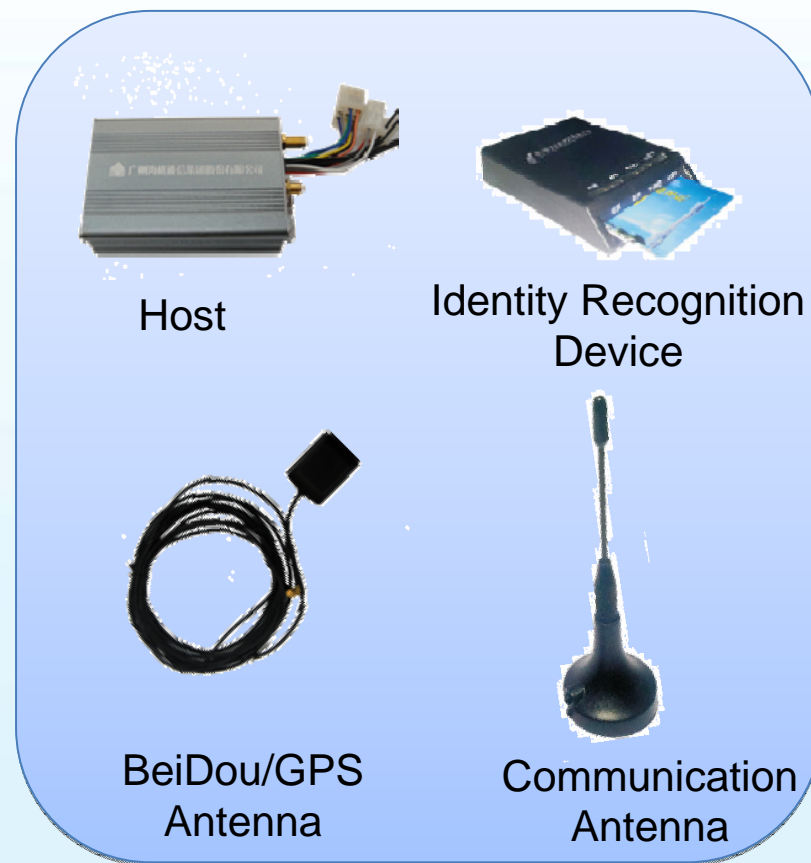
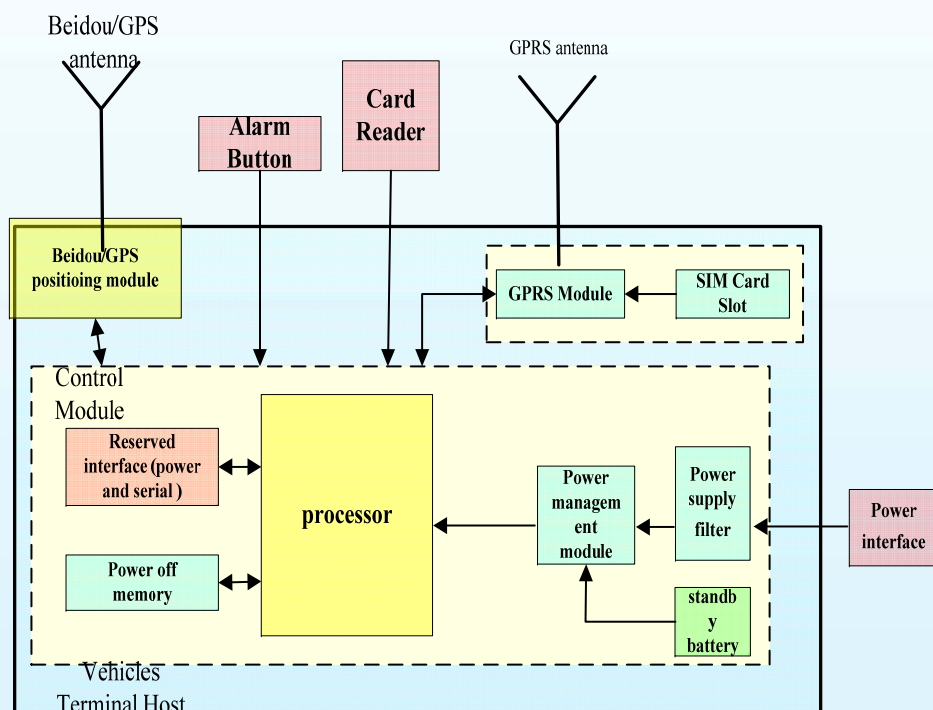


System Architecture



Vehicle Terminal

- BeiDou/GPS compatible receiver
- Identity recognition device





Government Vehicle Management Solution based on GNSS



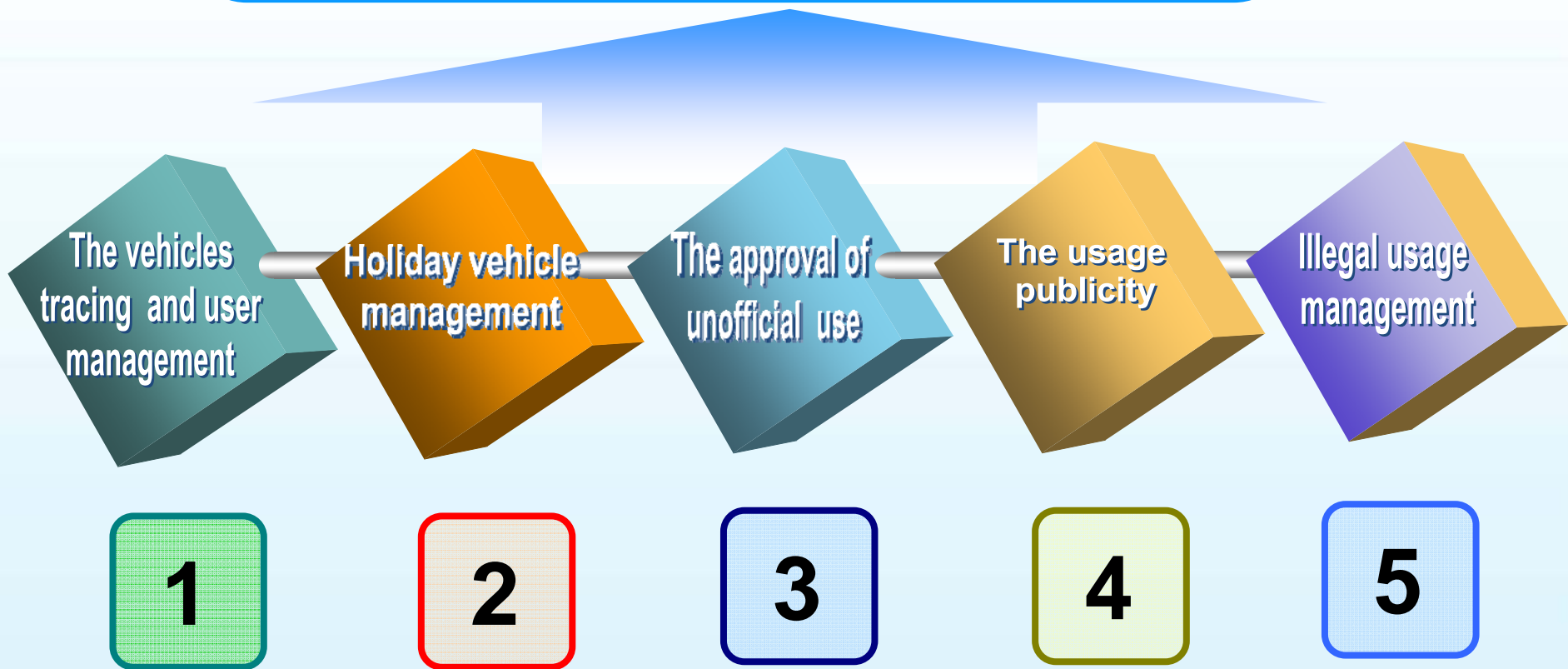
Key features and specifications

- 1 Vehicle status and road tracking control
- 2 Mileage statistics
- 3 Acousto-optic reminder
- 4 Remote upgrade
- 5 Remote setting
- 6 Communication backup
- 7 Road tracking compensation
- 8 Emergency alarm and abnormal alarm
- 9 Low voltage protection and alarm
- 10 Low power mode
- 11 Emergency shutdown

Accuracy Index	
Measurement Accuracy	0.1 m/s
Combined Positioning Accuracy	Level: 10m, Altitude: 10m
Positioning velocity update rate	1times/s
Time index	
Cold Start	37s
Warm Start	1s
Loss of lock catch	1s
Signal system and working mode	
Input Signal	B1:1561.098MHz, C Code; L1: 1575.42MHz, C/A Code
BeiDou positioning	Support
GPS positioing	Support
Dual positioing	Support



The Five Implementation of the management of government vehicles





Government Vehicle Management Solution based on GNSS



User Management

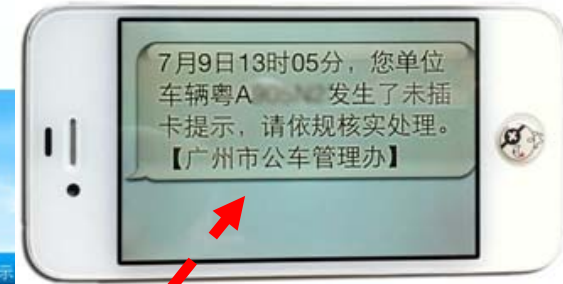


Identity Recognition

Reminder of forgetting to Plug in the Card



Text Message



广州市公务用车使用管理信息系统

欢迎登录系统: 市指挥中心管理 今天 2013年6月11日 星期五

首页 基础数据 车辆监控 提示信息 用车统计 用车公示

实时查询 历史查询

市直单位

- 市委
- 人大
- 政府
- 政协
- 法院检察院
- 事业单位
- 市国资委
- 市发改委
- 市经信委
- 市科技局
- 市人社局
- 市文广新局
- 市环保局
- 市食药监局
- 市卫计委
- 市总工会
- 市工商联
- 市侨办
- 市外事办
- 市港澳办
- 市台办
- 市档案局
- 市图书馆
- 市博物馆
- 市美术馆
- 市科技馆
- 市青少年宫
- 市妇女儿童活动中心
- 市老年活动中心
- 市残疾人服务中心
- 市公共就业服务中心
- 市公共服务中心
- 市公共图书馆
- 市公共博物馆
- 市公共美术馆
- 市公共科技馆
- 市公共青少年宫
- 市公共妇女儿童活动中心
- 市公共老年活动中心
- 市公共残疾人服务中心
- 市公共就业服务中心
- 市公共服务中心

实时提示信息统计

提示信息	数量
未插卡	8
越界	6
节假日用车	20
低电压	10
非正常离线	16
紧急报警	12
断点	19
超速	14
停车未熄火	10
拖车	6

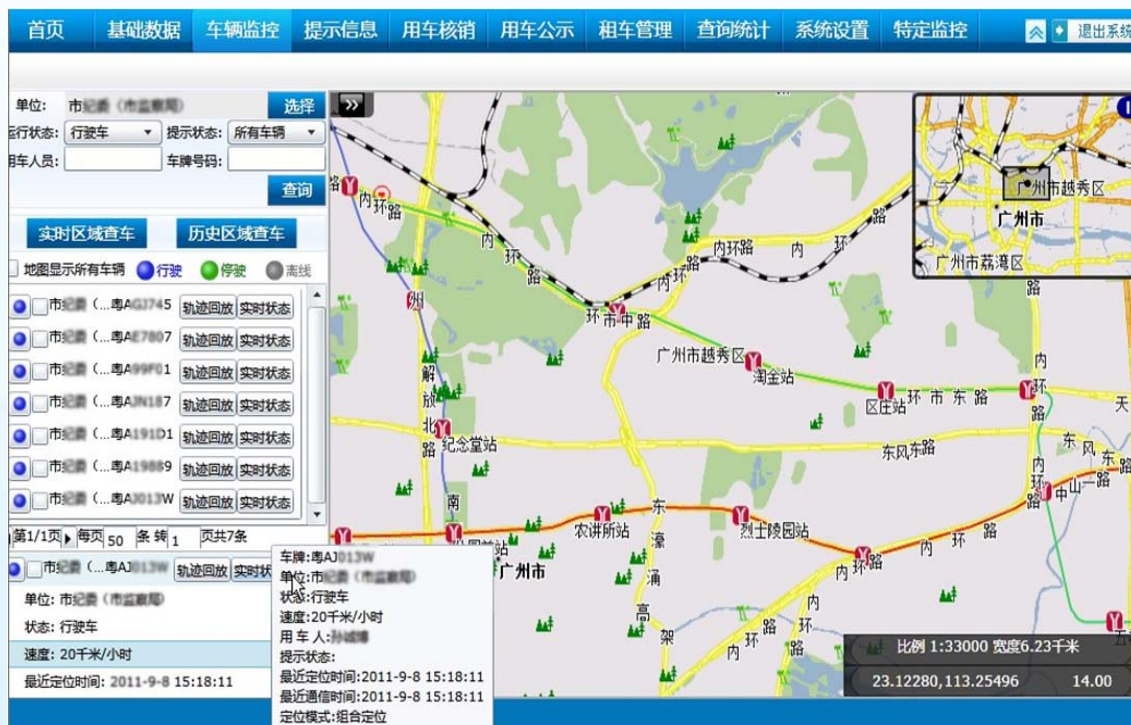
统计时间: 2013年6月10日 18:23:30



Government Vehicle Management Solution based on GNSS



Vehicle Tracing Management

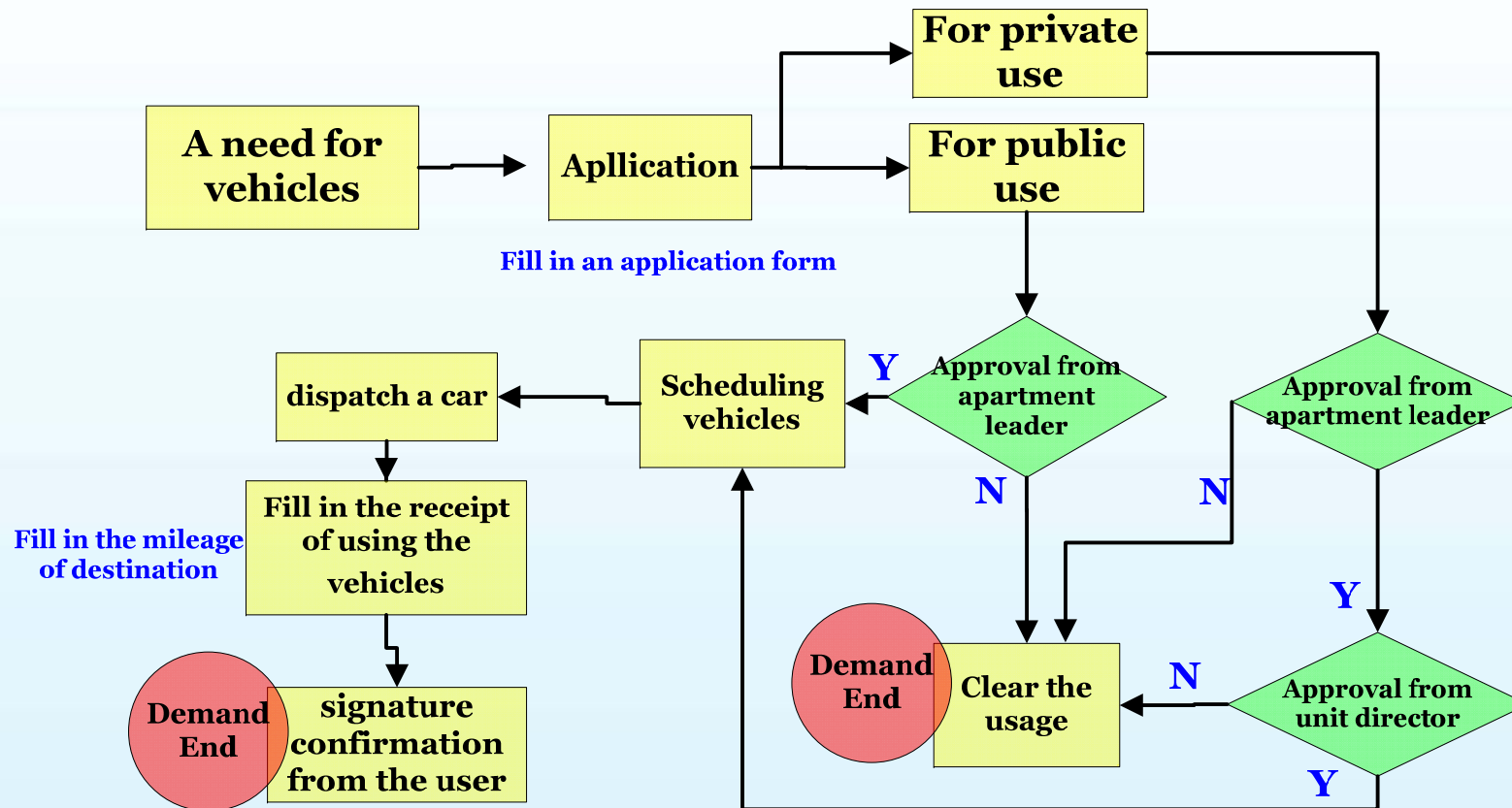


Real-time vehicle tracking
History query



Electronic fence
cross-border alarm

Vehicle Application Process





Government Vehicle Management Solution based on GNSS

Statistics Analysis

- vehicles' status
- abnormal usage
- payment
- mileage
-

广州市公务用车使用管理信息系统

欢迎登录系统:市监控中心管理员 今天是 2011年8月12日 星期五

[首页](#)
[基础数据](#)
[车辆监控](#)
[提示信息](#)
[用车核销](#)
[用车公示](#)
[租车管理](#)
[查询统计](#)
[系统设置](#)
[特定监控](#)
[退出系统](#)

通知公告

更多>>

- ▶ 08-09 关于启用公车管理系统域名的...
- ▶ 08-04 关于按车辆权属单位安装广州...
- ▶ 07-29 关于举办广州市公务用车使用...
- ▶ 07-29 关于广州市公务用车使用管理...
- ▶ 07-29 广州市数字证书管理中心数字...
- ▶ 07-29 关于启用广州市公务用车使用...

车辆状态

单位: 辆

行驶: 2
高线: 75
停放: 784

实时提示

单位: 条

未刷卡: 0
越界: 6
节假日用车: 0
低电压: 0
非正常高线: 3

资料下载

- ▶ 车属单位管理员手册
- ▶ 主管单位管理员手册
- ▶ 微软雅黑字体安装包
- ▶ 公务用车申请单
- ▶ 非公务用车申请单

缴费记录

单位: 条

2011年8月缴费情况

已缴费用车记录: 0
未缴费用车记录: 141
未缴费用车记录累计: 141

行车里程

单位: 公里

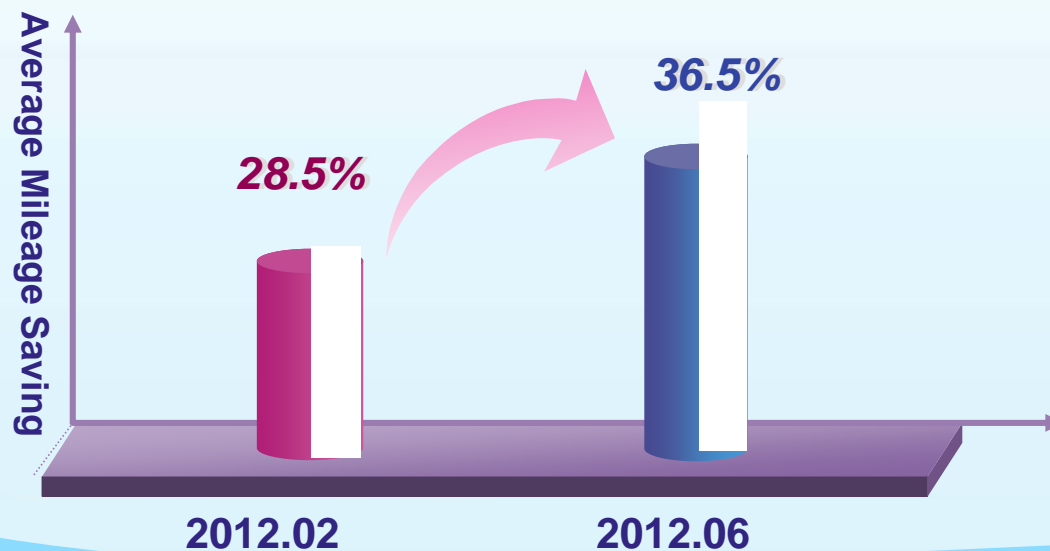
2011-05: 0, 0, 0, 0
2011-06: 0, 0, 0, 0
2011-07: 4,854.8 (Total), 4,602.8 (Workday), 140.8 (Overtime), 373 (Non-official)

服务热线: 020-82181335 咨询电邮: gzgovcar@haige.com



The Achievement of the Project

- 8440 government vehicles have been fitted with BeiDou/GPS monitoring device
- The system has been running for one year, showed reliable performance and got satisfied feedback
- Not only did vehicle management improve, cases of personal usage markedly decreased
- Reduced the cost, Improved the efficiency

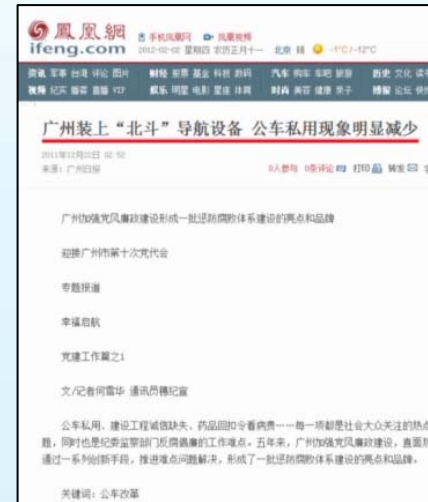




Government Vehicle Management Solution based on GNSS

Project's Social Impact

- Achieved volume applications of BeiDou in the field of civilian vehicles monitoring
- Got praise from China Satellite Navigation Office, government, and industry experts
- Got media attention, and follow-ups





Government Vehicle Management Solution based on GNSS



GNSS Application Effect

Reference: Evaluation Report of Guangzhou government vehicles project users, 2012.9

Static test

Location:

Guangzhou Science City,
Roof of the 6th floor

Test Environment: Broad
Vision with no obstructions



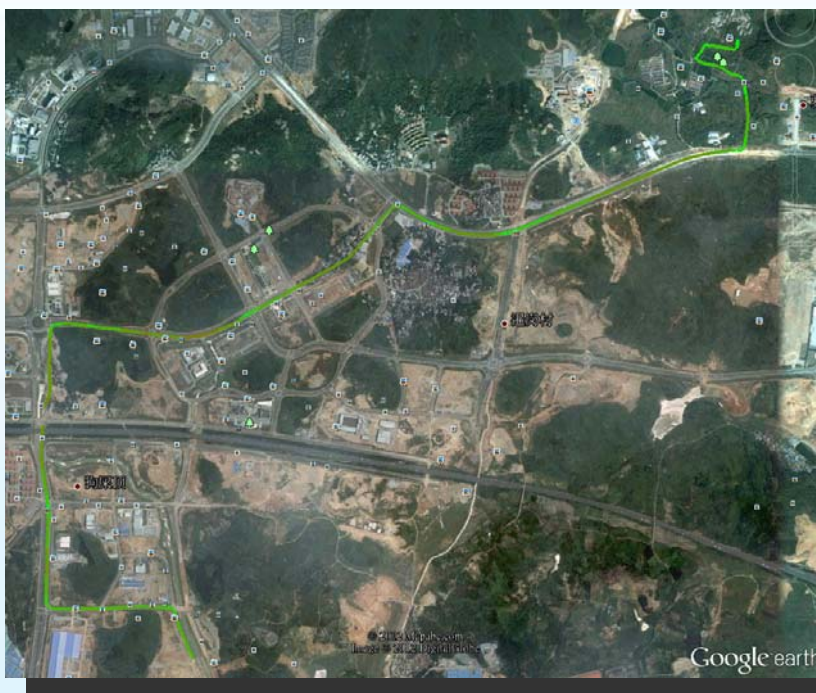
Test Group	Test date and the weather	Positioning Module/Positioning Mode	HDOP	Number of visible satellite	Positioning accuracy availability (10m, 95%)
Group A	Aug.4: cloudy 11:04:11~13:19:30 Data set N=10845	T-Module BeiDou	2.181	7.04	90.8%
Group B	Aug.4:cloudy 10:28:07~13:26:05 Data set N=10715	U-Module BeiDou+GPS	0.784	15.99	100%
Group C	Aug.7: Clear 13:32:50~16:35:40 Data Set N=10971	U-Module BeiDou	1.14	9	>99.99%
Group D	Aug.7日:Clear 13:33:12~16:35:48 Data Set N=10958	H-Module BeiDou	1.39	8.04	100%
Group E	Aug.8:Clear 16:46:58~18:29:49 Data Set N=6172	U-Module BeiDou	1.43	7.29	97.7%
Group F	Aug.8:Clear 16:46:43~18:29:58 Data Set N=6182	H-Module BeiDou	1.77	6.6	100%
Group I	Aug.9:Clear 8:30:16~20:31:34 Data Set N=42662	H-Module BeiDou+GPS	0.74	15.41	100%
Group J	Aug.9:Clear 8:30:16~20:31:34 Data Set N=40141	T-Module BeiDou	2.42	7.45	94.7%



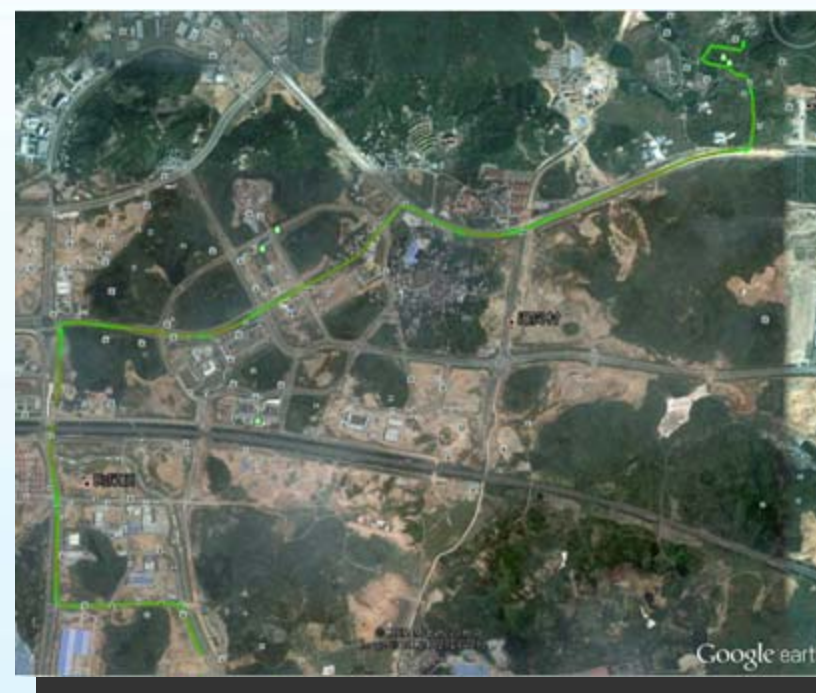
GNSS Application Effect

Dynamic Test

Aug.29,2012 , Guangzhou Science City, open area



BeiDou Positioning Mode



Dual Positioning Mode

Reference: Evaluation Report of Guangzhou government vehicles project users, 2012.9

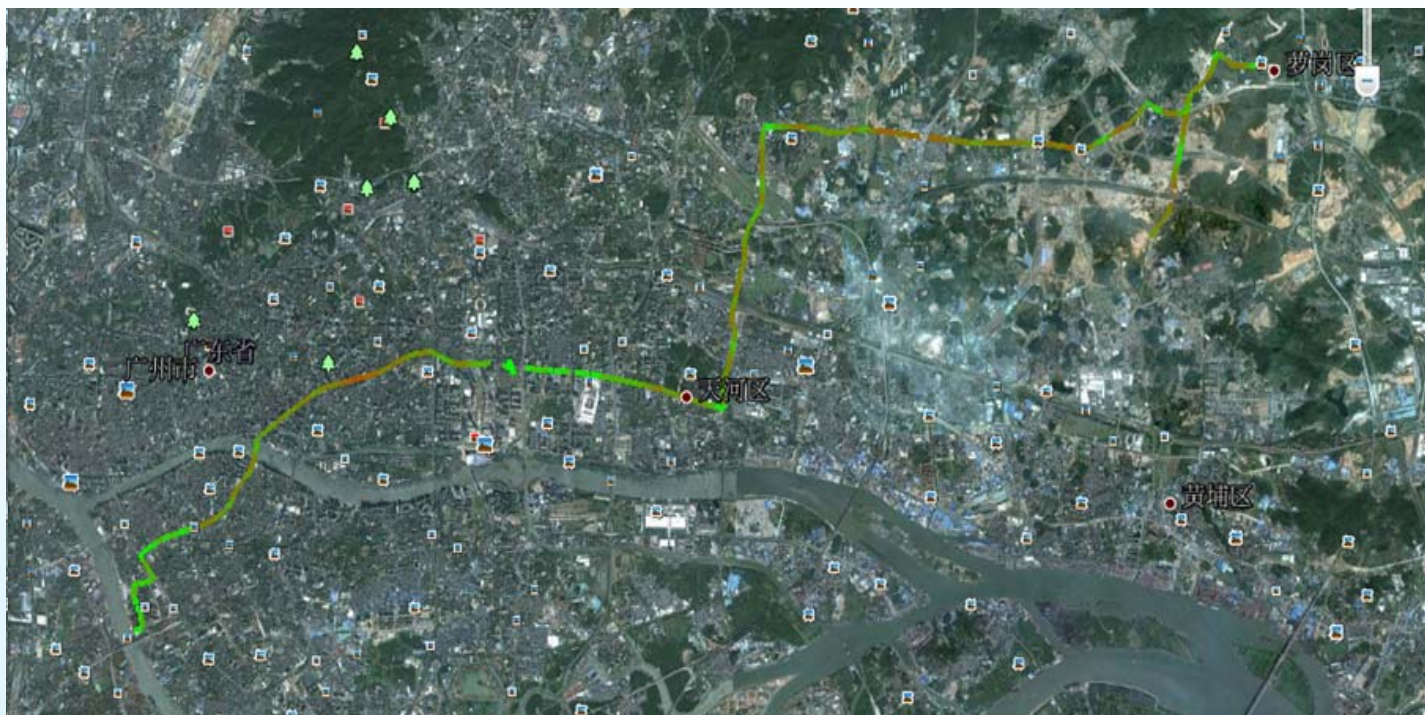


Government Vehicle Management Solution based on GNSS



GNSS Application Effect

In Guangzhou Area, the application of GPS is fine, BeiDou is usable, BeiDou+GPS has better effect



Aug.29, 2012, Urban area test, Dual Positioning Mode
Aug.29, 2012, Urban area test, BeiDou Positioning Mode

Note: **Red line means failed be positioned,** belonging to the linear prediction linear.

Reference: *Evaluation Report of Guangzhou government vehicles project users, 2012.9*



GNSS Application Effect

User experience index survey

Date: Aug.2012

Location: Guangzhou

Target: 120 vehicles

Choose one unit from each of the ten districts and two cities, totally 12 units, and 10 cars from each unit

Pattern: Dynamic Test

Index: Positioning Tracing Accuracy
Positioning Tracing Coherence
Positioning Results Stability

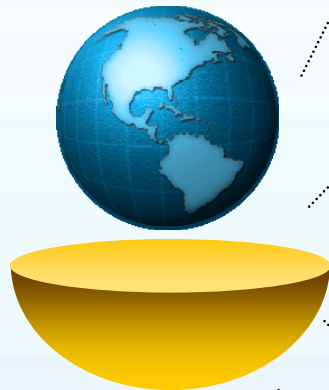
User Experience Index Questionnaire of Guangzhou Government Vehicle project

	Sum	Average	Degrees of Satisfaction
Positioning Tracing Accuracy	973	88.5	Satisfied
Positioning Tracing Coherence	960	87.3	Satisfied
Positioning Result Stability	1017	92.5	Very Satisfied
Total Score	2950	268.2	Satisfied

Reference: Evaluation Report of Guangzhou government vehicles project users, 2012.9



Conclusions



Guangzhou government vehicle project verified the availability of the BeiDou system

The multi-system can effectively improve the availability of satellite navigation positioning

The mature application of BeiDou in Guangzhou government vehicle system played a good demonstration effect in the industry

Strengthen international technical exchanges, technical cooperation and project cooperation, and jointly promote the GNSS industry booming



Thank you for your attention!

