

Forum 1 Summary 论坛一 总结

# The Pathway to Sustainable Mobility
# 城市交通的可持续未来

## Objective

The objective of the Pathway to Sustainable Mobility Forum was to formulate ideas for addressing the challenges that are accompanying growing global urbanization in order to achieve sustainable mobility.

## Challenges

By 2025, almost 60 percent of the world's population will likely be living in metropolitan areas. By 2050, the urban population is expected to number about 9 billion. China is one of the countries in the midst of rapid urbanization. Its urban population is projected to grow from less than 46 percent today to 55 percent in 2020, peaking at 75 percent in 2050.

Studies have shown that when people can afford to own a vehicle, they purchase one. As a result, the world's vehicle parc is growing as well – from 600 million today to a projected 1 billion by the middle of this decade. By 2020, China's vehicle parc alone is expected to total 20 million.

The growing urbanization combined with growing demand for four-wheel transportation – 96 percent powered by petroleum – is contributing to growing pollution. This has created a new challenge in the form of global warming, which is impacting people in rural as well as urban areas.

Contributing further to rising energy consumption and pollution is the greater consumption of food, water and minerals when people move to cities. The growing demand for land to support the rising population and new infrastructure is placing challenges on the preservation of environmentally sensitive land.

When they move to cities, people expect a certain level of livability, i.e., sufficient housing, health care, power, water, waste management, safety, telecommunications services, and transportation.

## The Way Forward

Studies have found that large cities are more efficient than small and medium-size cities in the use of resources and land to support economic development. In China, it is estimated that within 40 years, some 20 to 25

## 目标

城市交通的可持续未来论坛旨在为解决全球的城市化进程中所面临的挑战献计献策，以达到城市交通的可持续发展。

## 挑战

到2025年，全球约60%的人口将居住在大都市中。到2050年，城市人口将达90亿。中国的城市化进程发展迅速。预计到2020年，中国的城市人口比例将从当前的不足46%上升至55%，到2050年将达到高峰，为75%。

研究显示，当人们具备一定经济能力时就会购买汽车。因此，全球汽车数量也正在持续增长，预计到2015年，全球汽车保有量将从当前的6亿辆上升至10亿辆。到2020年，仅中国的汽车保有量量就将达2千万辆。

城市化进程以及对汽车交通（其中96%的汽车由石油产品驱动）需求的增加促进了环境污染的加剧。这会对人来带来类似全球变暖的系列挑战，影响着城市和农村的居民。

城市人口的增长导致人们对食品、水资源和矿产资源的消耗增加，从而进一步加剧能源消耗与污染排放。由于城市人口增长，需要兴建新的基础设施，因此对土地的需求上涨，从而对保护环境易受破坏的土地提出了挑战。

迁入城市后，居民期望城市生活有较好的宜居度，比如对住房、医疗保险、电力、生活用水、垃圾处理、安全、电信服务以及交通等提出了更高的要求。

## 前进之路

研究显示大城市在利用资源和土地促进经济发展方面较中小城市更具效率。预计在今后的40年中，中国将出现20至25个城市群支撑全国的经济发展。

city groups will support the entire nation's economic growth.

One way that some cities like Shanghai are managing urban growth and maximizing resources is by building suburban developments and satellite cities around the core city. However, the movement of people further from their jobs and the city center creates additional needs for transportation.

What is required is a new set of transportation strategies that factor in expanding the capacity of existing mass transit systems, cleaning up fuels, and leveraging multiple transportation methods such as subways and rapid buses. Walking and biking also should be factored into the urban transportation mix. Making streets "multi-mobile" by creating special dedicated lanes for different vehicles will enable various forms of transportation including new energy vehicles to coexist.

It is neither practical nor a realistic option to eliminate the passenger car, as existing public transportation networks would not be capable of handling the additional demand. Moreover, a gasoline-powered vehicle today only produces about one half of the percentage of emissions that a gasoline-powered vehicle generated in 1970. In London, a study found that a modern small car is actually better than the subway in carbon footprint terms. From a carbon point of view and a tax and social point of view, the car is attractive.

To address the growing pollution problem, it is imperative that the development of new energy vehicles, mainly plug-in hybrid vehicles and battery electric vehicles, be made a priority.

The government of China is focused on the development of pure electric vehicles. Even if pure electric vehicles are fully reliant on power generated by coal (considered a less efficient source of fuel) to recharge their batteries, energy consumption would still be consistent with the principles of sustainable development. Carbon dioxide emissions would be slightly lower than by using gasoline and diesel to power conventional engines.

This is part of the "glocal" concept – combining global policies and technology with local development strategies – to address issues such as pollution, congestion, safety, public health and mobility.

Urban areas around the globe are also utilizing "eco-city design," which involves the efficient use of land, transportation, design, structures, materials, energy and water to lessen the production of pollutants, wastes and toxins.

## Promises for the Future of Sustainable Transportation

New approaches to planning are making cities and transportation systems more environmentally friendly and better able to deliver to the growing urban population a higher quality of life better, cheaper and faster.

对于上海这样的大城市，管理城市发展和最大化利用资源的一种方式是开发城郊区域并在主城区周边建设卫星城。然而，居民因为远离工作地点及市中心对交通系统又提出了新的需求。

我们需要制定一系列新的交通策略，包括扩充现有公共交通系统的容量、使用更清洁的燃油、并利用地铁和快速公交等多种公共交通方式。步行和自行车也应纳入城市交通策略中。通过为不同的车辆设立专用车道，使城市道路适应“多样化交通方式”，可以使包括新能源汽车在内的各种车辆同时存在并共同发挥作用。

由于现有的公共交通网络无法满足额外的需求，因此，完全取消乘用车的方案既不具备实践性，也不具现实意义。而且，现在的汽油驱动的车辆所排放的废气仅为七十年代汽油驱动车辆的一半左右。伦敦的一项研究显示现代小型汽车在碳排放量方面实际上优于地铁。无论是从碳排放、税收还是从社交的角度来看，汽车都具有吸引力。

解决日益增长的污染问题的当务之急是开发新能源汽车，特别是将插入式混合动力汽车和电池电动汽车的发展作为重中之重。

中国政府关注纯电动汽车的发展。即使纯电动汽车完全依赖于用煤产生的能源（被认为是一种效率较低的燃料源）充电，但其能源消耗仍然与可持续发展的原则相符。因为其二氧化碳排放比传统的汽油动力和柴油动力汽车要稍低一些。

这就是解决环境污染、交通拥堵、安全、公共健康与交通等问题的“全球本土化”概念，它将全球政策和技术与当地的发展战略融合在了一起。

全球的城市也都在实施“生态城市设计”，即通过有效利用土地、交通、设计、建筑、材料、能源以及水资源减少污染物质、废物和有毒物质的产生。

## 未来可持续交通的前景

新的规划方式可以使城市和交通系统更环保、能够更好地向不断增长的城市人口提供更高的生活质量，使城市生活更美好、成本更低、出行更快捷。

The end game still has the personal vehicle as part of the solution. Among the many advanced new technology solutions for urban areas, electrification is making great headway. Vehicle electrification requires no planning permission in terms of fixed infrastructure, no land acquisition, no construction and no commissioning.

Electric vehicles are entering the new stage of commercialization. With governments in many large cities supporting the development of required infrastructure and considering offering subsidies to early adopters, electric vehicles have a positive outlook in urban areas.

Other technologies and solutions are also making rapid progress. All of the technologies required for intelligent vehicles like the EN-V concept developed by GM, which generate zero tailpipe emissions, will not crash, and drive themselves exist today. However, the technology is not yet affordable and not yet robust enough for commercialization.

Moving tomorrow's vehicles like EN-V from concept to commercial production will require cooperation between governments, urban planners and managers, automakers, energy companies, IT and network companies, academic institutions and national labs. It will also require private companies and government institutions to join together in funding new infrastructure to support the new technology.

Asia, and particularly China – which has the world's largest vehicle market – is where there is perhaps the greatest opportunity to drive sustainable transportation. By working together rather than going it alone, those with a stake in the future can help make it a reality sooner for the benefit of urban environments and the rising number of urban dwellers.

最终，我们还是要将个人汽车纳入解决方案。在关于城市众多先进的新技术解决方案中，电气化已经取得了很大的进展。车辆电气化不需要对固有的基础设施申请规划许可、不需要征地、不需要建设、也不需要试运行。

电动车正进入商业化的新阶段。由于许多大城市的政府支持电动车所需基础设施的发展，并对购买电动车给予补贴，因此电动车在城市的发展前景看好。

其他技术和解决方案也正在快速发展。通用汽车开发的EN-V电动联网概念车不排放任何尾气，不会撞车，而且还能自动驾驶，像这样的智能车辆所需的全部技术现在都已具备。但是这种技术在商业化方面还无法实现，也不够完备。

将EN-V电动联网概念这样的未来汽车概念转化为商业生产需要政府、城市规划师和管理者、汽车制造商、能源公司、信息技术和网络公司、学术机构以及国家实验室通力合作。还需要私营公司和政府机构共同筹资兴建支持这些新技术的基础设施。

亚洲特别是全球最大的汽车市场——中国，是最有机会推动可持续交通的发展的国家。只有利益各方通力合作，而非各自为政，才能够尽早使其变成现实，从而为城市环境和不断增长的城市人口带来便利。

# Speaker Highlights

## Elizabeth Deakin

**Director of the Transportation Research Center and Professor of City and Regional Planning at the University of California, Berkeley**

- Need better organization and planning for transportation.
- Need to take into account the values and concerns of cities and local communities.
- Solutions need to be multi-modal.
- Need intelligent vehicles and infrastructure working together to optimize traffic flows and usage.
- Need to factor in land use and urban planning changes to accommodate smaller, more intelligent vehicles.
- Need intelligent systems to manage transportation and flows.
- Also need full support for biking, walking and other forms of transportation combined with vehicles.

## Feng Fei

**Director General of Industry and Economy at the Development Research Center under China's State Council**

- Discussed the sustainable challenges of energy and the environment.
- Solutions will be affected by the urbanization challenges we face.
- Denser cities support rail infrastructure.
- Smaller/satellite cities will need more sophisticated passenger vehicle solutions.
- All solutions must be integrated with effective and innovative urban planning.
- New energy vehicles include both alternative fuels to increase the efficiency of internal combustion engine vehicles and electric vehicles.

## John Miles

**Global Leader of Energy, Resources and Industry, Arup Group**

- Vehicles are part of our future.
- Public transport is not as energy efficient or extensive as we think.
- Need intelligent, small, flexible personal transportation solutions.
- Challenge is how to get there with electrification.
- Induction charging is more convenient than plug-in electric.
- Cities will play a more dominant role.
- Personal transportation needs will increase so we need to work on the best solutions.

# 嘉宾观点精粹

## 伊丽莎白·迪金

美国加州大学交通发展研究中心主任
及加州大学伯克莱分校城市和区域规划教授

- 需要为交通设立更好的组织机构和规划
- 需要将城市与当地社区的价值和利益列入考虑范围
- 需要多样化的解决方案
- 需要智能化的交通工具和相应的基础设施紧密联系在一起，以期优化交通流
- 需要结合土地使用和城市规划来适应更小更智能的交通工具
- 需要智能化的体系来管理交通流
- 同时需要为骑自行车的人、路上行人以及其他交通方式的使用者提供支持，使不同方式的出行方式与汽车共存

## 冯飞

中国人民共和国国务院发展研究中心产业经济部部长

- 探讨了能源及环境方面可持续发展的挑战
- 解决方案可能将受到城市化挑战的影响
- 高密度城市支撑轨道设施
- 小城市及卫星城市将需要更复杂的乘用车交通解决方案
- 所有的这些解决方案都需要通过有效而创新的城市规划整合到一起
- 新能源交通工具包括采用可替代燃料增加效率的内燃机车辆及电动车辆

## 约翰·迈尔斯

奥雅纳集团全球能源和工业部主席

- 交通工具将是我们未来的一部分
- 公共交通工具并不是我们所想的那么节能和广泛
- 交通解决方案应该是智能、小巧、灵便及个人化
- 所面临的挑战是如何通过电气化达成目的
- 电磁感性充电比插入式充电更加便捷
- 城市将扮演更加重要的角色
- 个人交通将增加，因此，我们需要寻找最佳解决方案

## Alan Taub

**Vice President of GM Research and Development**

- Technology exists today to address the challenges we have in front of us.
  - Electric motors.
  - Sensors, GPS.
  - Sophisticated algorithms to sense and respond.
- We have demonstrated the capability of full V2V, V2P and V2X.
- Sensing transponders are small in size and easily retrofitted to cars, bicycles, or carried by pedestrians.
- Electrified urban vehicles like EN-V are flexible in both size and design.

## 陶蔼伦

通用汽车全球研发副总裁

- 今日已经存在的科技可以用来解决所面临的挑战，包括：
  - 电动马达
  - 传感器，全球导航系统
  - 复杂算法来感应及反馈
- 我们已经展示了车对车（V2V）、车对人（V2P）以及车对其他事物（V2X）沟通技术的各项能力
- 感应装置的体积很小，易于在汽车、自行车上安装或由行人随身携带
- 电动的城市用车，比如电动联网概念车EN-V无论在体型和设计方面都非常灵活