



## Digital Asset Management in the Shift2Rail Interoperability Framework

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# S2R Innovation Programmes



**IP1**

## **Passenger trains**

Cost-efficient and reliable trains, including high-capacity trains and high-speed trains

**IP2**

## **Traffic management**

Advanced Traffic Management and Control Systems' Solutions

**IP3**

## **Optimised Infrastructure**

Intelligent Asset Management and High Capacity Infrastructure

**IP4**

## **Digital services**

Towards "mobility as a service" engineered by railway

**IP5**

## **European Railway Freight**

Technologies for sustainable and attractive European Rail Freight

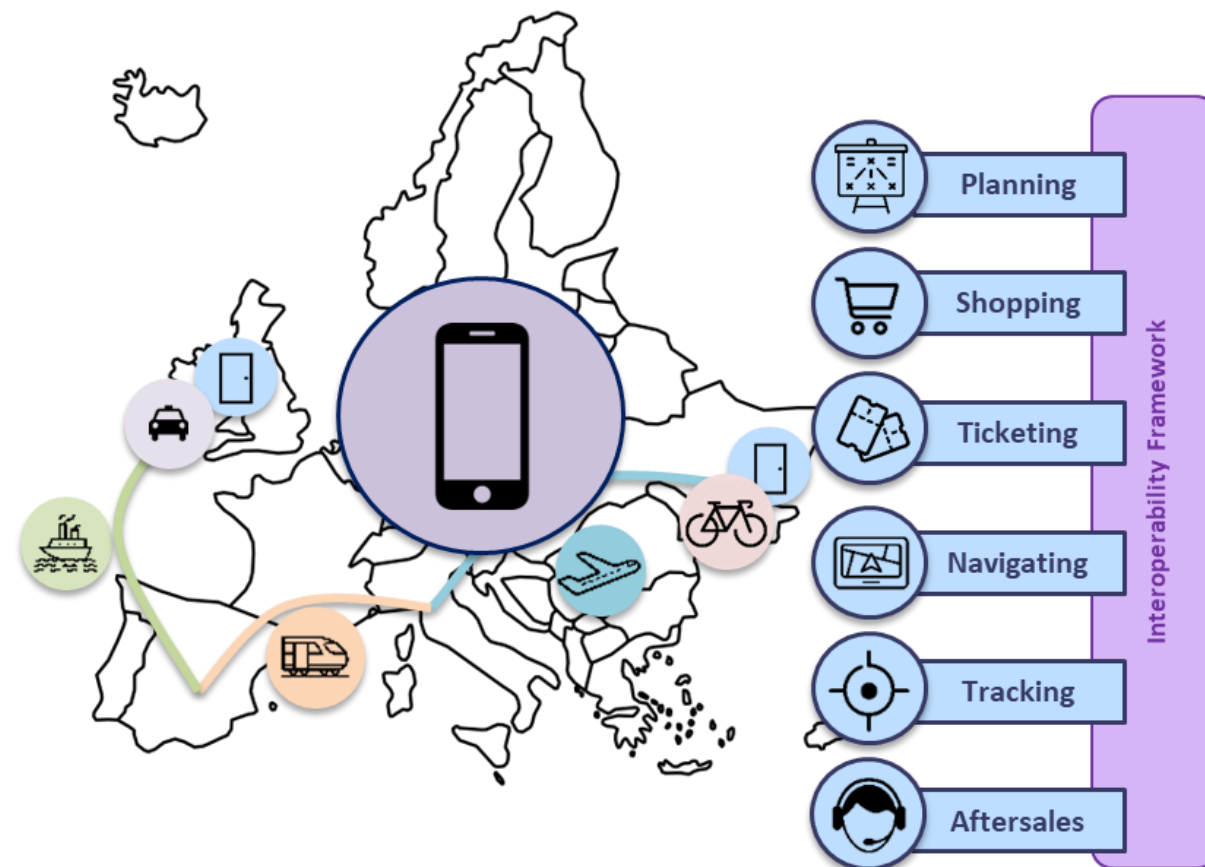
**CCA**

## **Horizontal Innovative Solutions for Railway**

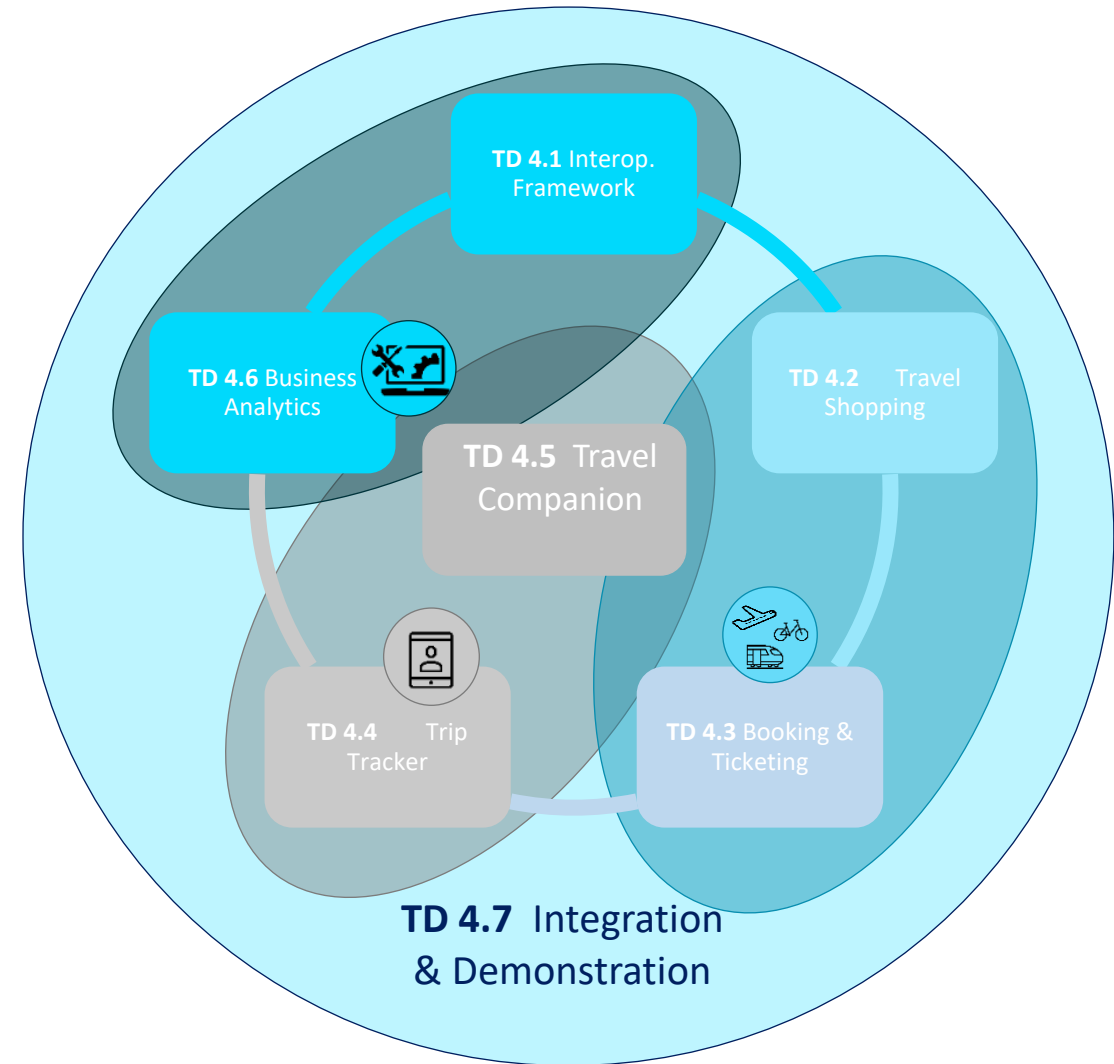
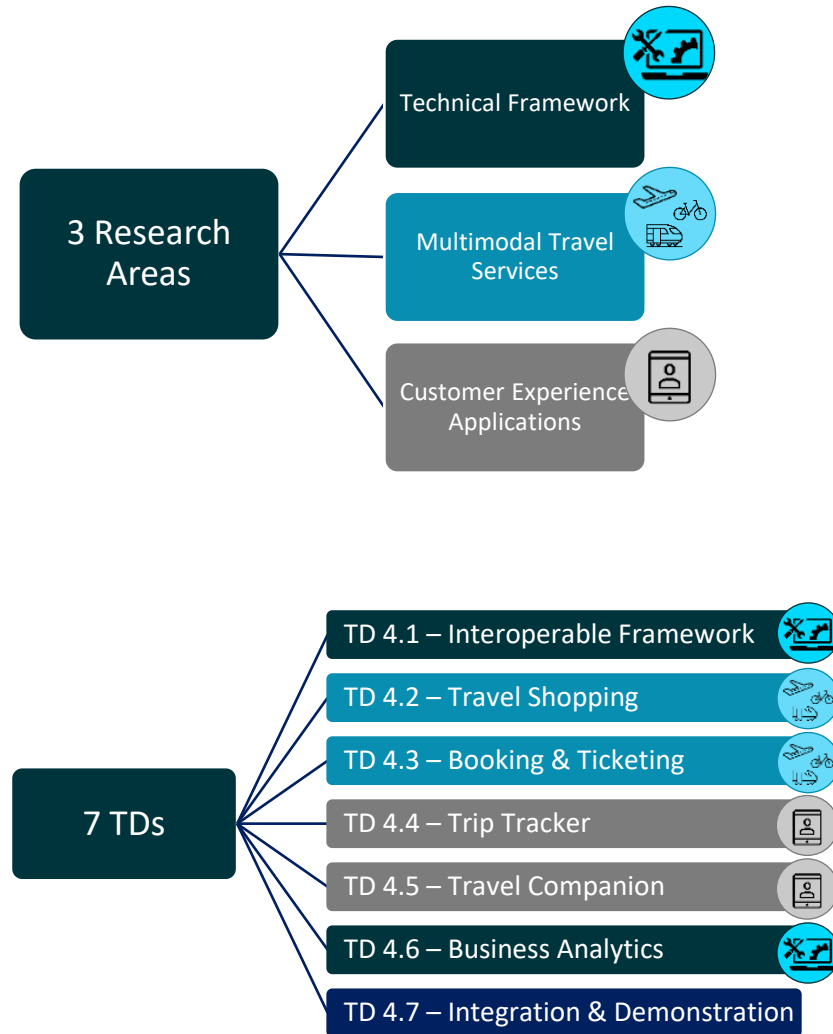
Cross-cutting activities

# IP4 Overview and Objectives

- Put the traveller back at the centre, ease access to rail, increasing its attractiveness
- Complete multimodal travel offer connecting the first and last mile to long distance journeys
- Give access to all multimodal travel services (shopping, ticketing, and tracking) through its travel-companion
- Build an open framework providing full interoperability whilst limiting impacts on existing systems

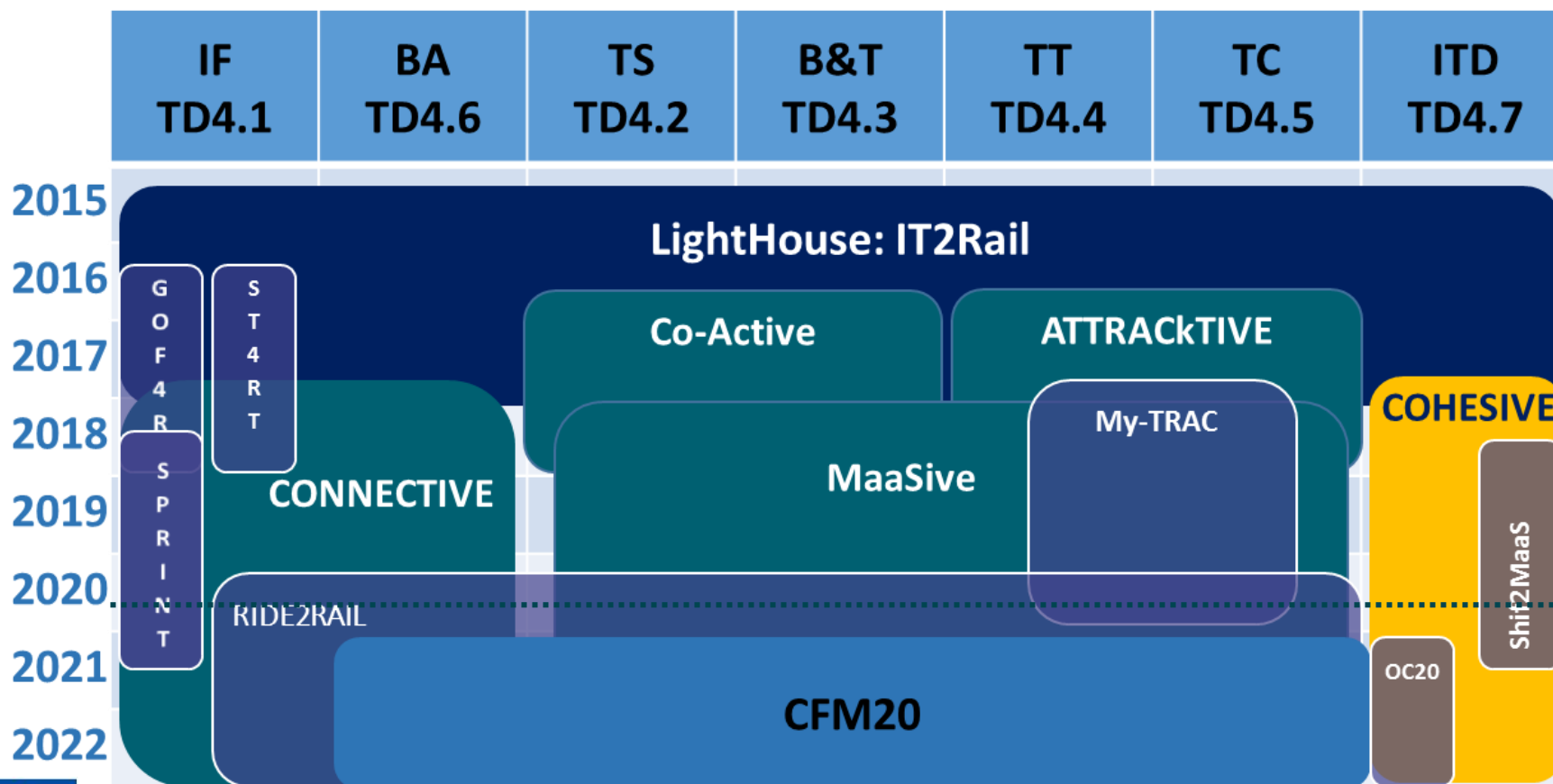


# Shift2Rail - IP4



# S2R-IP4 - Projects Roadmap

Lighthouse Project:	IT2Rail	OC15/16:	GoF4R and ST4RT
CFM15/16:	Co-Active and ATTRACKTIVE	OC17:	My-TRAC
CFM17:	CONNECTIVE and COHESIVE	OC18:	Shift2MaaS and SPRINT
CFM18:	MaaSIVE	OC19:	Ride2Rail
CFM20:	TD4.1-4.5	OC20:	IP4MaaS



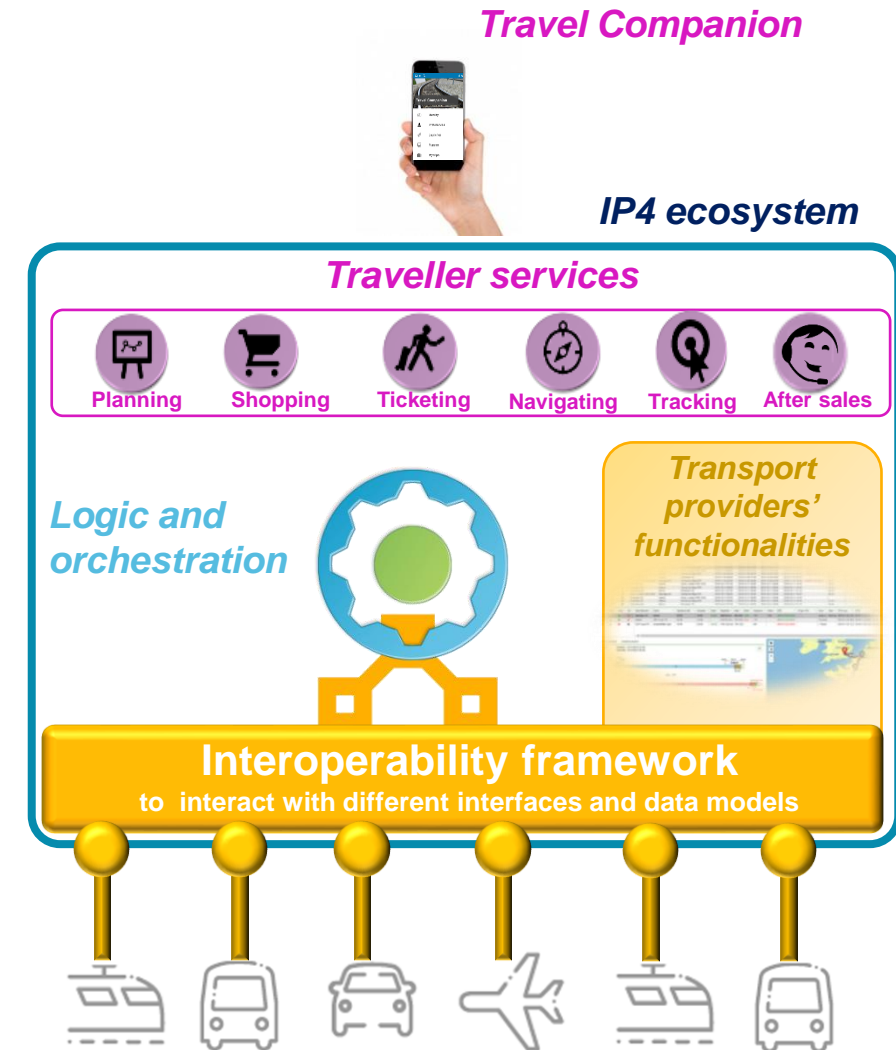
# Shift2Rail IP4 Ecosystem

Shift2Rail is aiming to create an ecosystem for traveller-related services:

- Planning
- Shopping
- Ticketing
- Navigation
- Tracking
- After sales

Establishing such ecosystem requires facing two main challenges:

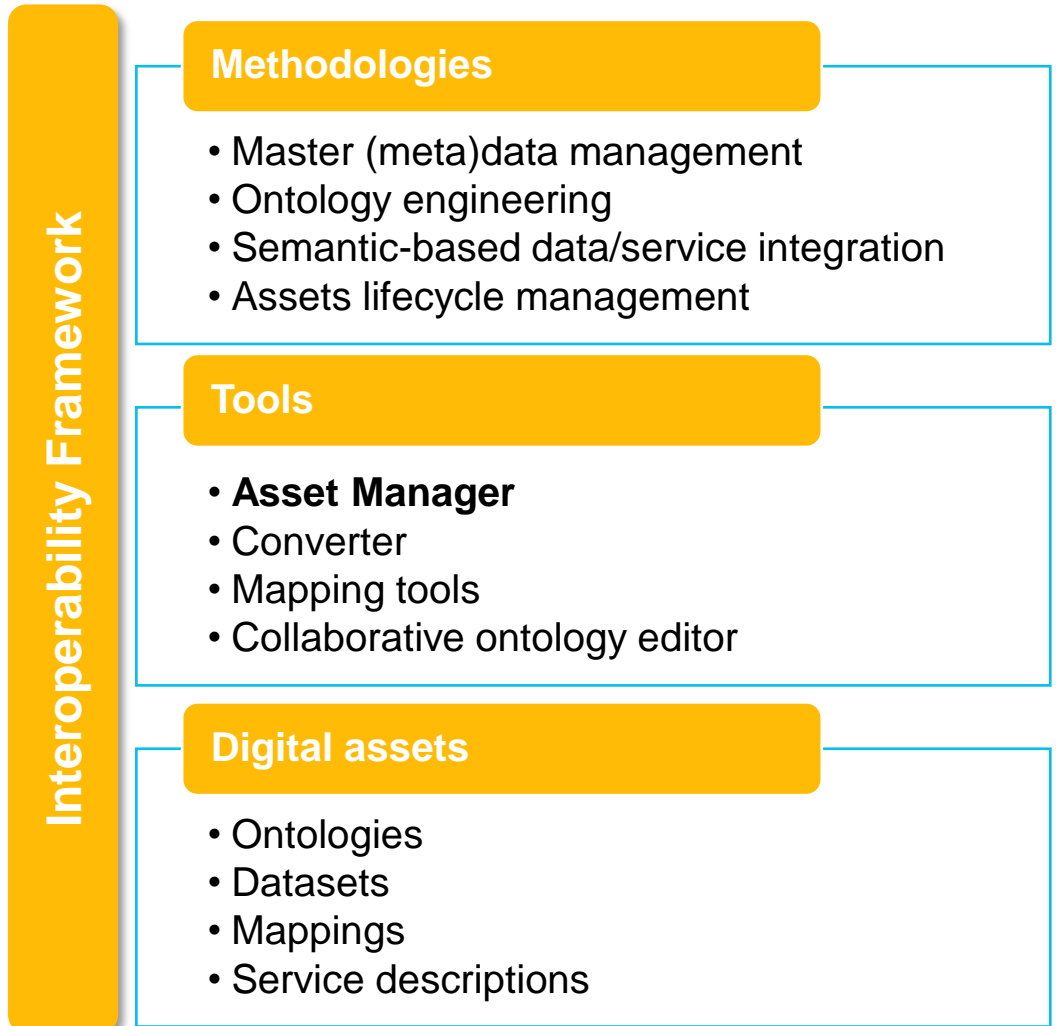
- Governance
- Interoperability



# Shift2Rail IP4 Ecosystem and Interoperability Framework

The Interoperability Framework consists of *tools* and *methodologies* to support Interoperability and Governance in an open ecosystem

- Data model definitions
- Data/Service integration
- Asset lifecycle management



## ~ SPRINT Asset Manager: general overview

### A shared catalogue of distributed digital assets

- Enforces governance of an ecosystem, providing workflow-based processes to review, create versions and publish assets according to well defined roles and responsibilities.
- Provides a single source of truth for a digital transport ecosystem,
- Contains all the information which can be reused to obtain interoperability (such as ontologies, data schemas and service descriptors).

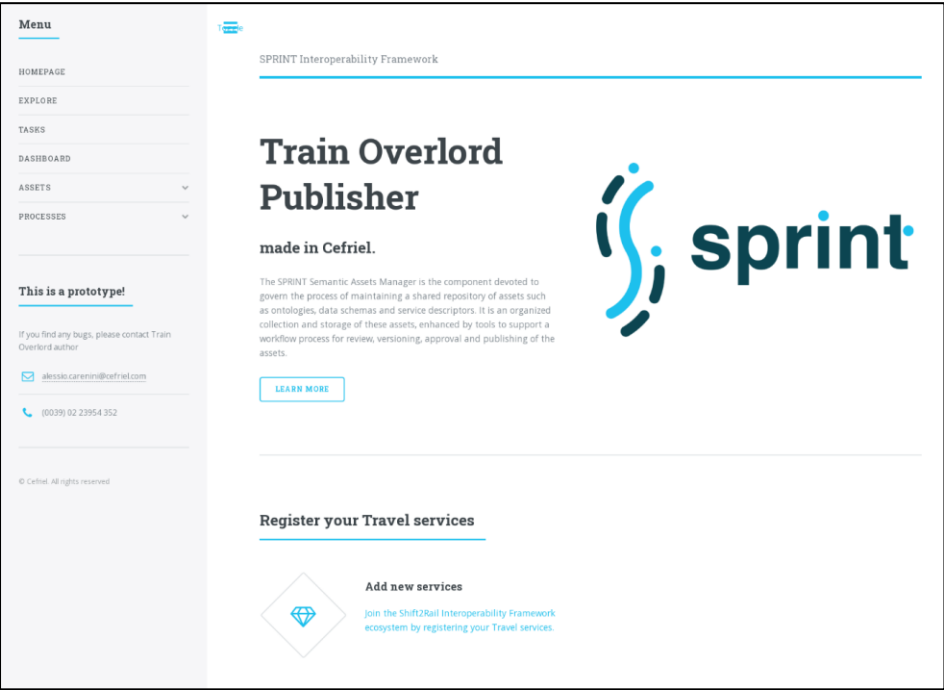




## **Asset Manager UI: the Publisher and the Store**

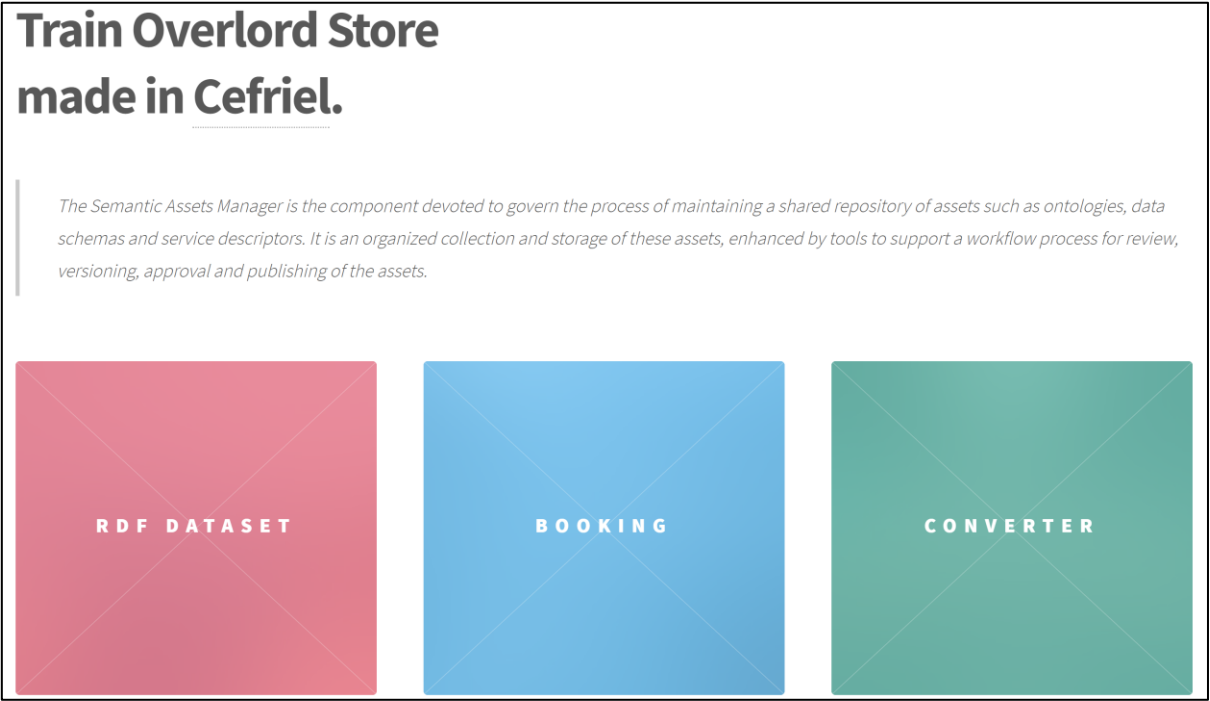
# Asset Manager – general overview

## Publisher



## Supplier view

## Store



## Consumer view

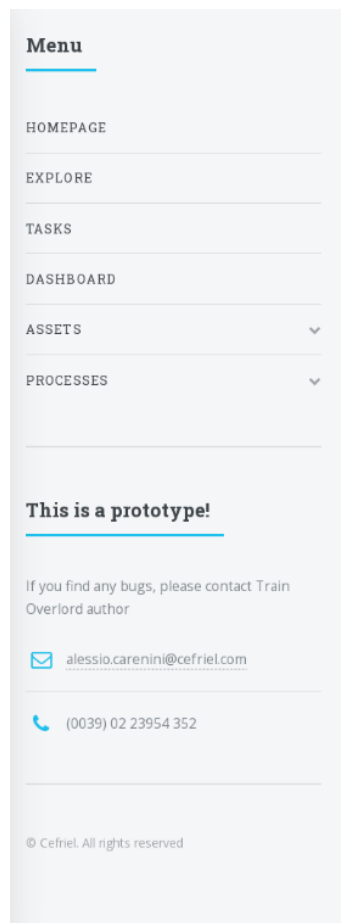
# ~ User interfaces: the Publisher

## Role

- Allow Suppliers to publish asset metadata
- Manage the lifecycle of assets according to a given governance structure

## Features

- Assets editing
- Lifecycle management
- User tasks and notifications



SPRINT Interoperability Framework

## Train Overlord Publisher

made in Cefriel.

The SPRINT Semantic Assets Manager is the component devoted to govern the process of maintaining a shared repository of assets such as ontologies, data schemas and service descriptors. It is an organized collection and storage of these assets, enhanced by tools to support a workflow process for review, versioning, approval and publishing of the assets.

[LEARN MORE](#)



Register your Travel services

# ~ User interfaces: the Store

## Role

Provide Consumer access to the Assets Catalogue

## Features

- Browse/search for assets
- Access requests for «private» assets
- Access to assets metadata
- Access to assets attachments



## Train Overlord made in Cefriel.

*The Semantic Assets Manager is the component devoted to govern the process of maintaining a shared repository of assets such as ontologies, data schemas and service descriptors. It is an organized collection and storage of these assets, enhanced by tools to support a workflow process for review, versioning, approval and publishing of the assets.*



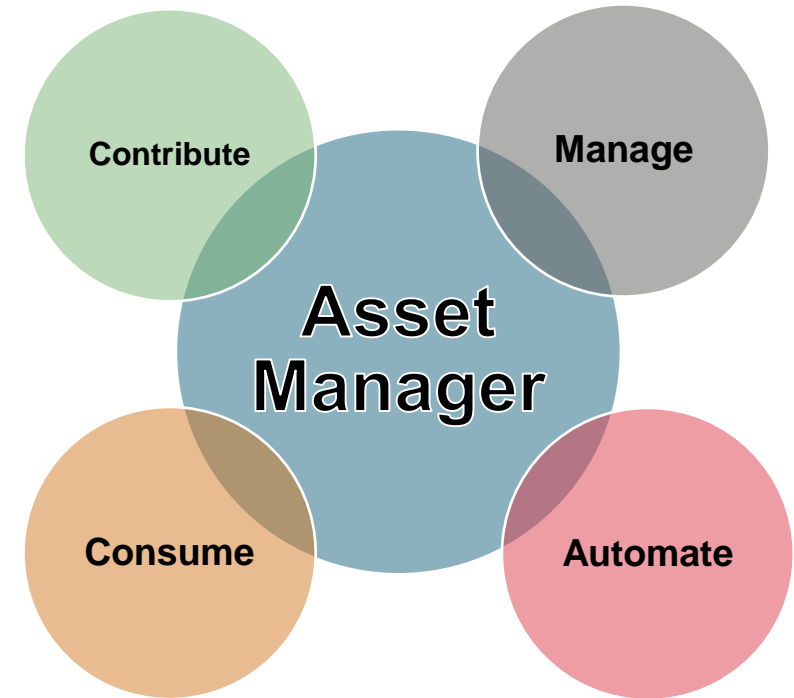


## Asset Manager: IP4 Use Cases

## ~ TSP Registration Scenario

### Travel Service Provider registration in the IP4 ecosystem

- Data used: GTFS feed
- Persona: EMT Malaga representative
- Scenario
  - EMT Malaga joins the IP4 ecosystem and submit their data
  - IP4 technical management board reviews the submission and approves it
  - Consumers can see EMT contributions
- Presentation during the Shift2Rail webinar  
<https://youtu.be/-SpLT7aL4N0?t=2870>



# ~ TSP Registration Scenario: main functionalities

## Regulated sovereignty environment

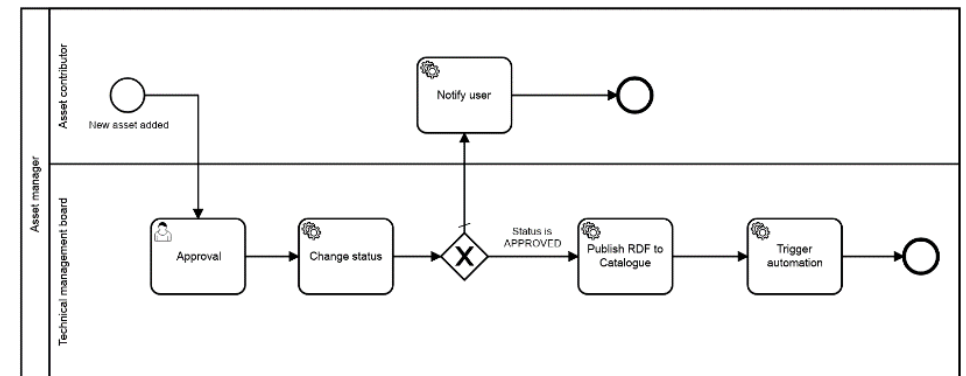
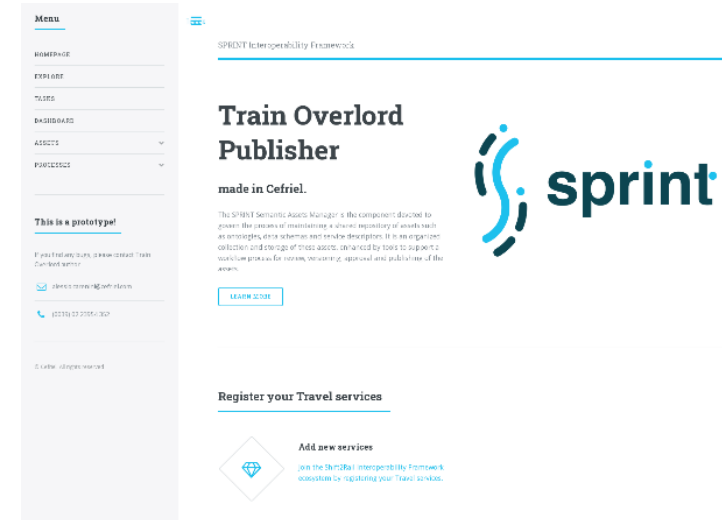
### 1. Define roles

### 2. Define responsibilities

### 3. Draw the lifecycle management process

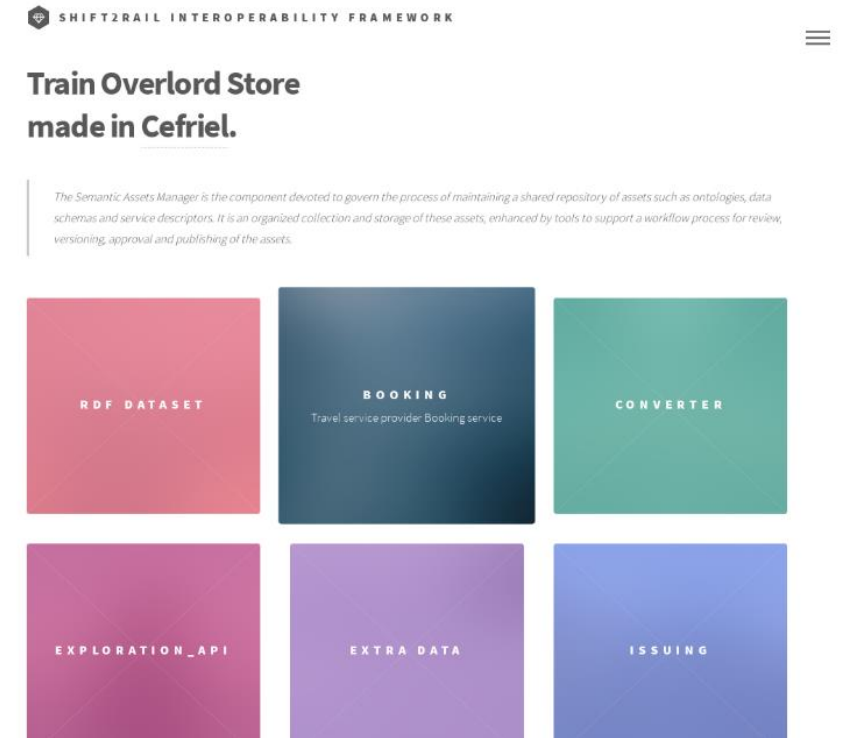
### 4. Enforce the process through the Asset manager

- User tasks
- Notifications
- Triggering of continuous delivery



## Dataset Publication and Consumer Access Scenario

- Data used
  - Journey planning information provided by EMT Malaga (GTFS feed)
- Persona
  - MaaS operator
- Scenario
  - EMT Malaga has published assets describing their services
  - A MaaS operator wants to obtain EMT Malaga GTFS feed
- Presentation during the Shift2Rail webinar  
<https://youtu.be/-SpLT7aL4N0?t=3278>





# Dataset Publication Scenario

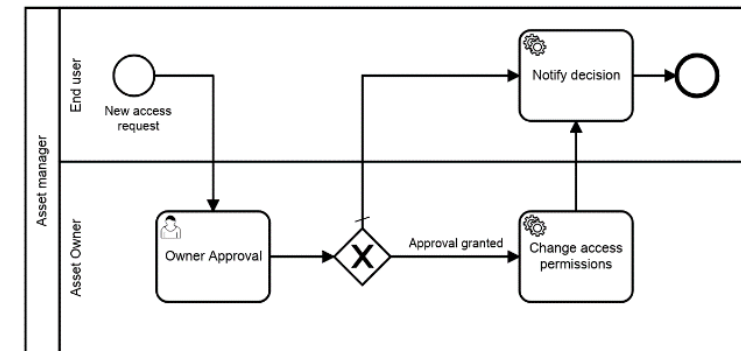
## Main functionalities used on the scenario

- **Asset consumer**
  - Finds an asset
  - Reads basic information
  - Asks for the permission to access it
- **Asset owner decides who has access to it**
  - Receive notifications for access requests
  - Allow consumer access
  - Revoke access

SHIFT2RAIL INTEROPERABILITY FRAMEWORK

### Access requests list

Date	Asset Name	Asset Type	Granted By
Feb. 12, 2019, 10:41 a.m.	I12Rail Ontology	ontology	



# Automatic Converter Creation Scenario

## Converter publication and access

- **Data used**
  - GTFS to Linked GTFS RML mappings
  - Linked GTFS ontology
- **Persona**
  - IP4 Developer
- **Scenario**
  - The IP4 developer want to integrate the TSP services inside the ecosystem, reusing transformation rules already published
  - The Asset Manager creates the microservice to ease the integration of the TSP in the IP4 ecosystem
- **Presentation during the Shift2Rail webinar**  
<https://youtu.be/-SpLT7aL4N0?t=3506>

### GTFS to Linked GTFS converter

The screenshot shows a web form for publishing a converter and a corresponding CI/CD pipeline status. The form fields are as follows:

Field	Value
Name	GTFS to Linked GTFS converter
Description	This is a test for the RML conversion of GTFS into the RDF-based Linked GTFS model
Version	1.0.0
Author	Mario Scrocca
Author Email	mario.scrocca@cefnel.com
Institution	Cefnrel
Source standard/specifications	GTFS
Destination standard/specifications	

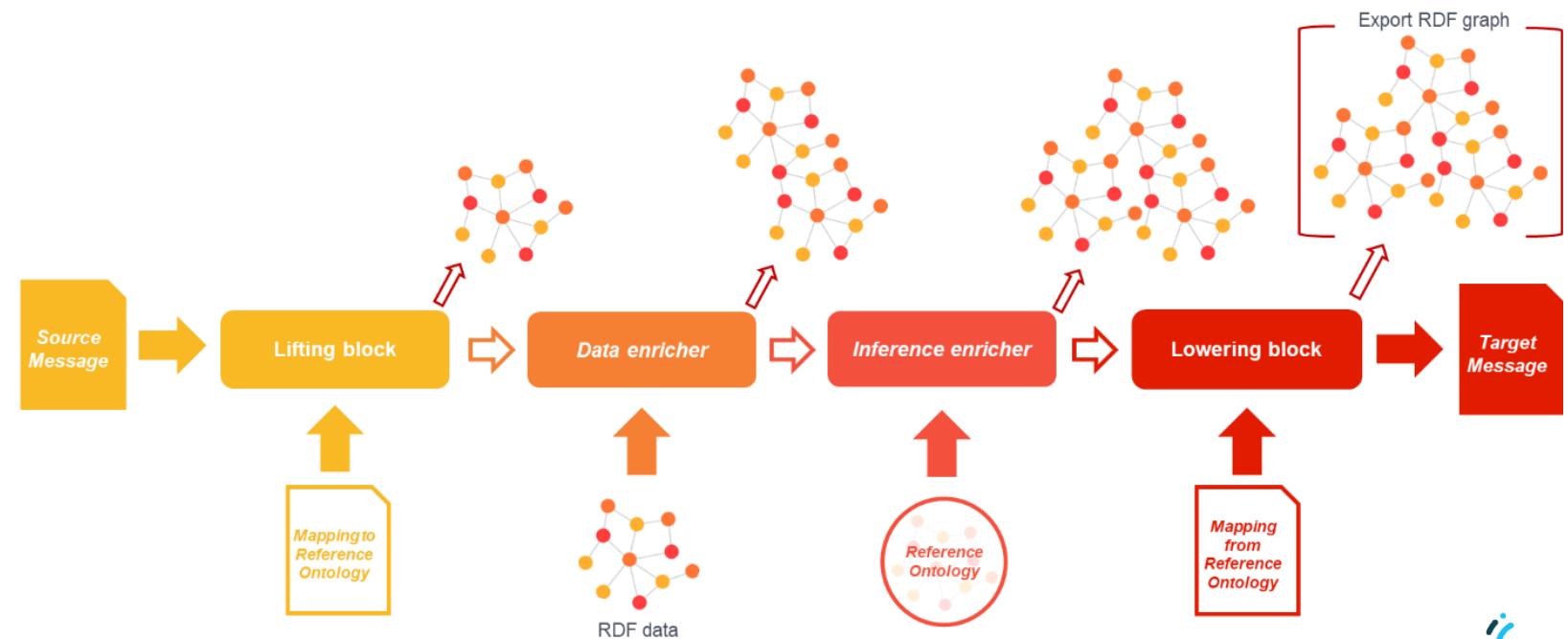
Below the form, a green bar indicates the CI/CD pipeline status: "Branch: master, Commit: 1, No changes, Review: diff/submit, abort". A progress bar shows the steps: Start (green dot), Process (green dot), Build (green dot), Upload (blue circle with checkmark), and End (grey dot).

At the bottom, a table lists the upload artifacts:

File	Size
env - Shell Script	15
print Message	15
Shell Script	15

## Automatic Converter Creation Scenario: Main functionalities used

- **Asset automation**
  - Asset reuse
  - Creation of deployable artifacts
  - Continuous deployment
- **Converter**
  - Message-to-message conversion
  - Low-code framework
  - Allows integration in real environments



~ ...and more to come

- Integration of National Access Points
- Dependency tracking
- Automatic data conversion

**STAY TUNED**

**Final Conference scheduled on 23 February 2021 14:00 CET**

visit <http://www.sprint-transport.eu/> for more info



Thank you for your attention!