

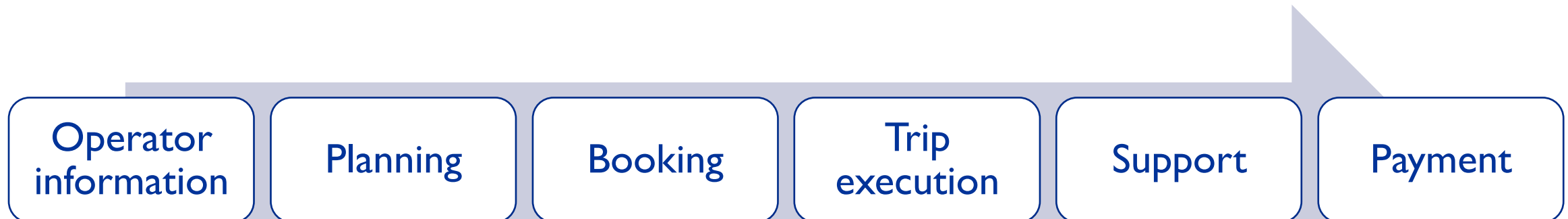


# **Challenges of rail interoperability within the scope of multimodal booking aspects**

08/11/2023

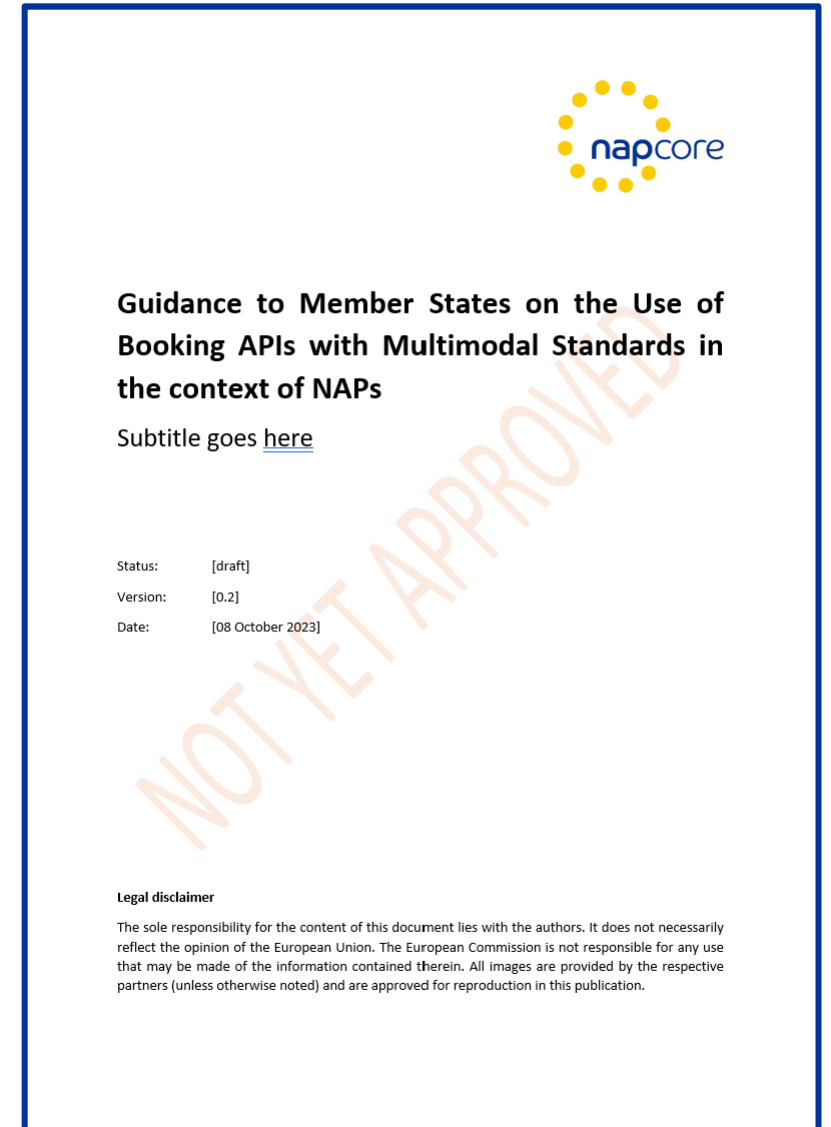
# Introduction

- Rail interoperability in the context of multimodal booking aspects represents a challenging topic for mobility sector.
- One of the key challenges of this topic is to create a seamless booking experience for passengers wishing to use multiple modes of transport in a single journey.
- As the demand for integrated, multimodal travel options continues to grow, finding solutions to rail interoperability challenges remains a key focus for the global transport industry.



# Introduction – Guidance report

- Guidance to Member States on the Use of Booking APIs with Multimodal Standards in the context of NAPs



# Introduction – Guidance report

- Objectives:
  - Find the available booking APIs.
  - Provide perspective of the role of NAPs in integration of booking APIs.
    - Data warehouse
    - Metadata repository
    - Hybrid approach
  - Develop scenarios and providing technical guidance for NAPs.
  - Look for interoperable systems and services.



## Guidance to Member States on the Use of Booking APIs with Multimodal Standards in the context of NAPs

Subtitle goes [here](#)

Status: [draft]

Version: [0.2]

Date: [08 October 2023]

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# Challenges of rail interoperability within the scope of multimodal booking aspects



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Amadeus



Johan Hammar

Samtrafiken



Edwin van den Belt

MaaS Alliance  
TOMPWG  
Dat.Mobility



Followed by Q&A and discussion

# Challenges of rail interoperability within the scope of multimodal booking aspects - Interoperability with rail sector/ Booking API

Stefan JUGELT (European Union Agency For Railways)



- DIRECTIVE (EU) 2016/797 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the interoperability of the rail system within the European Union

### *2.6. Telematics applications*

*In accordance with Annex I, this subsystem comprises two elements:*

*(a) applications for passenger services, including systems which provide passengers with information before and during the journey, reservation and payment systems, luggage management and management of connections between trains and with other modes of transport;*

## **Part I: Pre-journey information**

- *General conditions applicable to the contract*
- *Time schedules and conditions for the fastest trip*
- *Time schedules and conditions for all available fares, highlighting the lowest fares*
- *Accessibility, access conditions and availability on board of facilities for persons with disabilities and persons with reduced mobility in accordance with Directive (EU) 2019/882 and Regulations (EU) No 454/2011 and (EU) No 1300/2014*
- *Availability of capacity and access conditions for bicycles*
- *Availability of seats in first and second class as well as couchette cars and sleeping carriages*
- *Disruptions and delays (planned and in real time)*
- *Availability of on-board facilities, including Wi-Fi and toilets, and of on-board services, including the assistance passengers are provided with by staff*
- *Information prior to purchase on whether the ticket or the tickets constitute a through-ticket..*

## **Part II: Information during the journey**

- *On-board services and facilities, including Wi-Fi*
- *Next station*
- *Disruptions and delays (planned and in real time)*
- *Main connecting services*
- *Security and safety issues*

## **Part III: Operations regarding reservation systems**

- *Requests for availability of rail transport services, including applicable tariffs*
- *Requests for reservation of rail transport services*
- *Requests for partial or full cancellation of a reservation*



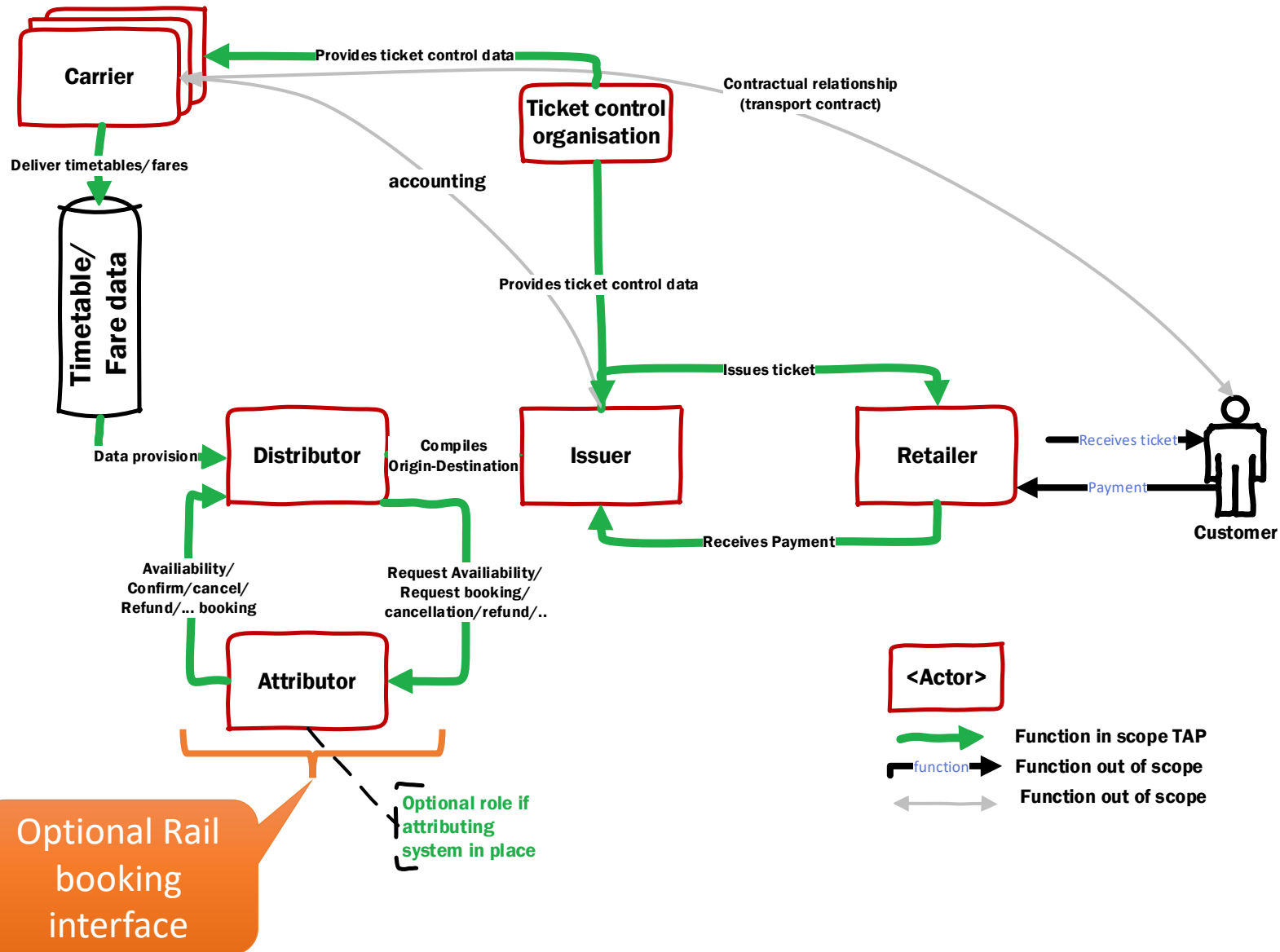
The Technical Specification for Interoperability on “Telematics Applications for Passengers” (TAP TSI) prescribes protocols for the data exchange of

- timetables,
- tariffs,
- reservations, fulfillment
- Information to passengers in station and vehicle area
- train running information,
- etc.

which must be respected by the European rail sector (railway undertakings, infrastructure managers, ticket vendors etc.)

**TAP TSI published as COMMISSION REGULATION (EU) No 454/2011**

Role	Definition
Attributor	Means a company managing an attributing system. May be a carrier
Booking (selling)	Means the selling of a ticket with or without a reservation
Distributor	Means an undertaking providing legal and technical capacity to issuers to sell rail products or to provide on line-facilities to customers to buy rail products. Besides, the distributor can offer services to issuers by assembling O-Ds carried out by different carriers into complete journeys as required by the traveller. The distributor may be a carrier
Issuer	Means an undertaking selling the ticket and receiving payment. May be a carrier and/or a distributor. The issuer is the undertaking indicated on the ticket with its code and possibly its logo
Retailer	Means a person or an undertaking that sells to the customer a ticket without or with a reservation for a rail service. A retailer can be a railway undertaking (agent) or an accredited travel agent



## TAP TSI Architecture view

- Each relationship in the architecture is based on the legal definition in the TAP TSI
  - Involved actors
  - Process requirements
  - Quality requirements
- Transactions not in scope of the TAP:
  - Accounting and settlement
  - Payment
- Booking functions:
  - Availability request/reply
  - Reservation request/reply
  - Cancellation request/reply

## Key points of rail booking interfaces within EU legislation

1. Reservation interfaces for rail are specified and mandatory within the European legislation for rail (e.g. TAP TSI)
2. For TAP TSI the glossary term „booking“ covers tickets with (e.g. seat reservations, yield managed fares) and without reservation (non-reservation tickets, open tickets)
  - Non-booked services without reservation: no interaction with a 3<sup>rd</sup> party booking interface necessary
  - Booked services with reservation: interaction with a 3<sup>rd</sup> party booking interface according to TAP TSI standards
3. TAP TSI scope is the specification of interoperable data and interfaces between the actors
4. **Booking engine** specifications (e.g. journey planner engine, fare engine, customer details management) are not part of the TAP TSI



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and safe railway system without frontiers.**

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Discover our job opportunities on [era.europa.eu](https://era.europa.eu)

# Rail Distribution challenges

How OSDM online booking API will help

8 November 2023 – Napcore Mobility Data days

Odile Angeras

# The challenges behind Rail travel distribution

## Traveler high expectations

Best price, travel duration, carbon footprint, on-board services, travel information... are important for travelers

Yet there is no one-stop-shop solution to compare rail travel options across providers or with air options



## Online distribution

Travelers are shifting online to compare and find the best deals

Online distribution requires standard APIs/flows to ease comparison between providers (rail, air, coach, car..)



## The need for dynamic pricing

Revenue management techniques require dynamic/continuous pricing. They allow better resiliency in competitive landscape and optimized train occupancy.

Personalized or bundled offers are common practices



## Rail or Air Rail partnerships

Are complex to put in place:

Between railways: orchestrating very different logics either domestic or cross border is today very challenging

Air Rail interline/codeshare partnership in Air GDS has limitations



## Difficulties for new railways to compete

New entrants enter a market dominated by the historical operator

Their initial investment would be reduced if they could adopt an off-the-shelf open API

Standard API + certification would facilitate their adoption and time to market



## Railways competition is just starting

Distributors still need to find a way to compare/combine rail travel options



# How a normalized booking API can help



## \_ For the Railways

- Lower barrier to entry
- Time to market/innovation
- More choice of IT providers
- Freedom to innovate (right to be wrong)
- Consistency of offers across distributors

## \_ For the Distributor

- Lower barrier to entry
- Agility on the content
- Time to market
- Lower risks
- More time for innovation

## \_ For the Traveler

- Comparison across carriers
- Access to more content
- Normalized presentation of the offers: more transparency
- Rich media presentation and personalized offers

## \_ For all of us

- Increase the modal share of rail passenger transport<sup>1</sup>

(1) : The modal share of rail passenger transport stagnates ~7% in Europe - ERA Annual overview of interoperability – July 2023

(12) : Simplified view. We don't show here the various roles involved in rail content distribution



# OSDM online: a normalized end2end booking API for rail and multimodal travel

## \_ Industry driven initiative and open source

- UIC, railways, travel distributors, IT providers participate in the working groups on a voluntary basis

## \_ Covers the end-to-end booking process

- shopping, booking, fulfilment, aftersales, complaint, booking synchronization

## \_ Based on common data models and syntax

- to ease orchestration between several providers

## \_ Based on industry best practices

- YAML, REST paradigm, OAuth 2.0

## \_ Certification framework is being put in place to verify and guarantee adequate implementation

## \_ Interoperable with other standards in Transmodel (H2O translator Hermes/Hosa to OSDM online)

## \_ Adoption is ongoing by main industry players

## \_ Adapted to multimodal transportation

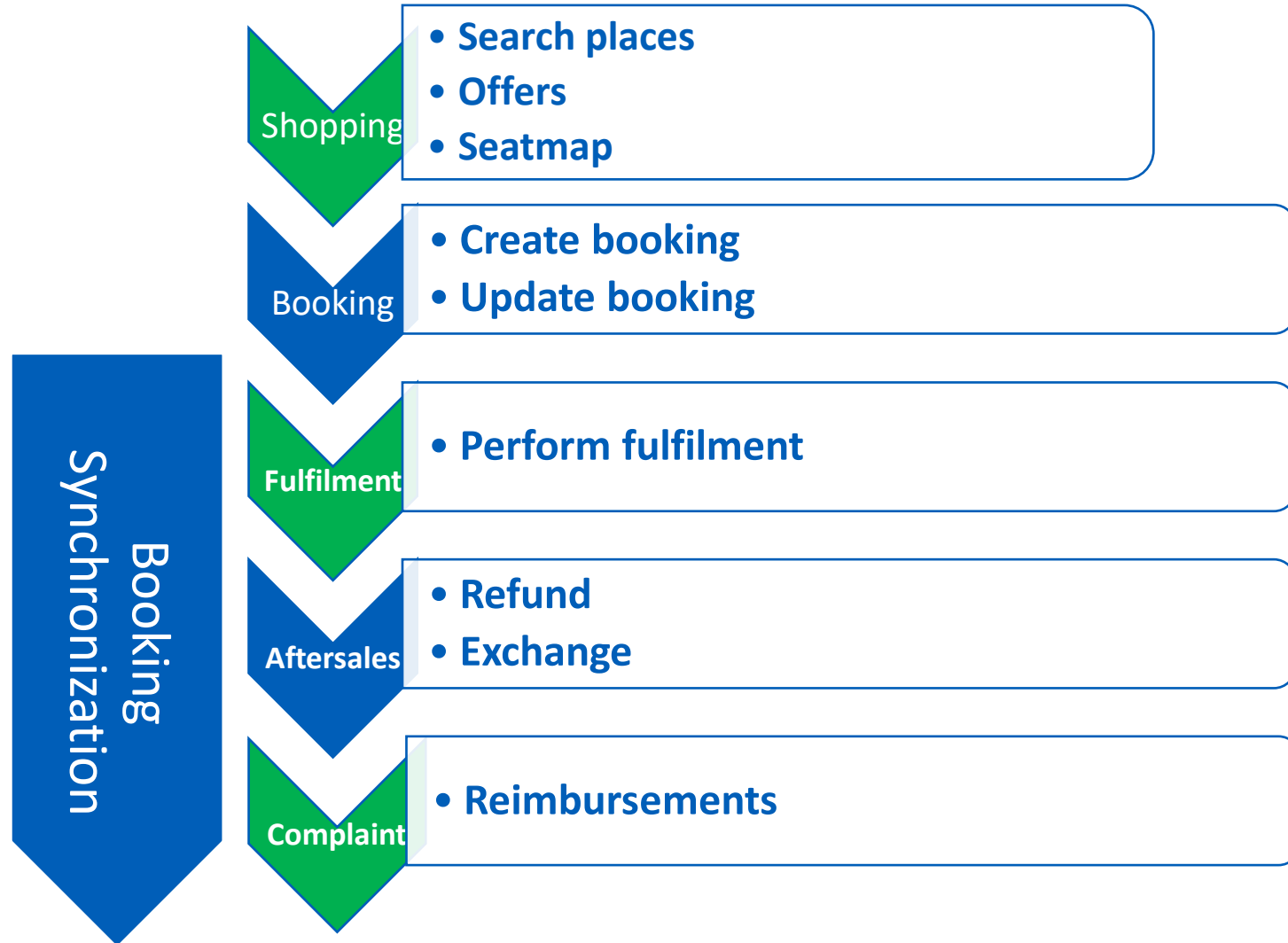
## \_ Version 3.1 has just been released and we foresee no major breaking changes

# Thank you!



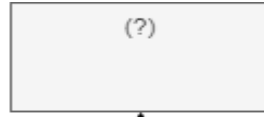
# OSDM Online

<http://osdm.io>



# How standards interoperate

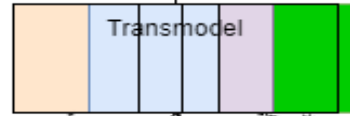
M3 Meta-Meta-Model



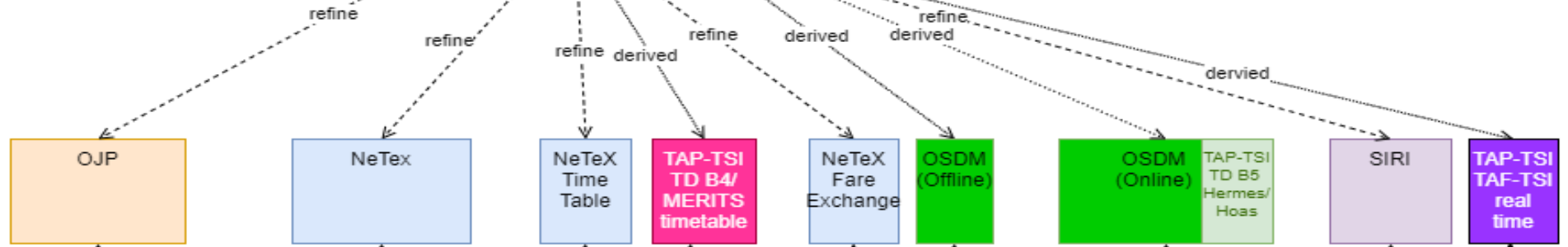
instanceOf

M2 Meta-Model

Conceptual Model



Physical Model



M1 Model

"instanceOf"

"instanceOf"

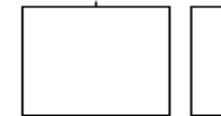
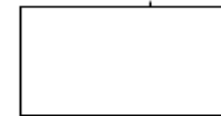
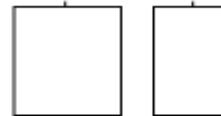
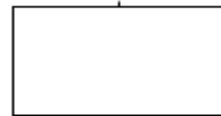
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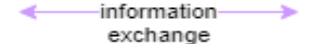
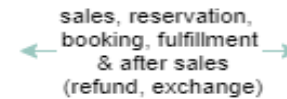
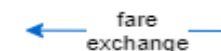
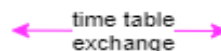
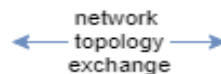
"instanceOf"

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Scheme Model

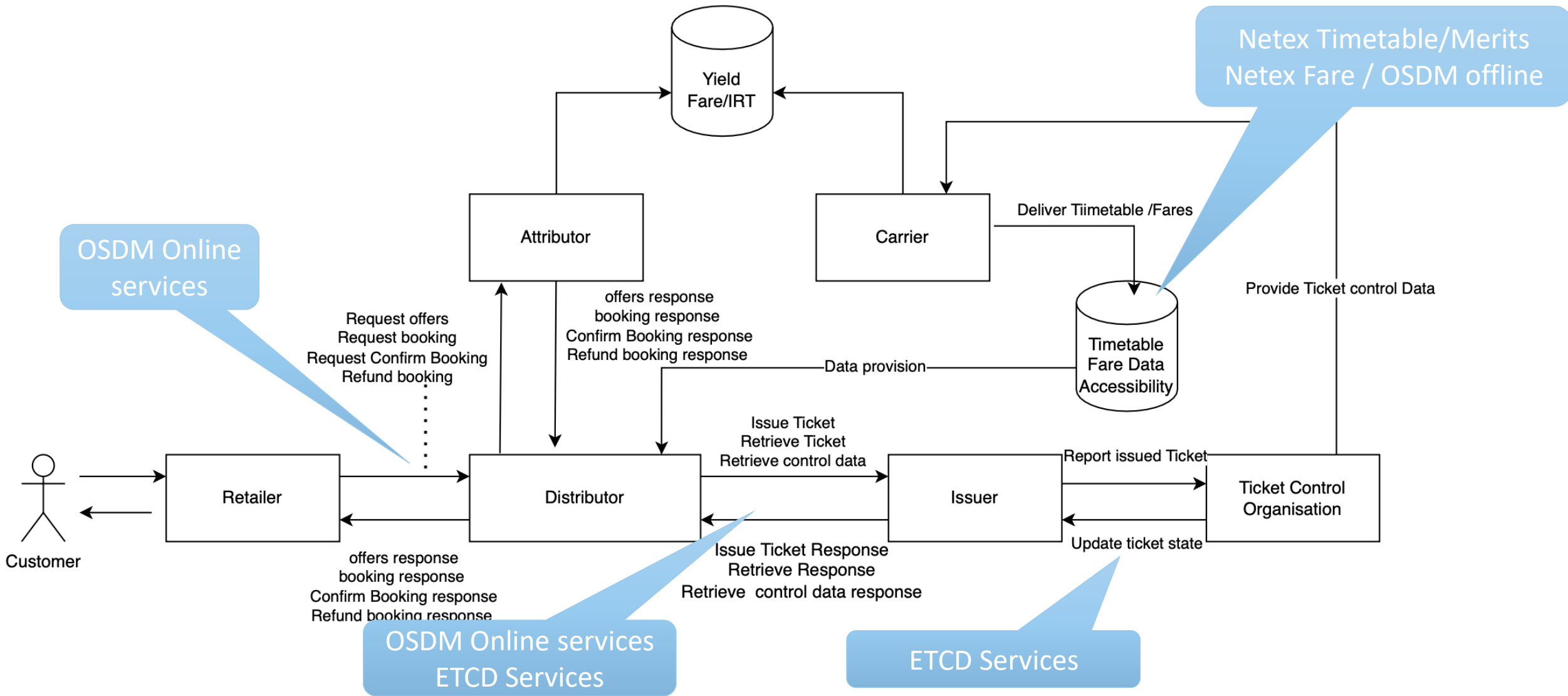


Use Cases Covered



# OSDM – TAP TSI Integration

EU Travel tech view



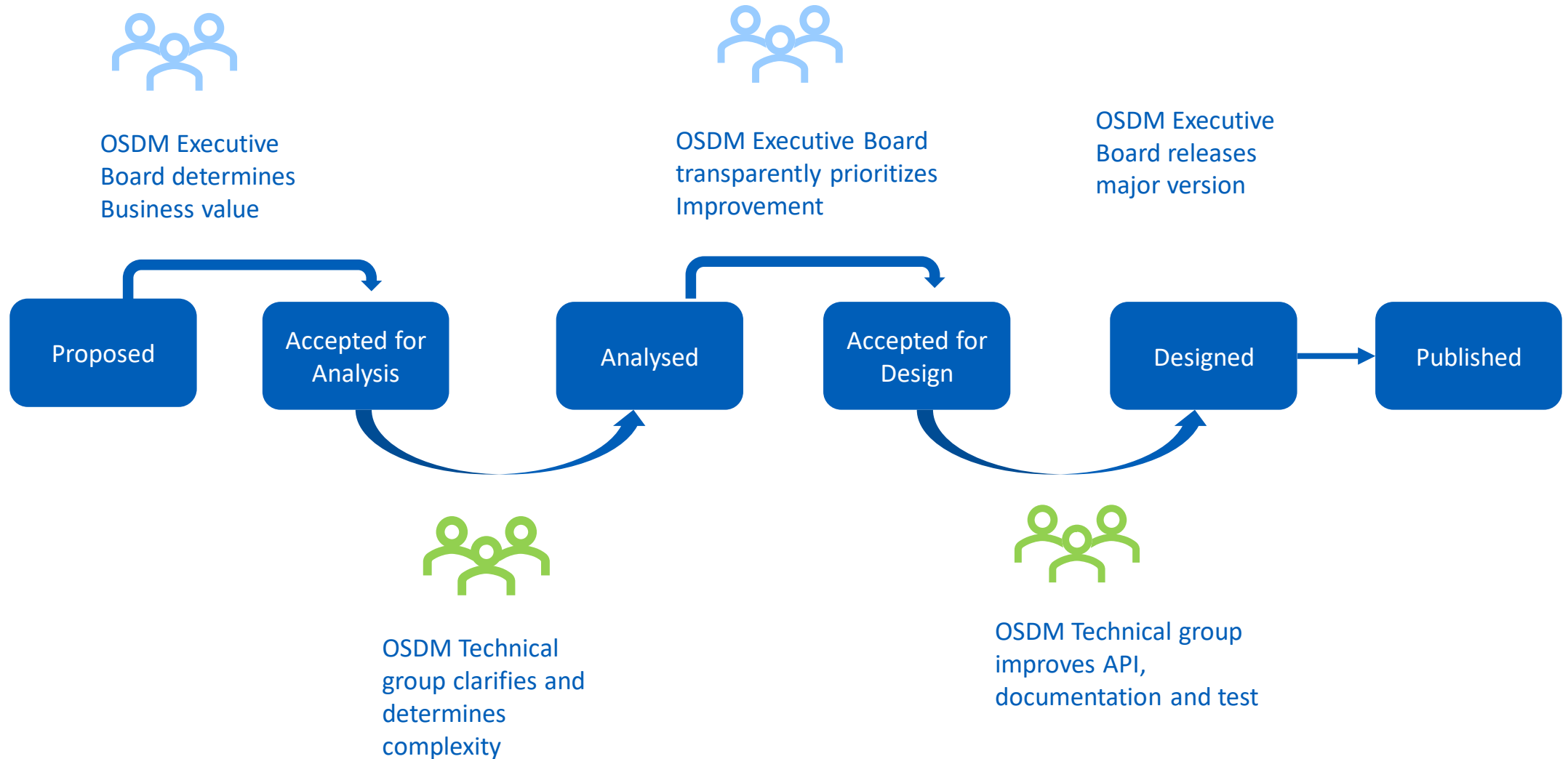
# Who is mainly involved in OSDM? Other actors contributing as well



# OSDM – Governance

As per toady with OSDM as a sector initiative

© Amadeus IT Group and its affiliates and subsidiaries  
Anyone can propose an improvement



# OSDM Certification

As per today with OSDM as a sector initiative

- \_ Currently under construction
- \_ Defines a set of scenario to be included in certification process
- \_ Ensure that OSDM will be implemented the same way
- \_ Not all OSDM online services will be included in the certification
  - For new entrants: easy way to prove their compliancy with the standard
  - For Distributors/retailers: no need to validate each railway they want to integrate



# Ticketing interoperability in Sweden

Napcore Mobility Data Days – Budapest, 7-9 November 2023

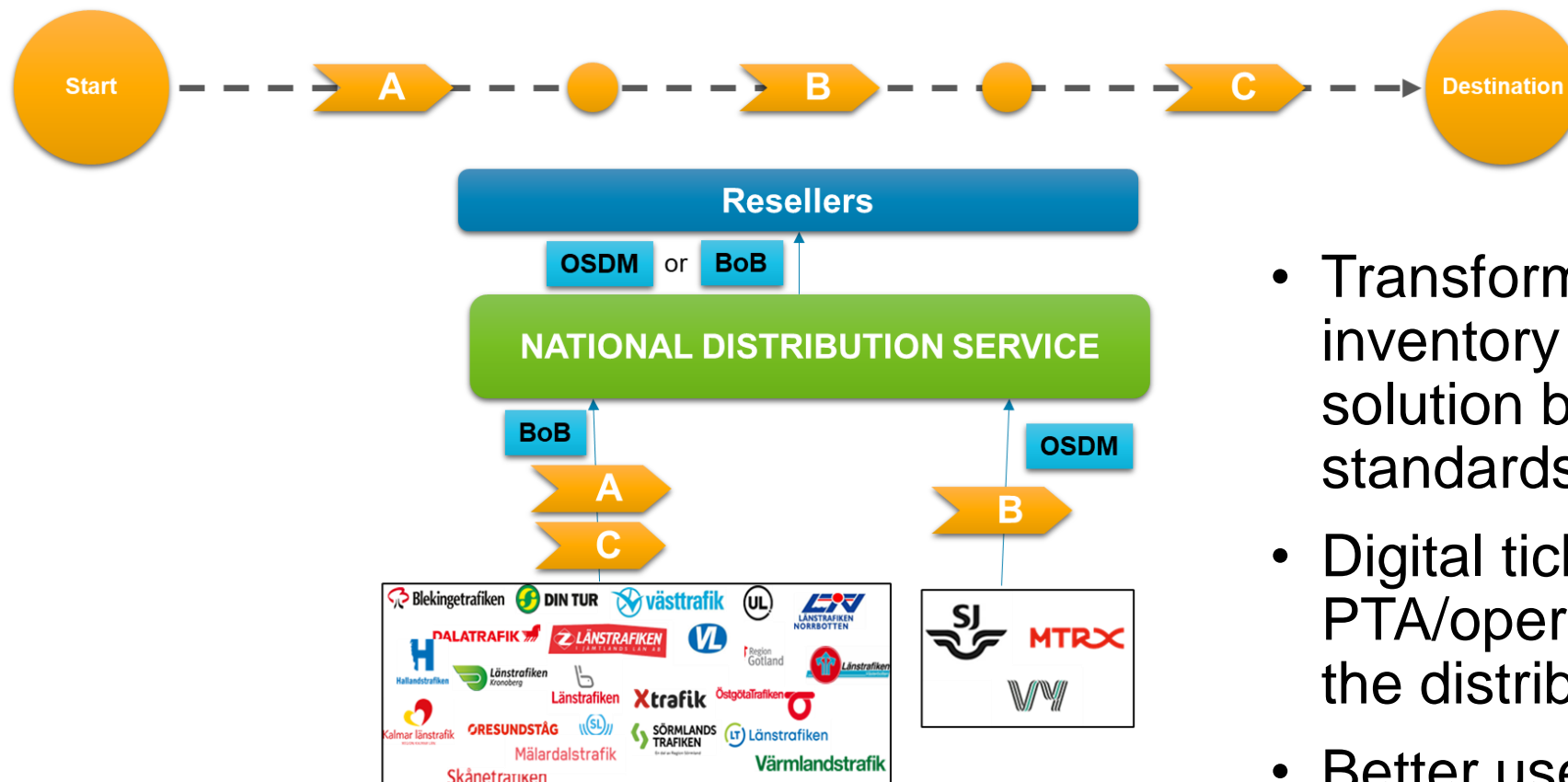
Johan Hammar - Samtrafiken i Sverige AB



## Resplus – Swedens largest ticket collaboration since 1993

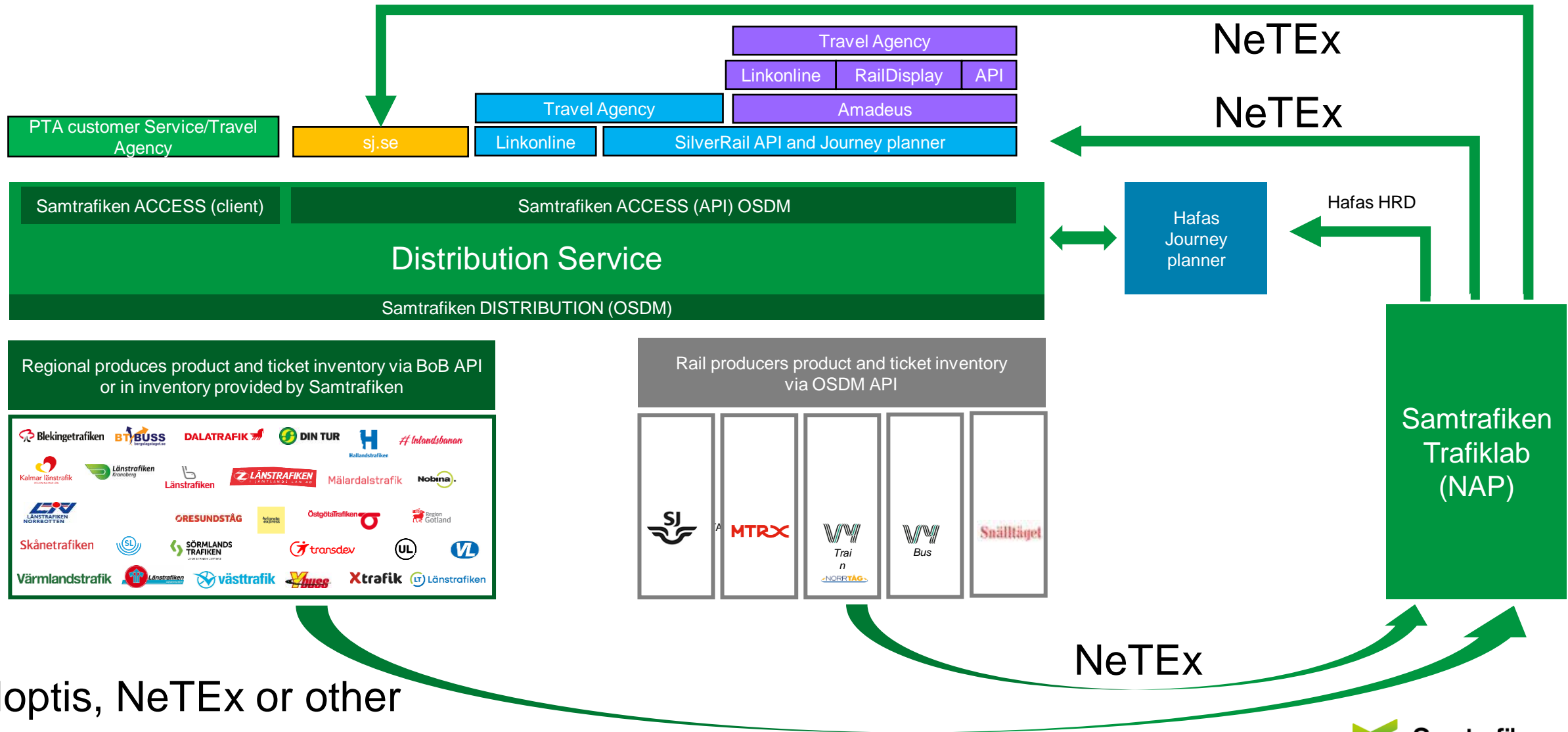
- Prebooked, pre-paid tickets and through-tickets
- Combining local zone tickets with booked tickets for long distance trains and bus coaches
- Enabeling seamless travelling with quality ensured interchanges and arrival guarantee
- The products (single tickets) of PTAs and commercial transport operators are accessible to the Swedish market and through UIC international sales

# Replacing the old, central, system with Samtrafiken National Distribution Service



- Transformation from a legacy inventory system to a distributed solution based on industry standards
- Digital tickets issued by each PTA/operator and combined in the distribution service
- Better user experience
- Better revenue control

# Utilizing the NAP NeTEx data for national ticketing sales



Noptis, NeTEx or other

# Challenges combining tickets

- How to digitally combine booked tickets with local traffic tickets
- Different priorities with copy protection between booked tickets and local traffic tickets
- How to display tickets with different characteristics in an intelligible way to the traveller
- How to get every operator to implement the standards in the same way
- ***How to handle differing business rules in a common sales dialogue***

CHALLENGE  
**ACCEPTED**

# Thank you!

Johan Hammar, Samtrafiken

[johan.hammar@samtrafiken.se](mailto:johan.hammar@samtrafiken.se)

# TOMP-API

NAPCORE Mobility Data Days

Challenges of rail interoperability  
within the scope of multimodal  
booking aspect

Presentation by Edwin van den Belt  
08 November 2023



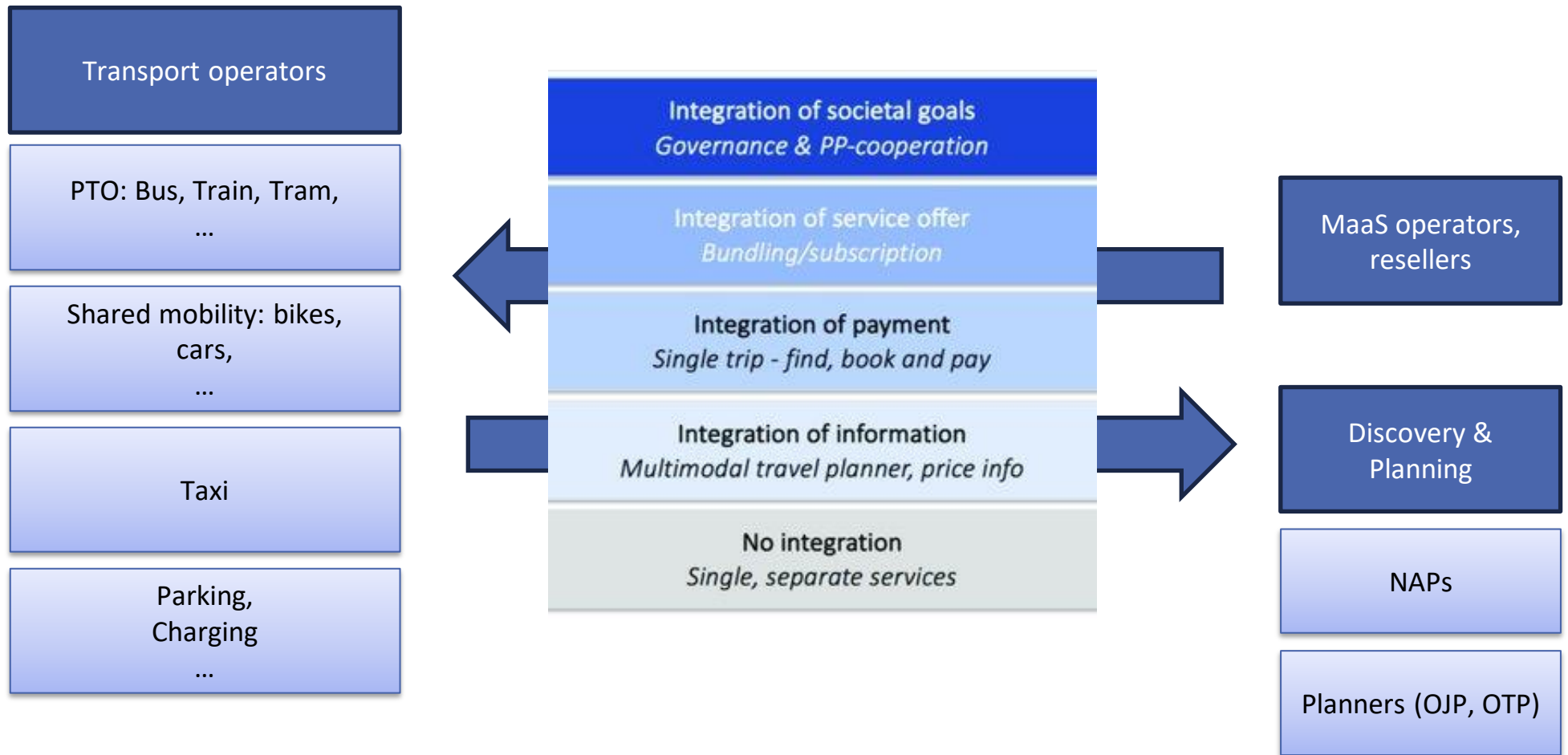


# Agenda

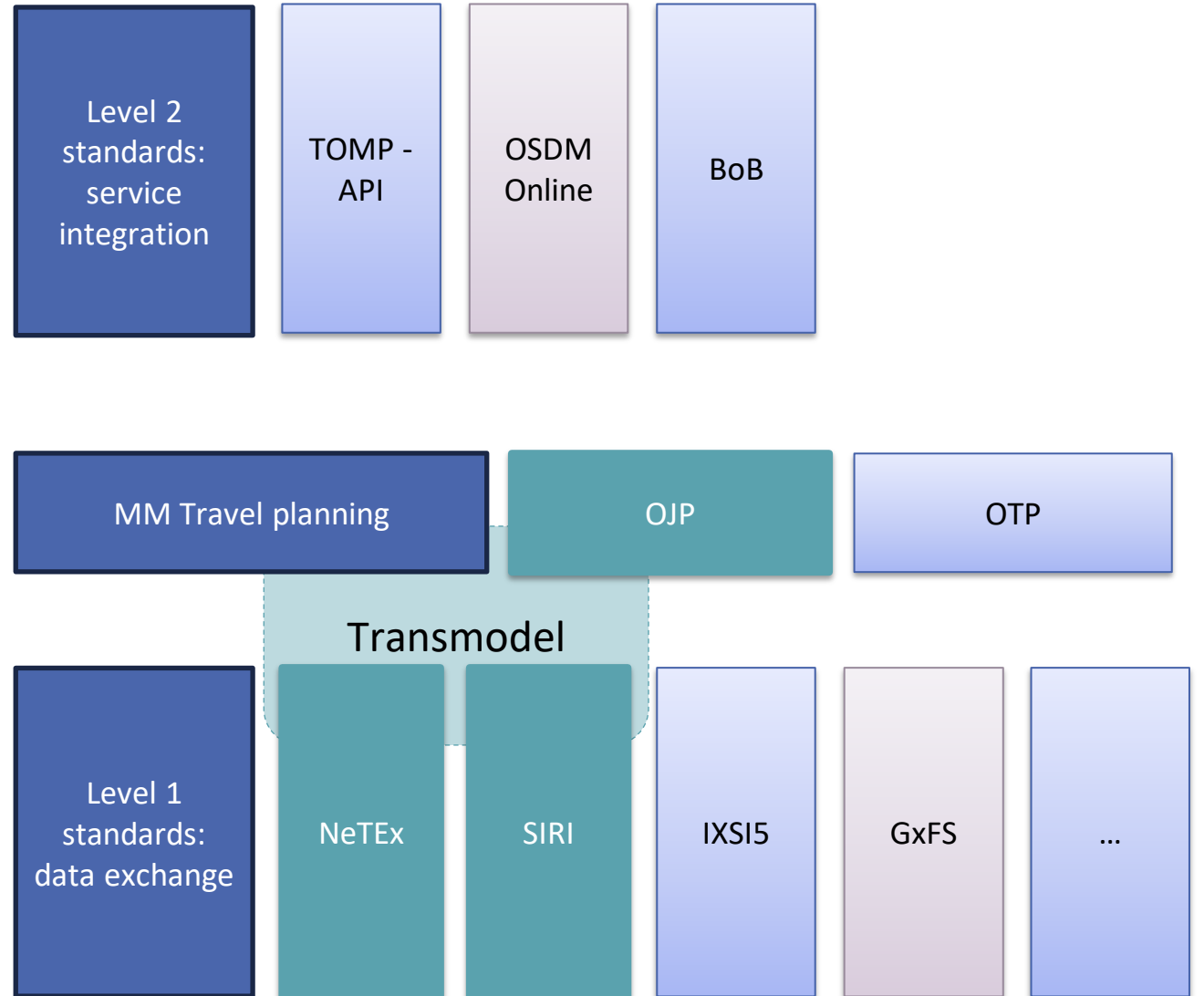
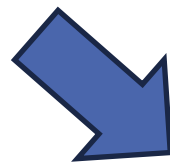
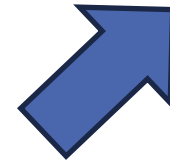
- Introduction to TOMP-API
  - Roles & Relations to other standards
  - Booking: working together with planning tools & other standards
- Main takeaways
  - TOMP
  - Interoperability for MaaS



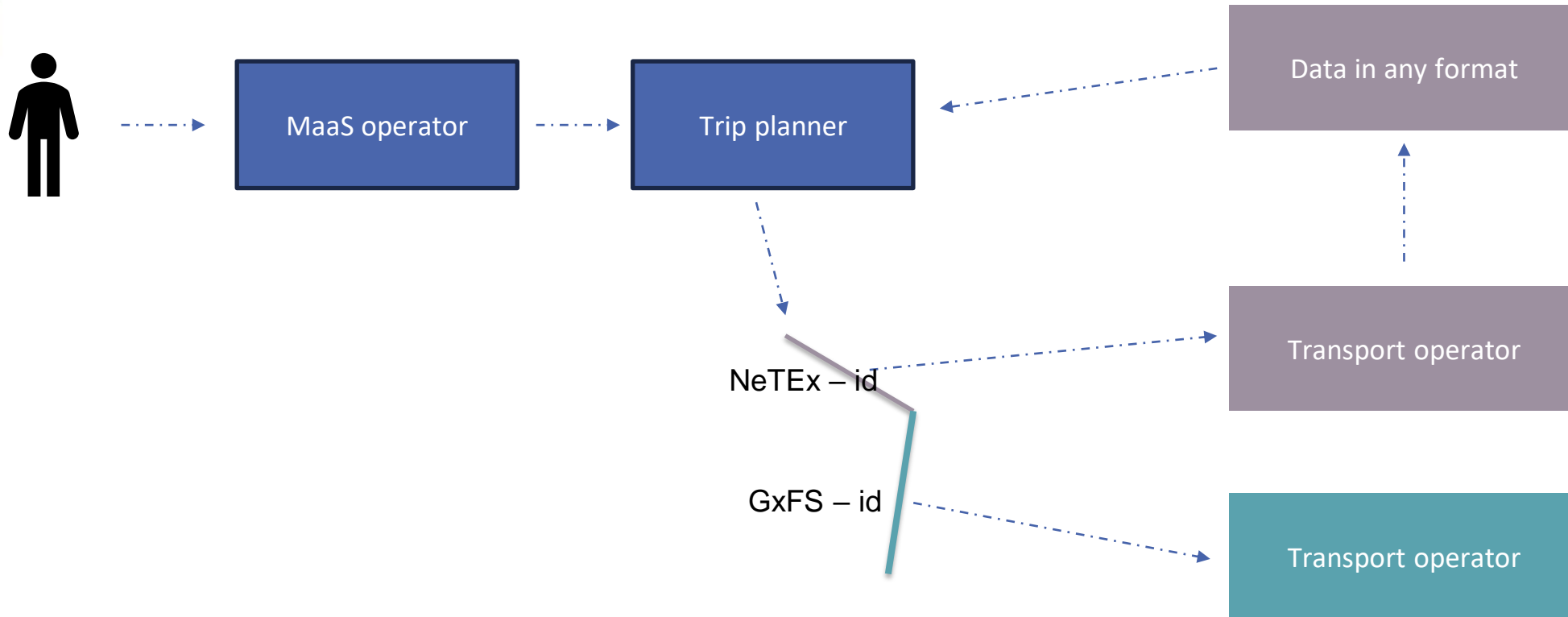
# Context – Roles



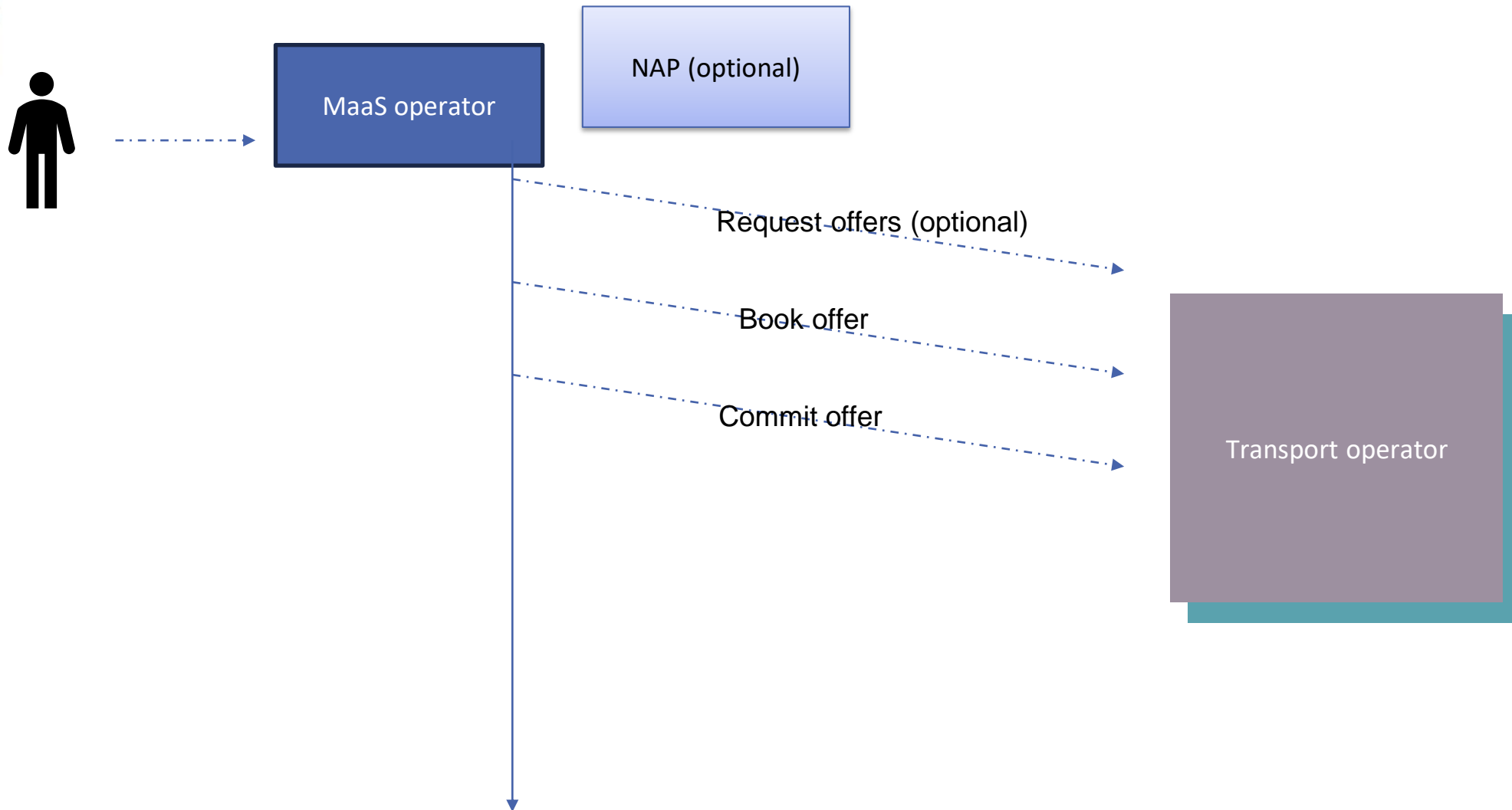
# Context – Standards and Specifications



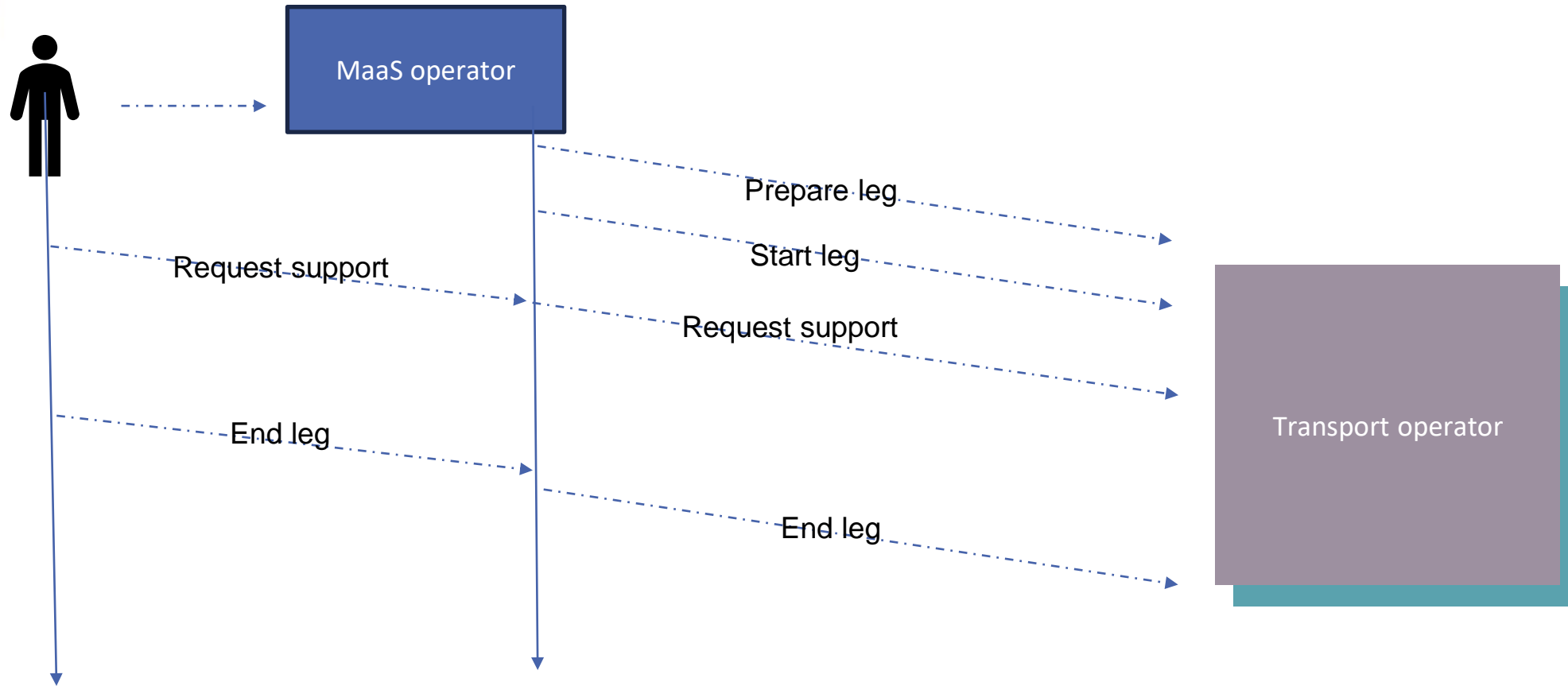
# TOMP – Step 1: planning



# TOMP – Step 2: available & booking



# TOMP – Step 3: execute & support



Payment – up front or post trip - agnostic



# Takeaways – TOMP

- It is about ‘service integration’, not just ‘data exchange’:  
no real alternative for non-conventional public transport ('alternative modes') & private modes
- Booking only works for Conventional Public Transport (tickets), but not for micro-mobility: trip execution & support are required.
- Leverage what everyone does best
  - Level 1: overlap between TOMP and GBFS (operator information) to be removed?
  - Level 2: distinction between route planning (OJP) and request/offer (TOMP/ OSDM) ?

# Takeaways – Interoperability for MaaS

To complete the MaaS puzzle (or ‘integrated mobility’), cooperation between:

## Operators

- Work in siloes
- Use different level 1 formats

## Trip planners

- Integration of different modes
- Integration of different level 1 formats

## MaaS Operators

- Use of level 1 and 2 formats
- Integration of book, travel & pay services for different operators

# Thank you for your attention!

Website: <https://tomp-wg.org/>

Resources: <https://github.com/TOMP-WG/TOMP-API>

Edwin van den Belt,  
Software Architect @ Dat.mobility / Goudappel

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- LinkedIn: <https://www.linkedin.com/in/edwinvandenbelt/>





# Q&A + discussion



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**Thank you for  
your attention!!!**