ITS Workshop in Bordeaux 2015

Associated event to the 22nd ITS World Congress, 7 October 2015

ITS FOR SUSTAINABLE MOBILITY AND THE MITIGATION OF CLIMATE CHANGE

Opening remarks

Jean-François JANIN (Ministry of Ecologie, France)

Mr Janin recalls that the ITS presentations take place on two sites (Palais des congrès and Parc des expositions). Mr Janin is very honored to come at this seminar. He recalls that two key note speakers are present this morning : Mr Christian Friis-Bach and Mr Michel Labardin.

François GUICHARD (UNECE)

François Guichard is the secretary of United Nations working group of active safety and automatic driving. He is very happy to welcome the participants here in Bordeaux.
We have been reflecting on the activities in Bordeaux since the beginning of the week. Perhaps, Mr Janin could say a few words about the manifesto for ITS and climate change. This is the reason why we are present today. We are those who are able to implement this type of policies. We need to answer to the agreement at the interministerial in the beginning of the week.
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Key note speeches

Christian FRIIS-BACH (Executive Secretary of UNECE)

He introduces this meeting.. He‘s very pleased to be here to be part of fascinating discussions and fascinating times. He thanks the Ministry of Ecology, Sustainable Development and Energy and its platform for the experimentation, research and innovation in the mobility (PREDIM). He thanks also the challenge Bibendum for the good cooperation and the organization of this event.
I saw a small newsletter clip from the defense advance research project agencies competition. It’s a front line competition in robots, computer advanced technology. Ten years ago in 2004, they had an exhibition on autonomous car without driver. I saw a picture of that car : It’s a monster with huge cameras and big kinds of technology on the roof and GPS sensors and whatever. And today, ten years later, we have small autonomous cars driving around being tested on real time on the roads. It is absolutely fascinating what technology is bringing us these days.
It‘s moving in quantum leaps and it is bringing a lot of hope for Intelligent transport system in the future.
Historically, when we’ve seen big technological leaps forward, it is often been at the cost of the environment. Think about the Industrial revolution, which brought immense pollution to the planet. And also the Transport revolution we saw during the last century, it has brought with it enormous environmental degradation. Today we have 20% of carbon dioxide emission from the transport sector. And it’s growing every day. Because it is one of the sectors where it has been difficult to

substantially bring down emissions. But we know that with the intelligent transport revolution it can be different. We can have a revolution now that can create benefits to people and prosperity to the planet and the environment at the same time. And it is something we have to achieve. Just less than two weeks ago I was in New York where we approved historically the 2030 sustainable development agenda, sustainable development goals or the global goals will be called the historic mission for mankind. We are the first generation, as the secretary general has said it, with the ability to eradicate extreme poverty. And we are the last generation with the ability to check climate change. It's an historic responsibility of an unprecedented scale that we face in this generation but also for historic opportunity. And part of the sustainable developing goals we have, as most of you know of course, the clear ambition to bring sustainable energy to every single citizen in the world, leaving no one behind, at the same time checking climate change. As part of this, mobility is clean. Soon of course we know we'll be meeting in Paris to, hopefully, have a strong, a binding, an ambitious climate agreement. And this time we must succeed. I'm from Danemark, I remember COP15 in Copenhagen. It wasn't easy . It wasn't a successful event. This time we cannot fail and we must not fail.

The transport systems have a huge potential to reduce greenhouse gaz (GHG) emissions and CO2 emissions from road transport, providing a pathway on how we can both get a better flow of traffic and also fewer emissions because ITS technologies can support the shift to the least harmful modes in environmental terms. Multi modal journey planners are developing state-of-the-art integrated international journey planning services that provide efficiency and decreased environmental impact of travelling. Individual travelers and freight free shipping enterprises are making better informed choices, better mode integration and promote inclusive mobility. I am sure Mr Michel Labardin will tell us more about this later today also. This enables flexibility if there is congestion, it makes sure we don't have major transport disruptions because that can really increase the time spent on the road and the emissions related to transport and it also brings up the cost. So this is a win-win situation if we do it right.

Rapid development is also taking place in the area of automated vehicles and connected vehicles. Vehicles can communicate with infrastructure, vehicles can communicate between themselves, and vehicles also will be able to communicate with the most vulnerable transport users on our roads. So, this will again allow us to reduce fuel consumption and CO2 emissions because cars can drive closer and trucks can just be after each other and I 've seen that a technology has been developed to drive 5 trucks with one driver. So the emissions can be reduced. There are a number of promising benefits for transport, for our economy and for the environment at the same time.

Of course there are also many challenges: safety, cycle security, technical and regulatory harmonization. This is what we deal in UNECE. In the inland transport Committee, we try our best to shape the regulation and the global regulation that can allow to new technologies to be used across borders, worldwide and used in an efficient manner. And these are the discussions we have on the ITS applications under the inland Transport committee and especially under the World Forum for the vehicle regulations and the Working Party on road traffic safety.

Here we need to strengthen now efforts. We are pleased to have now the Secretary General special envoy for road safety with us today, Mr Jean Todt, who can also here boost our work in terms of providing safe and sustainable transport systems for all.

The World Forum for vehicle Regulations is already responding to these new innovations. However we also see with the global competition in transport that many countries are now trying to drive forward a competitive edge by developing their own regulations, making their own policies, making their own principles for their own transport sector. It's an understandable political drive, every country wants to move and become the first driver in intelligent transport, but I would strongly warn against it. We should avoid local or regional or national solutions, we should strive for global harmonized solutions on a global basis.

And yet the UN instruments are there. They can help us to develop common regulations and requirements for safety and environmental protection. In the UNECE we have place to do this because, apart from our strong commitment on transport, we host air pollution convention and have

keen knowledge on how black carbon emissions from cars can create degradation, health problems and also increase climate change. We work on sustainable energy solutions in order to tackle the climate crisis.
So this combination is available for members states worldwide or also to develop strong regulations that can help us to bring Intelligent Transport systems that can tackle the climate crisis.
So ITS, the new transport systems can bring enormous benefits for people and for planet they can help us to ensure prosperity, they can help us to shape new partnerships and to see here at the world congress. They can help us to implement the ambitious and historic sustainable development goals and a strong climate agreement. So it's only possible if we're together. We hope to see many of you in Geneva.
Thank you very much for your attention

Jean-François JANIN (Ministry of Ecologie, France)

He thanks Mr Friis-Bach for the interesting speech. He comes back to the manifesto (see http://www.developpement-durable.gouv.fr/IMG/pdf/THE_ITS_2015_BORDEAUX_MANIFESTO-2.pdf)
The ITS world congress of Bordeaux will also serve as a launching pad for the COP21, to be held at Paris in december.

We have launched at the beginning of this process 85 letters to the different countries interested in the climate change. Thirty of them were representative on Monday and the Manifesto has been produced after this meeting and we have two versions of the Manifesto : an English and a French version. The initiative for ITS for Climate has been presented at this occasion. We shall have an exhibition on this subject at one o'clock today.
The next ITS world congress will be held in Melbourne next year and in Canada in Montréal in 2017. How to do something to be real and natural part of the ITS community and to prepare a common action involving many companies, research organisms, local authorities …, to have a real effective impact on this problem?

Michel LAVARDIN (Vice-Président of urban community of Bordeaux)

Bordeaux Metropole is the 6th largest French urban area (1,1 Millions habitants).

Bordeaux is a connected metropolis :

- The LGV High Speed Rail Line in 2017 will connect Paris to Bordeaux .
- the international airport
- 4 national and international motorways and a ring road
- two new bridges over the Garonne river. Bordeaux has a public transportation and Bordeaux has a program of building new bridges

The GERDRUDE System

GERTRUDE is a centralised traffic regulation system which has been created in 1973. It's a Real Time Electronic Management of Traffic Lights against jams. It's :

- A global solution in order to manage traffic and travel flows, deployed at first along the Garonne river and on main roads crossing the river
- A solution based on real-time processing of recovered sensor information and orders down to the junction lights

- A system which involves 610 totally adaptive intersections linked with the traffic centre out of a total of 910 intersections (9000 sensors)

The system will evolve towards GERTRUDE 2.0 which is taking account of Electronic Management of Real-Time Regulation for Urban Planning, Transport and the Environment. Example: the priority given to separate-lane public transport, with strategies that adapt to actual conditions.
In the 1990s the French State completed the local system with the ALIENOR system for traffic management and safety on the ring road.

Bus priority

The technology is based on hyper frequency transmission with receivers on traffic lights linked with GERTRUDE. There was an experimentation on a bus line for one year :

- Bus Line 3, 15 km with 10,000 travellers per day
- Redesigned 1.7 km of road with bus lane
- 45 cross roads equipped out of 49

The Consequences of the experimentation are :

- Travel time reduced from 1 hour to 50 minutes
- 10% more users since 2010
- Bus frequency upgraded from 12 minutes to 10 minutes
- But no measurable impact on energy consumption

We decide to extend the experimentation to 2 other lines.

The public transport network

It's composed of 3 tramway lines (60km) and 79 bus lines. The 4th line of tramways is in preparation. In the next fifteen years one billion euros will be invested.
The number of public transport users has increased by 30% over the last five years

The mobility in Bordeaux

The mobility is designed around several tramway lines and restructured bus lines. The tram network is based on a new operating mode: intermediate terminus and increased rush hour frequency (every 3mn30"). All parts of the chain of mobility complete the public transport network with bicycle (Vcub), river shuttle (Batcub), electric car sharing (BlueCUB), car-sharing (Koolicar and Citiz) and car-pooling.
The lessons we learnt from the latest household travel survey are that the upper limit for a person is 4 journeys/day. The alternative means of transport are increasing within the city. There are less and less cars in the city but more and more cars around the ring road. That is a challenge for the future. The use of personal cars is still preferred for 59% of daily journeys.
The tramways effect is very real in the city center. The horizontal red line is an estimation of the reality of the use of tramways in rush hour.

Characterisation of traffic

Car traffic within the city ring-road is less 35% inner the city. The distribution of inner-city daily travel is : car (14%), public transport (22%), walking (54%), cycling (8%)
But Bordeaux Metropolis is still facing congestion problems. Most of journeys under 2km are still made by personal car. The challenge is to bring back drivers to public transport and the metropole has a new urban planning trying make them to coming back the center of Bordeaux and the center of other cities. We attend that this movement produce a good effect.

Partnership mobility charter

We had a reflection and decided together to elaborate a partnership mobility charter :

- The need of a new mobility model for the next 20 years
- a mobility forum: a collaborative and participatory approach
- a partnership charter: 20 principles like urban logistic, going to school without a car, teleworking & a 17-action program
- mobility part of local town plan will take into account some of these proposals.

Our reflection is about the intelligent sustainable transport to maximize the existing structure and continue to restrict use of the car in the city center and avoid loss of attractiveness economically when companies are hesitating to settle in some agglomeration areas due to congestion.
Our challenge is a climate plan approved in February 2011. The objective for the next four years to 2020 is to decrease the use of cars (from 59% in 2009 to 45% in 2020, 33% in 2050) and increase the use of public transport (from 11% in 2009 to 15% in 2020, 20% in 2050), cycling (from 4% in 2009 to 15% in 2020, 18% in 2050), walking (24% in 2009 to 25% in 2020, 29% in 2050).

Optimisation of existing networks Innovation & developments

We involve the optimization of existing networks with the improvement of the coordination. So we use a multimodal dashboard in real time to help the good choice of mobility: connected vehicles (Compass 4D) and Possible new ring-road uses : the ring road 2x3-lanes constitutes an innovation opportunity ; a high-level bus service will be experimented ; public transport services and car-sharing will be promoted.

Estimated impact on CO2 emissions

We have estimated CO2 emissions :

- 30% for the road traffic in the inner city from 2000 to 2012
- Thanks to Natural Gaz Buses (NGB) (70% of the metro buses fleet)
- In the top 10 of most cyclist-friendly cities in the world (+76% from 2003 to 2013)
- 83% of residents in favour of restricting car usage in the city. People are very concerned

About their quality of live

Finally we are involved in the European Smartline project with 7 other cities in Europe. Smartline is based on the open cloud and big data storage and the goal is to study flexible mobility demand analysis, flexible mobility offer optimization and planning, transport means itineraries and users itineraries.

Hight-level panel : Impact of ITS on sustainable mobility – Expectations for the future

Expectations related to ITS and mobility – Jean TODT (UN special envoy)

It's a big pleasure for me to be at the ITS world congress in Bordeaux.
I am appointed by the UN secretary general as Special Envoy for Road Safety and I am President of the FIA. It's a big opportunity for me to speak today at this congress that addresses the impact of the intelligent transport system on sustainable mobility. My objective this morning is briefly present the expectations related to ITS and mobility with a special focus on how to improve the global situation for safety and also highlight a few elements from a consumer perspective.

Transport is a key element for sustainable development. Recently, the UN assembled, as mentioned by Mr Christian Friis-Bach, has convened in New York to approve the new sustainable development goals and to set a new global framework. In the new global framework for sustainability, I am pleased to see that transport text has a prominent role.
This is an historic step. As transport had not been recognized in the previous millennium development goals and as a consequence, hadn't received enough attention in the last decade. This is a key for improving safety and making transport more sustainable.

As far as road safety is concerned, we have a change ahead : a specific stand-alone target in the UN Health Sustainable Development Goals to reduce road traffic fatalities by 50% by 2020 and a target on sustainable urban transport cities has been approved, representing an important opportunity to advance the road safety agenda.

The key challenge for governments now is to implement policies that will contribute to achieve these goals. As far as implementation is concerned, I do see two main lines of actions:
1) Getting political support
2) Identifying the proper enabler

1) Getting political support

It is a big potential to improving safety in the transportation sector, where approximately 75% to 90% of accidents are the result of human error or disregard for traffic regulations.

Vehicle related ITS applications, such as electronic stability control (ESC), automated emergency braking systems (AEBS), pedestrian recognition and other developed and developing intelligent sensing tools a great potential to contribute to avoiding road crashes or at least to mitigate their impact on road users, therefore highly contributing to increased safety in transport systems.

Over the past decades, under the auspices of UNECE, the United Nations has developed 58 conventions and agreements in relation to international transport.

Many of them govern a huge variety of road safety areas, such as traffic rules, the standardization of road signs and signals as well as vehicle standards.

These legal instruments are in place: we know how to build safer vehicles; we know how to build safer roads; we know the benefits of advanced and consistent traffic rules and road signs in making people use roads safer still.

Yet there remain nations and regions that have not adopted these instruments.

If we could get these instituted and correctly policed on a global footing, we would see a dramatic improvement in road safety in the most crucial areas of the globe -- the low- and middle-income countries where a staggering 91% of worldwide road deaths occur.

The Second High Level Conference on Road Safety, next month in Brasilia, will give us a tremendous opportunity to get political support and move road safety to the next level.

One further consideration we should not underestimate: UNECE instruments set strong standards and requirements for safety. Existing regulations may be at odds with new information and communication technologies (ICT) developed for application in transport systems and vehicles. In order to avoid potential non-conformity of ITS technology with existing standards and regulations, the ITS community and UNECE need to work together in developing regulations.

I will close this first line of action on "political support" noting that one of the challenge for regulators is to maintain a balance between encouraging the development of new technologies and ensuring their interoperability as well as their safe and reliable deployment.
The promise of benefits should not be compromised by unexpected consequences of this technology. We want to prevent any failure and short-comings in hi-tech solutions becoming new technologies. Therefore we need to develop international regulations based on consensus.

2) Identifying the proper enabler

ITS is a major enabler: ITS are tools that will change the transport culture, a tool that can curb excess and unnecessary polluting, highly enhance the safety of individuals and goods in the transportation ecosystem, improve mobility, mitigate traffic congestion and thus contribute to the reduction of GHG emissions.

In the long-term, the delivery of 'Intelligent Mobility' is important to the continued economic and social well-being of all countries, in particular in the developing world, partly because without more efficiency, transport systems will increasingly become congested.

I believe that ITS should not be considered only as a technology and innovation tool, but also as an economic development tool.

Finally, we observe that the ITS Ecosystem is quite fragmented, therefore the list of ITS services is quite long and covers: in-vehicle systems, driving assistance systems, navigation and routing, infrastructure and parking management, traveler information, ticketing, fleet management and transport of goods.

From a consumer perspective, I believe that ITS can be effective as an enabler of sustainable mobility if:

a) There is convergence between the systems and services. People demand simpler and smarter mobility tools: they expect their vehicle to communicate with other vehicles and with infrastructure; they expect their public transport card to work in all modes of city transport (metro, bus and tram); they expect the technology in their vehicle to be intuitive and not leading to distractions.
b) The applications are deployed on a large scale. We need solutions which are affordable to people and to local authorities in the long-term, as well as compatible with an economic

growth agenda. We need solutions which empower consumers: technology alone will not deliver sustainability if it doesn't lead to behavioural change.

Let me list some criteria to assess the ITS deployment from a consumer's perspective. Services should be:

- Acceptable
- Convenient
- Reliable
- Robust
- Safe and secure
- Cost effective
- Fair

The broader consumer community has been working with the governments and the ITS community around the world to make sure that only new technology, reflecting these criteria, are deployed.
The benefits of the ITS must be understood by the broader public in order to achieve a balanced culture of innovation. Educating consumers on what is available on the market and receiving feedback from users on how the system has been designed can offer a huge opportunity for scaling up ITS deployment.

Conclusion

As transport takes a prominent role in the new global framework for sustainability I look forward to your inputs to advance the road safety agenda hence to improve the global situation of sustainable transportation.
Thank you for your attention

Expectations related to ITS and mobility – Pr Kiyoshi KOBAYASHI (Kyoto University)

ITS technology is a kind of link between the transportation network and the human network. So, each human behaviour can be interconnected even if transportation network and human network have their own intensive topics characters. This interconnection is the result of the growing introduction of information and communication technologies in the transport and mobility domains.
Indeed, both networks interlink. In theory, when we are at home we can consume a lot of things (you can read the newspaper, look at the TV…) but once you get up you are no more very much concerned, you have less need to consume so many commodities. In reality, the fact is that, according to IT technologies we can consume more and more services even in the transportation network. Even if there is still a gap, ITS is an effective toolkit that reduces the significant gap between the transportation network and the human network, the gap between what we can do in transportation network and what we can do in human network.

Basic Duality

	Transportation Network	Human Network
Node	Origin; Destination	Individual
Link	Roads, Railways	Meeting; Communication
Input	Trip Demand	Idea; Friendship, etc
Output	Realized Trips	Evolution of Ideas; Deepening of Friendships, etc.
Observable Variable	Transportation Trip	The Number of Meeting State
Variable(s)	Transportation Conditions	Function of Ideas, Friendship and others
Objective Variable(s)	Travel Time; Costs	Exchange of Knowledge and Ideas
Medium	Transportation Methods	Discussion
Activity Reachability	Long Distance	Short Distance

The value of IT technologies

The value of ITS in the transportation network is based on the following elements :

- the economic value of the information linked to the fact that in the new economy, thanks to this information, people can change their behaviour;
- Option value
- Decreasing external economies (reduction of congestion).

Looking at the human network, of course, decreasing external economies, but also economy by coordination: people have to coordinate their behaviour, this cannot be done without IT technologies. Density economy , for instance the reservation systems today; thick market economy, (a market with a low number of buyers and sellers, for example taxi services). But we must underline the importance of sorting economies: households "sort" across neighbourhoods according to their wealth and their preferences for public goods, social characteristics, and commuting opportunities. The aggregation of these individual choices in markets and in other institutions influences the supply of amenities and local public goods. Pollution, congestion, and the quality of public education are examples. Over the past decade, advances in economic models of this sorting process have led to a new framework that promises to alter the ways we conceptualize the policy evaluation process in the future. Thanks to the ITS you can increase your daily activities. The ITS can improve the quality of our life by sorting our needs.

Policy implications

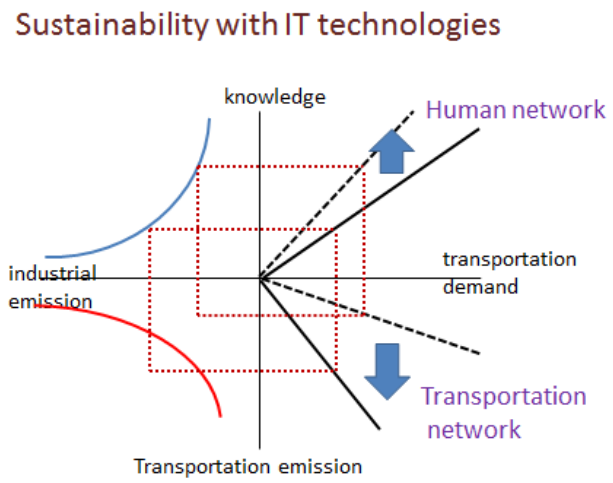
Internalization of external economies: Transport, like most human activities, has negative side effects, such as emissions and noise. These are labelled "external effects", whose associated costs are called "external costs". The challenge is to reduce these costs in an optimal way to achieve sustainable development in transport and mobility.
Internalization of external economies has to take into account new developments and progress in the following fields:

- Large new databases on noise, accidents and emission factors,

- New and updated models,
- Updated estimates of important input parameters,
- Research identifying additional health effects
- Case studies and marginal cost calculations.

*Policy coordination t*o favour intermodal and integrated mobility models and encourage the use of less polluting transports.

Policy initiatives of recovering from low efficient traps Shuffling, cross commuting, sorting encapsulation.



This picture aims at making understandable how CO2 emissions could be reduced using ITS technologies.

To reduce the CO2 emissions, we need a knowledge (human interaction): more knowledge more efficient transportation. We must underline the importance of human networks.

Supported by the highly advanced technologies of information/communication and transportation, the new knowledge society has been emerging. Newly developed transportation and communication technologies are diffused in the society, resulting in the rapid increase in the flexibility and the degree of freedom of human communication behaviours. The technological innovation of communications in the society does not only mean more rapid and efficient transmission of information and knowledge, it also expands the possibility of interactions of various types of activities in the spatially distant areas. The increased opportunity of communications in the society, greatly affecting the communication behaviours, brings about the structural evolution of social systems themselves.

Conclusion

New transportation technologies based on communications are developing. The diffusion of these technologies is rapidly increasing the flexibility of human communication behaviour. The innovation of communications technologies is not only making more efficient and faster transmissions of information and knowledge but also it is expanding the possibilities to connect various types of geographically dispersed activities.

In most of transport behaviour, the decision to make a travel of one individual is not completely independent of that taken by someone else. The traffic behaviour of any individual is more or less

subjected to the other's traffic behaviour. Especially, in face-to-face communications, meeting with other individuals can only be possible as a result of an established mutual agreement.
Meeting behaviour and traffic markets are important elements for the exchange of information and the knowledge society.

Application smartphone e.g. Blablacar – Laure WAGNER (Blablacar, Responsible of communication)

BlaBlaCar is the world leading long-distance ridesharing community. Blablacar connects people seeking to travel with drivers going the same way. They travel together and split the cost, over an average journey of 330 km.

Drivers optimise idle seats in their cars on planned city-to-city journeys. Drivers do not provide an on-demand commercial service; they do not make a profit. Prices per seat are based on a contribution to the average cost of the journey and are capped by the platform.

BlaBlaCar, available on mobile app and desktop, is a combination between a travel search engine and a social network, bringing together travellers willing to share enjoyable journeys and reduce travel costs. Key in enabling people to travel together is to create interpersonal trust through declared profiles and peer-to-peer ratings.

The service is in real growth. In 2014, 25% of user signed up on their mobile and today this rate has passed to 48%. And 65% of our users use the mobile app, with 15 million of downloads. The userscommunity has grown from 1 million of members in 2011 to 20 millions in 2015.

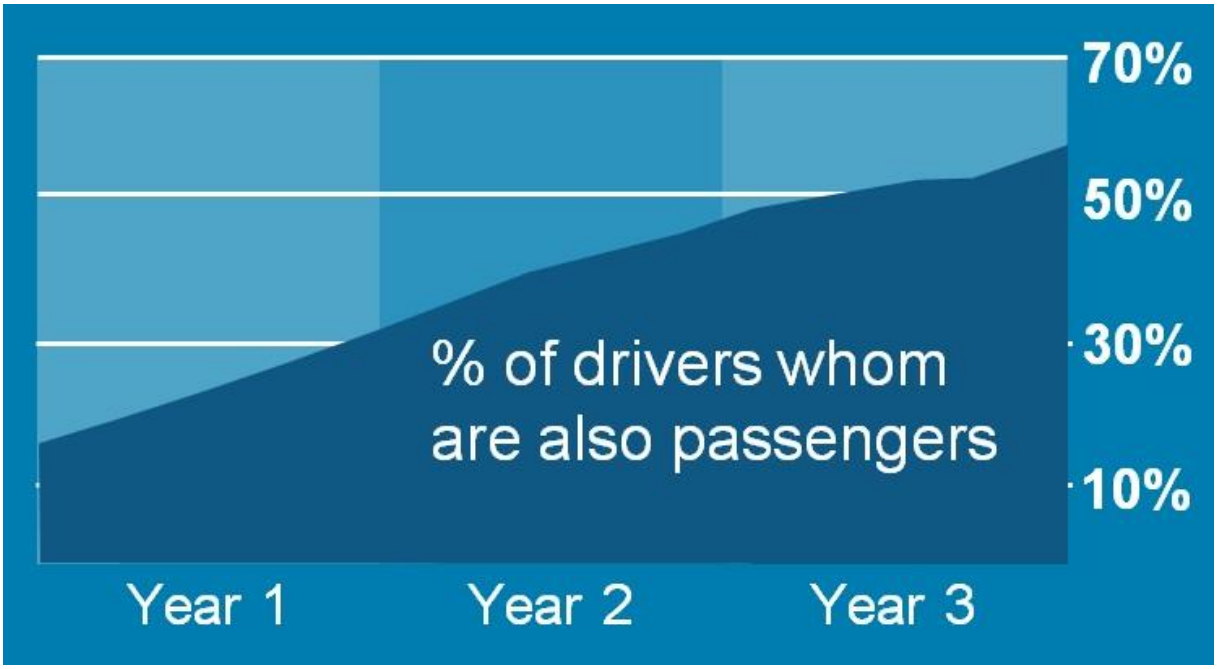
Blablacar is present in 19 countries (Russia, Germany, France, Spain…) and in 2015 (India, Mexico, Hungary, Romania, Serbia). Soon, Brazil will subscribe to the service. Blablacar offers city-to-city ridesharing across the different countries with one same app! As a result, 80% of this growth comes from the international markets, whilst France is still growing. 10 millions of members travel with BlaBlaCar every quarter. That's three times the volume of traffic on the Eurostar!

The question that BlaBlaCar raises is: Can we afford not to optimise car idle seats, and have a majority of cars driving around almost empty?

By connecting people seeking to travel with drivers already going the same way, BlaBlaCar is optimising an idle resource (empty car seats) whilst addressing the demand for new affordable mobility solutions. The average car occupancy in a car from the Blablacar community is 2.8, vs. a European average of 1.7 people.

Blablacar is creating an entirely new transport network and addressing growing needs for affordable mobility by optimizing cars driving almost empty on the roads, without the additional investment and environmental cost involved with large infrastructure projects.

By optimizing resources this activity has averted around 1 Million ton of CO2 over the past two years. What's interesting to note is that as members join the Blablacar platform and start ridesharing, their perspective on driving alone changes. Not only do they enjoy ridesharing, and filling up their car, but they also turn into passengers, leaving their car behind and travelling in other member's cars. A third of our members are both drivers and passengers. This is effectively taking cars off the road. 60% of drivers end up using the service as passengers.

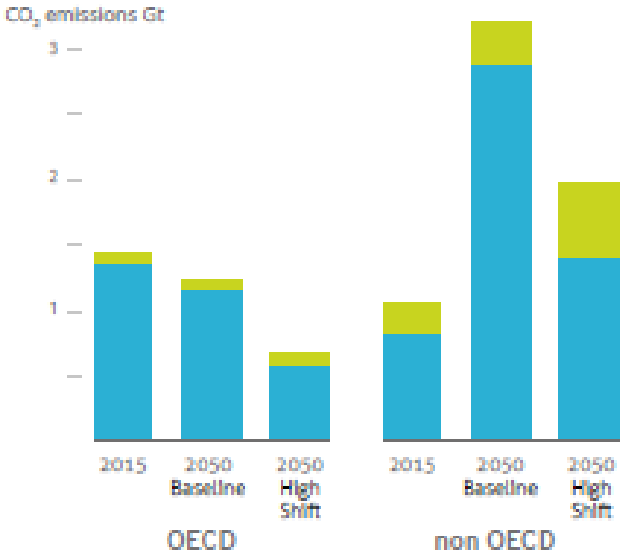


Global energy savings : in 2 years, Blablacar saved 500 000 tons oil equivalent. It represents enough energy to light Los Angeles for one year!
Ridesharing encourages safety : Online questionnaire administered to 4115 European BlaBlaCar members and 10 000 non-members (nationally representative) over 10 BlaBlaCar countries.

Financial policies for ITS to limite climate change in emerging countries – Lise BREUIL (AFD)

AFD is an agency to help finance ITS to improve urban mobility in developing countries. What is the paradigm of the mobility and climate change? AFD has a transport strategy. There will be 2,7 billion of additional urban inhabitants to 2015 and 92% will be in developing countries.
The emission of urban transport will increase in non-OCDE countries because mobility will be higher there. There are 3 solutions to reduce the GES emission. They combine 3 approaches in a SUMP (Sustainable Urban Mobility Plan) :

- Avoid the trips
- Shift from individual to public modes (see high shift on the graphic, high shift can reduce by 40% to the baseline)
- Improve energy efficiency of fuels and vehicles



The E-ASI (Enable, Avoid, Shift, Improve) approach for Sustainable Urban Mobility

The long term actions are probably the most efficient. But these actions should be done now even if they have an impact in 30 years. They take account of integration of urban development and transport and TOD (transit oriented development). They limit the number of motorized trips.
In the medium term, you have the shift approach which combines short term and long term. The user has incentives to use public transport. With this push and pull policy, you will attract and restrict car use.
The 'improve approach' implies short term actions :

- Traffic management policies
- Electric vehicles
- Norms and standards
- Incentives for industry and users

Mrs Breuil insists on the improve approach but also on the shift actions that she wants to develop.
Lastly all this makes sense if you put that in a combined approach in urban mobility plans with appropriate governance, intermodality, geographical scale. You can demonstrate the efficiency of urban transport.
The role of financing institutions
AFD is a bilateral development bank working with governments, local authorities and private sector in more than 70 countries, with different mandates :

- Fight against poverty – priority for Sub-Saharan Africa, 36% of total funding
- Inclusive and sustainable economic growth
- Climate change mitigation and adaptation : 53% of total funding

AFD is now at top 12 of international donors with 8 billion € of financing every year, out of which transport sector represents 1 billion € with 50% for urban transport.

The 5 guiding principles of AFD of urban transport strategy

- Integrate urban transport and urban development planning
- Better measure and communicate on climate change impact
- Improve governance with appropriate technical/institutional integration
- Adapt and work with local private sector, including paratransit
- Promote ITS and new technologies innovations

In all the cities where AFD works, AFD have this, as diagnostic : between 50% and 100% of public transport are done by “paratransit externalities”. It is an important part of the modal share of public transport with all the local and global negative externalities (congestion, mortality, pollution, CO2 emission)

ITS, an promising “piece” for the Sustainable Urban Mobility puzzle

In these cities you don’t have a map of what is the public transport network. The public transport lines and timetables are known by the users. There are no stops.
The ITS is used :

- to better assess a demand and select the best system (based on BRT, Bus Rapid Transit),
- to adapt transport supply in a flexible way in real time,
- To optimize, customize operation and schedules,
- To guide, inform and monitor users
- To make numerically “visible” the informal sector and turn it into a more efficient system

AFD helps a lot of small operators to give them the framework for this. They will not be able to really improve ITS. AFD offers them public-private partnership. AFD is supporting pilot operations (Mapping of “trotro” in Accra, Ghana ; pilot in Ivory Coast). AFD assists some incubators for specific projects and push for a standard ITS component in each project.

Conclusion

We are in climate change. The subject was not precisely about the ITS but urban mobility and climate change. There is a French-German sustainable urban mobility initiative which is on planning. The name is : ‘Mobilize your city’ that we are supporting along with some French technical operators.
It has both a political and a very operational approach. Cities that would endorse the fact that they would like to go into a planning exercise and not a project by project from operational approach we are also very much interested. Having a viewed planning, it’s also having good project behind and it ensures to go from project to policy again.

ITS For sustainable transport

Recent trends of ITS projects in China – Pr Xiaojing WANG (Chinese Ministry of Transports, in charge of ITS)

This presentation is divided into two parts : review of ITS currently operating in China, next stage of ITS in China.

Review of ITS in China

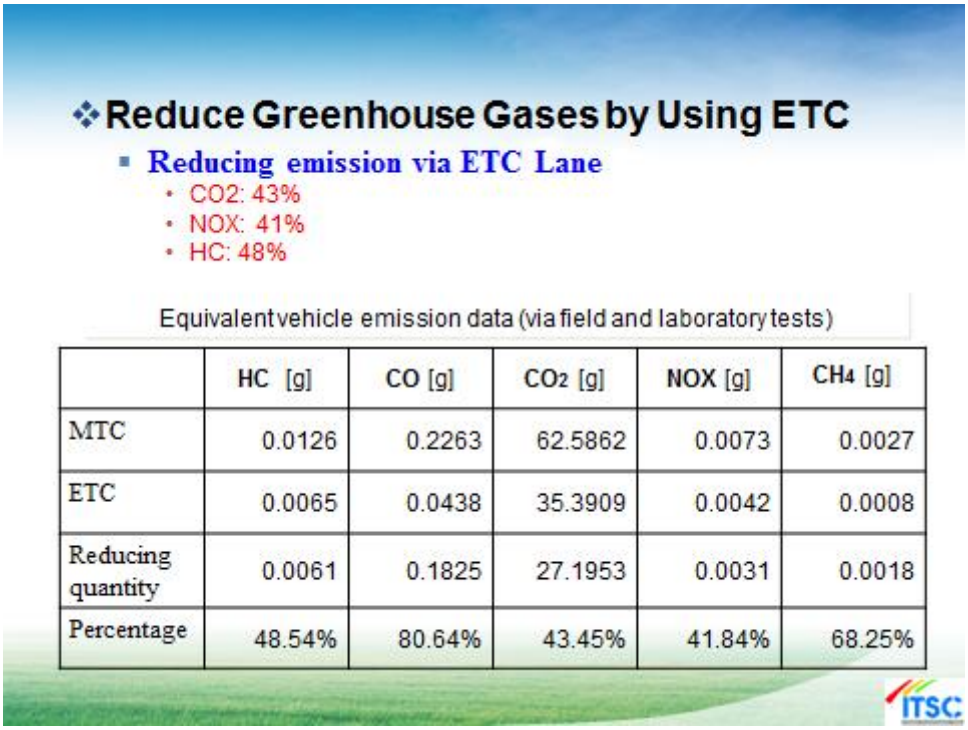
In 1994 the first worldwide ITS congress took place in Paris. 20 years later China has established a total development policy and the framework of a national ITS architecture and national ITS standards. Several ITS technologies have been applied in the country and new industries have been created.
National and local ITS application systems promote safety, flexible, and environmentally safe movement of people and goods. Nowadays, the enterprises are playing the main role in the development of ITS.
The picture below gives a view the different steps of development in China and the next stage of ITS

After the two first phases aiming at defining strategy and architecture (1995-2000) and making research and experimentations (2001-2005), ITS integration started in 2006 with the development of ITS services in the big events (Olympic Games, Shanghai Universal expo and Asia Games). ITS has also integrated in the management of the expressway system.
From 2011 to now the next stage of ITS development is being achieved, including ITS communication and ITS autonomous car

Examples of ITS applications

The first point is the traffic information story: in terms of data collection the main method is vehicle detectors (loops or microwave) but now the probe cars systems are very important (the GPS and mobile phone may adapt new collection methods). In China information can be provided to vehicles via broadcast, variable message signs, websites, smartphones…

Big cities have established car information services via VMS: for instance an integrated system covering the urban area made of 500 VMS in Beijing. A similar service is in operation in Shanghai.
Another thing is traffic management and control more than 600 cities have been equipped using monitoring cameras (51 000)
Public transport has been a priority in the last ten years: smart bus systems are used in many cities; smart cards are very popular (350 millions), Bus Rapid Transit is highly developed as well as smart dispatching systems.
Electronic Toll Collection (ETC) in China: national ETC standards have been established in 2007. A national deployment has been decided in 2010 and now ETC covers 29 provinces (Total ETC lanes: more than 12,000; ETC users: more than 21 million).This technology is very important for emission reduction. See details below:



	HC [g]	CO [g]	CO_2 [g]	NOX [g]	CH_4 [g]
MTC	0.0126	0.2263	62.5862	0.0073	0.0027
ETC	0.0065	0.0438	35.3909	0.0042	0.0008
Reducing quantity	0.0061	0.1825	27.1953	0.0031	0.0018
Percentage	48.54%	80.64%	43.45%	41.84%	68.25%

Commercial vehicle monitoring: a national platform has been set up in order to monitor intercity transport traffic of 1.79 million vehicles.

Next stage of ITS in China, New policy and strategy

National transport development policy: transport must support the national sustainable development strategy which integrates belt and roads, collaboration development in areas (for example in Beijing, Shanghai Hebei…) internet plus action plan, made in China 2025 strategy…
The main tasks of intelligent transport are to improve the quality, the efficiency and the safety of the transportation as well as the emergency management. ITS should be a tool for developing Green Transport and decreasing the use of private cars.
In the next stage China will pay more attention to transport platforms, efficiency improvement and more attention on improving convenience by ITC.
ITS should be driven by the market: industry and service operators have to play the leading role and enterprises, universities and research institutes must work together. Innovative new business models should be deepened.
ITS strategy should support and encourage multimodality, public transit and transport safety.
ITS should be driven by new technologies: Big Data, M2M, Mobile Internet, Cyber physical system(CPS), V2V, V2I, V2X, Autonomous car…

Cyber security and privacy protection are more and more essential.

ITS technology development

The main efforts should concern the following topics:

- Cooperative ITS, intelligent vehicle and intelligent service
- Integration of the internet
- Application of the broadband mobile communication in V2I and V2V
- Integration of new energy vehicle technology and ITS

Standardisation

Key areas : Data Management, Communication application standard, Interoperability Cyber Security in ITS, Cooperative ITS. In China we have new mechanisms for ITS standardization: standardization includes the national standards and the way to manage it. Recently China ITS Industry Alliance has been approved as a Pilot Organization Working areas of standardization C-ITS, Nomadic Devices in ITS, Security of Onboard Information Service, Intelligent Public Transport, Intelligent Car are the current areas of standardization work .

Reduction of CO2 in the city – François Richard (ORANGE, Director program smart cities)

The point of view of François Richard illustrates what we can do with ITS to decrease the greenhouse gas emissions. He gives examples about services which are already delivered.

Urban trends driving ITS changes

Wifi is key element of the multimodal shift. You can be connected immediately when you are in the transportation. That's not probable when you are in a car. It's a very good argument for transportation operators to shift people from cars to the public transportation.

Intelligent parking reduces the delay to park cars in parking with guidance and payment on smartphone. NFC facilitates and gives some comfort about the payment. There are a lot of studies about intelligent parking which show that CO2 emission are reduced of 7%.

Fleet management offers the possibility to locate every vehicle on the territory and optimizes the turn of vehicles during very kind of activity, but also provides through the fleet management a lot of tools to the drivers for the eco-routing and eco-driving. But drivers must be educated to change their behavior. Eco-routing and eco-driving can reduce CO2 emissions of 20%.

<u>2 examples</u>

- Electrical vehicle. There are a lot of services around the smartphone use. It's important for the driver to find the good route and to recharge his car when it's necessary, to combine information for the driver and information for the electrical charging station. It's also a link with the smartgrid deployment : the electrical distribution operator can manage very precisely the load in charging station. It's a good example on the management of charge and electricity distribution.
- The very simple example in mobility is "don't move". Smart work centers can avoid mobility during the "rush hours" on roads and public transport. It's a good example on how to decrease the emission if we can manage correctly the mobility of citizens using smart work centers. It's very useful for the road management and also the public transport management.

Orange is working a lot with transportation operator to deploy this kind of telecenters around the cities (Amsterdam is a good example)

Big data for reduction of greenhouse gas

Orange has deployed in a few cities a communication tracking which gives a lot of information about mobility. Orange gets precise view of the mobility and the movement of everyone (via the SIM cards) and a correlation between these movements and the information about the roads (map of the road, map of transport lines). We can analyze mobile data and we can describe very precisely from the movements in the transportation. We can distinguish the different modes: bus, tram, bicycle... With this kind of big data we have a good geographical view of CO2 emission. We can assess the measures impact taken by the authorities on the greenhouse gases emission from different transport modes (bus, tram….).

Big data in the future

The big issue in the transportation is the last mile because it's not efficient for the public transportation. But it's possible now with ICT to transform the last mile as an opportunity for the citizen if we can provide some community tools which can be used to share cars, taxis … on-demand way. It's a collective on-demand way. It's possible to match what is the demand 'home to work' with the possibility of providing some very efficient transportation. It's a good way to involve the citizens to change their behavior and the efficiency of the transportation itself for the last mile. It's an interesting way to minimize the transportation and the citizen becomes an actor of the transportation way.

How much of the capacity of big data and origin-destination analysis are used today?

In France we work with transportation operators to analyze destination route. But it's the beginning of the process. It's not only with SIM card tracking that we deal but we can also provide a right mapping and a right analysis. We have to gather a lot of other information. All telecommunication operators have these localized information.

Door-to-door – Matthieu JACQUIER (SNCF, Director mobility door-to-door and responsible of the project IDPASS)

We are the French Railway Operators, operating the national level and also European level covering major European countries. We launched, a year and a half ago, a major door-to-door initiative.

The objective for this is to integrate different transportation modes around our trains, to create and to promote the interfaces for the customers with other modes (bus, metro, carpooling, carsharing and whatever new modes). If you don't put that in your customers' pocket, then in my point of view, it's useless : There is a gap between the vision we have, that is the engineering work we do on creating those different modes and the ability we have to give it to the customers and the customers perception through digital interfaces. The main stake for us is to make them happen in real life.
There is a difference between that vision of saying we have made different modes around the train and the reality where we have customers travelling seamless from Paris to Bordeaux using a cab, a metro, a train … When I say "seamlessly door-to-door", it has to be very easy, very simple to have access to shared mobility and we were computing against individual car. To come to Bordeaux from Paris, I could have taken my car but it would be in extreme case. It would be a bit longer but very easy. I had to take the metro and go to Gare Montparnasse, take the train to Bordeaux. There were

works in the Bordeaux station and it was difficult to find a cab. Arriving here and realizing that the meeting didn't hold in Parc des Expositions, but Palais des Congrès, I had to walk during 10 mn.
My door-to-door experience this morning is that it is not smooth but finally I arrived here on time.
We are trying to give the tools to our customers. When you go outside the station you can see the bikes, taxis waiting in line, buses, trams and you have trains behind you. But the information is not sufficient : you don't know that there will be bikes just at the entrance of the Parc des Expositions, you don't even know how to find a cab in Gare de Bordeaux Saint-Jean.

So that's why we decided to build an application and a contactless card what we call IDPass. It's a major initiative for our frequent travelers to access to all those modes around the train and of course the train. So enabling that seamless mobility, we have to make it real. That's why we launched IDPass.

What's IDPass?

It's a mobile application on Iphone and Android usable in France or almost everywhere in France. It's aiming a single access to all modes at least in the major cities or major stations.
I can find a range of services. What's important for me as a national operator is that I can find the same range of services in Paris, Bordeaux, Lyon, or everywhere. Because my prime customers for this service are people travelling frequently. I live in Paris. I have a range of services and I'm accustomed to hailing a cab or finding an autolib, carsharing or at night asking for a Uber or using the bikes. But when I arrive in Bordeaux, it's different : the names of mobility services are different, I need to create a new account for carsharing. So each time I'm travelling to a different city I have those hurdles.
We need to be easier than what we already perceived as being easy and that's the goal of IDPass : unifying all this.
The application has 5 bubbles. Each bubble has one service.

The basic service is taxi/cab hailing. That's for train customers (10% of the train travels). It's a major subject for us. We have also carsharing. We do believe that promoting carsharing has a real meaning combined to train.

I came here for the day. If I could, I would have taken an electric vehicle in Bordeaux station to come here just do a round trip for the day and back. Il would be less expensive than taking 2 cabs and more practical. And if I want to drive or be driven, I mean, I have the choice.

Parking is also the key of the mobility. It's still a hurdle to find a parking. There are many things happening around a parking. I mean, I don't want to miss my train because it takes me 5, 10 mn to find a parking place. I just want to be sure I had my parking pre-booked.
We have launched the IDPass mobile application on July 15. This application includes carsharing, bike sharing, taxi, VTC and parking services and it's intended to the members of loyalty program customers. This national application is the same everywhere in France and tomorrow in Europe.

What's next?

We have 3 main applications in the SNCF universe :

- An application for selling tickets
- The application voyages-sncf.com (route from A to B ; is my train in late)
- IDPass

We have developed different partnerships with: taxis, cab, electrical carsharing, regular carsharing, bikesharing of course. We have a partnership with B-car, the number 1 of the carsharing in the USA. And for the parking, we're working with all the main parking operators.
We are covering London, Brussels, Geneva, Madrid, Barcelona…. With our trains and with all our services.
My main objective is to gain new customers into real usage because otherwise it's just one more engineering stuff!
We want hundreds of thousand customers using IDPass, having it in their pocket. Digital application must be very simple and very smooth.
Ridesharing or carpooling is a peer-2-peer service. Idpass doesn't aim to include this service.

ITS and autonomous car – Iain FORBES (United Kingdom, Department for Transport)

The centre for connected and autonomous vehicles is a unit of the UK Department of Transport.

Why does the UK Government invest in the development of connected and autonomous vehicles ?

UK DOT started with electric vehicles and then to electronic vehicles a few years ago and it is now connected to autonomous vehicles as well. The decision was considered as strategic and important for the UK.
Serious people in different backgrounds are talking seriously about access and the use of connected and autonomous vehicles.
They are expected to impact different domains:

Safety: according to the most recent statistics, 94 % of the traffic accidents involve human error. UK has one of the most safe roads in the world even though last year even 1 700 people died on UK roads. Government and Industries invested a lot in safety points.

Efficiency we have to optimize our networks by investment decisions. Since a long time the financial impact of the road network improvement and maintenance is very large. However the public capacity for that is currently decreasing.

Mobility : how to keep the society mobile ? How to get more people involved in transport ?

Productivity: the UK has a proud history of automotive innovation with significant research centres and R&D investment Today in the UK, connected and autonomous vehicles are being developed and tested on UK roads There are many adjacent sectors which will be impacted by connected and autonomous vehicles including insurance, telecommunications, electronics, technology, IT, transportation, logistics, advertising, digital and retail. In many of these sectors the UK has a leading position. We have to check how technologies emerge and the potential for a real growth of investments. Companies are making a lot of investments and we have to take decisions whose consequence could be important in the medium and long term.

The Centre for Connected and Autonomous Vehicles (CCAV)

The government has already begun work to support the research, development, demonstration, and deployment of connected and autonomous vehicles. This includes:

- Publishing the Department for Transport's (DfT) code of practice for testing driverless cars,
- Launching the Department for Business, Innovation and Skills' (BIS) £20 million feasibility studies and collaborative research and development competition,
- Establishing a new joint policy unit – the Centre for Connected and Autonomous Vehicles (CCAV) – to help ensure that the UK remains a world leader in developing and testing connected and autonomous vehicles.

CCAV is basically a Government's response to this opportunity to boost ITS productivity thanks to the capacity of capitalizing new technologies. So, it deals with transport but it is also a tool to face an economic challenge.
The Centre has been launched in July 2015. It has two main aims: first, to be a point of contact in the Government for people wishing to engage in the domain. Second, to help the UK speed ahead in the race to create connected and autonomous vehicles. CCAV is establishing a new joint policy unit to help ensure that the UK remains a world leader in developing and testing connected and autonomous vehicles.
CCAV 's main activities are:

- Leading innovating policy development in this sector; our attitude is characterized as follows, we enable, we encourage. (Example, we have established what could be done in terms of regulation, safety, and any other innovation)
- Delivering a programme of research, development: the Government decided to invest heavily and favored a collaborative approach.
- Coordinating demonstration, and deployment activity: 4 cities have be chosen to run formal trials that will last between 18 and 36 months from January 2015: Greenwich, South East London, Milton Keynes and Coventry (working together as one project), Bristol
- Providing co-ordination across administrations.

UK forward plan

Best practice

The UK is one of the best countries for car makers and others to develop and test these technologies because of permissive regulations, thriving automotive sector, excellentresearch base and innovation infrastructure.
The code of practice for testing of automated vehicle technologies published in February 2015, provides guidance to anyone wishing to conduct testing of automated vehicle technologies on public roads or in other public places in the UK. It provides details of recommendations for maintaining safety and minimizing potential risks. The code applies to the testing of a wide range of vehicles, from smaller automated pods and shuttles, through to cars, vans and heavy duty vehicles.

Legal framework

The automotive sector has concerns about the consequences of a failure in design. It looks to governments to provide a legal and regulatory framework that covers the deployment of co-operative systems.
After best practice and demonstration we should set up a legal framework for real and the future. We need harmonization at national and international levels (take position in the standardization process).

Data

Security: systems that rely on spatial and temporal information are reliant on high integrity data: Vehicles can be hacked, critical functions can be attacked. So, there is hardly a security option. Many security issues relating to critically important functions can be fixed relatively easily. An agreement between the different categories of actors is mandatory. According to the market confidence is critical and it widely lies on security issues.
Privacy and data protection are important issues that need to be carefully considered. This is especially crucial for businesses. There are very different attitudes to privacy in different countries and different attitudes within those countries.

New services in mobility

Secured exchanges of data along the logistic chains, applications for safety and climate - (Pr Guy DOUMEINGTS (University of Bordeaux) and Christophe REYNAUD (MGI)

After a short presentation of INTEROP VI Lab and MGI, the NOSCIFEL project which was sponsored by the French Government and finished recently will be presented. First, the method for Enterprise Interoperability in order to check the production of the data and the production of the system will be described before the Transport service toolbox. It should be mentioned that in the NOSCIFEL project some knowledge issued in the domain of manufacturing will be transferred and reused in the domain of transport. After that the presentation will continue with the description of the on-line platform to design intelligent connectors and the NOSCIFEL platform's services : vehicle booking system and digital safe services.

INTEROP VI Lab

It is non-profit Belgium organization resulting from a Network of Excellence coordinated by IMS / University of Bordeaux in 2007. It gathers 60 partners organised in « poles », represented by 200 researchers and engineers. It does not only cover Europe but also China and, in the future, Brazil, South Africa.
The main activities are:

- Finalized research, education, innovation standardisation in the domain of enterprise interoperability
- To support INTEROP V1 Lab through transfer of advanced knowledge at large scale
- European Projects accompaniment.

MGI

MGI, which stands for "Marseille Gyptis International", was created in 1985 and belongs to Marseille Port community. Its main activity is to develop and manage the Cargo community system, a software which is connecting all the organizations that are involved in the Port process. MGI is politically sponsored by the French ministries of finance and transport.

NOSCIFEL general presentation

The NOSCIFEL project

NOSCIFEL is an innovation collaborative project, gathering 12 partners, aiming at building a generic and common basis allowing to facilitate and standardize data interchange, to track logistics events between actors of the supply chain, and to promote the interoperability. It was supported by the French government.
The results of the project are:

- NORMAFRET services;
- Transport Services Tool Box for modelling performance indicators and Enterprise Interoperability;

- Innovative and modular platform for the management of transport goods offering 3 main trusted services: SERVE, vehicle booking service, STEGE, traceability and geo-reference service, SECCO2, CO2 estimation service.

The NOSCIFEL method

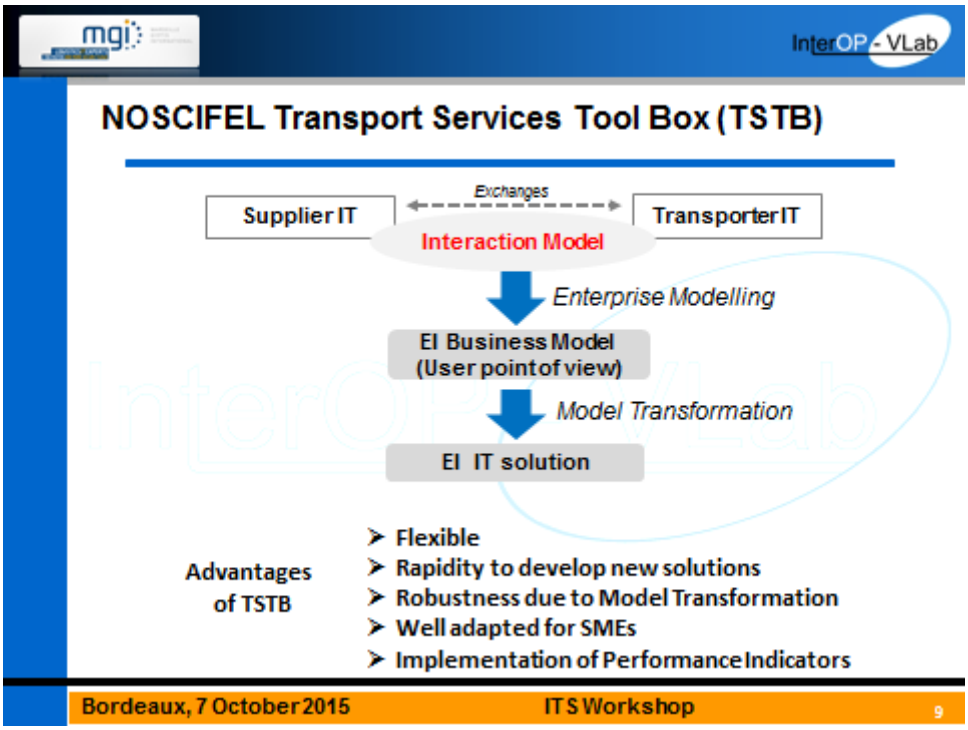
One of the main lessons we got from the project is that, indeed, enterprise interoperability is not a technical problem. In fact a number of interoperability interfaces are already usable. It is an economical problem resulting of the high cost to develop Enterprise interoperable solutions and to update these solutions, and because enterprises are permanently evolving. For instance, when one firm has reached a good interoperability level, unfortunately a few months after it must finance additional developments to update its solution.
Consequently, if we want to maintain interoperability we have to try to find some solutions to develop at low cost, particularly for the SMEs. This is an important challenge for intermodal supply chains. It is sure that the relation between the supplier and the customer must be organized very quickly. If, for instance there is a new supplier or a new transport system you have to very quickly develop an interoperable interface in order to maintain the interoperability.

To solve the interoperability problem

To understand the problem, we use "Enterprise Modelling" which is "the abstract representation, description and definition of the structure, processes, information and resources of an identifiable business, government, body, or other large organization." Enterprise modelling deals with the process of understanding an enterprise business and improving its performance through creation of enterprise models.
The search of enterprise interoperability solutions needs to use Enterprise modelling, to represent data, processes, services, decisions, businesses, to identify all the exchanges between partners and, by consequence, to understand the reasons why such system is not interoperable. Finally, it allows to remake the model of the supplier and the model of the transporter. The enterprise interoperability framework is used to identify the barriers and the Model Driven Interoperability (MDI) is used to generate IT solutions based on the model transformation. It is called the transport service toolbox.

NOSCIFEL Transport Service Toolbox

So, to define the exchanges and the requirements for interoperability, we use modelling at the business level at the user point of view, then after we use some new technologies with model transformation in order to generate the solution.



Using Enterprise modelling, we have the right requirements and we can after generate a solution with an agreement previously defined
The advantages of such approach are :

- flexibility,
- rapidity (we can develop more rapidly),
- robustness because you must be sure that your solution correspond exactly to the problem you have,
- well adapted for SMEs because the cost of such development is not high
- implementation of performance indicators.

NOSCIFEL Platform

Interoperability makes possible that the systems of the different organizations implied in the supply chain can be well connected in term of process. This is what the Transport Services Toolbox brings. The problem, then, is how to connect and to secure the data of the different actors involved in the supply chain, and mainly the SMEs which are the weakest partners in the supply chain.
To solve this problem we have developed a an innovative multimodal interoperable platform created to answer essentially to the needs of SMEs specialized in transport and logistics by proposing a modular platform giving access to functionalities they need in their everyday work.

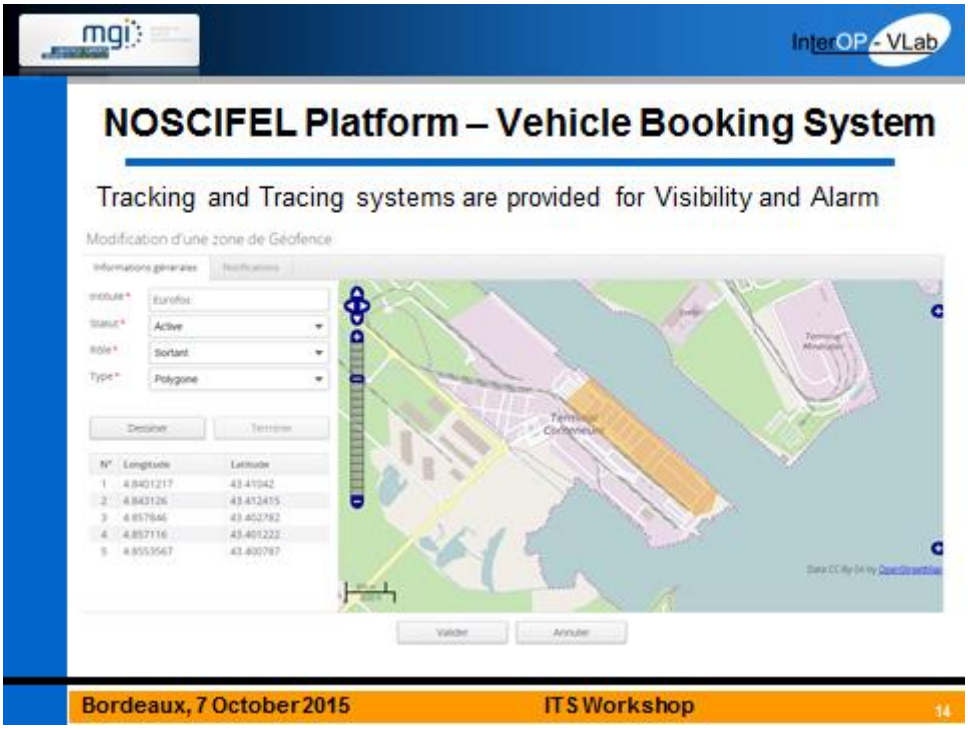
An online platform to design intelligent connectors

The NOSCIFEL platform demonstrator can be tested on internet. It allows to convert any document (in particular Excel documents) to a standardized EDIFACT document very easily and user-friendly and use it in your own system. It is the first service that we have delivered for the SMEs of the transport sector : the connector. You can easily upload it and integrate it in your own system. It is a strong step forward for SMEs in order for them to implement secured interoperability and secured information exchanges with all the partners in the supply chain.

An online platform to design secured connectors

Then we have provided infrastructure to enable signing electronically all information that are exchanged all along the supply chain.

Vehicle booking System



Another type of service is to secure the physical flow at any node of the process, at any transhipment platform and any transhipment node. For that purpose, NOSCIFEL delivers the so-called Vehicle Booking system which allows different partners to generate ability of appointments at any step of the logistic process.
Another way to secure the supply chain is track and truck physically the physical flow. We are then connected with the Vehicle booking system facilities that can inform people from the different companies of any incident that occurs during the physical flow process. The message of information can be delivered in very different formats and in real time.

Digital safe services

The NOSCIFEL platform is connected to digital sites in which any information or document that is exchanged by an SME in the transport supply chain can be automatically saved and stored as long as necessary for legal or commercial reasons.

Conclusion

From a formal point of view, NOSCIFEL project has been achieved but INTEROP V1 Lab considers that the work is not finished and that:

- First, the results of the development on the subject have to be maintained and enriched. Bordeaux University and UNINOVA (which is a very important research centre) in Portugal are involved in this process.
- In addition a community should be created to promote and disseminate the NOSCIFEL toolbox.

MGI considers that NOSCIFEL, which is able to secure the different levels of data, documents and services is an important positive global solution to secure the global information exchanges all along the transport supply chain and should, in particular, provide benefit to Port Authorities and their partners. The second benefit of NOSCIFEL is to show that now with this kind of solution became very competitive technically and economically for SMEs that are now able to implement interoperability to secure data interchange all along the supply chain. In addition NOSCIFEL should bring opportunities to develop new businesses.

ITS and the last mile – Martyn BRIGGS (Frost & Sullivan)

This presentation tries to show how far new business models in mobility are starting to impact the climate change and also how far there is an evolution from ITS towards intelligent mobility.

Externalities driving transport innovation

Today's transportation challenge supposes to take effective measures in order to decrease traffic congestion which costs a lot to economy, to limit transport pollution which represents 14% of the total pollution (air pollution brings about 7 Millions premature deaths per year), improve journey time (globally over 2 billion hours per year are spent by the population commuting alone), and improve energy consumption (5.95 Billion liters of fuel wasted annually in advanced economies by vehicles idling in congested traffic) .
A number of solutions can be applied. They can be applied individually but also be combined for an integrated mobility whose benefit is much more important.
Solutions can be brought by the progresses in automotive industry, policy makers, public transport and systems of partnerships required to bring together individual solutions. The use of technologies is also a mean to meet the challenge.

Paradigm shift from vehicle ownership to vehicle usage

At the same time social changes towards a more multimodal and integrated mobility appear. There is a growth of on-demand services which are more and more replacing the traditional model of car ownership. The role and perception of the automobile in our lives continues to evolve. We are moving very quickly from public and private transport being separate businesses, to a more Integrated Multi Modal Mobility Network, due to changing demographics, preferences, and technology
Transport is more and more available on a door to door basis, more specifically point to point, office to office. With increasing population density and connected lifestyles, we're witnessing a new wave of products and services improving the efficiency of the transportation network, and facilitating seamless integration of several services to make it easier for people to get from A to B, which is beginning to make people question the need to own as many cars in their household.

From intelligent transport systems to intelligent mobility

When you start speaking of connectivity and automated transportation you will have to redefine the context of intelligent mobility. The combination of connected, automated and new mobility business

models has underpinned a shift from ITS to Intelligent Mobility with more tangible return on investment and increasing public sector support. Many players are investing significantly to deliver a seamless proposition and user experience for Integrated Mobility.

New Mobility Business Models & Partnerships to deliver mobility services

In both B2C and B2B environments, customers are demanding intuitive services: many players investing significantly to deliver a seamless proposition and user experience for Integrated Mobility. Many types of partnerships to deliver mobility services solutions have been created. New players are coming on the table and the traditional transport actors are redefining their strategies. For instance automotive companies are now looking at mobility as a business model. But the change will also be oriented by technologies. For the technology side the value in transport is very much shifting to the access to the services through technological platforms.
Nobody will stop using a car and use public transport and new mobility services to replace it. The question needs to be handled as a toolbox enabling the citizen to use the most effective solution according to his profile.
For mobility solutions to become "mainstream" three main areas are needed: policy, to enable and utilize the benefit, Investment both on public and private sectors and Behaviour Change from user.

Quantifying the Environmental Impact of Mobility Services

Potential for mobility services and climate change will be illustrated by the specific model of the car sharing through studies which are currently carried out for London. The questions are: what are the impacts of car sharing on traffic congestion ? How far will it reduce car ownership ? How much can car sharing reduce emissions?
Car sharing has already taken off in the UK capital. London currently has about 140,000 car club members (the second highest number of any city in the world) and forecasts suggest that could increase to 800,000 by 2020 and 1 million by 2025.
First what should be the benefits of the car sharing in London as far as the scheme is realized at the scale which was planned:

- Economic benefits : Londoners will reduce their cost of living by 360 £ a year.
- The number of individual cars in London should be reduced by 4.2% in 2020
- (- 120 000 cars).
- Concerning emissions, London could achieve up to a 6% reduction in CO2 emissions from cars.

Car On Demand, and Mobility on Demand – The Rise of "Asset Light"

Transport is nowadays subject to a number of disruptions. The most recent one is the creation of "UBER" services, in competition with the traditional taxis. "UBER" is the most flagrant, but, nowadays any new service could appear as that.
The true disruptive forces in Mobility are taking place via platforms linking supply and demand, a marketplace phenomenon; customers now expect mobility services on demand. We are facing to the Rise of "Asset Light".
Let us take the example of parking. The problem is quite simple: people want to know where the parking space is, how much it costs, how they can pay. They will be happy to get information. There is need to combine information concerning the location, the cost and the payment. By consequence there is need for a partnership management company. You have to think at a business plan. Finally this company will not be necessarily a classical parking company.

In all the new mobility services, the value is really the technology. There is a shift towards the technology sector providing more solutions rather than the traditional industry.

Tech-enabled Mobility Services growing rapidly, due to "Asset Light" scenario, with platforms matching supply and demand to reduce spare capacity and improve the user experience. Customers now expect on-demand solutions and are happy to use shared services.

Case Study: Helsinki Mobility-As-A-Service (MAAS) Concept

Integration of public and private forms of mobility under the same platform will give rise to a new type of mobility business model: a monthly subscription for Mobility.

The Helsinki model aspires to upgrade the service level of transportation by harnessing the passion and capacities of public and private entities. Collaboration and integration of services aims to create a seamless, demand-based and compelling travel experience for the public.

23 key organizations in Finland have partnered to cooperate in the establishment of the platform whose goal is to offer tailor-made transport services to consumers, based on their individual needs. The service will be developed based on an open market model with broad cooperation. Creating unambiguous rules and standards is the prerequisite for numerous actors to be able to join the service network.

All the things that have been mentioned in the presentation are moving in a worldwide mobility integrated. This is exactly the vision of MaaS Finland. The business model is quite challenging but the benefits could be extreme.

The roadmap of services like MaaS is first to facilitate the alliance between operators, deliver a concept, then come to the vehicle system in terms of business model understanding contractually relationships between each other; together to manage a service and lastly to shape the society, to change the government towards transportation.

Summary of the presentation

We have seen that mobility is a big opportunity in terms of business and this certainly because what technologies have been provided. We interested about more connected asset-lights, then integrated services and the reason is exciting because it is not just about pushing products it is because of the shifting towards these types of tech-enabled services.
Of course, there are several ways to establish business models, business models are evolving all the time. Car sharing of course that was seen as an example will not be the same in five years. We will see more automated parks, we will see more one way and two ways business models.
When we look at mobility, the work we can do today is much more based on a city basis. We have to look at this type of services working on local territories. We have to look at the impacts they can bring to a city because if you are starting to look at how to reduce emissions, how to make people's behaviour changing, this has be localized: there is no universal solution across the world, the risk has to be accepted locally.
Secondly one should highlight the importance of the best practice in mobility services.

And last it is essential for cities to understand what business models are, understand what is happening in the mobility areas and how they should engage with the private sector.

Conclusion

We see a significant number of opportunities not only in terms of business, but also in terms of social and environmental benefits because if we start to change behaviour to more multimodal network and if we are succeeding in the reduction of the number of private cars in cities, we are going to see a reduction of congestion, few emissions, shorten journey time, a reduction of energy waste.

New services in mobility C-ITS – Gerhard MENZEL (European Commission, DG MOVE)

President Juncker highlighted in September in his speech to the state of the Union that the European Union is on track and made a clear pledge back in March: a binding, economy-wide emissions reduction target of at least 40% by 2030, compared to 1990 levels. This is the most ambitious contribution presented to date. President Juncker also stressed that the EU will not sign just any deal. "Our priority, Europe's priority, is to adopt an ambitious, robust and binding global climate deal." This challenge has been the topic of the ministries of transport roundtable earlier this week and it will be discussed during a COP 21 meeting in December.

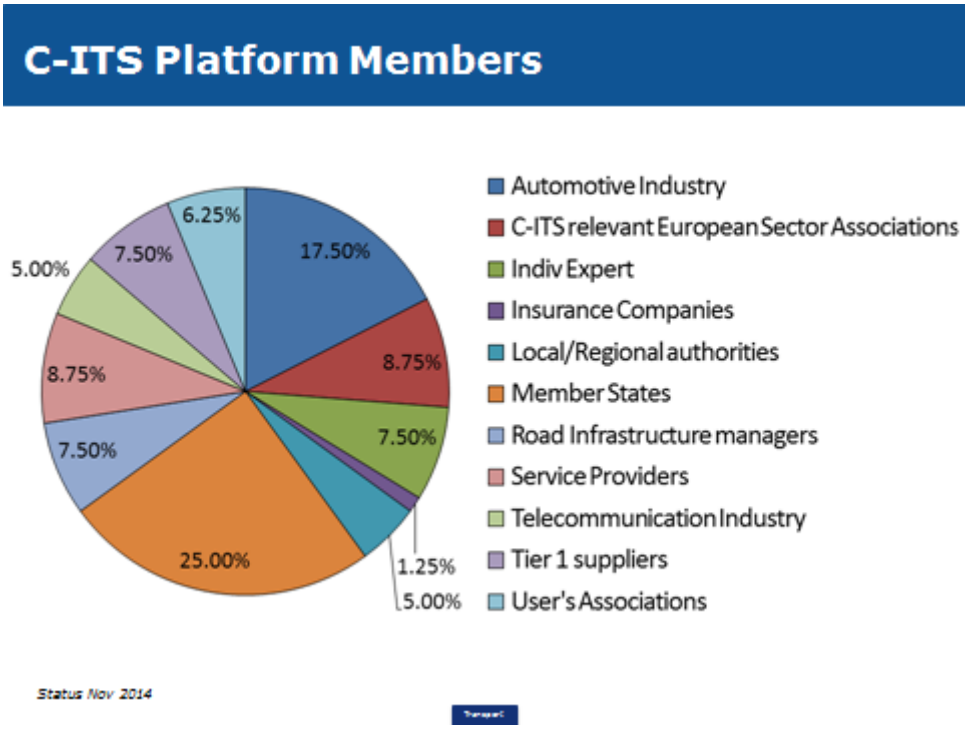
Why C-ITS ?

The European Commission has adopted its strategy for a European Energy Union and Cooperative ITS is part of the Energy Union. Within the European Commission C-ITS is not seen only as a technical communication between vehicle and infrastructure. In fact, the connectivity is really enabling the emergence of new services as an additional medium. The Commission is also very much convinced that to get the full benefit of automated cars it must not only be automated cars, but vehicles that are able to communicate. Automated and autonomous are two words that have to fit together.
Regarding the policy objectives, improving road safety is the main aim of many of the services that will be deployed in a first phase; but as soon as there is a connectivity in the car, as soon as everything is connected in the mobility systems, they will change by enhancing the mobility and reducing the congestion overall. The mobility patterns will change. The optimization of the infrastructure management will lead to optimizing performance and capacity of the transport infrastructure (C6-TS has also to be seen as a first step towards automation which allows efficient and good use of the infrastructure). The efficiency of logistic operations could be improved, and, finally energy consumption could be reduced and impacts on environment decrease.
C-ITS is not a theory anymore. In Europe we need a coherent vision, we need a clear understanding of how these technologies can be deployed, the potential that these technologies are able to deploy in Europe because looking at the global scheme we see that things are going on. We want to be sure that the competitiveness will be benefit for Europe. Therefore we have identified last year that there is a need for a shared vision on the deployment of C-ITS, first on connected vehicles. Therefore the Commission has launched the C-ITS platform as an instrument for taking off the dialog, to identify a way forward.

The C-ITS Platform

Formally it is a Commission's expert group that has been set up after an open call in 2014. Currently it gathers over than 100 members. They use to meet every month in Brussels to discuss open issues on the deployment of ITS in Europe. From Commission's viewpoint it is not only a DG MOVE

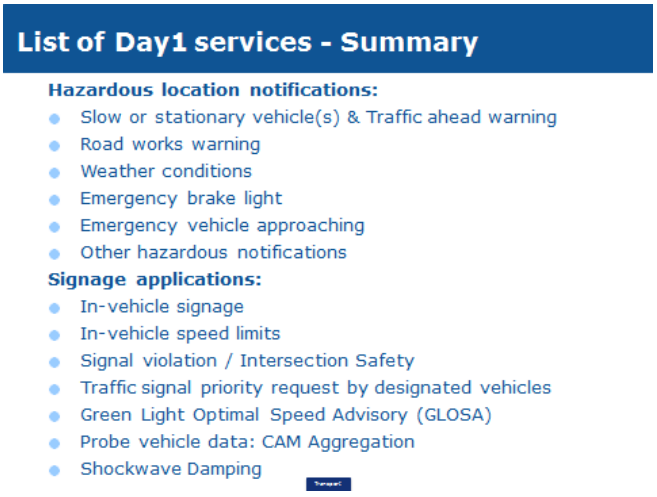
exercise, several Commission services and other EU institutions are also engaged. The C-ITS platform is really an integrated initiative aiming to discuss not only about connectivity but also industrial dimension, privacy issues etc..



As mentioned before the overall aim for the Commission is to develop a shared vision and a roadmap for the deployment of cooperative systems in the EU. The outcome is building blocks for a "Communication by the European Commission on the Deployment of C-ITS" in 2016. The Commission collects the experts discussion in order to adopt a master plan for the deployment of C-ITS in Europe.

Objectives of the C-ITS platform

Again we are not speaking about full automation, we are not speaking about partial automation. We are talking on a first step we want first to achieve. We are taking up the needs of the stakeholders, we have many discussions, different views, many definitions, and we have defined a list of "day 1 applications" corresponding to the services which are most likely to take place in Europe first. That does not mean they will be the only ones, but we need something to start in order to move on to other services.



C-ITS platform working groups

Within the C-ITS platform, these topics have been structured around working groups. Some current topics are described below.

Cost-benefit analysis

The Commission has also started an accompanying study trying to identify the deployment scenario. It proposes establishing a matrix of different geographical environments and time horizons, in order to identify for each of them the most likely applications to be deployed in different time frames. In addition the cost benefit analysis needs to consider how applications can benefit different categories of users as for many C-ITS applications there is a potential benefit for the user as an individual, as well as a potential benefit for the society, that goes beyond the addition of the individual benefits.

Open legal issues

The deployment of C-ITS brings an important number of legal questions regarding liability, privacy or road traffic legislation related to future vehicle technologies. Many questions arose:

- What is the state of legislation in the different member States ?
- Compatibility with existing legislation (the Vienna Convention). Is there a need for further amendments ? (the response today is clearly negative).
- Is there a need for a common European framework on liability ?

Data protection and privacy

C-ITS services will produce enormous amounts of data that will have to be collected, transmitted and processed. This will imply a complex data management and exchanges that will exceed any of the current situations. Ensuring quality, traceability and reliability of data throughout a secure value chain will therefore become a great challenge.

The C-ITS Platform is expected to look at the possible alternatives for ensuring reliable data management throughout the C-ITS services, and eventually produce recommendations on what type of future actions need to be undertaken by both private and public stakeholders in this respect.

We had a lot of discussions. The currently pattern is that there is no way around for the broadcasting of messages which have to be seen as completely personal data. How to process data ? The principle should be that consent is mandatory. Frequency: How to ensure co-existence between C-ITS-G5 (5.9 GHz) and DSRC (5.8 GHz) : amendments of ETSI standards.

Access to in-vehicle data

A specific working group has been created. It discusses on who, why and how to access to the data. A few principles about what can be done has been agreed by now. Currently we analyze the type of model that could be granted in the future.

Security and certification

Starting the first experimentations, people said that they would not be able to deploy because they don't know how the security system will look like. Member states interests and the industry interests are quite different and there are different interests in the different countries.
The EU Commission believes that C-ITS systems have to be really interoperable and that, for that aim, the security system must be trusted. We need to agree on one common trust model. The question

is: how to design the necessary compliance assessment processes; how will the system be tested ? What needs to be tested ? Who will be responsible for that ?

Public acceptance

The C-ITS Platform is expected to produce policy recommendations for the development of effective educational and communication programmes for improving the acceptance of Cooperative Systems by the general public and the different communities of beneficiaries.

Funding schemes

In HORIZON 2020 - Research and innovation there is a lot of funding. Also in the CEP –infrastructure funds – where there will be a dedicated call this year whose budget is 70 M€. DG MOVE is looking for initiatives and proposals. They will have to show a coherent approach with general policy framework under development, they will have to be interoperable, and a cooperation between existing projects and initiatives and new ones (common elements, cross-site tests) are highly encouraged.

Innovative software and services – Russell SCHIELDS (Ygomi, ITU)

Road data can improve fuel economy

If we do environmental testing on real-world activities we can see that vehicles do not know anything about Information about upcoming hills and curves, upcoming speed limit changes and stop signs, traffic signals phase and timing, information from variable signs, pavement surface quality, difficult weather conditions, traffic conditions.
The current technology allows us to do. It has been shown that a reliable knowledge of the road ahead can help powertrain process. Introduction of technologies and using road data in the process will lead to at least a 6% reduction in the duel use and CO2 reduction. And what we really want to do is actually correct what the car is doing.

Use of Probe Data about Actual Emissions Instead of Bench Tests to Set Vehicle Emissions Regulations

Most administrations use simulated driving conditions in laboratory tests to determine vehicle manufacturer compliance with fuel economy and emissions regulations. The tests do not accurately represent actual use and maintenance of vehicles. Vehicle manufacturers spend all their money to develop vehicles to maximize laboratory test results, not real-world behaviour. As a consequence, more fuel is used than necessary, more CO2 is produced than necessary.
It is a fact point that the regulation approach has not led to an evolution improvement in transport. Computers and communication technologies could lead to better progresses. Fuel economy and emissions regulations can be based on real-world performance. In-vehicle connectivity allows direct tracking of fuel usage and emissions as probe data, generated from vehicle sensors. This probe data can be used to determine actual average fuel consumption during a vehicle's service life under actual driving conditions, driving style, maintenance protocols.
With fuel efficiency based on the current regulatory approach, determined by the current testing methods, vehicle manufacturer investment may reduce real average fuel usage per kilometre driven by 30% for new vehicles in 2025. But if fuel efficiency and emissions regulations become based on real-world, vehicle-life fuel averages the same vehicle manufacturer investment could reduce real average fuel usage per kilometre driven by over 50% for new vehicles in 2025 (estimation provided by senior vehicle manufacturer engineers).

We have now reached a very big potential: all the relevant technology already exists and is commercially available; connected vehicles are becoming widespread. But we want to do much more. For that purpose, we need a structure for the discussion. We think that WP 26 of the UNECE on harmonization of transport regulation could be appropriate.
Strategies must be put in place to manage privacy issues. For example, probe data should only include enough of the VIN data field to identify vehicle year and model, regulation mandating real-world emission enforcement could require vehicles that violate emission rules to send the entire VIN, the VIN can be matched to license plate records to enforce proper repairs.

Conclusions and wrap-up

François GUICHARD

We are all gathering in Bordeaux o see what we can do with ITS technologies. There are many ideas, but we don't know exactly how to do, how to transform the transport system with all these technologies. This is the reason why we are working now all together. Having in mind what the information and communication technologies can do for emissions tests and measurements, we invite you to present your ideas and we know people in the room who will be very happy to hear what you are saying. In term of maintenance there are some people in WP29 trying to go that way. So, let's connect and see the synergies.

Russel SHIELDS

There are several cases of type approval. US have taken care of many things but they are relatively limited in comparison to what could be done.

François GUICHARD

We are talking about real driving emissions. In the EU people are working on this: there will be tests of new cars not only in the labs but also on the street. That means we agree on the fact that we have to use modern technologies.

Eva MOLNAR

ITS in a way delivers three messages we will have to follow up with Governments.

- The first one is : all types of regulations are still valid to a goal, but there are new ways of management. We have to try to move towards them. It will not happen overnight but it has to be in the minds.
- The second is : in certain domains our methodology is the same than 20 years ago. Usually it is good to have all types of methodologies but for this particular topics, I believe that we have to go to the big data and to use the benefits of ITS.
- The third message is: some of you felt that it was necessary to move quickly and, for this, it was necessary to limit the formalism and the length of proceedings. It is true that business is going very fast ahead. Public servants, Governments and international organizations try to understand what happens. So we need experts and private sector's assistance to be able to keep place and influence; in some cases we must do more marketing, more communication. Under certain conditions, we must take into account these remarks and we invite you to make it be the subject for a discussion in the WP29.

Jean-François JANIN

The Transport Ministers and their representatives have discussed on Monday about the Manifesto and the "ITS for climate" initiative was presented to them. According to Manifesto and the "ITS for climate" initiative, it is time to prepare statements to be given to the COP on December 3th (Transport Focus Day) as a demonstration that ITS is a mean to improve climate and that many stakeholders agree with this idea. The conclusions of the UN-ECE seminar could be a confirmation of the importance of ITS for implementation of plans of reduction of emissions.

Patrick OLIVA

First, it is important to agree on a vision of the world, but if we want to go forward we certainly have to agree on a certain number of disruptions that must be introduced in the transport system.
Second point, COP 21, which is CO2 focused, is a fabulous opportunity to engage on a few disruptions in the transport sector. 14 initiatives have been launched at worldwide level. One of them is "ITS for the climate": we have to use it to present the disruptions that we want to introduce. As support of this conference focusing on ITS, I would like to make sure that we can voice this objective of disruption as soon as necessary.
So, let us do it. I have no doubt in mind : if we have the courage to say it, to voice it, we can be sure that the private sector will support such elements of disruption. We need disruptions on powertrains, on the way we use data, on energy consumption and emissions, in the way we conceive co-modality, in the way we decrease the weight of the vehicles (because we are in a situation where all vehicles are too heavy today and this is something which is not acceptable). If we want to light the vehicle we have to introduce some safety features…
So, a very logical approach to the disruption has to be voiced and clearly formatted. If this was done, we could count on UNECE's support and other institutions. We have two months for that and this is a sufficient delay because we know what are the major disruptions that we have to involve in. If we want the politicians to support what we are saying, we need to show that we are on the way of innovation; by investing in innovation we have a chance of creating jobs. We have to show that these elements are not only for the climate, but will also have very important side benefits. You can count on me to be your spokesperson. If you have ideas, I will be very happy to receive your testimonials.

Jean-François JANIN comes to the conclusion. As co-organizer of the conference he felt very happy with the presentations. He thanked François GUICHARD from the UNECE and the PREDIM team to have prepared this successful event. The final result is quite interesting.

Eva MOLNAR

First of all I want to join everybody to thank for the partnership, Jean-François JANIN and the French Ministry's task force for intelligent transport, the PREDIM team and Michelin Bibendum challenge that supported the event.
I would like to thank the participants. This room has been half full or half empty. Half full because we managed to have this annual workshop connected to the ITS world congress and empty because 240 people registered and finally a number did not attend.
The presentations and the proceedings will be published in UNECE as well as in PREDIM sites as soon as possible.
The workshop issue was looking on how to rationalize the political wish to benefit from the ITS solutions to reduce the climate change impact. We did not have the critical mass to start to discuss a report. But we will write complete proceedings which will be put on the UNECE and PREDIM websites as well as the presentations.
The third point is how to be linked with COP 21 ? I think there will be links on different layers. The first is that we have a message and I assume that the French delegation will include it in the speaking points. The second layer is that there will be on December 3rd an important event where the 14 initiatives will be mentioned, "ITS for the climate change" is one of them. It is led by TEC-ITS-France and TOPOS Aquitaine, with the support of ERTICO, ITS Europe and the regional and national ITS associations. They all will be aware of the proceedings of our conference to take its results into account.
Among the different aspects mentioned by Patrick OLIVA on how ITS to contribute to climate change, I underline those which have been discussed here today: disruptions on the way we collect data, and on the way we use data on energy consumption and emissions. These elements coming from the

meeting are very important to improve the trust of the drivers, the traffic managers and the citizens in the efforts made for the Climate.
Final remark: At the end of February there will be a political session of UNECE on innovation for sustainable development where there will be concrete actions to be discussed. It will be also an opportunity to discuss the follow-up of this conference.