

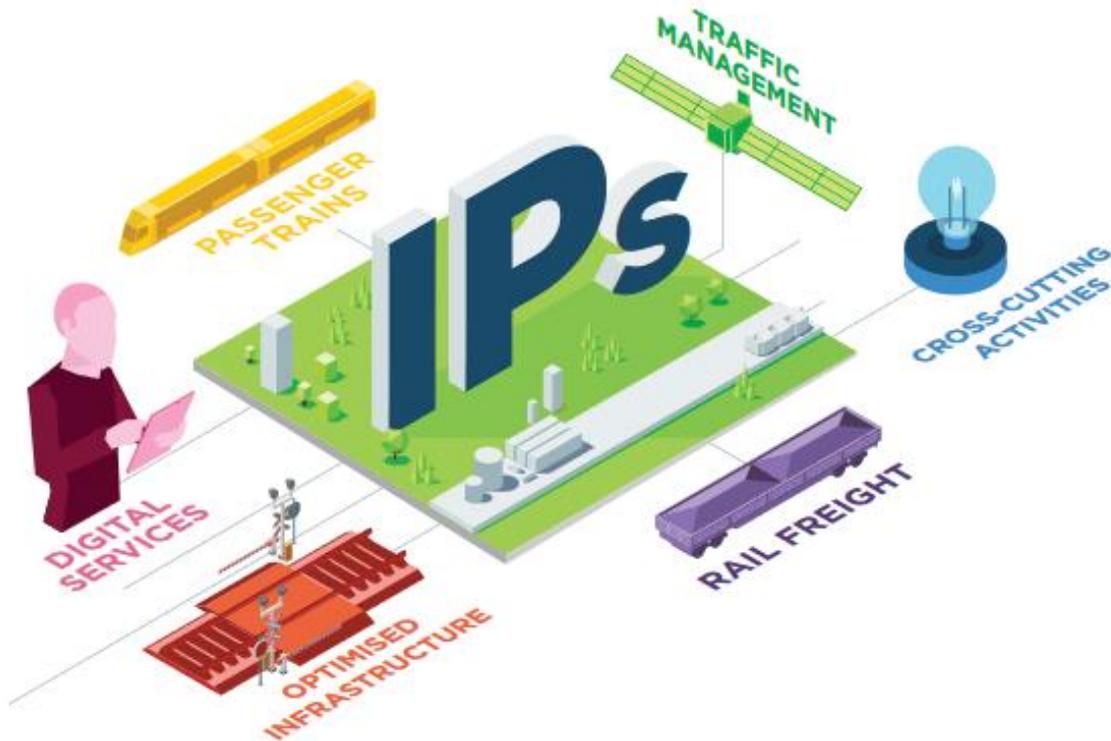


## Digital Asset Management in the Shift2Rail Interoperability Framework

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09/12/2020

# 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

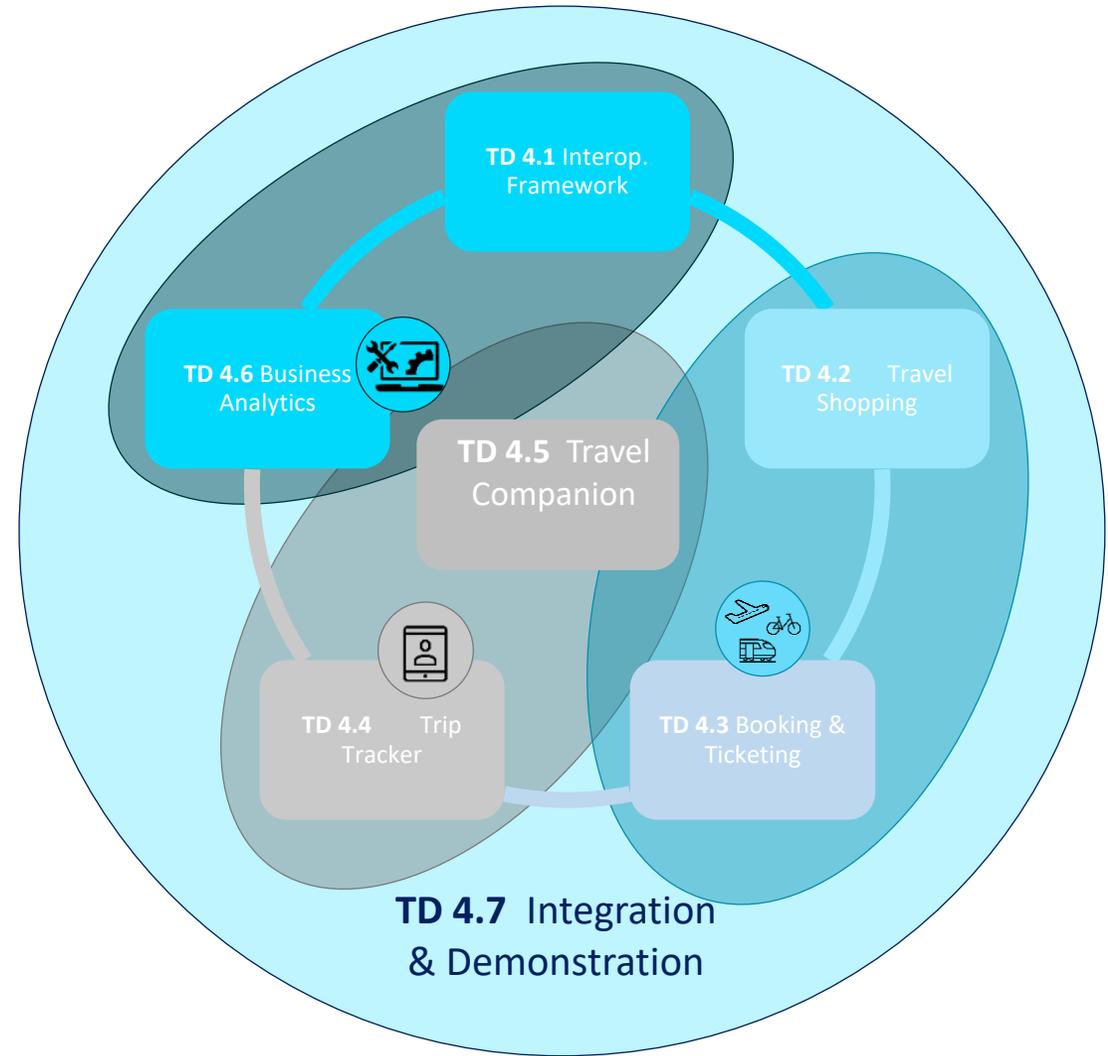
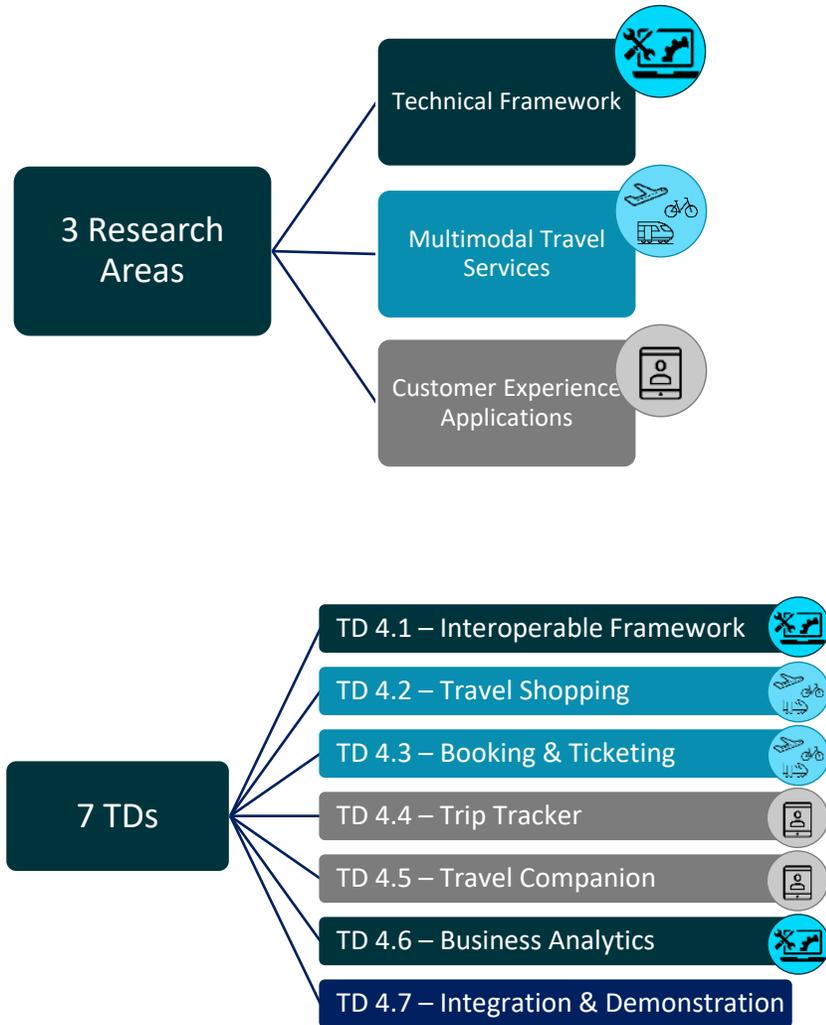
**CCA** **Horizontal Innovative Solutions for Railway**  
Cross-cutting activities

# 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

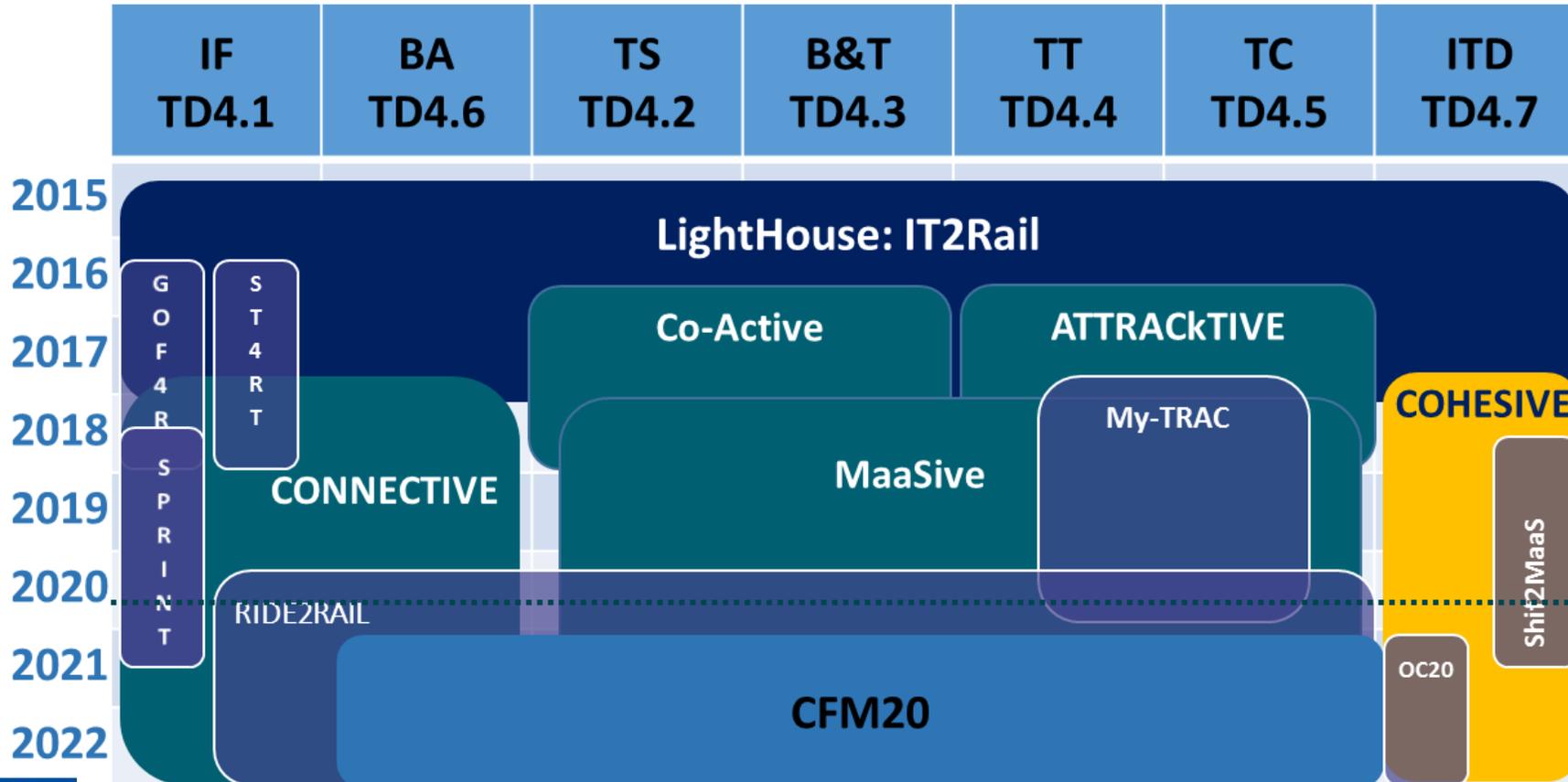


# Shift2Rail - IP4



# S2R-IP4 - Projects Roadmap

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



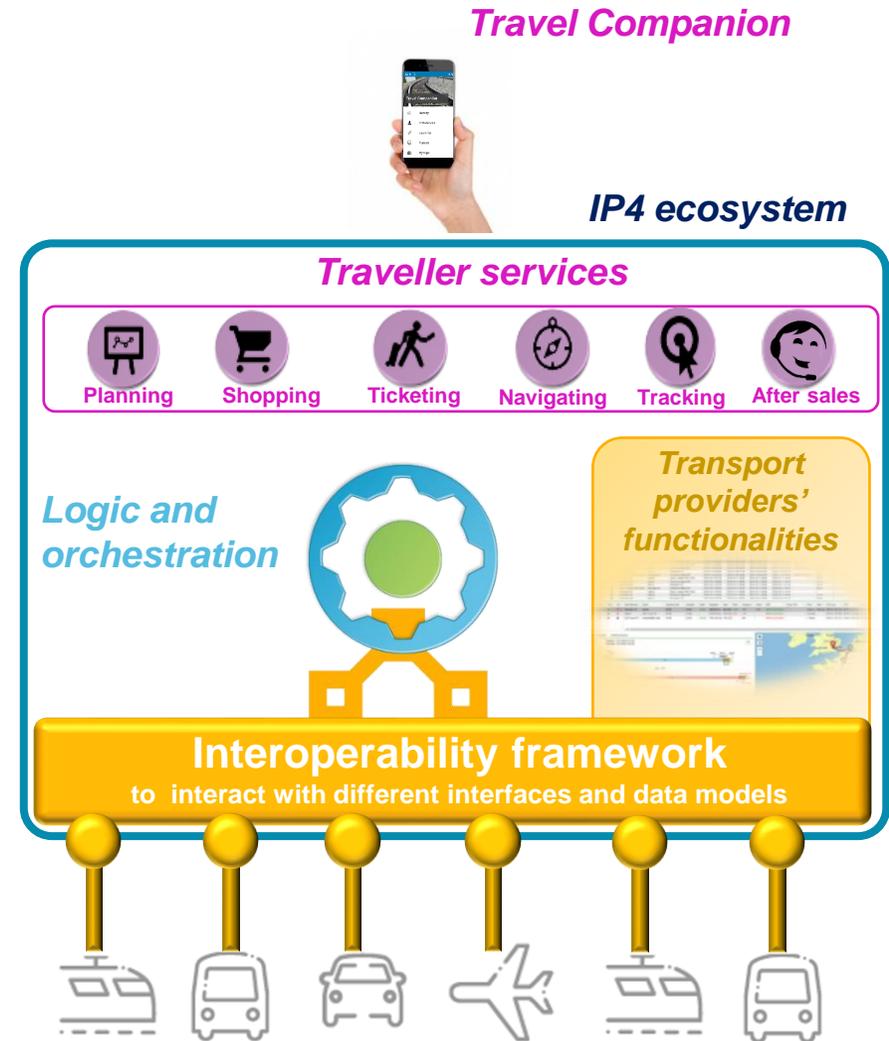
# Shift2Rail IP4 Ecosystem

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

## Interoperability Framework

### Methodologies

- Master (meta)data management
- Ontology engineering
- Semantic-based data/service integration
- Assets lifecycle management

### Tools

- **Asset Manager**
- Converter
- Mapping tools
- Collaborative ontology editor

### Digital assets

- Ontologies
- Datasets
- Mappings
- Service descriptions

## ~ SPRINT Asset Manager: general overview

### A shared catalogue of distributed digital assets

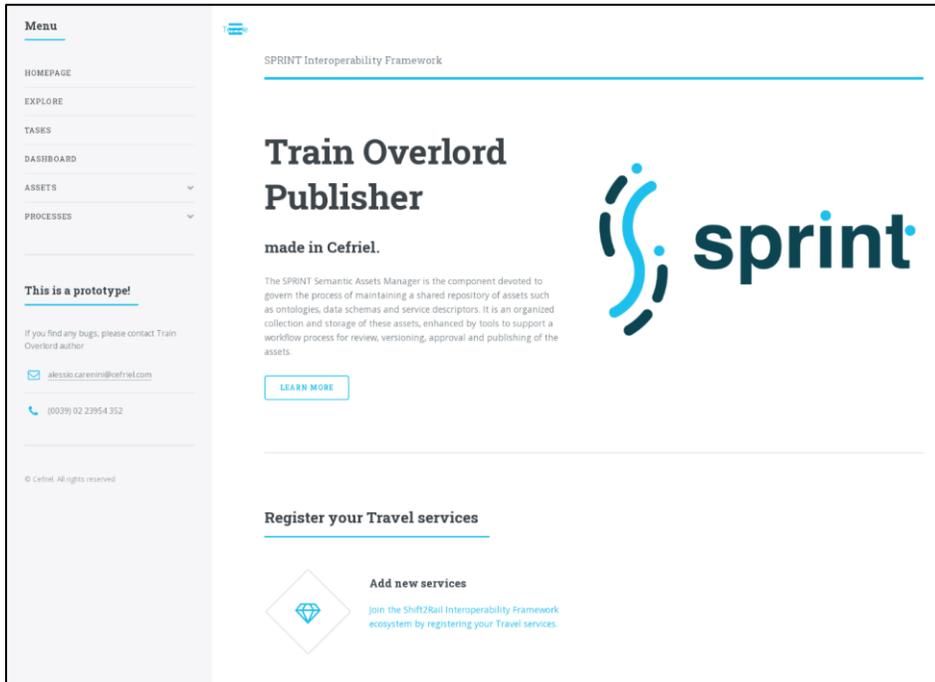
- Enforces governance of an ecosystem, providing workflow-based processes to review, create versions and publish assets according to well defined roles and responsibilities.
- Provides a single source of truth for a digital transport ecosystem,
- Contains all the information which can be reused to obtain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



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

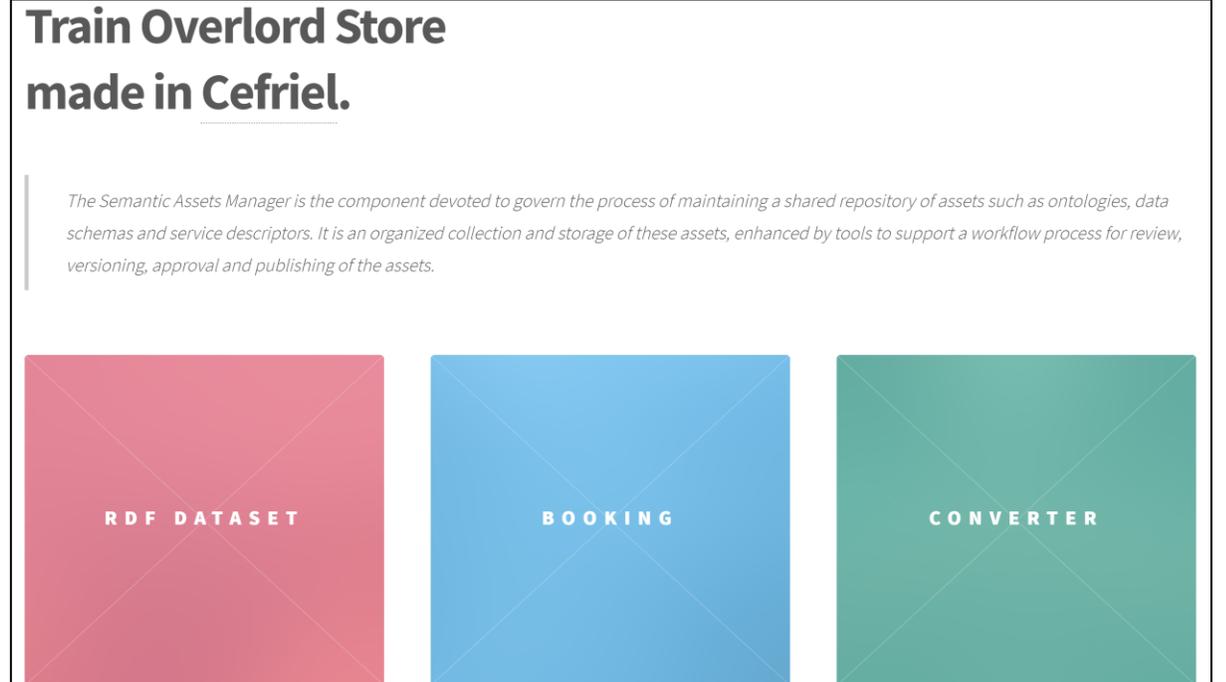
# Asset Manager – general overview

## Publisher



## Supplier view

## Store



## Consumer view

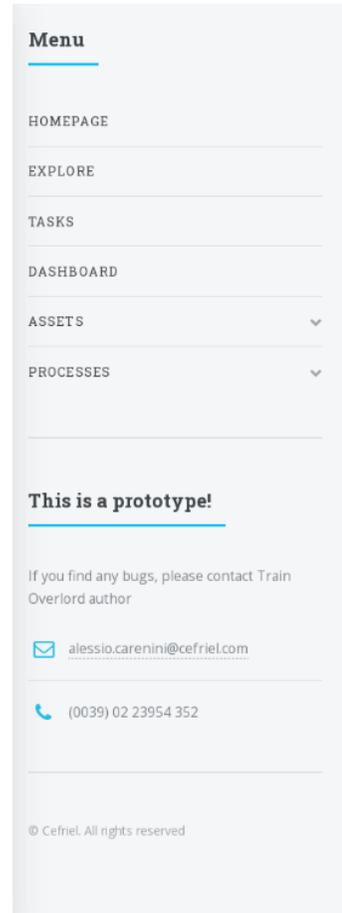
# ~ User interfaces: the Publisher

## 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



 SHIFT2RAIL INTEROPERABILITY FRAMEWORK

## 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

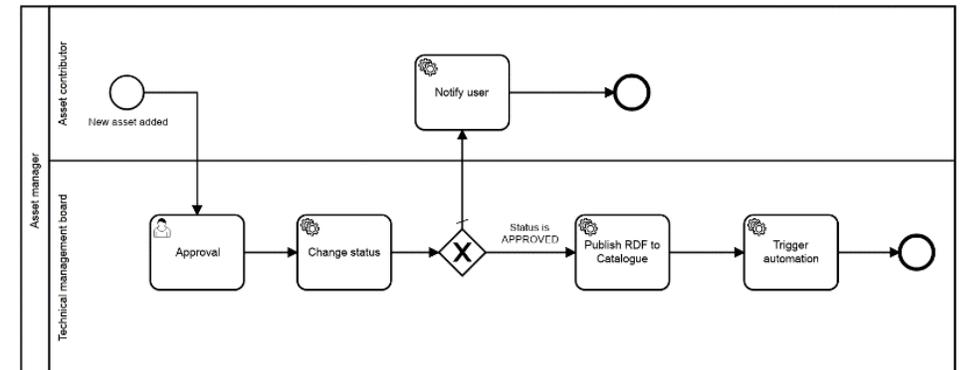
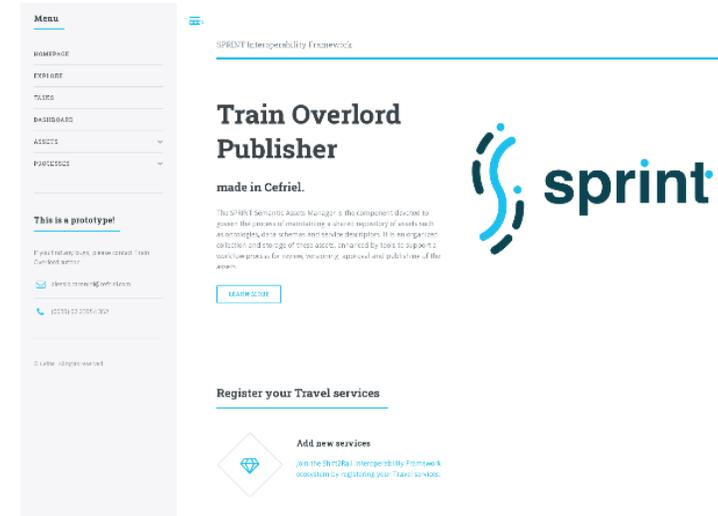
### 1. Define roles

### 2. Define responsibilities

### 3. Draw the lifecycle management process

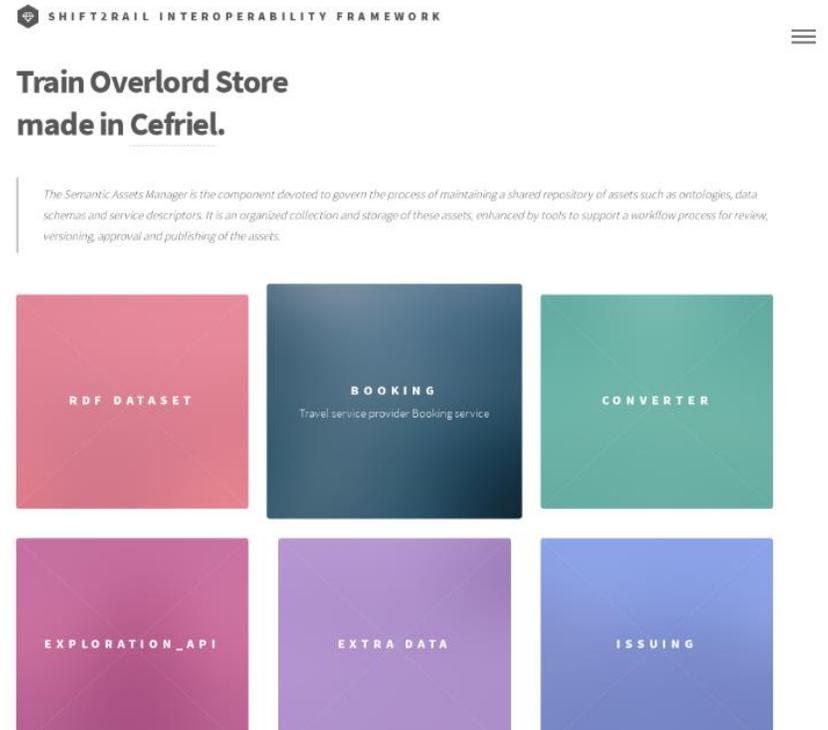
### 4. Enforce the process through the Asset manager

- 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

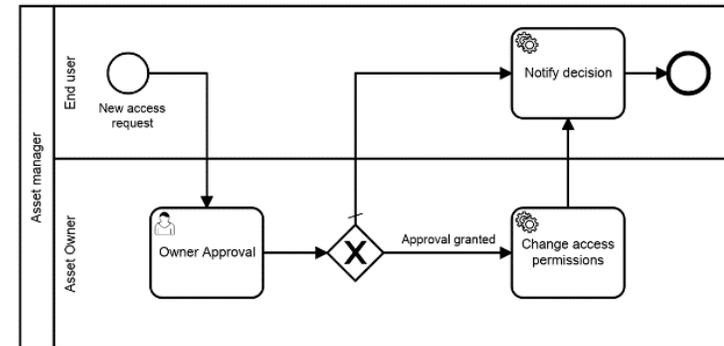
## Main functionalities used on the scenario

- **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.	112Rail 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**

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

Branch: master (9) No changes  
Commit: 4 months ago Antonio Dall'Acqua, admin

Start Process Build Upload End

Upload - 1s

✓	env	Shell Script	1s
✓	testMessage	1s	
✓	Shell Script	1s	

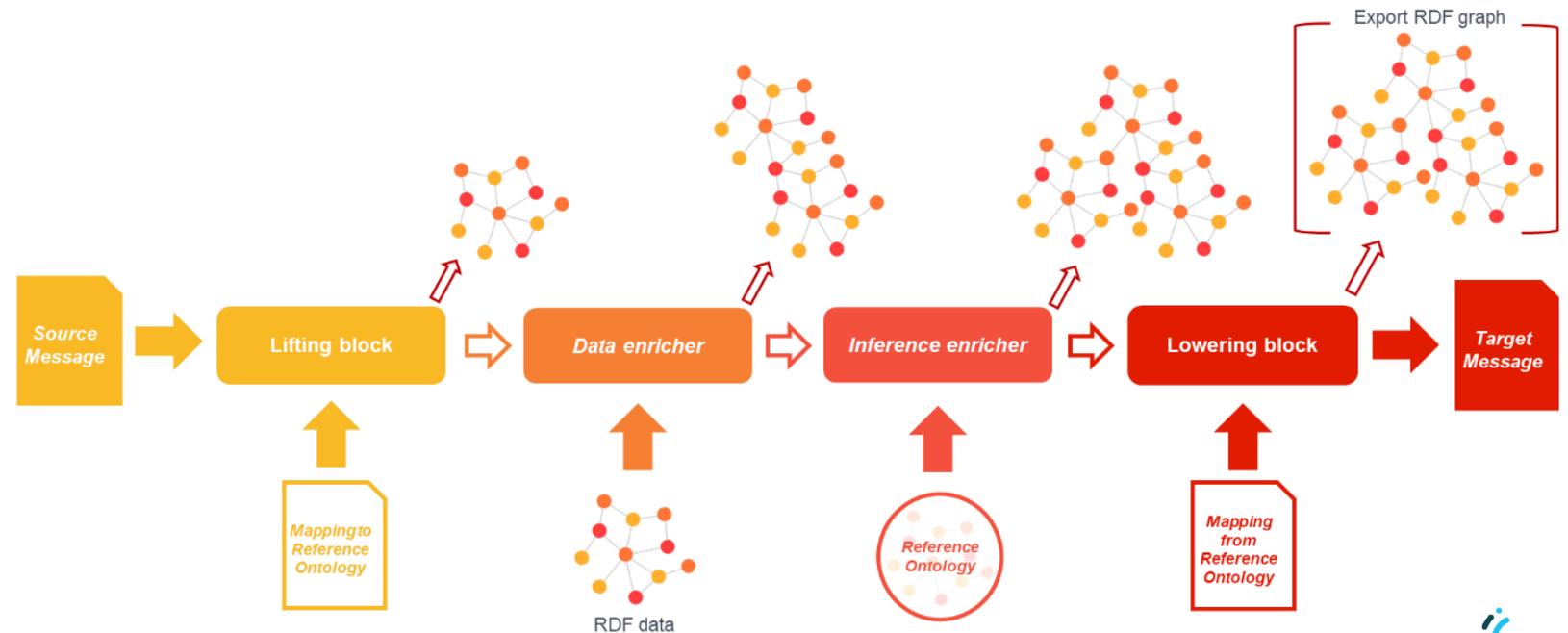
# Automatic Converter Creation Scenario: Main functionalities used

- **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!