



Forum 2 Summary 论坛二 总结

# Mobility Internet - Connecting the Virtual Superhighway

## 车联网 – 网联城市智能交通



### Objective

The objective of the Mobility Internet – Connecting the Virtual Superhighway Forum was to explore the challenges and opportunities created by the mobility Internet and how society and vehicle users can benefit from such a new technology trend. The different solution set for mobility will enable a fundamental redesign of personal vehicles.

### Background

Over the past 20 years, the Internet has changed the way people work and live. Today people are connected via the internet and interact with each other via a wide range of Internet services.

In recent years, the Internet has extended its reach from people's homes and offices to their vehicles. Vehicle users now can enjoy services such as vehicle security, emergency support, turn-by-turn navigation, and other convenience and infotainment services via the Internet from in-vehicle telematics service providers like OnStar. They can enjoy these service anytime, anywhere.

The Internet continues to evolve. With new communication technologies such as DSRC (Dedicated Short-Range Communications), vehicles can now connect with other vehicles and the transportation infrastructure. This connectivity is making vehicle traffic more efficient; providing people like the elderly, children and the disabled access to personal transportation; making parking more convenient; and ultimately improving safety.

This new Internet, which connects vehicles to vehicles and vehicles to the infrastructure and through which Internet services are delivered to vehicle users, is what we call the mobility Internet.

The mobility Internet could be a key ingredient of future urban transportation systems. It will enable us to redesign the way urban vehicles work by taking advantage of sophisticated sensing, communication and computing capabilities. It also will enable us to

### 目标

车联网—网联城市智能交通论坛旨在探讨车联网技术所带来的挑战和机遇，以及社会大众和车辆驾驶者将如何从此项新技术中受益。这些不同的交通移动解决方案将会彻底重塑汽车。

### 背景

在过去的20年里，互联网改变了人们的工作和生活方式。今天，人们通过互联网相互连接，并通过各种不同类型的互联网服务进行互动。

近年来，互联网的范围从人们的家庭、工作场所延伸到了汽车。如今，通过以安吉星为例的车载信息服务系统，消费者能够保持与互联网的对接，随时随地使用车辆安全保障，紧急救援，实时导航，及其他便利的生活和信息服务。

同时，互联网新技术也在不断涌现。伴随着新型通信技术的出现，如专用短距离无线通信系统 (Dedicated Short-Range Communications)，车辆之间可以实现彼此互联，车辆与交通基础设施之间也可以实现互联。车联网技术将使车辆运行更为高效，为老人、儿童与残障人士的个人出行提供便利，使停车更为方便，最终提升行车安全性。

这种新型的互联网形式能让车与车之间实现互联，车与交通基础设施建设之间实现互联，并且让车辆使用者享受到其他互联网服务。这就是所谓的车联网。

车联网将成为未来城市交通体系的一个关键组成部分。利用先进的传感技术，无线通讯和高速计算技术，我们将重新定义未来城市交通工具的运行方式，重新设计规划城市交通基础设施来提高交通流量的管理能力，以及

redesign the transportation infrastructure through better management of traffic flow, while improving and helping manage electricity use and recharging by optimizing recharging times and locations.

Addressing traffic congestion, road safety, environmental protection, new transportation, autonomous driving and new information and entertainment involves information technology. Today's traffic system can be regarded as a complex IT system. With the realization of new concepts, urban transportation and consumer behavior have been gradually undergoing the beginning of a radical change.

The mobility Internet is driving the continued transformation, with vehicles becoming a central point of how people don't just connect in terms of getting from point A to point B, but also what they do while going there.

## The Mobility Internet and Sustainable Transportation

The mobility Internet is part of GM's vision for a future of how vehicles are connected and how Internet services are delivered to connected cars. It allows vehicles to collect, process and share enormous amounts of data by linking them to each other and to an urban network, much as the Internet links computers today. The mobility Internet will enable vehicle users to benefit.

This can be done by integrating mobile devices with in-vehicle equipment. It requires connecting individual vehicles on the road with each other as well as with infrastructure including traffic lights and the very roads being driven upon.

Once vehicles are connected to the Internet, users will be able to connect to their homes, workplaces and the power grid. This will additionally enable autonomous driving, bringing the promise of an accident-free and congestion-free future closer to fruition.

The EN-V concept vehicle is a great example of what could be the future. It can determine the cruising speed of the car ahead and react to other objects on the road. It incorporates GPS, which identifies its positioning; a wireless antenna, for connection with other cars and the infrastructure; a front-view camera and chassis infrared sensors, which are mainly responsible for ambient environment perception; and a screen on the inside, which enables the user to videoconference or obtain outside information.

The adoption of platooning has the potential to enable vehicles going to the same destination to automatically form a queue, starting and stopping simultaneously.

通过优化充电时间与地点来改善和管理城市用电量和充电需求。

交通拥堵、道路安全、环境保护、新型交通方式、自动驾驶、信息处理和娱乐服务等解决方案都离不开信息技术。当今的交通系统就是一个复杂的信息技术系统。随着一些新概念技术的实现，城市交通和消费者行为正开始逐渐发生根本性的变化。

车联网技术正在推动城市交通的不断变革。汽车不仅仅通过将人从一处驶到另一处的形式将人们联系在一起，而且在行使的过程中也将人们始终紧密地联系在一起。

## 车联网与可持续的未来交通

车联网是通用汽车未来交通愿景的重要组成部分。这一愿景展示了未来车辆如何实现互联，及互联网服务如何被应用到互联的车辆上。车联网技术通过将车与车互联、车与城市网络互联，使车辆具备收集、处理并共享强大数据的能力，就如同今天的互联网联接着所有的个人电脑一样。车联网技术让驾乘者受益其中。

车联网技术可以通过移动通讯设备与车载通讯设备的整合得以实现。同时它还需要将行驶在路上的所有车辆进行互联，且将车辆与交通基础设施如交通信号灯和专用行驶道路等进行互联。

车辆联接至车联网后，车主即可与家庭网络、工作网络和国家电网进行互联，进而实现自动驾驶，使零交通事故和零交通拥堵的未来愿景更快变为现实。

EN-V 电动联网概念车是未来汽车的一个极好的例子。EN-V 可以确定前方车辆的行驶速度，并能对道路上其他物体作出反应。全球定位系统（GPS）可以确定其所在位置；无线天线可以使它与其它车辆和交通基础设施进行互联；前视镜头和底盘红外传感器用于感知周围环境；内置显示屏可用于召开视频会议或获取外部信息。

该车型配备结队行驶功能。该功能可以让开往同一方向的车辆实现自动排队行驶，保持同步启动、加速或减速。

## Next Steps

There is a consensus that the mobility Internet exists and that the time for its broad deployment has arrived. However, its growth will require cooperation among the automotive industry and other industries, the academic and research community, and government institutions. We also know that connected vehicles exist and will exist into the future.

Research needs to be carried out to identify what an intelligent connected vehicle of the future should look like, what performance it should display, and what features it should possess.

Additional research will be needed to optimize how the features of the mobility Internet can best be integrated into vehicles over time, and what near-term applications to start with.

Another area of research will be to assess how intelligent connected vehicles and vehicles that are not intelligently connected can coexist during a transition period. We need to address steps for getting there and technology to enable it.

New software and hardware will be required to ensure the mobility Internet can keep up with the rapid changes and updates in computer and other technology.

Another major issue that must be addressed is how to simplify the process and provide a safe and private operating environment. Government institutions will have to formulate new laws and standards in response to current technical progress, while helping develop a security system that addresses the ongoing threat to the Internet, which endangers information security as well as privacy.

Finally, financial support is required. This can be obtained through the provision of service for which consumers are willing to pay.

As vehicles like the EN-V concept demonstrate, the future is almost here. The mobility Internet is a way of life for all of us. The rapid acceptance in China of OnStar, which has built a base of 29,000 local subscribers in just seven months, and the thirst for new technology are strong signs that consumers in China are ready to embrace the future. Internet mobility combined with electrification will be the foundation upon which that future is developed.

## 下一个目标

车联网已经存在且其广泛应用的时机也已经到来的论点已为广大学界人士所公认。但是，车联网技术的发展还需要汽车行业及其它产业、学术和研究团体以及政府机构之间相互合作。我们相信互联的汽车也已成为现实并将不断发展。

在未来发展的过程中，我们需要展开进一步的研究工作来确定未来智能互联汽车的外观、操作性能以及其所需要具备的功能特征。

我们还需要更多的研究工作来集中解决如何更好地将车联网的功能整合到车辆中，以及从哪些近期应用技术开始入手等问题。

另一个研究工作领域是致力于解决智能互联车辆与非智能互联车辆如何在过渡期内共存的问题。我们需要解决这一过程中产生的问题并取得相关技术使这一过渡成为可能。

我们还将致力于不断开发新的软件及硬件设施，从而确保车联网技术与正在快速发展的计算机以及其他技术保持同步。

实现车联网必须解决的另一个主要问题是如何简化操作流程、提供安全且私密的操作环境。政府机构必须制定新的法律和标准来应对这些技术的发展，并建立一个安全的系统来抵御长期以来危害信息安全及个人隐私的互联网威胁。

最后，车联网的实现还需要财力方面的支持。这将从消费者按照自己的意愿选择相应的服务并为此所支付相应的费用中获得。

正如EN-V电动联网概念车所展示的那样，未来并不遥远，几乎触手可及。车联网是一种生活方式。安吉星进入中国仅7个月时间，在中国的注册用户就突破2.9万名，中国消费者对安吉星的迅速接受以及对新技术的渴望表明中国的消费者已经做好了迎接未来的准备。车联网技术将携手电气化，成为未来发展的基础。

## Speaker Highlights

### Chris Preuss

President, OnStar

- As connectivity and the Internet reach their full potential, they will intersect in ways we never thought possible, improving how we interact.
- OnStar uses the latest GPS technology, wireless communication and sophisticated computerized system. It is the first example of using mobility Internet to provide real-life benefits to customers in the vehicles we drive today.
- OnStar began in 1995. Today it has over 6 million customers, providing a range of safety, security and convenience services in all packages.
- The flexibility and growth in mobility Internet will ensure many services will be gradually added to OnStar’s current product offering.
- OnStar has been introduced in China. In just seven months, OnStar has passed 29,000 subscribers in China, making it the leading provider of in-car telematics; OnStar will be into the hundreds of thousands of subscribers by the end of this year in China and will be the pioneer in bringing mobility Internet service to customers in China.

### Guo Xingang

Principal Engineer and Senior Director, Embedded Platform and Applications Research, Intel Labs

- The future is almost here today.
- Traffic congestion, public transport, road safety, environmental protection, and information and entertainment are all related to automotive and each solution involves information technology.
- The mobility Internet needs to begin with cars, first by linking cars with the Internet by integrating mobile devices with in-vehicle equipment, then by integrating cars with other vehicles and infrastructure, and connecting cars to the existing mobile Internet.
- To make the mobility Internet happen sooner: Use all existing Internet standards and the Internet’s ecological system, jointly develop software and hardware to keep up with rapid technological changes in mobile phones and computers, and establish an industry alliance.
- The link between cars and the power grid will not only allow the latter to charge the cars but will ensure the traffic system operates more efficiently.

## 嘉宾观点精粹

### 克里斯·普鲁斯

安吉星全球总裁

- 当互联网与车联网发展充分实现其潜力时，它们将以一种前所未有的方式来改善人们沟通和互动的方式。
- 安吉星使用了最新的GPS技术、无线通讯和尖端的计算系统。它是第一个通过车联网为车辆使用者提供实际便捷服务的绝佳案例。
- 安吉星成立于1995年，现在它向超过6百万的用户提供包括安全、保障和便利服务等一系列的车载信息服务。
- 未来车联网技术的灵活性及可持续发展将帮助安吉星在现有服务项目基础上增加更多的信息化服务内容。
- 安吉星进入中国仅仅七个月时间，注册用户就已突破2.9万名，成为车载信息服务行业的领导者。预计今年年底，中国注册用户将会达到数十万人，同时也将成为中国车联网应用的先锋。

### 郭新钢

英特尔实验室嵌入式平台和应用首席工程师及高级总监

- 未来其实并不遥远，几乎触手可及。
- 交通拥堵、公共交通、道路安全、环境保护、信息处理和娱乐服务等解决方案都与汽车行业息息相关，每一个解决方案背后都有信息科技的存在。
- 车联网技术需要从汽车本身开始，首先我们需要将移动通讯设备与车载通讯设备进行整合，然后我们需要将车辆与其它车辆以及周围交通基础设施进行整合，最后将车辆与既有的车联网系统进行整合。
- 让车联网时代尽早到来：利用现有互联网的标准和生态系统，共同设计发展新的软硬件以确保车联网技术与正在快速发展的移动电话以及计算机技术保持同步发展，并建立行业联盟。
- 汽车和电网的联合，不仅可让汽车随时充电，同时也可使交通系统更加高效运行。

## Yang Xiaoguang

Director, Department of Transportation Engineering, and Director, ITS Research Center, Tongji University

- The advancing development of technologies such as digitization, networking, information and intelligence gathering, combined with new problems facing society today, is creating a constantly changing urban environment.
- This has contributed to the growth of cities, transportation systems and society as a whole.
- Transportation systems based on previous conditions and environmental standards are no longer relevant. The intelligent society will be impacted by the nature of cities, current transportation systems and how society deals with today's traffic problems.
- The application of transportation technologies will make us more dependent on digital information and the Internet. Structuring next-generation transportation systems will help overcome human societal challenges.
- With the advancing development of technologies such as digitization, information gathering and intelligence gathering, and the growth in the mobility Internet, urban transportation and society have been undergoing radical changes gradually and silently.
- We need cooperation between those with a stake in the future to build the mobility Internet.
- Compared to automobiles, public transportation may be more efficient. Because of the mobility Internet, various transportation means will get along harmoniously in future systems.
- New laws and standards need to be established for the mobility Internet. In addition, Internet security needs to be strengthened. As we have seen, the Internet can be hacked, causing great harm to users and systems.

## John Du

Director, GM China Science Lab

- An intelligent transportation system provides the foundation upon which information, infrastructure and regulations rest.
- With platooning, cars will be able to connect according to destination, distances will be maintained automatically, cars will start and stop simultaneously, and the number of passengers they can collectively carry will exceed that of a modern bus.
- GM's strategy is to make connected vehicles capable of running on ordinary roads in the same way as ordinary cars. However, when they are in an environment with intelligent functions, they will function as connected vehicles.
- We need to figure out what an intelligent connected vehicle of the future should look like, what performance it should display, and what backward compatible features it should possess to make it possible to transition to the mobility Internet.

## 杨晓光

同济大学交通运输工程学院交通工程系主任  
同济大学智能交通运输系统（ITS）研究中心主任

- 信息技术例如数字化、网络化、信息智能化技术的飞速发展，以及社会面临的新问题，创造出一个不断变化的城市环境。
- 信息技术的发展同时这也加剧了城市规模、交通系统和社会系统的飞速增长。
- 基于以往基础条件与环境下建立起来的交通运输系统已不适用。智能化社会将受到城市本身、现有交通系统和城市应对交通问题方式的影响。
- 交通运输技术的应用将使我们更加依赖于数字化信息和互联网。建构下一代交通运输系统将帮助人类社会克服现有问题。
- 随着数字化、信息化、智能化技术以及车联网的不断发展，城市交通和整个社会已经在悄悄地发生着巨变。
- 建立车联网需要利益各方之间的协同合作。
- 相较于私人汽车，公共交通设施可能更加有效。而有了车联网以后，各种交通方式将在未来的体系内和谐相处。
- 需要为车联网制定新的法律和标准，同时网络安全体系也需加强。互联网被入侵将对用户和系统造成巨大伤害。

## 杜江凌

通用汽车中国科学研究院院长

- 智能交通系统是信息、基础设施、法律法规等多方面共同需要的一个基础。
- 自动结队行使的功能使开往同一方向的车辆可自动排队行驶，并自动保持车辆间距，还可实现同时启动或停车。自动结队行使车辆共同运载的乘客总数甚至可以超出公交车辆运送的乘客数量。
- 通用汽车的战略是实现让车辆既能够在一般公路上像普通车一样行驶，也可以在智能工作环境下相互联接。
- 我们还需要进行一系列研究，确定未来智能互联汽车的外观、性能以及向后兼容的特征，以使我们成功过渡到车联网时代。