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## **E-Mobility – Fresh Power for Clean City Mobility? (Mr. M. Koppenborg, MBtech Mercedes-Benz technology Germany)**

- Social and environmental trends generate challenges for future cities
  - Social trends are the ageing population, growing megacities, growing mobility demands, individual customer needs and the development of global supply chains
  - Environmental trends are CO2 emissions, limited global resources, the need for integrated recycling concepts and new energy supply concepts as well as integrating renewable energy
- The resulting challenges are:
  - Improvement of life quality through reduced automotive CO2 pollution and noises
  - Increasing population will demand optimized transport and traffic flows
  - Combine all stakeholder expectation in a systemic innovation approach and create one „City Master Plan“ with modular, scaleable „Innovation Roadmap Concepts“
  - Build traffic and energy infrastructure for E-Mobility usage and business scenarios
  - Generate a “Green City - Corporate Identity” with modern lifestyle and attractive flair
- There are new individual mobility needs that require innovation of public and individual transport products and services
- A clever intermodal split of public transport and fleet management is necessary to fulfil new mobility needs
- There is a need for full service providers that can provide new service packages for the mobility needs of different target groups
- Future vehicle innovations and the selection of alternative energies depend on the user profile:
  - Battery electric vehicles are useful for transport demand within the city region
  - Fuel cell vehicles can be used in long distance travel as well as in city mobility due to their larger travel range and short refuelling time
  - Plug-in hybrid Electric Vehicle are seen as alternative for city to city travel and for mobility within the city
  - Conventional engines are advantageous for long distance travel
- The key players in generating a sustainable city mobility are: citizens / mobility users, politics / administration, city region development, infrastructure operators, economy / industry, mobility services (regional transport services)
- The regional transport service provider has to reflect and fulfil the demand from all other key stakeholders
- Cross-functional expert teams (consisting of energy suppliers, automotive industry, mobility service provider, and the city region) should cooperate to provide mobility solution including e-mobility concepts

- Leadership and trust determine the success of such expert teams
- A comprehensive view is necessary to address city mobility challenges

Discussion points concerning the presentation:

- *Auditorium: Is a change in mobility necessary to make E-mobility applicable?*
  - Sizing and distance are essential factors for E-mobility
  - There is no single solution for the future of all types of mobility, but the alternatives depend on the characteristics of each mobility type (e.g. for buses hydrogen is an applicable alternative)
  - E-mobility is applicable for small vehicles and short distance travel such as city mobility for other types of mobility today's battery technology is not sufficient
- *Auditorium: The energy density of the battery is very low. Is there really a future for e-mobility?*
  - A change in lifestyle is necessary, which will result in new mobility patterns. Furthermore, city cars should be offered and the existing technology is sufficient for these kinds of cars.
- *Auditorium: Does the traffic management system have to change for electric cars?*
  - It might be useful to provide incentives that increase the attractiveness for E-mobility, such as an additional lane that is reserved for electric vehicles.
- *Auditorium: Do you think a collapse of the transport system can happen in future megacities? Do you think your solution can be applied in all cities?*
  - It is important to have a strategic plan to avoid a collapse. There is no single solution for all cities, but the approaches must be customized to the different cities to take regional conditions into account.

**Last Stage Management Platform for Intelligent Transport Systems: Metrasys and Hefei City Planning – looking forward to a sustainable transportation in a fast growing city (Dr. Y. Ping, Hefei, Municipal City Planning Bureau)**

- General information about Hefei:
  - Hefei has an important location in China, because it connects Central China with the coastal region including the nearby city of Shanghai.
  - The central urban district of Hefei has 5 million inhabitants and encompasses an area of 879 km<sup>2</sup>
  - Several high speed railways of the national net meet in Hefei. Further, a new railway station and an international airport is built in Hefei.
- Hefei is facing rapid urbanization and economic development as well as a fast growth of vehicles, resulting in a huge demand for road transportation



- During the last 10 years the city scale grew 2.5 times. The number of vehicles increased 23.4% every year on average in the past ten years. In 2009, Hefei had a vehicle ownership rate of 420 vehicles per 1000 inhabitants.
- It is projected that the size of the urban population will increase up to 7 million inhabitants till 2020.
- A City Master Plan was developed for the City of Hefei. The Master Plan focuses on a spatial structure with one main city and four city groups that are located around the main city but several kilometres away.
- To cope with the rapid growth of road traffic several new roads were constructed and the total road length was more than doubled between 2001 and 2009
- The main challenges Hefei is facing are:
  - The compatibility of city structure and road structure
  - Congestion and low travel speeds especially in downtown Hefei
  - Priority of public transport (today, only 20% of the residential trips are occupied by public transport)
  - High development in the old town
- To face the existing transit problems and the future increase in road traffic the city developed several measures:
  - Construction of a light rail system
  - Development of a BRT network
  - Increase of the road density in downtown Hefei
  - Promotion of electric cars and buses
  - Development of a public bicycle program
  - ITS – Intelligent Traffic System (In the METRASYS project the city of Hefei tries to improve information about the traffic volume by translating speed data into volume data)
- Case studies from the METRASYS projects
  - The new high speed railway station is improved by well placed signage and easy accessibility and the station is combined with working places and should be surrounded by mixed uses.
  - The frequent congestion in the old town is addressed by supporting walking and cycling (e.g. by creating new corridors that link parks and the old town)

Discussion points concerning the presentation:

- *Auditorium: What are the long-term planning ideas to avoid suburbanisation?*
  - It is difficult to predict the future borders of the city, but supply problems (e.g. for water) can be a restriction to future development.
  - In contrast to single centre cities like Shanghai, the city of Hefei tries to develop group cities. Furthermore, they try to make the road structure more compatible to future development.



- *Auditorium: What are the driving forces for Hefei's transport planning?*
  - The main driving force is to avoid congestion in Hefei.
- *Auditorium: The rate of motorization has doubled in Hefei? Why does the city experience such a high increase in vehicle ownership?*
  - The car industry is an important driver for the increase in motorization. Further, more and more people earn enough money to afford a car.
- *Auditorium: Is the increase in road density an appropriate measure to cope with increasing traffic volumes? Do you think the growth in cars will stop if the local government build attractive public transport?*
  - Road density is added to avoid congestion. Non-motorized transport is only an alternative for short-distance travel.
- *Auditorium: It seems as if the city of Hefei primarily reacts or responds to the increasing traffic volumes. It is essential to look ahead and to act before unnecessary travel demand is generated. Urban planning should try to reduce the creation of additional traffic.*
- *Auditorium: Do you think a collapse of the transport system can happen in future megacities? Do you think your solution can be applied in all cities?*
  - A collapse will not happen, because the cities are already working hard to prevent a collapse.
  - There is no single solution for all cities. The background and characteristics of a city have to be considered to find the best solution for each city.

**City Logistics – High Impact on Sustainable Mobility of Megacities: City Logistics by DHL (Mr. J. Hanser, DHL Solutions & Innovations)**

- Municipalities face 7 challenges:
  - Cope with limited budget funds
  - Provide companies with a supportive business environment
  - Ensure efficient transportation (enable an optimal framework for all kinds of transportation that is able to absorb the growing traffic)
  - Provide employment and social security
  - Reduce pollution
  - Provide a good quality of life
  - Improve suboptimal infrastructure in order to keep up with economic growth and increasing population
- Due to financial constraints and environmental and health concerns, building roads is not a solution to cope with increasing transport demand.
- Proper city logistics can help to facilitate efficient transportation and reduce pollution, so that it can help to improve the quality of life in the city.
- The Heathrow Airport Consolidation Centre can be seen as best practice example for city logistics



- Before the consolidation centre was build the airport shops were supplied separately.
- The consolidation centre helped to reduce vehicle movement and the supplying vehicles had fuller loads. Furthermore, the security scanning was eased and accelerated.
- Consolidation centres can optimize inner-city freight deliveries by having the following benefits:
  - Consolidation centres help to share transport capacities across industries and the last miles of deliveries are combined, which leads to less traffic.
  - The city logistic concepts can optimize timing by shifting freight transport off-peak hours.
  - The frequency of delivers can be adapted
  - Technological improvements like dynamic route optimization or efficient vehicles can be easily implemented for the vehicle fleet of the consolidation centre. Also electric vehicles could be used for city logistics.
  - Service Points, where deliveries can be picked up or from which deliveries can be sent.
- Consolidation centres for city logistics are a good measure to avoid traffic in the city.
- Consolidation centres are especially applicable as short-term measure for reducing the traffic volume.

Discussion points concerning the presentation:

- *Auditorium: What is the benefit of collective deliveries compared to individual deliveries?*
  - With the help of consolidation centres less individual supply is necessary and the number of vehicles can be reduced.
- *Auditorium: What about the flexibility of supply? Do consolidation centres limit the flexibility?*
  - Consolidation centres can also improve urgent delivery needs. If smart trucks are used the route for urgent deliveries can be optimized by dynamical route guidance. Further, with routing software and smart trucks, the truck closed to the costumer can be easily used.
- *Auditorium: What are the cost and benefits of a consolidation centre for the city?*
  - Several investments have to be made for consolidation centres (e.g. service points, trucks, routing software). For its implementation, it is essential that the city supports the idea.
  - To achieve the benefits a consolidation centre can provide, several regulative measures might be necessary. For instance, the use of a consolidation centre can be made obligatory for companies.
  - The total impact of the consolidation centre depends strongly upon the degree of support from the city.



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- The overall benefits are the reduction of congestion, noise pollution and emissions
  - *Auditorium: Do you think a collapse of the transport system can happen in future megacities? Do you think your solution can be applied in all cities?*
    - A collapse of the transport system is realistic and to some extent it is already happening today.
    - City logistics can be even better applied in emerging markets. However, in very poor cities the concept might be inapplicable.