25TH ITS WORLD CONGRESS
COPENHAGEN
17 – 21 SEPTEMBER 2018
Quality of life

Congress Report

25th ITS World Congress

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Co-organised by: ITS AMERICA, ITS ASIA-PACIFIC

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The 25th ITS World Congress 2018

Hosted in a different location each year, the ITS World Congress is an international meeting point for the mobility sector, rotating between Europe, the Americas and Asia Pacific. This year, ERTICO – ITS Europe and the City of Copenhagen hosted the 25th ITS World Congress. The Congress was co-organised by ITS Asia-Pacific and ITS America and strongly supported by the European Commission.

With the main theme: "**ITS – Quality of Life**", the 2018 ITS World Congress explored and demonstrated how transport and mobility solutions can improve the quality of life in our cities by placing users and their needs at the heart of the mobility system.

The 25th ITS World Congress raised the bar in terms of scope, content, and features. ITS experts from across the globe came to exchange best practices and advance the discussion on how to leverage smart mobility solutions to enhance people's lives. More than 10,000 participants from over 100 countries discussed issues related to cybersecurity, resilience planning and safety amongst many other themes.

Before the official Opening, a **press conference** was held with an overwhelming turnout from local and international journalists. The panel was presented with the question: "Quality of life: How is innovation making mobility better?". The panel consisted of high level representatives and our main commercial partners contributing to a very successful event for both panellists and journalists.

During the **Opening Ceremony** HRH, the Crown Prince of Denmark, as patron of the 25th ITS World Congress, warmly welcomed the participants to Copenhagen, while the European Commissioner for Transport, Ms Violeta Bulc, the President of the FIA, Mr Jean Todt, and the Deputy Mayor of Paris, Mr Christophe Najdovski, engaged in a debate about the future of ITS and road safety. The European Commissioner for Competition, Ms Margrethe Vestager, addressed the audience during the Closing Ceremony on the last day of the Congress.

In addition to the packed congress **Programme** featuring over 200 sessions, there were various workshops, associated events and networking opportunities where delegates could learn from peers and share knowledge about the latest technologies and policy developments from across the world.

The Programme was complemented by the 20,000 sqm **Exhibition** area where over 400 companies and organisations from all over the world showcased their intelligent transport and smart city technologies and solutions. The event also saw the launch of the first-ever exhibition space dedicated to the young ventures of smart mobility at an ITS World Congress: The Area C – startup connector. This exclusive space for startups gave them the opportunity to present their latest innovations and meet with potential business partners.

In addition to these indoor activities, technical visits and the "Copenhagen 1:1" series provided direct discussions and user engagement with the people responsible for actual deployments in the city. A wide range of **Demonstrations** showcased the latest state-of-the-art products and solutions for real world mobility scenarios, providing answers to some of the world's most pressing challenges like climate change, air quality, urbanisation, congestion and traffic safety.

In conclusion, the 2018 edition of the ITS World Congress, which celebrated its **25th Anniversary** in style, was a major success. We want to extend our sincere gratitude to the International Programme Committee and Board of Directors, the ITS National Associations, our commercial partners and all the people who worked together to deliver this great event!

Key figures

10000
Participants

2000
Opening Ceremony

850
Speakers

2400
Delegates

92
Students

525
Public Day

95
Staff and Volunteers

96
Countries

250+
Sessions

25
Associated Meetings

17
Technical Visits

900
Technical Visits booked

12
Demonstrations

1700
Demonstration slots booked via app

200
Press

36
Media Partners

200+
B2B

5555
Congress app downloads

1115
Session ratings

4500
MinRejseplan downloads

100000
Travel requests

400
Exhibitors

2350
Exhibition Visitors

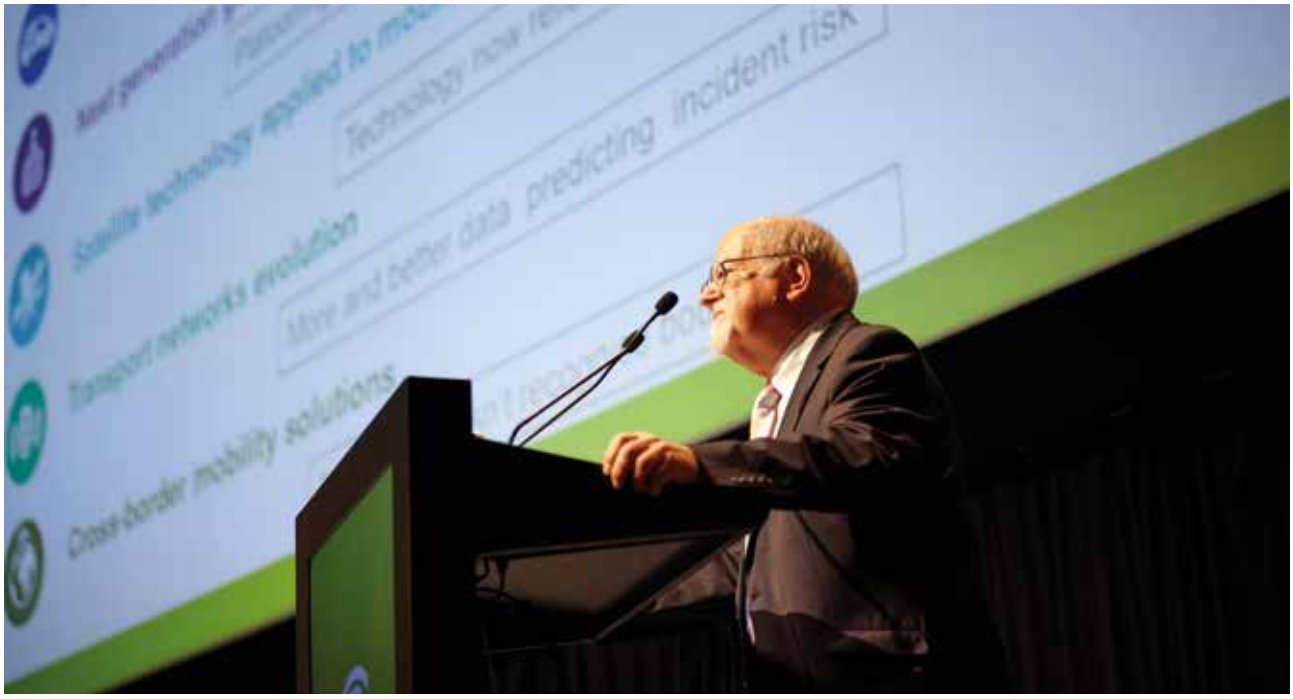
3900
Exhibition Personnel

20000 Sqm
Exhibition Area

17
Commercial Partners

25
ITS National Associations

Introduction



The Congress was organised around seven key Topics:

- **Mobility services – from transport to mobility to liveability**
- **ITS and the environment**
- **Connected, cooperative and automated transport**
- **Next generation goods delivery**
- **Satellite technology applied to mobility**
- **Transport networks evolution**
- **Host Topic – Cross-border mobility solutions**

A team of rapporteurs was appointed for each topic tasked with capturing the key messages and outcomes from the Congress, the exhibition and the demonstrations. The tracks were addressed by a wide range of different types of sessions, over 250 in total – Plenary, Executive, Special Interest, Technical, and Scientific.

This Report summarises the Congress proceedings. The first part focuses mostly on the Technical & Scientific papers and the Special Interest Sessions; the second part paints a picture of proceedings at the Plenary and Executive Sessions; and the third summarises the proceedings at the High Level Round Table.

I give my profound thanks to the main team of rapporteurs who contributed so much to this document:

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Professor Eric Sampson
Chief Rapporteur
Brussels, October 2018

Executive Summary

The Congress had as its main theme "ITS – Quality of Life" and was organised around seven key Topics:

- Mobility services – from transport to mobility to liveability
- ITS and the environment
- Connected, cooperative and automated transport
- Next generation goods delivery
- Satellite technology applied to mobility
- Transport networks operations

There was also a Host Topic of Cross-border mobility solutions. The main themes underpinning the seven topics were distilled into three plenary sessions supported by twelve Executive Sessions to reflect the hot issues of the moment, not just within ITS but across the transport discipline as a whole:

- Achieving higher quality of life in our cities
- Ensuring integrated mobility services
- What's next for automated mobility?

The High Level Round Table (HLRT) was a key element of the Congress with over 150 Ministers, Mayors, industry leaders and senior representatives of national and local governments coming together to review how intelligent and green mobility can contribute to sustainable growth and a better environment for all citizens. The participants enjoyed the opportunity to meet their global counterparts to talk about solutions to transport challenges.

Around 550 papers were presented in about 170 Congress sessions. In the three Plenary Sessions and twelve Executive Sessions high-level industry executives, public officials and international experts shared their perspectives and extensive experience of ITS topics encompassing policy, strategic, economic, technical, organisational and societal aspects.

Mobility services – from transport to mobility to liveability was one of the three busiest topics. It showed a steady evolution based on exploiting new technologies, adding new services using current technology, and integrating social media information. There was considerable interest in Mobility as a Service but with a rather limited number of schemes fully operating globally there was a relative lack of information, especially actual evaluations, so it was hard to measure success. MaaS business cases still had challenges to overcome. Moreover operational schemes usually focus on services for individual travellers but do little to optimise wider mobility operations through traffic and multi modal transport management.

Services for users continued to develop; we now know how to integrate traveller information and traffic management. Today's innovation is in using new digital platforms (cell phones, computers, social media) to bring greater connectivity between the two systems (*ie* draw data from road users to support road management decision-making; provide information to road users for travel options *etc*). Route planners now do more than give estimates of travel time based on traffic conditions at the time of departure; they can also predict traffic conditions as they change along the route during the trip and will further improve when they become linked to interactive traffic management and connected systems generally.

ITS and the Environment was one of the smaller topics in terms of paper numbers but covered a lot of interest areas. It was clear from sessions that the available technology permits environmental issues to be looked at from different perspectives and suggests that many potentially useful solutions are being developed. The market was very active in updating systems and services in order to use less energy and reduce emissions but the regulators seemed not to be moving as quickly, for example regarding cleaner air in cities.

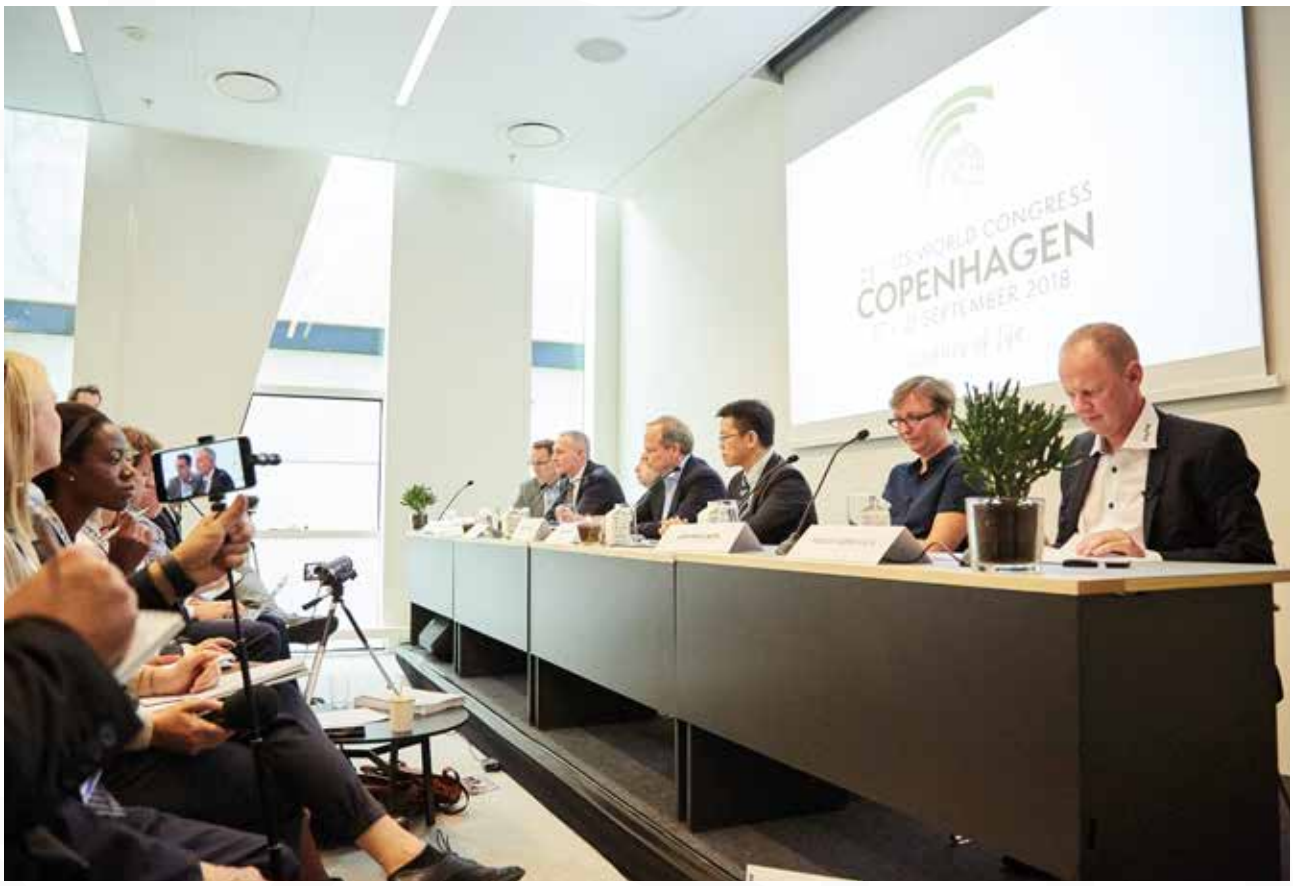
Connected, cooperative and automated transport was the busiest topic reflecting the worldwide interest in automated mobility. There was an interesting split – presentations and discussions on connected transport were very down-to-earth with a focus on getting the proven benefits from deployment as quickly as possible as a part of wider networks (for example interactive traffic management) and as data sources. The emphasis in sessions on highly or fully automated vehicles was very much on accident reduction and was urban-centric. Technology developments were often dominant although for both connected and autonomous cases there was emphasis on the benefits to the end users. The tone was quite optimistic with regard to automated driving although several speakers referred to the need to advance in very small steps to ensure successful deployment. In summary – connected is today; autonomous will be next month.

Next generation goods delivery was a story of incremental innovation to help increase productivity and minimise negative impacts rather than overnight revolution. This industry has tended to be rather conservative and dominated by direct supplier costs, rather than a wider perspective of social benefit. It was beginning to accept that open platforms holding shared data to open standards brought benefits to everyone. Platooning was seen as key to linking ITS innovation and breakthrough of automation in the future. Two visions were discussed: platooning as a driver support service; platooning as driver replacement.

Satellite technology applied to mobility was another small but lively topic. The well-established role of satellite as key enabling technology for positioning is developing steadily as constellations are expanded. Applications for communication were much discussed as the telecoms industry is bringing satellite and mobile communications together reinforcing the point that satellite communication is a reliable, accessible, affordable and proven technology. Sessions also addressed applications for earth observation and for the first time there were presentations on safety benefits such as monitoring infrastructure and the safety of vehicles.

Transport networks evolution was the second busiest topic covering the familiar areas of network and intersection management, simulation, modelling, security and safety but it also included many aspects related to data. There was emphasis on the value of 'Big Data' particularly as devices for collecting data can be

Executive Summary



deployed cheaply and on a large scale. More and better data allowed more accurate simulations, which could be used to identify incident risk areas. Most of the papers presented evaluated the efficiencies of current traffic systems rather than introducing novel future techniques. Travel time estimation studies were still limited to individual traffic state estimation so were not moving forward as expected to cope with advances in big data analytics. It would be useful to see new methods for real-time travel time estimation for different origin-destination from medium to long distances.

And finally – looking back to the previous two Congresses we can see a mobility services thread running through them as well as Copenhagen. It was clear that we're going through a transport transformation driven by automation and AI, connectivity, electrification, digitalisation, and sharing that is disrupting beyond the transport sector *eg* land use planning, urban design. There was a common "feel" across all the Topics and demonstrations with everyone giving broadly the same messages: share data (you don't need to own it to use it) held on open platforms in open standards formats; use vehicles rather than own them; move people not things; address the environmental issues before deploying not after; exploit Connected today and plan for Automated a little later on; expect business models to be dynamic; plan to evolve from transport, to mobility and then to liveability and recognise that there is no single definition of liveability – ultimately a city and its citizens need to agree on what they want and the ways to achieve it.

The High-Level Round Table

The High-Level Round Table on Wednesday 18 September was a much anticipated part of the Congress. Around160 Ministers, Mayors, Industry leaders and senior representatives of national and local governments came together to review how intelligent and green mobility can contribute to sustainable growth and a better environment for all citizens.

After a short **orientating Plenary** including welcomes by Ms Ninna Hedeager Olsen (Mayor of Technical and Environmental Affairs, Copenhagen) and Mr Jacob Bangsgaard (CEO, ERTICO) the participants divided into five parallel streams to explore solutions for issues facing most cities globally. These included space management, pollution control, safety and security, regulatory issues for new technologies and the general challenge of maintaining seamless mobility for all citizens when expanding and ageing populations were putting increased pressure on transport systems and urban spaces.

The Round Table streams were based around three broad themes:

- Making cities more liveable by reducing congestion and improving air quality
- Helping cities to plan for the deployment of new mobility services
- The changing roles of Governments, especially regulating and legislating

These themes were translated into five key questions to prompt discussions

- How can we reduce emissions and improve air quality?
- How can we achieve modal shift in cities?
- How can cities plan for the deployment of new mobility services?
- How can we manage urban space use for public transport, active modes and private vehicles, to deliver enhanced green mobility and accommodate highly automated vehicles?
- How might legislation facilitate the deployment of automated transport for both people and goods?

The **Ministers** talked about many points relating to deployment of highly automated vehicles ranging from the possibility of drastically reducing fatalities to benefits for older or restricted drivers; and from the likely impact on congestion and vehicle ownership to enabling a variety of innovative mobility services. Many countries were hosting trials of some form of automated vehicle and it was not yet clear whether their large-scale deployment would require changes to how cities managed urban space use.

Mobility was not yet a stand-alone aspect of everyday life and Governments were faced with the challenge of working on various policy and legislative aspects relating to the new services that automated transport would support. For many Governments there was not yet a clear picture of the amendments to legislation and regulation likely be needed to facilitate the deployment of automated transport for both people and goods. The need to refresh legislation to keep up with the development of transport technology was emphasised.

The Ministers noted a number of areas in which regulation needed to be introduced or updated to support transport and mobility. These related to safety, privacy and cybersecurity issues stemming from data use, and the new emerging partnerships of industry, government and private actors in providing new mobility services.

Further discussions focused on the use of data, strategies for reducing emissions and improving air quality, the changes needed in regulation for deployment of new mobility services, and the push towards the goal of zero-based fatalities. Using data for mobility presented challenges and opportunities. There were still a number of trust issues and a lack of adequate (digital) infrastructure for data. This pointed to the need for a clear definition of the objectives for data use and for standards and open APIs for data exchange.

The Ministers agreed strongly that a zero emissions strategy with goals for all stakeholder sectors must be worked out. Transport should be an enabler for lower emissions. In Europe the EC was already seen as a big part of the solution in initiating measures to encourage

cleaner mobility. In some countries tax changes had advanced the penetration of electric vehicles (EVs), setting an example perhaps for others to follow.

The Ministers agreed that a goal of zero-based could not be achieved in a hurry. The most optimistic scenario showed 2060 and beyond for realising the goal, underlining the view that much work remained to be done in this regard.

The **Mayors** met around two tables to discuss pressing issues facing cities today in terms of deployment of new mobility services, modal shift, the use of urban space, and reduction of emissions and improving air quality.

To manage urban space efficiently for public transport, private vehicles and active modes as well as aiming to deliver enhanced green mobility and additionally accommodate highly automated vehicles, cities would have to set priorities by making difficult choices. One group of mayors ranked different modes in order of preference for space management: walking, cycling, public transport, mobility-as-a-service (MaaS), cars. Autonomous vehicles carrying multiple passengers should be given more priority than vehicles carrying single drivers/passengers. The Mayors stressed the importance of exploring the scope for deploying highly automated vehicles for freight as well as passenger services.

Every city needed to look for the causes of its congestion problem and choose the most suitable solution from the multiple options available. It was important to think long-term for mobility planning but also to be flexible at the same time. Some transport policies and plans operated for longer than the term of the elected officials who instituted them and should perhaps be reviewed regularly to ensure that they still served the best interests of citizens.

New mobility services must be deployed to increase the possibilities of modal shift. “Top down” and “bottom up” approaches to deployment could both be effective provided cities acted as enablers. The users must be made to feel that public transport was good and something worth valuing. Very often they did not consider it a good enough option.

It was clear that cities around the world had a lot in common while facing unique sets of local issues. City authorities had the vision to come up with solutions and with decision making powers on transport issues, and with bold mayors, they could realise their goals. The Mayors felt that the public sector should have more oversight and regulatory powers to give the right to experiment and run pilot deployments for prioritisation of modes.

Working together with other cities to share knowledge and experience had brought many benefits – not least the sharing of open source data to improve safety and efficiency of transport. As a complement to that the Mayors pressed the case for more “State of the Art” documents: simple reports on what cities and countries were doing, why they were doing it and links to any more detailed information available.

A mix of **Industry Leaders and Government Officials** also had two tables for their discussions on the use of urban space for private and public transport, including autonomous driving and solutions for greener mobility.

The answers for handling future mobility challenges in cities were not building more infrastructure for cars. The boundaries between transport modes needed to be removed to create integrated and efficient solutions – across borders and also across fleet and personal transport. We needed to rethink mobility and work with users to understand their needs and “nudge” them towards new habits and a culture change. There was not always a good understanding of user behaviour and in some areas this would be essential for change to take place – for example we could not support future population growth in cities if the demand for individual cars continued. It was very important to focus on the human factor and to understand different users’ needs.

Financial mechanisms had been proven to influence behaviour but options such as road pricing were not always popular for political reasons. If policies were recast into incentive-based frameworks they could be very effective – for example a traffic guidance system to ensure a more efficient use of infrastructure (driving at off-peak hours, guiding to less congested/polluted roads, changing to mass-transit or bikes *etc*) could deliver excellent results.

Good solutions required access to good data *eg* about traffic and air-pollution, which in turn required good sensors, etc. To support the technological development and innovation needed to create future modern mobility solutions policy-makers must introduce test zones for new technology such as autonomous vehicles. There must be more emphasis on benchmarking and scaling projects when launching tests and pilot projects. Autonomous vehicles that were tested in different environments and climactic conditions would help improve mobility in rural areas too where public transport is not feasible in many areas.

There was a need for rethinking approaches to infrastructure as ITS could ensure a more efficient and flexible use of the limited space in cities. For example better maintenance and optimisation of traffic lights could reduce emissions by over 20% but politicians often preferred funding for capital projects where they could “cut the red tape” to an increased budget for maintenance.

There was much discussion on data and how legislation could both help but also hinder data’s crucial role in enabling automation. GDPR was given as an example of how legislation was seen by the industry to be potentially hindering automation and connectivity. However there was no consensus between the stakeholders regarding who should own the data and who should have access to it.

A poll of participants revealed the paradox that although legislation in general was seen as a hindrance there was almost unanimous agreement that it would be necessary to make automation happen. The issues of liability, standardisation and harmonisation (across industries but also across borders or even beyond the EU) would

The High-Level Round Table

need some legislation to enable widespread uptake. All participants agreed that it was critical to make this a global process even though that would be extremely hard and slow.

The discussion on modal shift prompted the key questions "Why do we, or more specifically cities, actually want automation? What are the outcomes we want to secure?" This should be the basis of discussions on automation and modal shift, and the regulation and policies behind it. It was also noted that we needed different regulatory and policy approaches on urban and rural areas for both automation and modal shift.

In the **concluding plenary session** the participants recorded their appreciation of a stimulating opportunity to meet their global counterparts to talk about solutions to transport challenges. They also looked at emerging opportunities as in many cases problems previously considered too difficult were beginning to be addressed because transport technology was developing so rapidly.

The participants at the High Level Round Table:

- Noted the proven benefits of ITS for reducing congestion, emissions and energy consumption while enhancing safety and mobility for people and freight
- Invited the Regional Congress organisations to continue to work with public and private sector stakeholders to encourage the publication of evaluations of completed ITS implementations
- Stressed the need for more
  - large-scale trials of highly automated or driverless vehicles to assess the combined impact on safety, air quality and congestion
  - research on the behavioural aspects of transport
  - guides to the potential of emerging ITS technologies for policy development
  - research on ways to manage city space including parking and automated vehicles
  - guides to the different processes for procurement
  - research on the needs of travellers with reduced mobility
- Confirmed their wish to continue to work together to address the mobility challenges facing cities today through the deployment of efficient and sustainable ITS solutions
- Welcomed plans for the organisation of a similar high-level policy discussion at the ITS World Congress in Singapore 2019
- Thanked ERTICO and Copenhagen City Council for organising the event.