

# From smart to elastic and collaborative mobility

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Tomorrow's Elastic  
Adaptive Mobility

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Proven solutions driving user services

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# Smart and Sustainable cities

- **Mobility & transportation:**
  - vital for modern cities operation
- However... several **problems** are caused, especially in urban and densely populated areas:
  - GHG emissions / noise
  - Accidents
  - Traffic congestion
- Whereas... several **megatrends** will influence the development of future smart cities:
  - Urbanization
  - Climate change
  - Insufficient fossil fuel
- Solution?
  - **New technologies** part of the transition to sustainable mobility



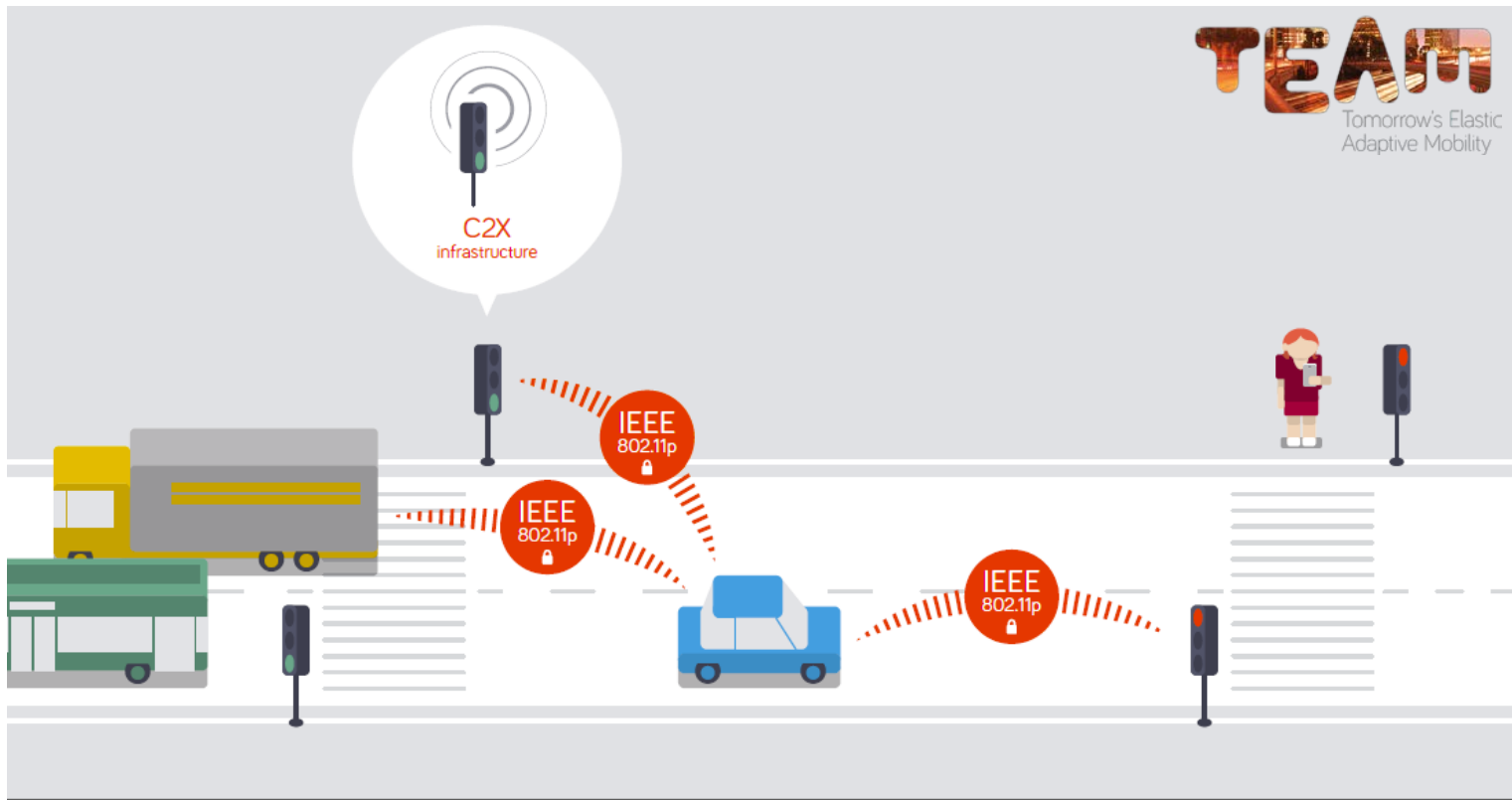
# Smart Mobility

- The user's ability to move **efficiently** and **intelligently** using the most appropriate means of transport and taking advantage of the advances in ICT technologies (e.g. smartphones, cloud technologies)
- **Collaboration** is a key concept towards enhanced and environmentally aware mobility for all citizens, building on *cooperative systems*, reliable *real-time data*, and on *active participation* of all network actors.



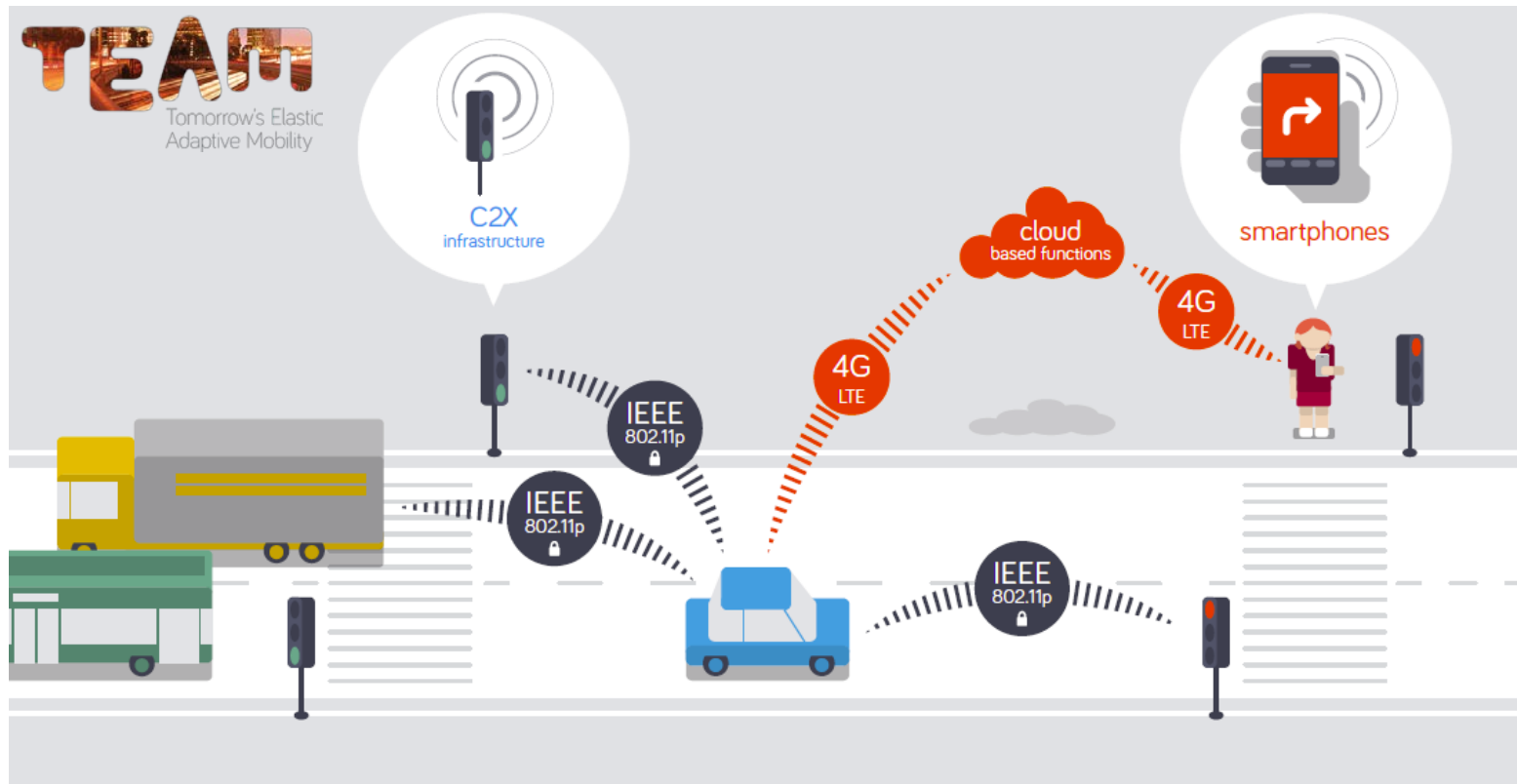
# Concept of Elastic and Collaborative Mobility (1)

- Vehicles and infrastructure already communicate.



# Concept of Elastic and Collaborative Mobility (2)

- Smartphones and cloud services will be connected, too.





# Concept of Elastic and Collaborative Mobility (3)

- Now drivers and travelers are integrated to participate.



# Elastic Infrastructure Objectives (1)

- **Elastic traffic infrastructures** - let infrastructures start to be flexible and change based on citizens' or cities' needs
- Provide “**on demand**” **mobility services** to offer maximum flexibility in the usage of different transport modes (multi-modal mobility)
- Develop **collaborative applications** targeting mainly at the enhancement of *energy efficiency* and *environmental friendly mobility*





# Elastic Infrastructure Objectives (2)

- Flexible use of available mobility facilities (i.e. road lanes, parking places etc.) by making a **sustainable dynamic planning**
- **Cooperative control sensing and optimization algorithms** able to:
  - *evaluate mobility decisions*
  - *orchestrate different user alternatives* to increase traffic efficiency and optimize mobility



# Challenges

- **Technical**

- Communications convergence (802.11p, LTE)
- Data cloud and positioning accuracy
- Privacy and security

- **Scientific**

- **Large scale systems** (infrastructure information and mobile data)
- Consider **all road users** and their interactions
- Regulate the system in a **decentralized best-effort** manner
- Elastically **respond to the changing needs** of the participating actors



# Conclusions

- **Sustainability** is a challenge in modern cities
- **Mobility** is one of the major problems
- **Elastic and Collaborative Infrastructure:** key concept for addressing transport problems of modern cities
- Need for **investments** and **research** (e.g. optimisation & control)
- Support and willingness of all the involved **stakeholders**



# Thank you!

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