International Transport Forum

Digital Connectivity and the Railways: opportunities and challenges

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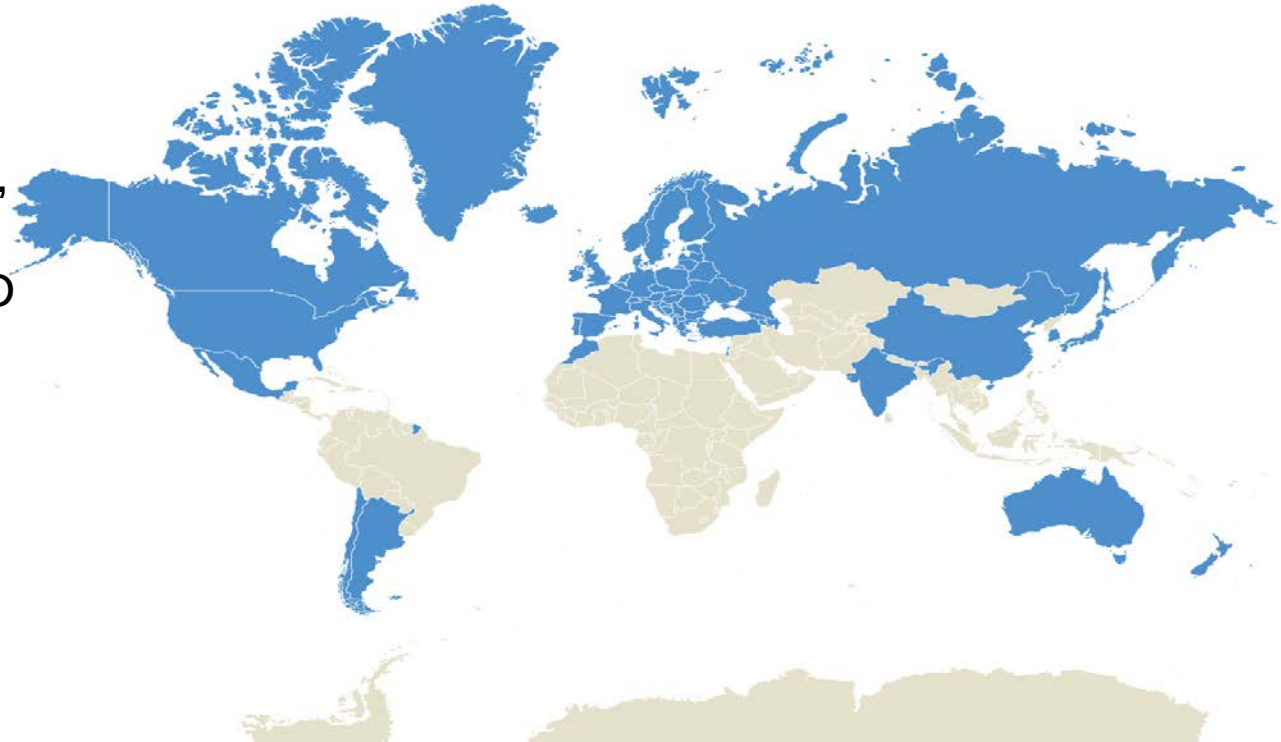
OECD

International Transport Forum

Intergovernmental Organisation

- 57 member countries (23 non-OECD)
- Politically autonomous, administratively integrated at the OECD
- Council of Ministers of Transport, rotating annual presidency
- Legal instruments: European Multilateral Quota System (Road Freight)



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Corporate Partnership Board

- Established in 2013 as the ITF's platform to enrich policy analysis and discussions with a corporate perspective
- Current Members (20)
- Set to grow to some 50 companies, from all modes of transport and associated sectors, with importance placed also on a balanced geographical representation
- Most of the work presented below developed in this context

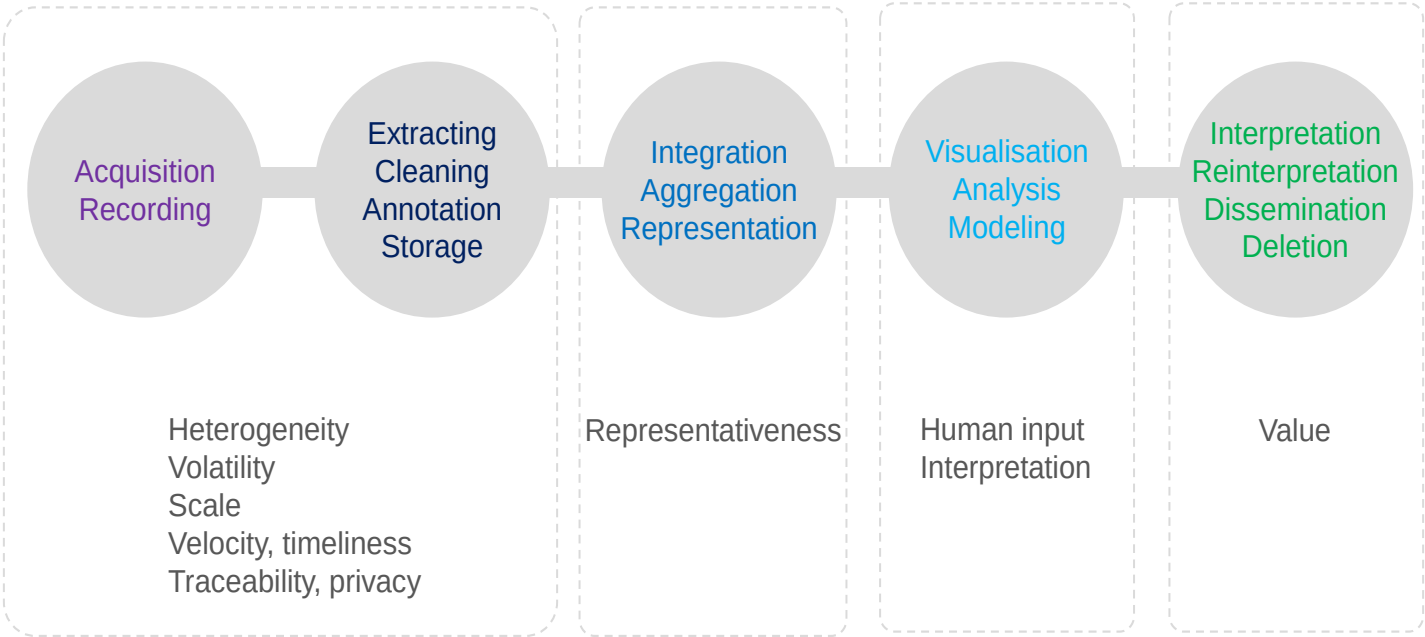
Pros and Cons of Digital

- Digitally coded information has many advantages:
  - Transmission speed, capacity and integrity
  - Density and speed of storage and retrieval
  - Ease of processing for multiple uses
  - Very low cost of processing, storing and transmitting
  - Accuracy in copy
  - Durability
- But it also presents some non negligible risks
  - Abuse with malicious intents / Hacking (ID or money theft, privacy invasion, operational interference)
  - Tampering may be difficult to detect
- New features:
  - Multiple types of sensors, new types of data
  - Ubiquitous reach (anywhere, anytime)
  - Easy tracking of vehicles and people
  - IT Platform neutral (transparent)

The new data context: Big, often messy, open multi-purpose potential

- The fusion of *purposely*-sensed, *opportunistically*-sensed and *crowd-sourced* data generates new knowledge regarding transport activity and flows, and opportunities for services. It also creates unique privacy risks
  - Big data is often not clean – issues with data quality may entail significant upfront costs to render it useable and this should be factored upfront into decision processes
  - Transport authorities should account for biases in the data they use and encourage adequate metadata
  - The knowledge derived from this fusion may not have been anticipated by data collectors at the time of collection nor may the use of these insights have been anticipated or communicated to people who are the object of that data
  - Data visualisation will play an increasingly more import role in policy dialogue

Big Data collection and analysis pipeline



Source: ITF

The new data-centred business models

- Data is being collected in ways that support new business models that challenge existing regulation
- Transport data is shifting to the private sector and away from the public sector, possibly leading to a shift in control
  - Mandatory data-sharing should largely be limited to those instances where benefits are clear to all parties and where capacity exists for public authorities to handle the data
  - New models of public-private partnership involving data-sharing may be necessary to leverage both public and private benefits
- Whatever data is collected and whoever holds that data, it should be an integral part of more flexible regulation of emerging transport services
  - Transport authorities will need to audit the data collected in public spaces in order to understand what it says and does not say and how it can best be used

The Privacy Issue

- Location and trajectory data is inherently personal in nature and difficult to anonymise effectively
  - These trajectories are as unique as fingerprints and though many techniques exist to de-identify this data, doing so effectively while retaining sufficient granularity for useful analysis is not a straightforward exercise
  - More effective protection of location data will have to be designed upfront into technologies, algorithms and processes
    - 'Privacy by Design' must be adopted ensuring that strong data protection and controls are front-loaded into data collection
- Shared access to data does not necessarily have to involve sharing (raw) data
  - Solutions exist for having acceptable queries into a non-shared data warehouse
- Data protection policies are lagging behind new modes of data collection and uses, especially true location data

The Regulatory Framework on Privacy (I)

- In 1980, the OECD adopted the first internationally-agreed (but non-binding) guidelines on the collection and exchange of personally identifiable data – the "Guidelines Governing the Protection of Privacy and Transborder Flows of Personal Data".
  - Multiple technological changes led to recognition of new challenges, a reassessment of the 1980 principles and adoption of a revised set of OECD Guidelines (OECD, 2013) that provided new guidance, notably in the areas of accountability and notification of security breaches.
  - The 2013 guidelines also highlighted the need for further research on the evolving roles for consent, purpose limitation and of the role of the individual in data privacy.
- Even if inspired by the OECD guidelines, different countries / regions have made different departures

The Regulatory Framework on Privacy (II)

- The EU just adopted (14 April 2016) new “General Data Protection” legislation – Directive and Regulation
  - “Privacy by Design and by Default”, and the need for “Valid Consent” are key elements
  - Rules apply also to international use of personal data of EU residents
- In the US data privacy is NOT subject to strong legislation or regulation
  - “Regulatory parsimony” seems to be the principle in the field of personal data protection: access to private data contained in for example third-party credit reports may be sought for other purposes
  - In January 2014, the President’s Council of Advisors on Science and Technology notes that “each company should take responsibility for conforming its uses of personal data to a personal privacy profile designated by the consumer and made available to that company (including from a third party designated by the consumer)” (PCAST, 2014)
- Japan and Korea have adopted an EU-like approach
  - Encompassing formalised notice and consent requirements for data collection and use, and controls on the forward movement of data to third parties or other jurisdictions

Richer data uses in Transport

- Different trajectories in different modes / contexts
  - Crowdsourcing apps based on cars and smartphones relay real-time information on traffic conditions, including incidents, and adjust navigation recommendations
  - Real time for-hire car services with very strong acceptance, partially with ride-sharing
  - Large scale real-time ride-sharing in urban areas as a potential “killer app” to fight congestion and emissions (ITF own work for Lisbon, now starting tests for 5 more volunteer cities)
  - Public transport (and railways in particular) so far only making their planned and real-time timetables available
    - Often with reluctance, aiming for direct monetization
    - Navigation apps based only on planned timetables
- Possibilities opened by the new ICT systems inducing quick movement towards real-time based organization of demand and of supply (initiated from either side)

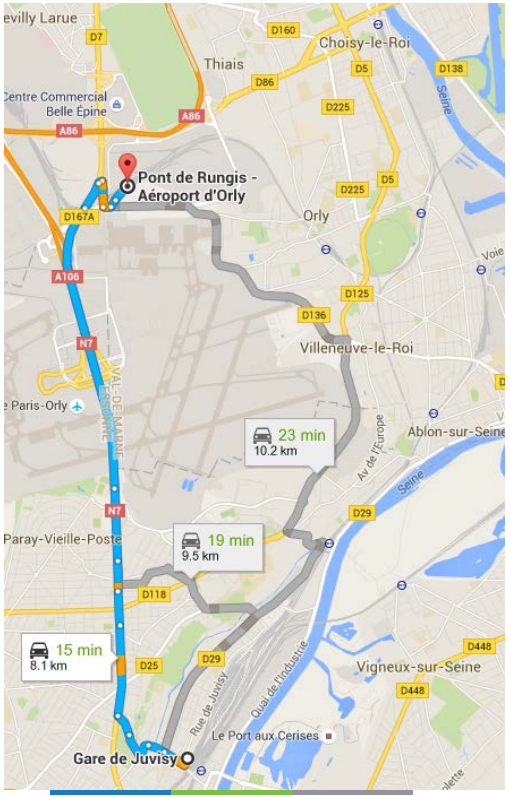
How could Railways ride this wave?

- The physics of railways make it very difficult to conceive a high capacity rail system based on quick (quasi real-time) dispatch
- In a real-time age, railways must be a ***reliable trunk***, stimulating customised links to other more flexible modes. Possible examples with individually tailored services & communication:
  - Feeding railway services with a set of small buses, providing (quasi) direct services from / to different neighbourhoods, with routes organized according to the shortly before declared requests of those clients, and ensuring very short waiting times in both directions
  - Ensuring quick deployment of alternative / complementary services in case of disruption, preferably with individual notification of each passenger about her new path

It's not what data you have, but what you do with it

- A personal experience (April 22nd, 2016)

1. In Paris going to Orly Airport, in a RER train to Pont de Rungis – Aéroport d'Orly station, from where a bus shuttle takes you to the Airport
2. By a switching mistake at Choisy-le-Roi, train goes on the line to Juvisy and stops there (passengers asked to leave the train)
3. No solution is prepared. Suggestion from staff is to take a train back to Choisy-le-Roy and then the next train going in direction of Pont de Rungis. Arrival time there ~1h after the scheduled time.
4. **BUT**, a bus shuttle was idle at Pont de Rungis waiting for passengers that did not come, passengers left stranded at Juvisy, only 8km away.



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Thank you

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