ITU Symposium on The Future Networked Car
Geneva, Switzerland, 5-6 March 2014

C-ITS for Urban Mobility

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ERTICO, Member of the Supervisory Board and Strategy Board

Content

What Are the Worlds Biggest Challenges?
Traffic Collapse is one of them

Water Crisis

Human population tripled over the last **50 years**!

Peak Oil

2020: production peak of copper, gold and oil

Medical Supply

In Germany alone:
12,000 vacancies for physicians

Species Extinction

Species **for important food supply** are going extinct

Climate Change

Mankind to **work together or face mutual destruction**

Traffic Collapse

Average one-way commuting time in mega-cities:
80 minutes

Traffic Collapse

Options of future individual Mobility Behavior

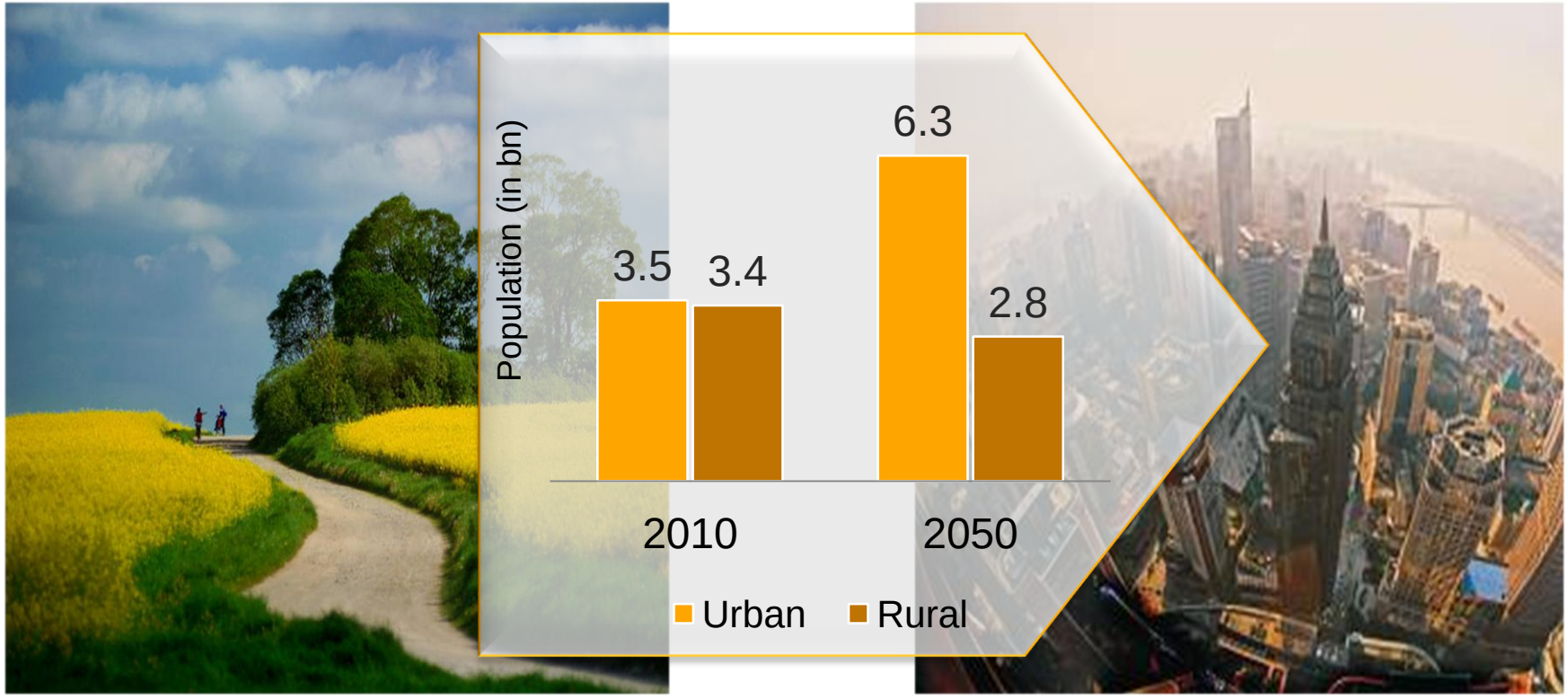
Urbanization Demographic Change New Values Connectivity

Highly Automated Driving

Internet of Everything

Affordability Legislation Electrification Resource Scarcity

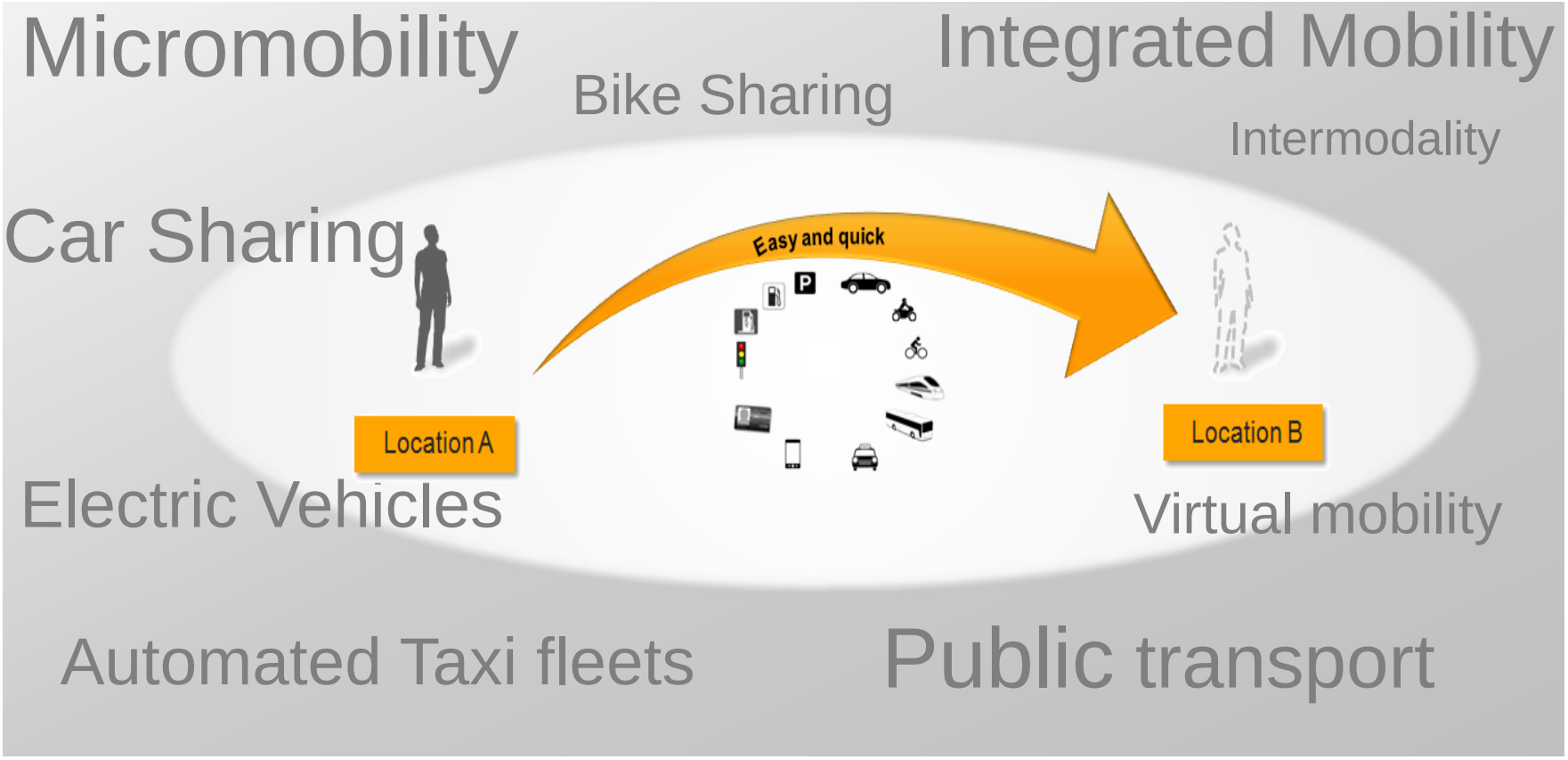
Urbanization
Traffic collapse in cities?



Urbanization
New Mobility Behavior

Urbainzation

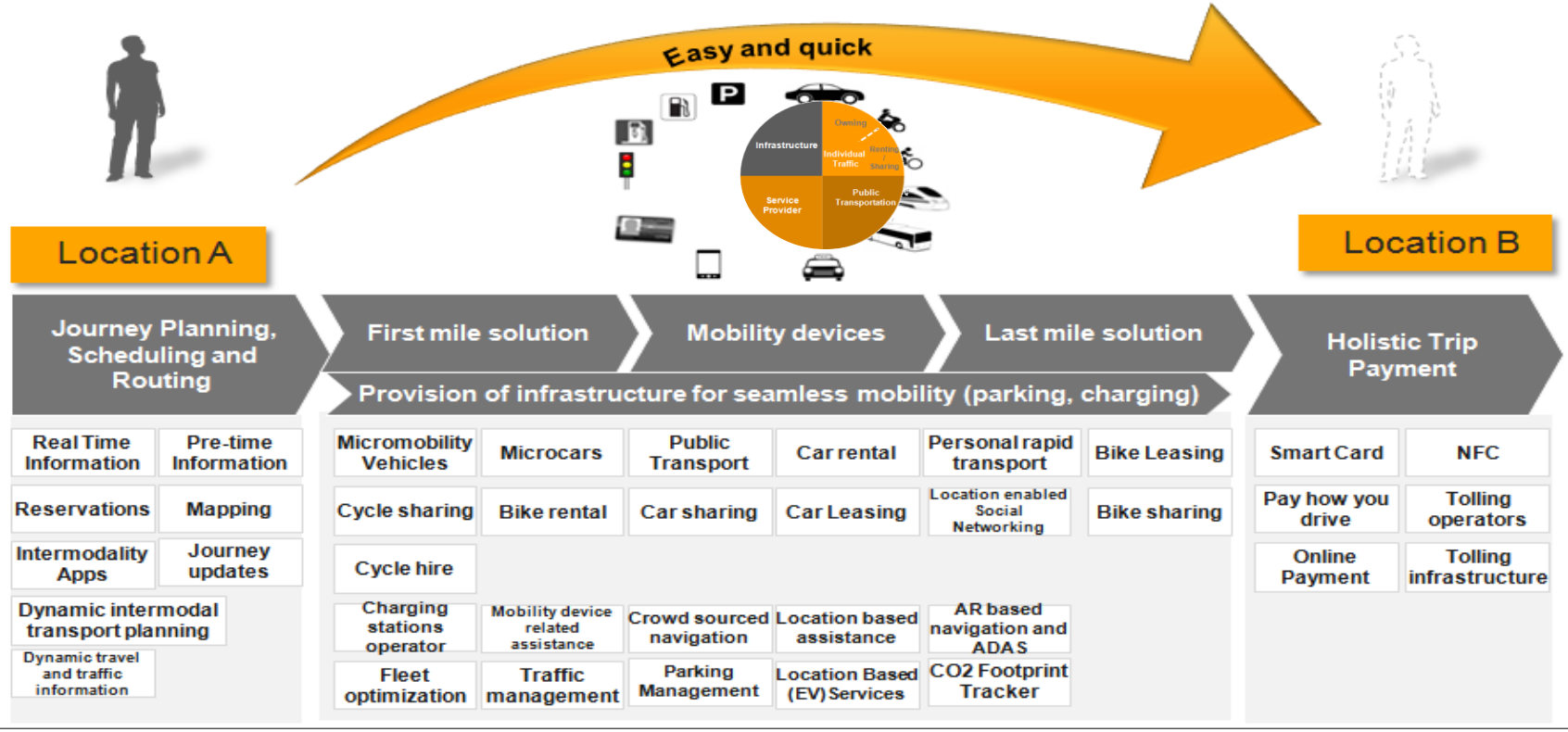
New Mobility Behavior Requires New Offers



New Mobility Behaviour

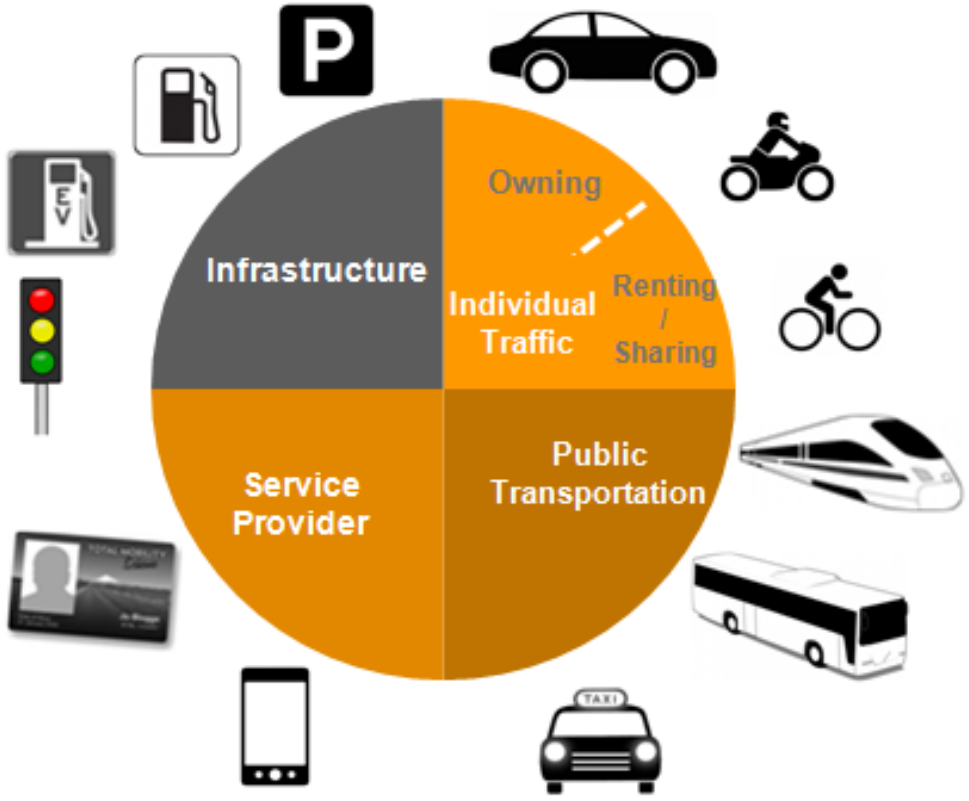
Integrated Mobility Offers Door-to-Door Mobility

- Future Mobility is not just about vehicles, it is a convergence of different industry sectors interacting seamlessly, integrated and intermodal
- Integrated Mobility offers door-to-door mobility: One Plan, one order, one ticket one bill
- Various stakeholders from diverse industries will participate



New Mobility Behavior
Integration of Various Industries

› Integrated Mobility requires integration of various stakeholders from diverse industries



Example Carsharing

Up to 16% Penetration After only 5 Years

City	Start	CAR 2GO Users of total inhabitants
Seattle	2012	4%
Vancouver	2011	5%
Ulm	2009	16%

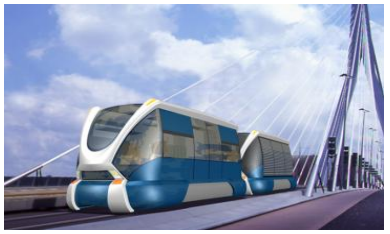
	NA	EU	APAC
Toyota		✓	✓
GM	✓	✓	
Renault		✓	
PSA Peugeot Citroën		✓	
Audi		✓	✓
Volkswagen		✓	✓
Mercedes	✓	✓	
BMW	✓	✓	

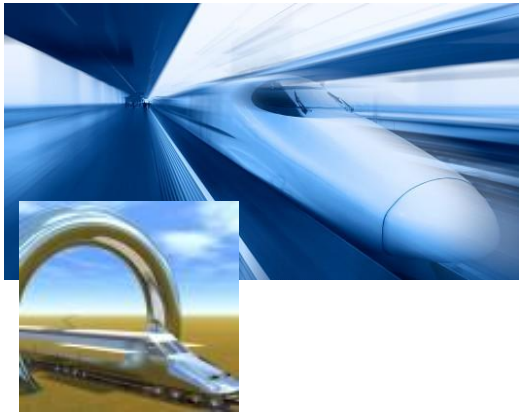
✓ current ✓ planned

Example Public Transport
Futuristic Concepts for Public Transport

RailCab (University of Paderborn)

- Scientists and students from seven university chairs are jointly doing research on the new rail system in the domains of mechanical and electrical engineering, economics, and information science.





Hyperloop (Elon Musk)

- "Hyperloop" as a future replacement for bullet trains
- A pneumatic transport system (PTS) in the form of a closed tube that loops
- Would get commuters from San Francisco to Los Angeles in as little as 30 minutes
- a non-scheduled service which leaves when you arrive, is immune to the weather and never crashes
- would double the gate-to-gate average speed of an aircraft over that distance, which is 560 km

"Cybernetic Transport Systems" (CTS)

- composed of road vehicles with fully automated driving capabilities under control of a central management system (software drives the routing and management of the fleet of vehicles)
- transportation for passengers or goods on a network of roads with on-demand and door-to-door capability
- advantage of being able to run on normal road infrastructure → cheaper, more flexible

Example Service Offerings

Mobility Integrators Enable Door-to-Door Mobility

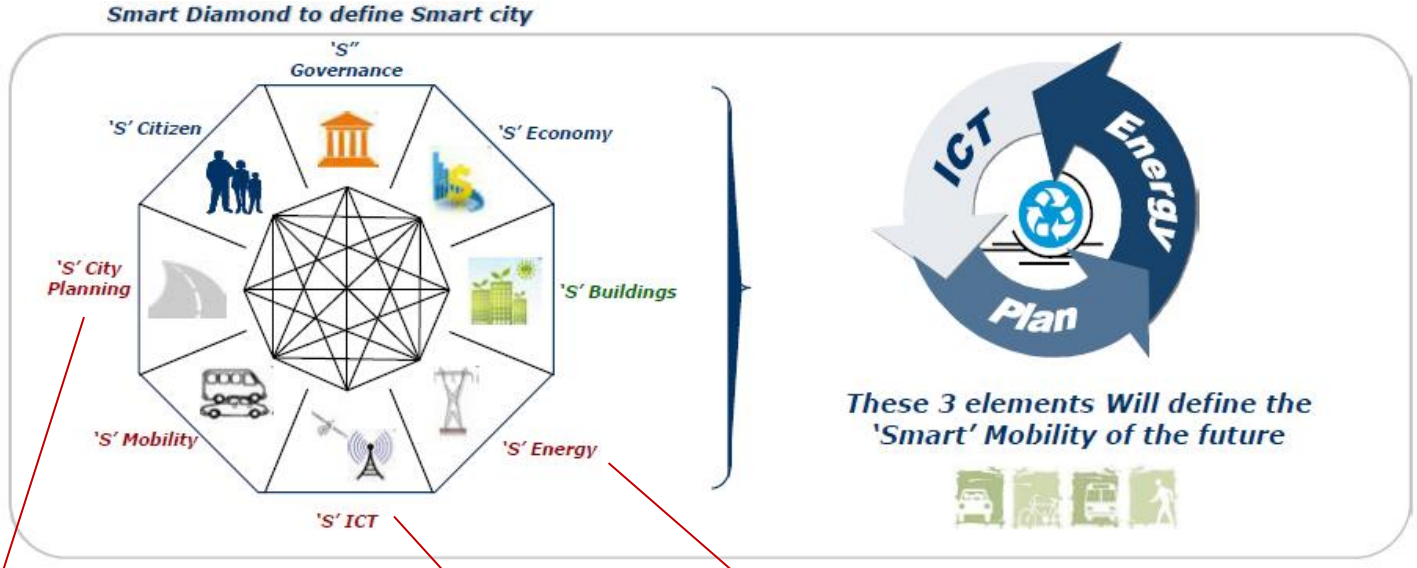
- Mobility Integrators act as single point of access for all mobility-related activities:
  - Planning
  - Booking of mobility devices
  - Holistic trip payment

Business model	Target customers	Offerings	Core assets and capabilities	Revenue source
Google Mobility services platform manager	■ Traveller community at large	Single point of access for getting information, planning, booking and payment for a journey	■ IT enabled platform ■ Consumer interface ■ Supplier sourcing and contracting	■ Transaction fees ■ Interest income ■ Advertising & chip storage space leasing
Mobility chain integrator	■ Individual (high-end) traveller	Personalized seamless journey to get as fast and convenient from A to B	■ Brand ■ Dense service network ■ Partnerships	■ Fee for service

Urbanization

Over 110 Global Cities to be SMART Cities in 2020

- More than 50% of smart cities of 2025 will be from Europe and North America
- Smart cities within emerging economies will be built from scratch with an **eco-focus**, while developed economies will change existing eco cities into smart cities through high investments in sustainable infrastructure



EV- and congestion charging, smart grid, Bus Rapid Transit, parking infrastructure

renewable energy, smart grid infrastructure

telematics, navigation, smart metering, internet technologies

Content

ERTICO

ERTICO Vision

Bringing intelligence into mobility for:

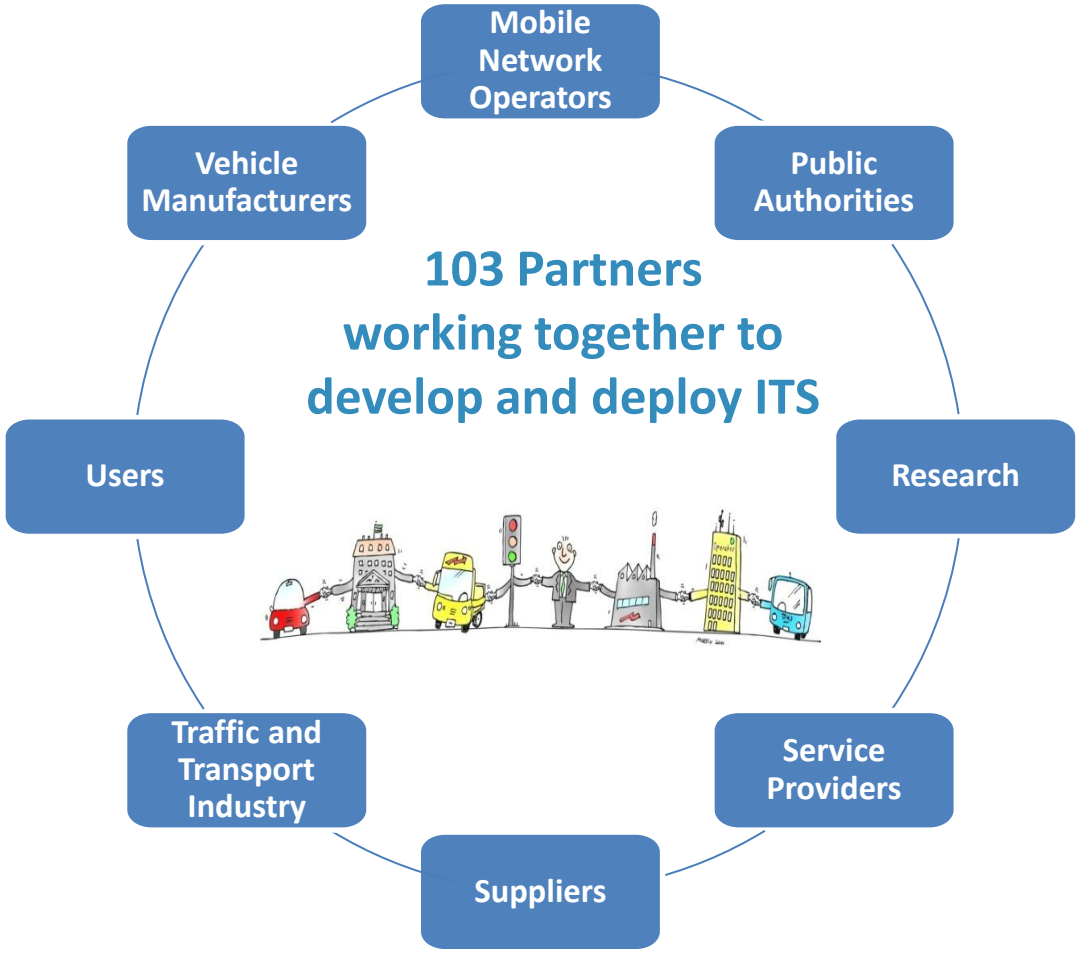
SaferMobility	**zero accidents**
SmarterMobility	**zero delays and fully informed people**
CleanerMobility	**reduced impact on the environment**

ERTICO Mission

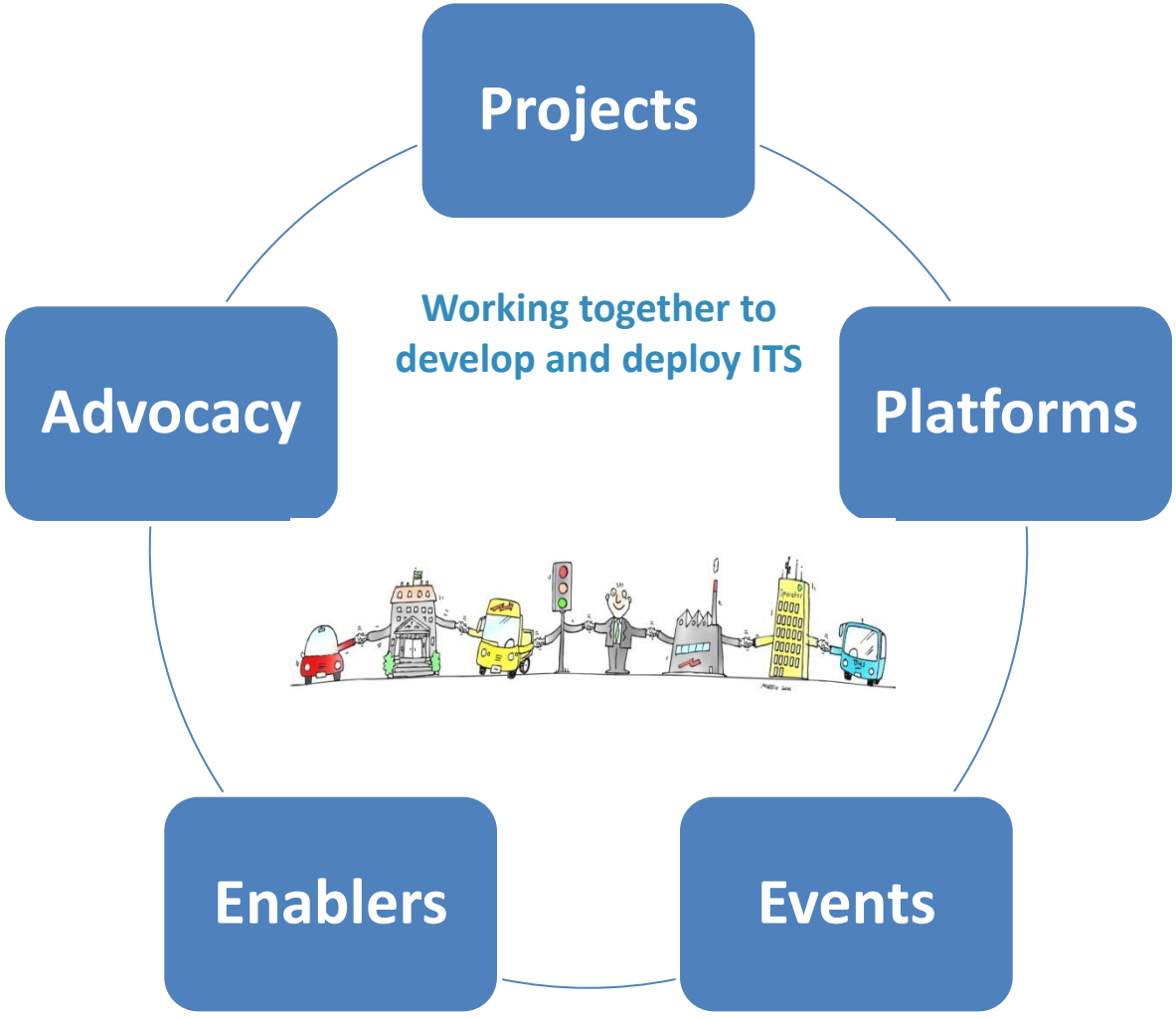
Develop, promote and deploy intelligent transport systems and services which needs multi-stakeholder engagement

- Implementing necessary deployment enablers
- Evaluating, adapting and using most advanced related technologies

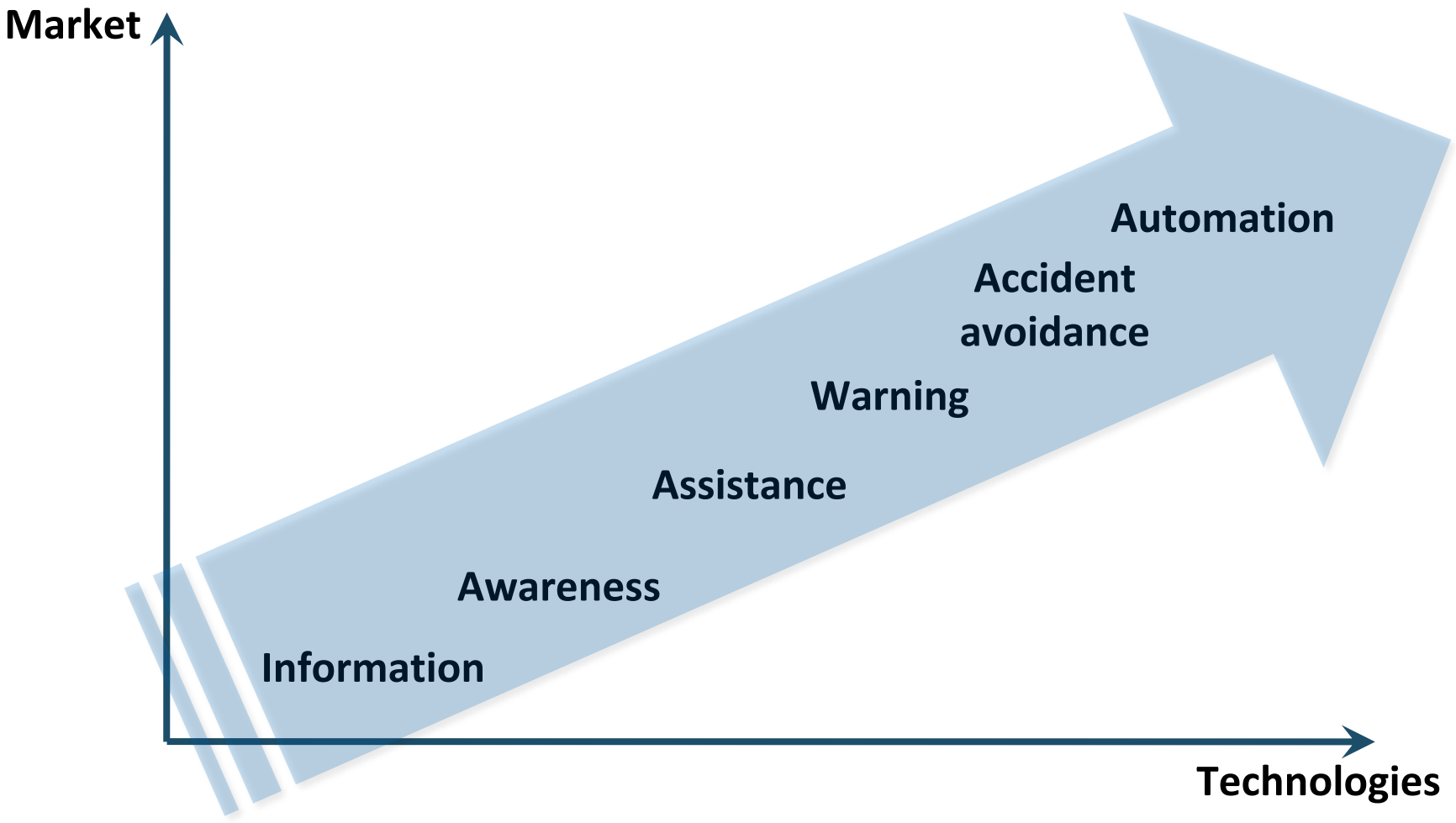
ERTICO Partnership



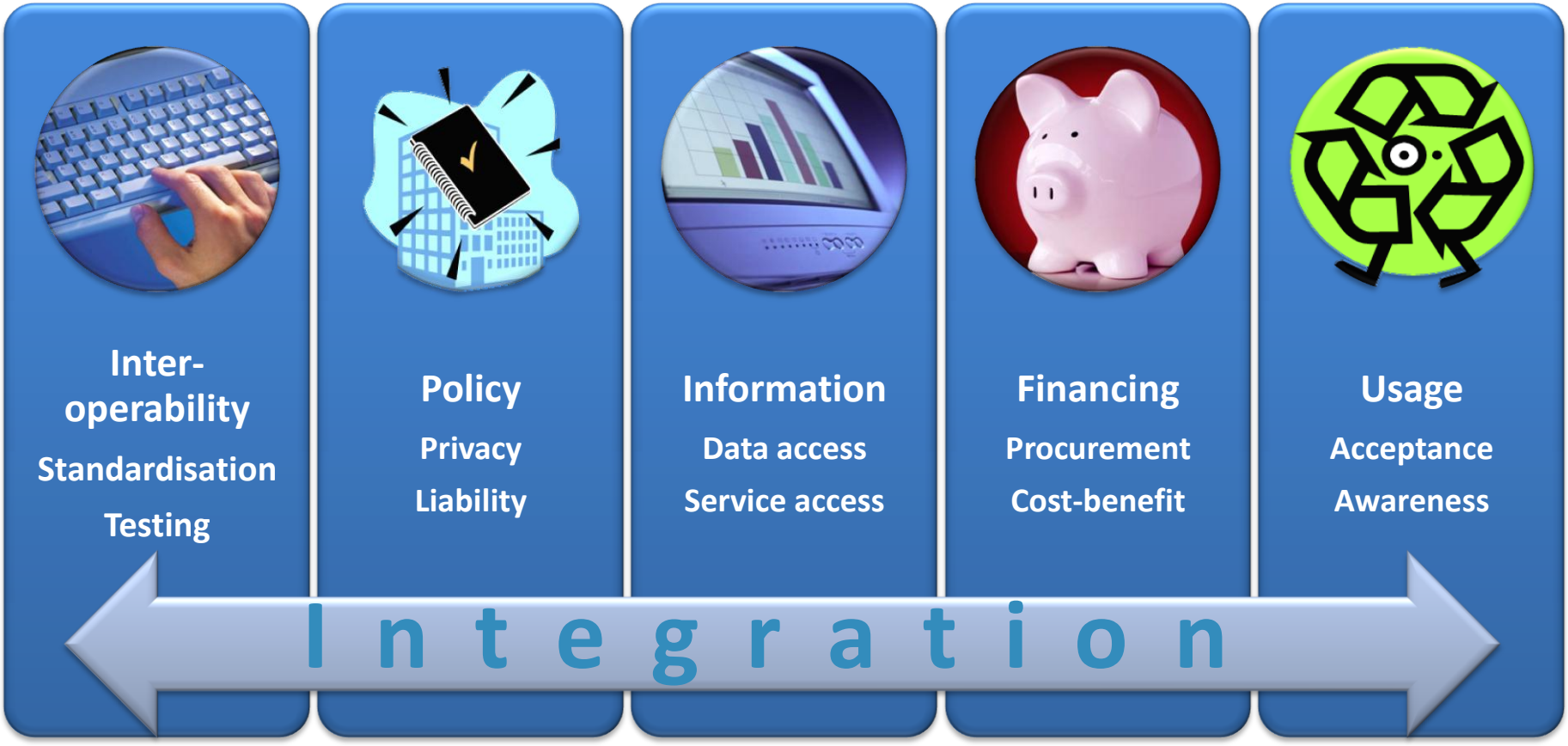
ERTICO Tools



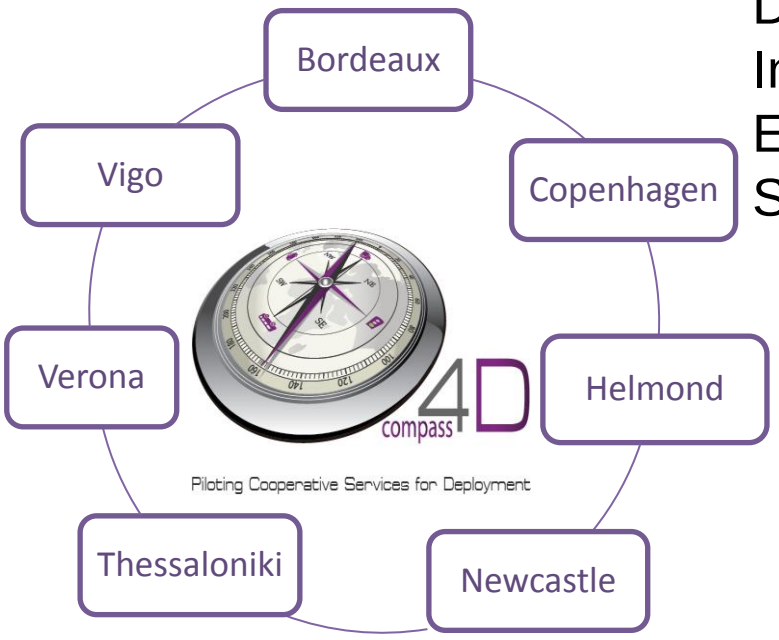
C-ITS: Services



C-ITS: Enabler



Compass4D



Deploys 3 C-ITS services in 7 European cities
Interoperability
Economic sustainability of the services
Scalability

- Road Hazard Warning (RHW)

- Red Light Violation Warning (RLVW)

- Energy Efficient Intersection Service (EEIS)

Test Interoperability of C-ITS

Test minimum requirements

Test Pass certificate

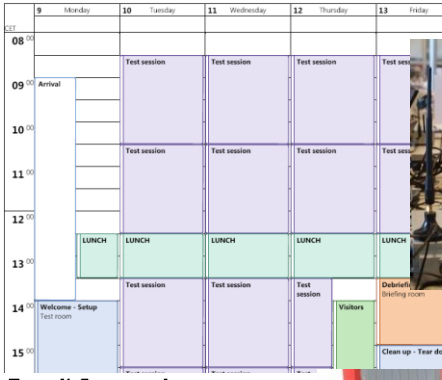
Standards

Testing

Compliancy Assessment

Interoperability test events

C-ITS



eCall

Result Summaries

Results for all configurations

Number of tests per test session: 30
Number of Sessions: 348
Of the 348 reported sessions 339 were agreed (

All results in the following includes no

Overall Results

Interoperability		Not Executed		Totals	
OK	NO	NA	OT	Run	Results
2095 (93.7%)	142 (6.3%)	990 (24.8%)	761 (19.1%)	2237 (56.1%)	3988

Total: 2237

Results Statistics per Test Session

	Interoperability		Not Executed		Totals
	OK	NO	NA	OT	Runs
Minimum	0	0	0	0	0
Maximum	19	7	18	18	20
Mean	6.5	0.4	3.1	2.3	7.0
Deviation	3.03	0.98	4.16	4.72	3.04

TPEG

Results per Group

	Interoperability		Not Executed		Totals	
Group	OK	NO	NA	OT	Run	Results
Mandatory	1232 (93.9%)	80 (6.1%)	257 (15.5%)	87 (5.3%)	1312 (79.2%)	1656
Optional_CFG_01	830 (93.5%)	58 (6.5%)	733 (32.0%)	673 (29.3%)	888 (38.7%)	2294
Optional_CFG_02	33 (89.2%)	4 (10.8%)	0 (0.0%)	1 (2.6%)	37 (97.4%)	38

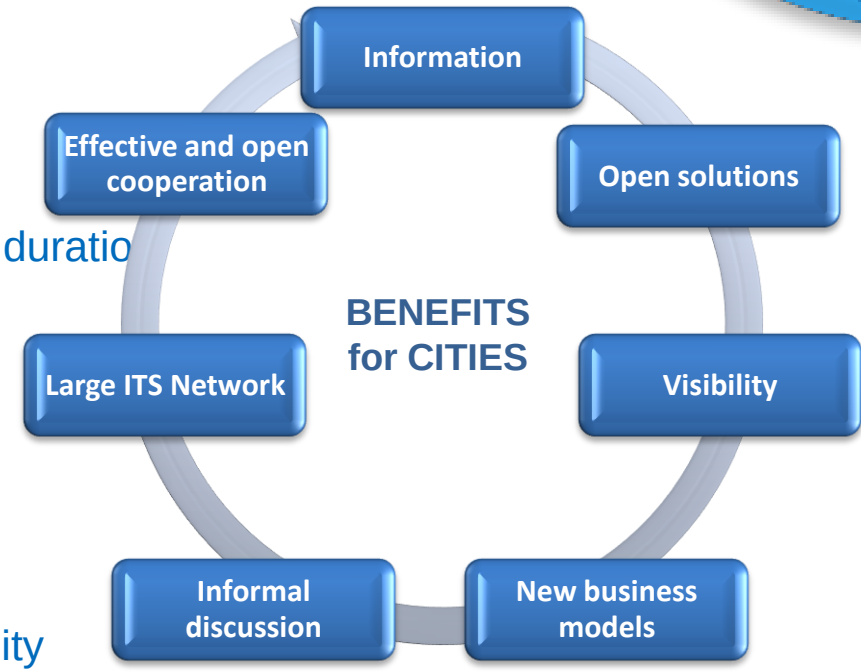
TESTFEST

ITS for Urban Mobility

More than 50 cities involved in our activities

BUT - Participation and benefits limited to the project duratio

AND – Deployment obstacles still exists



HOW?

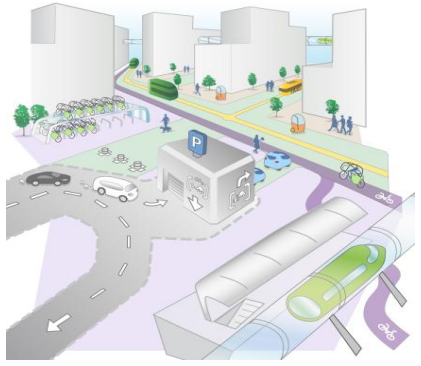
Our initiative:

- Approach cities and Industry
- Create a sustainable public-private community

for long term ITS development

WHY?

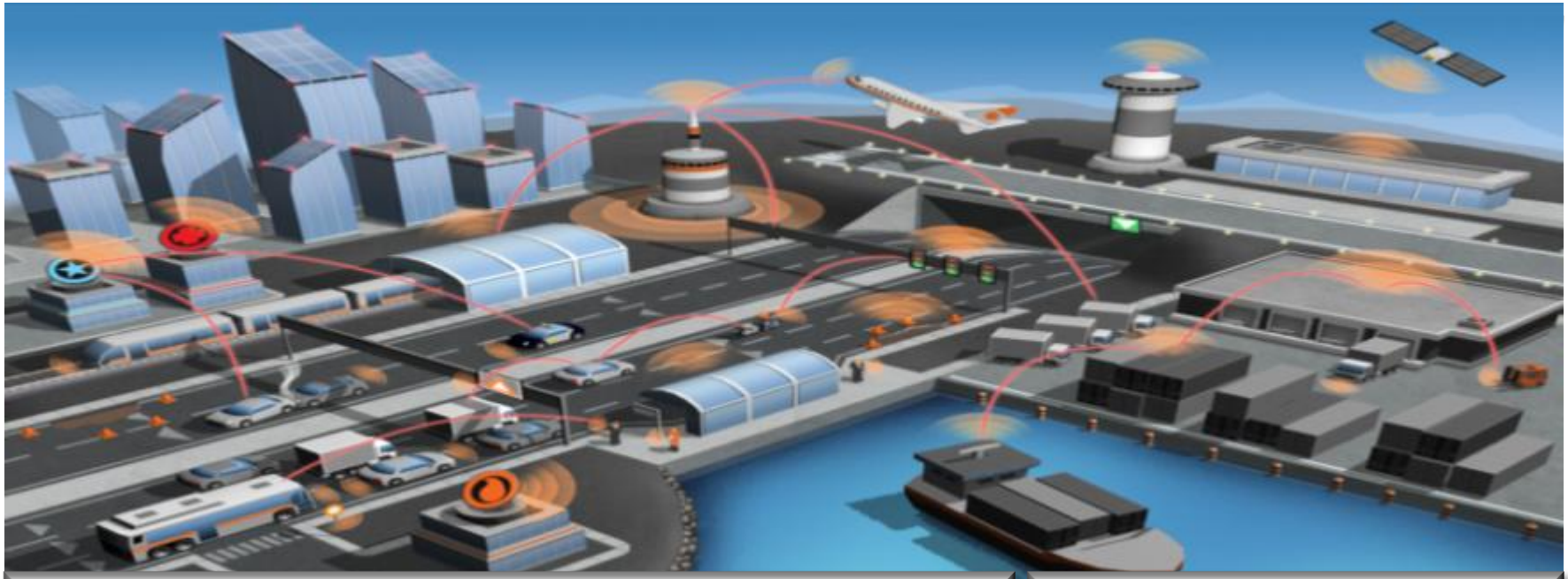
- To exchange knowledge, show solutions & lessons learned
- Spread awareness and ITS culture
- Match city ambition with open solutions
- Demonstrate ITS solutions through projects



Content

Intelligent Transportation System Definition

Data is the Oil of the 21st Century and Basis of ITS Value Chain



Intelligent Transportation System (ITS) Definition*

ITS is the creation of a **data network** between **transport infrastructure, vehicles and users** by using information and communication technology.

It is more than in-vehicle products. The intelligent transportation system is only possible if a **representative quantity of data is collected, linked and processed.** Hence a high quality information is provided as a service in real-time.

ITS Targets

- **Save Costs**
- **Save Time**
- **Protect Life**
- **Protect Environment**

*Source: European Telecommunications Standards Institute (ETSI)

Intelligent Transportation System

Urban ITS affects all ITS Business Sectors

Zero traffic jams
Individual routing

Save life
Automation of rescue chain

Reduce TCO
Logistic automation

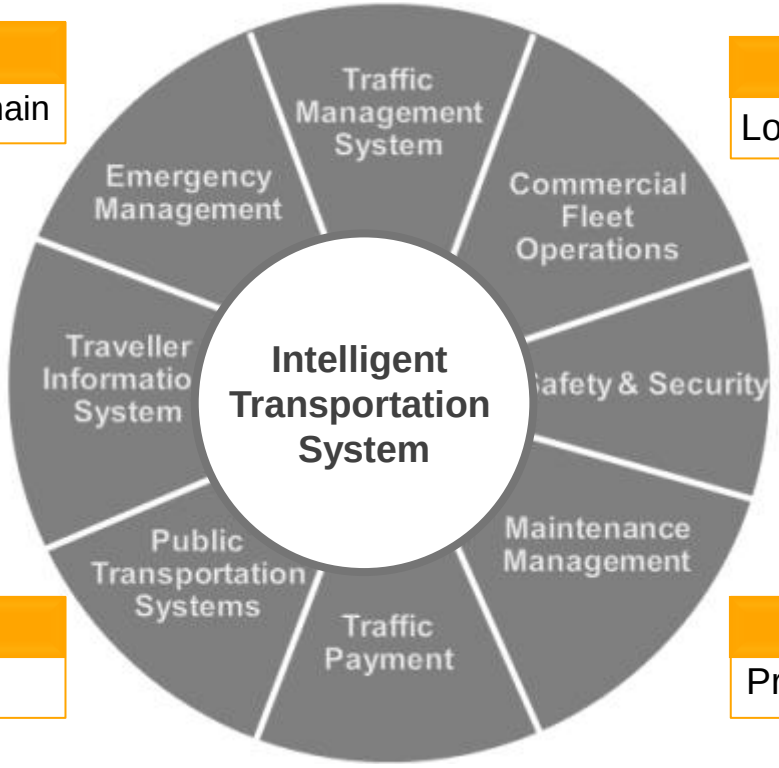
Choices at one glance
Intermodal recommendation

Zero accidents
Automated Driving

Zero loss of time
Real time scheduling

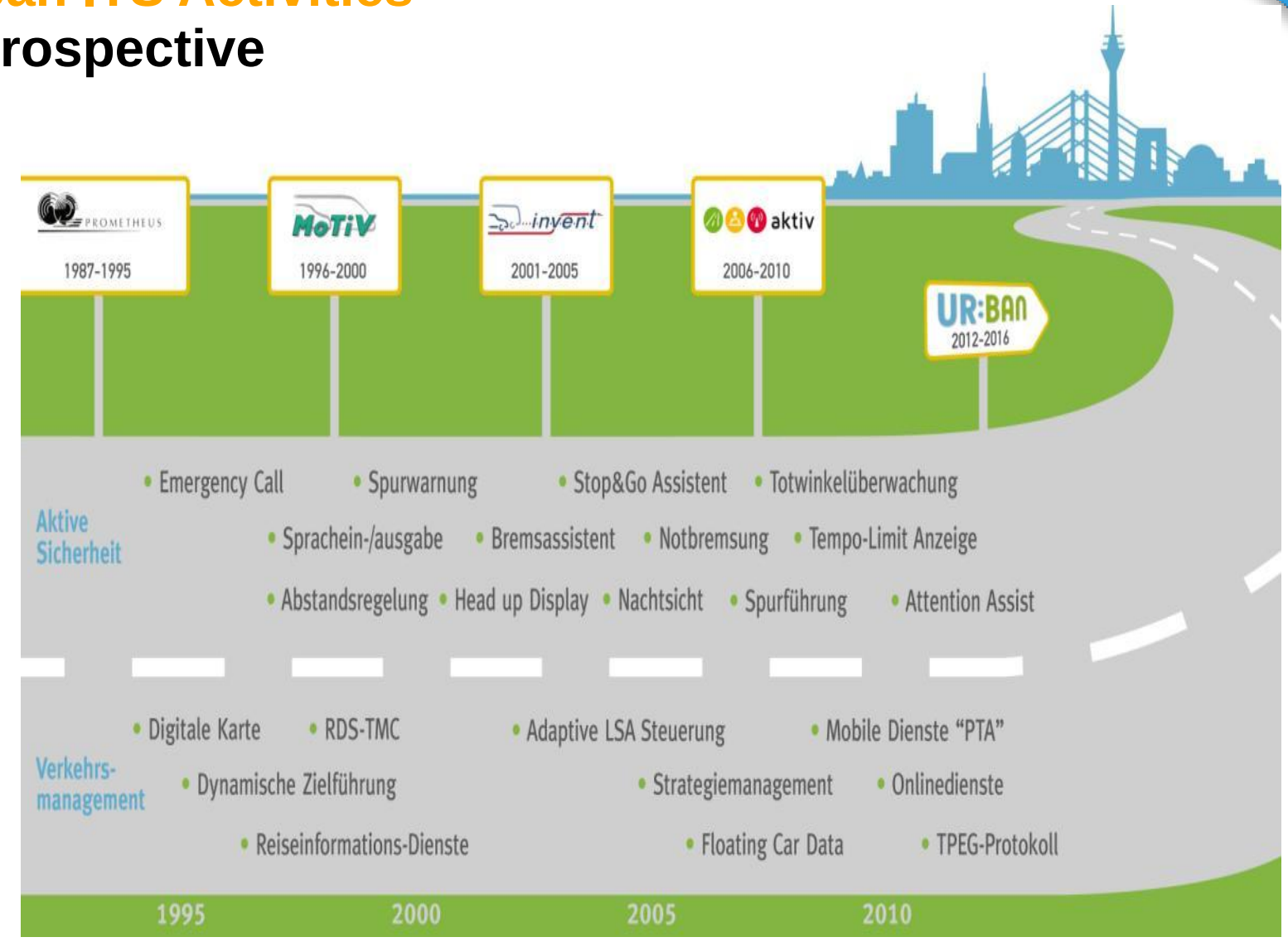
Zero breakdowns
Predictive maintenance

New business models
Pay per use, pay how you use



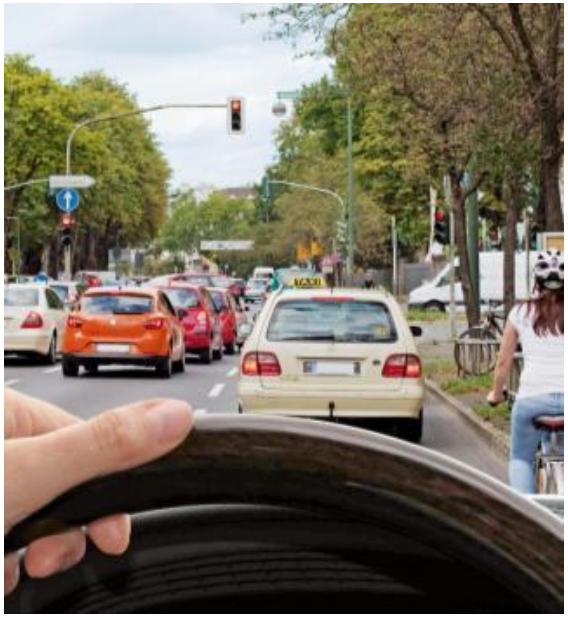
TCO: Total Cost of Ownership

Urban ITS Activities
Retrospective



Example UR:BAN
Further Improvement of SMART Cities

Examples:
- Passenger Safety
- Collision Avoidance
- Smart Cross Roads



Cognitive Assistance

Connected Traffic Management

People in the traffic

Content

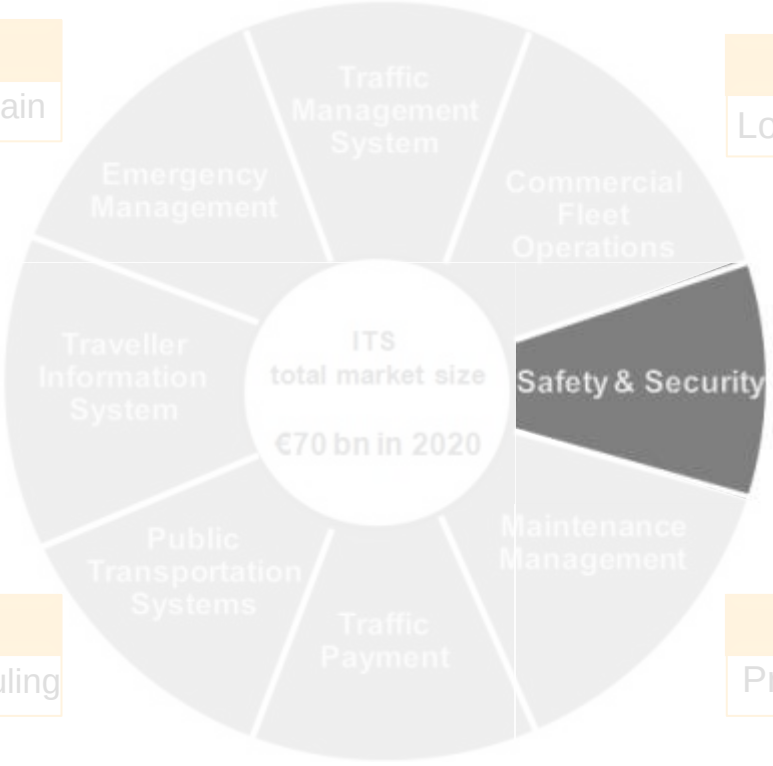
Urban ITS
Towards Automated Driving

Zero traffic jams
Individual routing

Save life
Automation of rescue chain

Reduce TCO
Logistic automation

Choices at one glance
Intermodal recommendation



Zero accidents
Automated Driving

Zero loss of time
Real time scheduling

Zero breakdowns
Predictive maintenance

New business models
Pay per use, pay how you use

TCO: Total Cost of Ownership

Continental Mobility Study 2013

Majority of motorists consider advanced driver assistance systems to be helpful

Continental Mobility Study 2013

Majority of motorists expect partially automated vehicles to be available after 2020

Industry experts trust the reliability of automated driving, and see freedom to make decisions as a prerequisite for market success

Automated Driving for Urban ITS

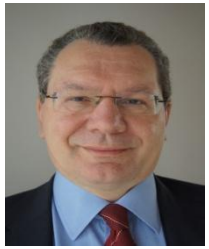
A Revolutionary Approach in Evolutionary Steps

10th ITS EUROPEAN CONGRESS
Helsinki, Finland | 16-19 June 2014

“One of the core themes: From connected to automated vehicles”

Communication technologies
V2V based applications
V2I based applications
Advanced Driver Assistance Systems
Highly automated driving
Fully automated transport
Legal and Institutional Issues
Human factors
Social issues (privacy, etc.)

Thank you
for your attention!



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