Asset digitalization and monitoring

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Chairman of UIC Passenger Experts Group
Agenda

1. PSG mission and main initiatives
2. Standardisation efforts in Passenger Services
3. Highlights on Air+Rail and D2D projects
1. PSG mission and main initiatives
During 2018 the PSG decided to start 3-year work program, aimed to provide innovation and fresh energy to the activities of the group.

Pillars of the action were founded on the principles stated by the UIC top management: Innovation, Digitalization, Intermodality and integrated Technical and Commercial views.

In 2019, the first results are coming up and show the substantial effectiveness of the plan, with a budget situation that is significantly positive and innovation activities and new working methodology in place.
## PSG’s Initiatives

<table>
<thead>
<tr>
<th>Main Initiatives</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. MERITS Enhancement</td>
<td>The MERITS system in March 2019 made accessible to third parties stations and timetable services.</td>
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<tr>
<td>2. Standardization of e-ticketing</td>
<td>Standardization based on the concept of Security in System (dematerialized online ticketing) is now complete for IRT with the publication of IRS 90-918-1.</td>
</tr>
<tr>
<td>3. Enabling E-ticketing NRT (UIC Leaflet 90-918-4)</td>
<td>Standardization of NRT is now at the stage of the approval of the new IRS 90-918-4. Central implementation of registries will take place in 2Q 2019.</td>
</tr>
<tr>
<td>4. Air+Rail</td>
<td>Integration between rail and air transportation can provide several benefits to rail and air players. PSG will publish at the end of 2019 a paper including analysis of relevant intermodal endeavors and identification of key barriers.</td>
</tr>
<tr>
<td>5. D2D</td>
<td>Integration between rail and other surface transportation services (e.g. car / bike sharing, public transportation) enables door-to-door solutions for passengers. PSG will publish a paper including the identification of candidate standards for integrated ticketing.</td>
</tr>
<tr>
<td>6. Innovation Workshops</td>
<td>Workshops run by subject matter experts with multimedia materials and interactive tools, attended by RUs, to disseminate knowledge and generate ideas on new technologies and potential game changers in passenger rail.</td>
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</table>
Innovation workshops are a source of ideas for future initiatives

1. Workshops cover topics with potentially high impact on the passenger rail business in the next year.

2. During the workshop, a brainstorming session is stimulated among the attending RU’s representatives.

3. Following the discussion and brainstorming, new ideas for future innovation initiatives come out from the workshops.

Examples of outcomes of the Digitalization innovation workshop held in February 2019:

- **About Planning and shopping experience:**
  - Extend MERITS to other transport modes
  - Standardise modeling pricing and conditions in the same data model

- **About Station experience:**
  - Standardise seamless Wi-Fi experience from station to train

- **About In-journey experience:**
  - Extend MERITS to share real-time information
2. Standardisation efforts in Passenger Services
Focus on Enabling E-ticketing NRT (UIC Leaflet 90-918-4): IRT and NRT Context

Integrated Reservation Tickets

• Ticket for a specific train on a travel day usually including the seats

• The tickets are sold by an Distributor/Issuer but managed for a train in one central system of the Attributor

• The ticket is valid on that train on a certain day only

IRT tickets have been standardized (leaflets 918-0 / 918-1) thus they don’t share NRT’s limitations.

Non-Integrated Reservation Tickets

A ticket not including an integrated reservation, which means that there is not only one central system to manage all the ticket data for the product on a route. Many systems can create a ticket for the same routes and carriers independently. This means that carriers do not know:

• which tickets have been issued
• for which train and date tickets are valid for
• when a ticket has already been used
NRT’s limitations with today’s controls

No interoperability between TCOs

No transfer of annotations

Extended validity
ETCD initiative

UIC is looking for a Software as a Service (SaaS) solution implementing the Ticket data exchanges for e-Ticket control for its members, as defined in IRS 90918-4 (which contemplates a central **electronic ticketing control database (ETCD)**).

Once launched, the ETCD service will become an important foundation for passenger travel based on the increasingly adopted e-Tickets. Moreover, the ETCD architecture will be capable of supporting future UIC services requiring the storing or checking of Ticket data.

**Interoperability between TCOs**
Target implementation: ETCD Business architecture

Flow new tickets

ETCD Ticket Control Registry

Personal data filtering

AMQP In

AMQP

AMQP

AMQP

AMQP

TCO 1 Central system

TCO 2 Central system

Tickets in big data DB solution

Allocators

AMQP out

AMQP
3. Highlights on Air+Rail and D2D projects
## UIC’s Role

UIC intends to be a catalyst for accelerating intermodal integration with these specific Programs

<table>
<thead>
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<th>Pillars</th>
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<tr>
<td><strong>1. Awareness</strong></td>
<td>Increase the awareness and knowledge of members about intermodal integration, including opportunities, scenarios and solutions.</td>
</tr>
<tr>
<td><strong>2. Elimination of Barriers</strong></td>
<td>Identify the major technical barriers to adoption and develop a solution strategy to remove or mitigate them</td>
</tr>
<tr>
<td><strong>3. Standardization</strong></td>
<td>Provide technical guidance and standards in order to facilitate integration and increase confidence of players in investing</td>
</tr>
<tr>
<td><strong>4. Enablement</strong></td>
<td>Provide technical solutions, including enabling platforms, to accelerate adoption and facilitate multilateral approaches</td>
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</table>
Introduction and Context of Air+Rail Project

Air+Rail capabilities are key to improve travelers’ journey experience

Air+Rail INTERMODAL TRANSPORTATION

Air+Rail AS COMPLEMENTS

Airport A

Airport B

City C

Air & RAIL AS COMPLEMENTS

Rail complements air by replacing or adding a short/medium distance connection which is integrated with the air service in one product

CONTRACT ARRANGEMENTS

The passenger may have a separate contract with each operator or a single transport contract agreement with only one entity, which represents each of the operators participating in their journey

INTEROPERABILITY IS KEY

Better multi-modal experience requires interoperability among the business applications of the transport service providers that need to dialogue with each other

Air+Rail INTEGRATION

Journey Planning

Easy and transparent planning of whole journey

Fare Integration

Single price for the whole journey

Ticketing Integration

A single or combined ticket is issued for the entire journey

Booking Integration

Common procedures for booking

Additional Services

Easy and transparent planning of whole journey

Integration

Additional Services

Fare Integration

Booking Integration

Easy and transparent planning of whole journey

Single price for the whole journey

A single or combined ticket is issued for the entire journey

Common procedures for booking
Air+Rail cooperation can provide benefits to all parties

<table>
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<tr>
<th>Rail operators</th>
<th>Airlines</th>
<th>Travel Agents</th>
<th>Travelers</th>
</tr>
</thead>
<tbody>
<tr>
<td>➢ Access to global network of online and traditional travel agents</td>
<td>➢ Extend network reach</td>
<td>➢ Expand product mix to air and rail capturing additional revenue</td>
<td>➢ Seamless travel experience to final destination</td>
</tr>
<tr>
<td>➢ Opportunity to win market share from other airport ground transport operators</td>
<td>➢ Expand relationships with high-yield customers</td>
<td>➢ Apply standard airline booking and ticketing processes to rail segments</td>
<td>➢ Simplified booking and ticketing</td>
</tr>
<tr>
<td>➢ Additional international sales opportunities</td>
<td>➢ Improve service to passengers</td>
<td>➢ Provide better service to customers</td>
<td>➢ Access to combined offers and promotions</td>
</tr>
<tr>
<td>➢ Booking, ticketing and revenue collection managed through travel agents’ and airlines’ normal workflow</td>
<td>➢ Capture ancillary revenue opportunities</td>
<td>➢ Simplified back-office processes</td>
<td>➢ Facilitated access to rail offerings in destination country</td>
</tr>
</tbody>
</table>
A number of challenges have slowed air-rail cooperation

- **Lack of common standards** and technology platforms enabling distribution systems for multi-modal tickets
- **Different selling and distribution systems** used by air and rail operators which do not communicate with each other
- **Different business models** and lack of overall business models for intermodal solutions
- Limitations and constraints deriving from the **airline GDS model**
## Air+Rail 2019-2020 Activities

<table>
<thead>
<tr>
<th>1</th>
<th>Strategy (2019)</th>
<th>2</th>
<th>Design (2020)</th>
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<tr>
<td><strong>Objectives</strong></td>
<td>Provide a clear strategic vision based on analysis of context, trends and scenarios</td>
<td>Provide stakeholders with technical guidelines and standards for implementing intermodal solutions</td>
<td></td>
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<tr>
<td><strong>Key activities</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>► Analysis of relevant industry and technology market trends, that may influence Air+Rail integration</td>
<td>► Define solution to achieve fully integrated intermodal journey</td>
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</tr>
<tr>
<td>► Assessment of key barriers for intermodal offerings</td>
<td>► Describe impacts on processes and systems</td>
<td></td>
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<td>► Gap analysis of current protocols and standards with respect to potential integration needs</td>
<td>► Define technical interoperability mapping between TAP-TSI and other involved standards</td>
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<tr>
<td>► Analysis of legal and regulatory framework</td>
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<tr>
<td>► Identification of key Air+Rail integration areas</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>► Proposed action roadmap to implement strategy</td>
<td></td>
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<tr>
<td><strong>Deliverables</strong></td>
<td>Position paper</td>
<td>Technical Interoperability Guidelines</td>
<td></td>
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</table>
UIC–IATA Cooperation within Air+Rail Project: Areas of Interest

- **Journey Planning & Shopping**
  - Location (MCT)
  - Timetable
  - Fares
  - Availability
- **Booking**
  - Reservation
  - Seat assignment
- **Ticketing**
  - E-ticket
- **Check-In / Validation & Control**
  - Entitlement
  - Seat assignment
- **Customer Care**
  - IRROPS and schedule change
  - Refund / Compensation
- **Revenue Sharing**
  - Settlement
- **Liability**
  - Responsibilities
Envisaged integration architecture for Air+Rail

- **Internal Airline Booking Channels**
  - Airline Reservation System
  - Airline Departure Control System
  - Airline Check-in Channels

- **External Airline Booking Channels**
  - Internal Rail Booking Channels

- **Rail Common Interface**
  - Dynamic Mapping Registry Platform

- **Air Common Interface**

- **Rail Reservation System**
  - Rail Ticket Validation and Inspection System
  - Rail Ticket Validation and Inspection Channels

- **External Rail Booking Channels**
  - Internal Airline Booking Channels
Deep differences between air transportation and surface transportation markets suggest different approaches to rail integration.
Cooperation between rail and other surface transportation modes can provide benefits to all parties

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<th>Transport companies</th>
<th>Local authorities</th>
<th>Travelers</th>
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<tr>
<td>➢ Improve service to customers</td>
<td>➢ Improve service to customers</td>
<td>➢ Provide benefits to citizens</td>
<td>➢ Seamless door-to-door travel experience</td>
</tr>
<tr>
<td>➢ Transform from pure transport provider to mobility service player</td>
<td>➢ Access new markets and sales channels</td>
<td>➢ Attract leisure and business travel</td>
<td>➢ Simplified ticketing and traveling</td>
</tr>
<tr>
<td>➢ Drive additional passenger volumes and enable modal shift</td>
<td>➢ Leverage new efficient revenue collection</td>
<td>➢ Better planning and implementation of mobility policies driving modal shift</td>
<td>➢ Access to combined offers and promotions</td>
</tr>
<tr>
<td>➢ New revenue sources</td>
<td>➢ Drive additional passenger volumes</td>
<td>➢ Reduce congestion</td>
<td>➢ Better real-time management of journey</td>
</tr>
</tbody>
</table>
UIC actions should be aimed at three main goals

1. Facilitate partnerships between member rail companies and other surface transport providers by removing technical obstacles and providing accelerators for developing integrated offerings.

2. Facilitate development of digital integrated mobility solutions by member rail companies helping them to evolve from pure transport operators to providers of door-to-door mobility to their customer.

3. Facilitate development of an ecosystem and marketplace of digital integrated mobility services by allowing 3rd party developers to create innovative travel applications and services bringing value to the services offered by member rail companies.
# D2D 2019-2020 Activities

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## Key activities

1. Analysis of relevant industry and technology market trends, that may influence future D2D integration
2. Assessment of key barriers for intermodal transportation
3. Gap analysis of current protocols and standards with respect to potential integration needs
4. Analysis of legal and regulatory framework
5. Identification of key D2D integration areas
6. Proposed action roadmap to implement strategy
7. Define guidelines and formats for the exchange of real time data
8. Define solution templates for token-based electronic ticketing
9. Define guidelines for token-based electronic ticketing

## Deliverables

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Envisaged integration architecture for D2D

- Internal Rail Sales Channels
- Rail Sales System
- Digital Ticketing Interface
- Shared Digital Entitlement Repository
- Key & Master Data Registries
- External Rail Sales Channels
- Digital Ticketing Interface
- Advanced partner
- Ticket Validation and Inspection System
- Ticketing System
- Less advanced partner
- Validation App
- Ticket Validation and Inspection System
- Ticketing System
- Ticket Validation and Inspection Channels
Thank you!
for your kind attention