Strategic session 3 –
International cooperation

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International Cooperation
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II. Various Aspects on CAD
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I. ITF: a Quick Overview
The ITF is the only global body that covers all transport modes

- Intergovernmental organisation with 59 member countries
- Think tank and platform
- Annual Summit of transport ministers
- Mission is to foster a deeper understanding of the role of transport in economic growth, environmental sustainability and social inclusion
ITF Members as of April 2019

Presidency countries:
- South Korea (2019)
- Ireland (2020)
- Nigeria (2021)
- United Kingdom (2022)

Ongoing exchange with:
- Tunisia
- Brazil
- Singapore
- Thailand
Five Major Themes

- Digitalisation
- Connectivity
- Safety + Security
- Universal Access
- Decarbonisation
ITF’s works on Digitalisation
II. Various Aspects on Connected & Automated Driving
| Technology                        | - Smart communication: V2V, V2I  
|                                  | - High precision map  
|                                  | - Efficient control system  
|                                  | - Cybersecurity  
| Law and other rules             | - Vehicle standards  
|                                  | - Facilitation of driving on the roads  
|                                  | - Communication and insurance  
| Ethical question                | - Information sharing  
|                                  | - Algorithm on the basis of consensus  
| Connectivity and extension      | - Disconnectivity coming from connectivity: decentralization  
|                                  | - Connecting transport to other sectors
III. International Cases
Declaration of Amsterdam
Cooperation in the field of connected & automated driving

SUPPORTING the following objectives:

a. to work towards a **coherent European framework** for the deployment of interoperable **connected & automated driving**, which should be available, if possible, by 2019;

b. to bring together developments of connected and automated driving in order to reach their full potential to **improve road safety, human health, traffic flows, and to reduce the environmental impact of road transport**;

c. to adopt a “**learning by experience**” approach, including, where possible, cross-border cooperation, sharing and expanding knowledge on connected & automated driving and to develop practical guidelines to ensure interoperability of systems and services;

d. to support **further innovation** in connected & automated vehicle technologies to strengthen the global market position of European industry; and

e. to ensure **data protection and privacy**.
Minister’s Speech at UN Inland & Transport Committee, Geneva – 19 February 2019

• Smart Mobility: safety is the top priority!

• Accidents involving self-driving cars will make the front page.

• Collectively testing and gaining experience in trials and experiments requires legislative scope for experimentation. So our motto must be ‘Safe and responsible testing’. Let’s tackle that jointly, across borders. I’m happy to make Dutch expertise available, and for our part we’re keen to learn from you.
French AD strategy at a glance

Key priorities:

• Foster testing
• Adapt driving rules
• Adapt responsibility rules
• Upgrade safety validation / approval framework
• Assess needs and challenges of connectivity for AD
• Assess acceptance challenges
• Integrate AD in local mobility policies
• Assess and prepare skills adaptation

Main milestone = 2020-2021: regulatory framework and service deployment for highly automated transport (public, shared) on pre-defined paths
2030, Realization of Full Automated Driving

2022
(prepare the system for full automated driving)

2021
(commercialization of automated vehicle)

2020
Advancement of K-City

2019
Completion of Seoul test bed

2018
Completion of K-City Data Sharing Center

- Pilot project in Seoul, Jeju
- Demonstration of Truck platoon
- Demonstration of mid-to-large bus
- Legislation of vehicle safety, insurance
- Prepare a draft of vehicle safety, insurance

- All highways
- Precision map
- All highways
- Demonstration of mini bus

- Smart infra
- All highways
- Leading in development of int’l regulations

- Demonstration of min bus
- Lead in development of int’l regulations

Foundation for Technology Development

Smart Infrastructure

Public Experience

System Preparation
IV. A Way Forward
New tech ▶ New mode ▶ Automation

next step: artificial intelligence
Collective Efforts for a Success

Discussion & Research

- Main international platforms: ITF, UNECE, ITS World Congress
- Research oriented platforms: TRB, TRA, WCTRS, ECTRI

Rule making

- International: EC, UNECE, ISO, ITU
- Domestic: National legislation compatible with international standards

* EC funding for holistic approach is crucial
Horizon Europe proposed by EU (2021-2027, 100 billion euros for research and innovation)
TRANSPORT CONNECTIVITY for Regional Integration

22-24 May
Leipzig, Germany
A N D,

Under Irish Presidency

• May 27–29, 2020
• Leipzig, Germany
• ITF 2020 Summit: Transport Innovation for Sustainable Development
Thank you

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SIP Automated Driving System
SIP-adus; Automated Driving System for universal service

Seigo KUZUMAKI
Program Director of SIP-adus

3 April 2019
Society 5.0

Data convergence
high degree of convergence between cyberspace (virtual space) and physical space (real space).

Economic advancement
provision of products and services that are needed to the people that need them at the time they are needed.

Solution of social problems
human-centered society in which anyone can enjoy a high quality of life full of vigor

New society “Society 5.0”

(Cabinet office HP)
Outline of SIP2

- **Intensive R&D program**
  - promote 5-years R&D (FY2018 - FY2022)
  - from fundamental research to practical and commercialization

- **Promote cross-sector collaboration**
  - enhancing cross-ministerial cooperation
  - promote industry-academia-government collaboration

- **Leadership and total Budget**
  - CSTI appointed Program Directors and allocates the budget for each research theme.*
    
  * \$50bil in total per year
    (65% for SIP 12 themes, 35% for medical R&D)
Promotion framework of Japanese Government

Cabinet Office
(Council for Science, Technology and Innovation)

NPA
(National Police Agency)
Road traffic safety

MIC
(Ministry of Internal Affairs & Communications)
Info-Communication Technology for ITS

METI
(Ministry of Economy, Trade and Industry)
Promotion of the automobile industry

MLIT
(Ministry of Land, Infrastructure, Transport and Tourism)

Road Bureau Deployment of road infrastructure
Road Transport Bureau Safety standards for automobile

“The charter for improvement of legal system and driving environment for automated driving system”

“The Public-Private ITS Initiative/Roadmaps 2018”
Overview of 2nd Phase of SIP-adus

The operational domain of automated driving will be extended from highways to arterial and general public roads, and automated driving systems will be implemented in mobility services including public transport and logistic operations.

⇒ Safe and comfortable mobility for everyone in society.

SAE* automated driving level

- **Level 0**: Restricted
  - (Regions, roads, environments, traffic conditions, speeds, drivers, etc.)
- **Level 1**: Restricted
  - (Pedal error control)
- **Level 2**: (Auto-braking)
- **Level 3**: (Unmanned transport vehicles in factories)
  - (Golf carts)
- **Level 4**: (Unmanned transport vehicles in factories)
  - Address driver shortages
  - Freedom of movement
  - Address depopulation
- **Level 5**: Restricted
  - (Pedal error control)

**Practical implementation of logistics/mobility services**

**Fully automated driving society**

- **Logistics/mobility services**
- **Privately owned vehicles**
- **Expansion of operational domain from highways to general roads**

- **Resolution of societal challenges**
- **International cooperation**
- **Economic development**

- **Vehicle value improvement**

- **Traffic accident reduction**
- **Traffic congestion reduction**

- **SAE (Society of Automotive Engineers)**: Standardization body in the U.S.
Objectives

Public-Private ITS Initiative/Roadmaps 2018

Scenario for the commercialization and service of fully automated driving by 2025

- **By 2020**
  - Development/demonstration
  - Automated driving on general roads [L2]
  - [Private vehicles]

- **Early 2020s**
  - Development/demonstration
  - Automated driving on expressways [L2, L3]
  - [Logistics services]

- **Circa 2025**
  - Development/demonstration
  - Automated driving on expressways [L2, L3]
  - [Mobility services]

- **Reduction of traffic accidents**
- **Alleviation of traffic congestion**
- **Strengthening of industrial competitiveness**

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- **Innovative streamlining of logistics in the era of population decrease**
  - Truck platooning on expressways [L2 and above]
  - [L2 and above]

- **Society that enables the elderly to move around freely in each region nationwide**
  - Unmanned autonomous driving transport system in specified areas [L4]
  - [L4]

- **To establish the cooperative areas technologies essential for implementation by 2023**

- **To create multiple example cases for commercialization through FOTs by involving various businesses and local government**

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*Note: L2 refers to partial automation, L3 to conditional automation, and L4 to full automation.*
Deployment Milestones

Investment and business planning by private operators will be promoted by:

1) taking full advantage of the Olympic and Paralympic Games Tokyo 2020
2) conducting FOTs based on the business plans of entrepreneurs and local government

Course

- FOTs in the Tokyo Waterfront City area
- FOTs in the Haneda area
- FOTs with matching fund

Open discussion for promoting international standardization and R&D

Local FOTs involve entrepreneurs and local government.
Main domain of SIP-adus’ R&D

Vehicle

<Recognition>
Map, ITS info., Sensor

<Judgement>
AI

<Operation>
Actuator

HMI

<Cooperation w/Human>
Human Machine Interface

Traffic Environmental Data

3D HD Map + Dynamic Traffic information

Connected

Dynamic map

Social acceptance

Impact Assessment

Basic technology

Cybersecurity
Simulation
Database
Over the air
Safety assurance

In red: Main Domain of SIP-adus (Area of Cooperation)
4 Pillars of 2\textsuperscript{nd} SIP-adus

- [I] Field operational Test
- [II] Technology development
- [III] Social Acceptance
- [IV] International Cooperation

Regulatory Reform/Rule making

‘The charter for improvement of legal system and driving environment for ADS’
FOTs (Tokyo Waterfront City–Haneda Area)

- FOTs will start in autumn 2019 in the Tokyo waterfront city area (general roads and Metropolitan Expressway / Haneda area) with recruiting participants widely

**Providing traffic signal information**
Providing the signal display and change timing information even in environments where recognition is difficult using in-vehicle cameras.

**Merging assistance on the main lane of highways**
Providing vehicle information on the main lane

**Public transport system (self-driving buses)**
FOTs for the next-generation ART by using automated driving technology in mixed traffic flow.
Building the Traffic Environmental Info. Framework

Realizing Society 5.0 (implementation CPS*)

- Building geographical space information market
- Utilization of traffic environment information in multiple fields
- Collection and utilization of vehicle probe information
- Dynamic map basic concept
- Construction of static information
- Large-scale FOT on linking high-definition 3D map and information
- Signal information provision
- Cooperative control of infrastructure and vehicle such as traffic merging support
- FOT at Tokyo waterfront area for dynamic information distribution

Developing and operating dynamic traffic information (Cooperative area)

- Promote dissemination by cost reduction of high-definition 3D maps
- Visualization of traffic environment information and social utilization
- Realization of smart mobility service/logistics service
- Achieve safe and smooth traveling by prefecture information
- Reducing traffic congestion by traffic flow control
- Accident reduction by V2X technology
- Distribution real-time information on restrictions
- Implementing cooperative automated driving

Establishment of static information infrastructure

- Ordinary road L2
- Expressway L2-L3
- By 2018
- By around 2020
- By 2022
- By around 2025

* CPS: Cyber Physical System
FOTs (Local Transportation)

- Long-term FOTs will be implemented in underpopulated areas, local communities, etc. through collaboration with entrepreneurs and local government to validate business feasibility of automated driving in terms of logistics and mobility services.

Ensuring means of mobility in areas where many elderly persons live or that are not easily accessible
International cooperation

SIP-adus Workshop 2019
November 12-14 @ Tokyo International Ex
change Center

Regular annual international conference for Info. Sh
arining & discussion

【Themes at Breakout WS】
Dynamic map, Connected, Human Factors Cyberse
curity, , Safety Assurance, FOT

FOT in Tokyo Bay area
Start from Oct. 2019

Recruit participants widely including overseas
⇒ Discuss about standardization openly with vari
ous entities like OEMs, suppliers, academia.
More than 25 participants are expected to join.

Collaborative research with research institutes overseas is under discussion
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CAVs in Australia
Contents

1. Key policies and actions for deployment in Australia
2. Areas where international co-operation are beneficial
3. How can international co-operation activities be improved
About the NTC

Independent body

National transport policy reform proposals

Funded by the Commonwealth, state and territory governments

Remove regulatory barriers to new, innovative transport services and products
Regulatory context for vehicles

Australia

- **Federal** system
- Eight states and territories and Commonwealth
- **First supply** (type approval) Commonwealth
- **In-service** (including regulation of (human) drivers, vehicle registration, licensing, civil liability, criminal liability-states and territories)
Goal

- End-to-end regulation to support the safe, commercial deployment and operation of automated vehicles at all levels of automation
About the automated vehicle program

Who is responsible for driving and what are the responsibilities of various parties?

How do we ensure automated vehicles are safe at first supply and once on roads?

How do we protect users’ data?

How do we ensure people in an accident with an automated vehicle are not in a worse position than people in an accident with a conventional vehicle?

Changing driving laws to support automated vehicles

Safety assurance system

Review of government access to connected and automated vehicle data

Motor accident injury insurance review
Consultation

Key themes

- **National approach** to laws regulating an ADS ‘driver’ and safety assurance.
- **International alignment**
- **Legal certainty** and clarity about:
  - whether an ADS is legally permitted to perform the dynamic driving task.
  - which entity is legally responsible for an ADS when it is performing the dynamic driving task, including responsibility for complying with road traffic laws.
- **No safety gaps** if an ADS performs the dynamic driving task.
- **Equity of insurance coverage** people injured in an accident with an automated vehicle need to be no worse off
Automated Driving System Entity (ADSE)

Key concept for our work:
The ADSE is the entity that is certifying that the ADS can safely perform the driving task.
Challenge
Vehicles and drivers

Vehicle with Automated Driving System
Responsibility?
Automated Driving System Entity

Vehicles
- Road Vehicle Standards Act (ADRs)
- Vehicle Standards/Roadworthiness

Drivers
- Driver licensing
- Australian Road Rules

Manufacturers
Owner

Human drivers
Human Driver
Uniform approach to driving laws

1. Allows an ADS to perform the dynamic driving task
2. Ensures that there is always a legal entity responsible
3. Clarifies responsibility when the ADS is engaged.
4. Sets out any obligations on relevant entities.
5. Provides a regulatory framework with flexible compliance and enforcement options.
When engaged, the ADS is in control at conditional, high and full automation and the ADSE is responsible for compliance with dynamic driving task obligations.
Fallback-ready user

Recommended duties for fallback-ready users:

a) remain sufficiently vigilant to respond without undue delay when required

b) hold the appropriate licence

c) comply with drug, alcohol and fatigue driver obligations
First supply of vehicles with an ADS

November 2018, transport ministers decided:

- Mandatory self-certification at first supply based on 11 safety criteria and 3 additional obligations
- Incorporated into existing framework for first supply (Road Vehicle Standards Act)
- Transition to pre-market approval as international standards are developed.

Safety assurance for automated vehicles
Safety assessment criteria

1. Safe system design and validation processes
2. Operational design domain
3. Human-machine interface
4. Compliance with relevant road traffic laws
5. Interaction with enforcement and other emergency services
6. Minimal risk condition
7. On-road behavioural competency
8. Installation of system upgrades
9. Verifying for the Australian road environment
10. Cybersecurity
11. Education and training
Additional obligations

1. Data recording and sharing
2. Corporate presence in Australia
3. Minimum financial requirements
In-service safety – What is the problem?

- In our current regulatory environment, when vehicles with automated driving systems become ready for deployment:
  - they may introduce new in-service safety risks that the market will not eliminate or mitigate
  - nationally inconsistent approaches to in-service safety and multiple regulators without clearly defined roles could be a regulatory barrier to market entry.
In-service safety – Key issues

1. Parties – which parties influence on-road safety? ADS entities, OEMs, owners, modifiers, repairers, ...

2. Duties – what duties should these parties have? Should there be a general safety duty or more prescriptive requirements?

3. Institutional arrangements – who is the regulator for in-service safety of ADSs? Does it need to be national regulator?
In-service risks

Considering types of safety duties

- Non-prescriptive, overarching and positive general safety duty on the ADSE to ensure the safety of the ADS ‘as far as reasonably practicable’.
- Safety duties on others such as modifiers, repairers, registered owners?
- Similar to WHS or HVNL duties. It is likely that the WHS safety duty would apply in many cases so this would not be create an additional burden
- Allows ADSEs to integrate compliance systems with existing WHS systems
How do we protect users’ data while ensuring the benefits of government access are realised?

- What is different about C-ITS and automated vehicle data?
- How would current privacy and information access laws apply?
- Is there a need for reform to manage government access?
Motor accident injury insurance (MAII)

- What happens when an AV crashes and injures someone?
- Are they covered by existing compulsory third party insurance?
Areas where international co-operation are beneficial?

- Testing - share information, avoid unnecessary duplication
- Vehicle standards - development of standards through WP 29 - maximum involvement of countries in this
- Regulatory approaches - share information - approaches to regulation and adopt successful approaches where possible
How can international co-operation activities be improved?

- Streamline number of forums, avoid duplication
- Aim for as much consistency of organisational representation as possible
- Focus on industry/government international forums