Digital Rail Baltica. The Role of GIS in the Digitalization of Rail Baltica Construction Supervision

**Vaidas Ulenskas,
GIS Team Leader at RB Rail AS**

Rail Baltica
#StandWithUkraine

Co-financed by the Connecting Europe
Facility of the European Union

Speakers

**Vaidas Ulenskas**
GIS Team Leader

- M.Sc. Civil Engineering
- In Rail Baltica Global Project since March 2019
- "Involved" with GIS since 2011

Connected Baltics in a Connected Europe

We are delivering seamless mobility for people, goods and services to accelerate social and economic development in the Baltics and beyond

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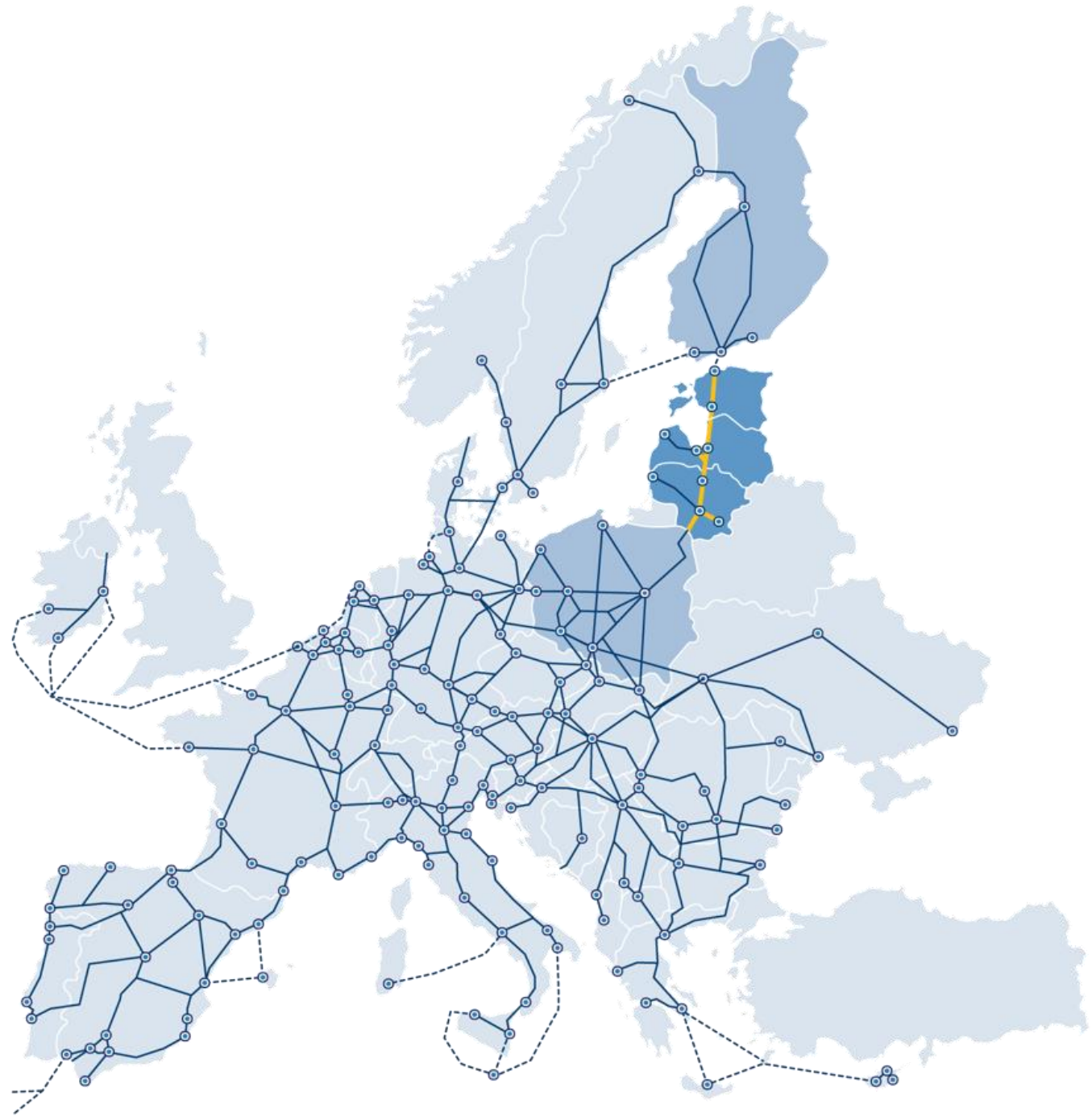
Basis for a New Economic Corridor and Military Mobility
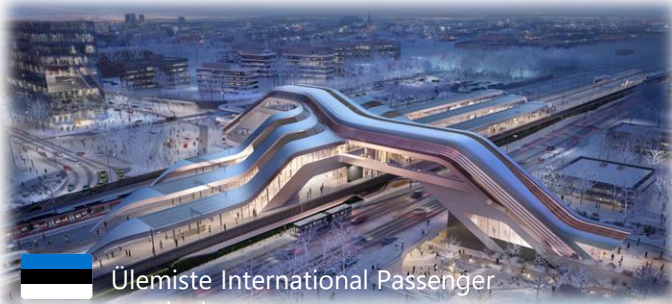
Ülemiste International Passenger terminal

RIX Airport Station

Rīga Central Station

Vilnius Connect

Helsinki

Muuga

Tallinn

0:40 min

Pärnu — Pärnu

1 h

Rīga Central — Salaspils

0:08 min

Rīga Airport

0:45 min

Panevėžys — Panevėžys

0:37 min

Vilnius

Kaunas — Kaunas

3:27 min

Warszawa — Warszawa

0:38 min

Hamburg

Berlin

Rotterdam

Duisburg

Milano

Wien

Legend:
- High Speed
- Night Train
- Freight
- Regional
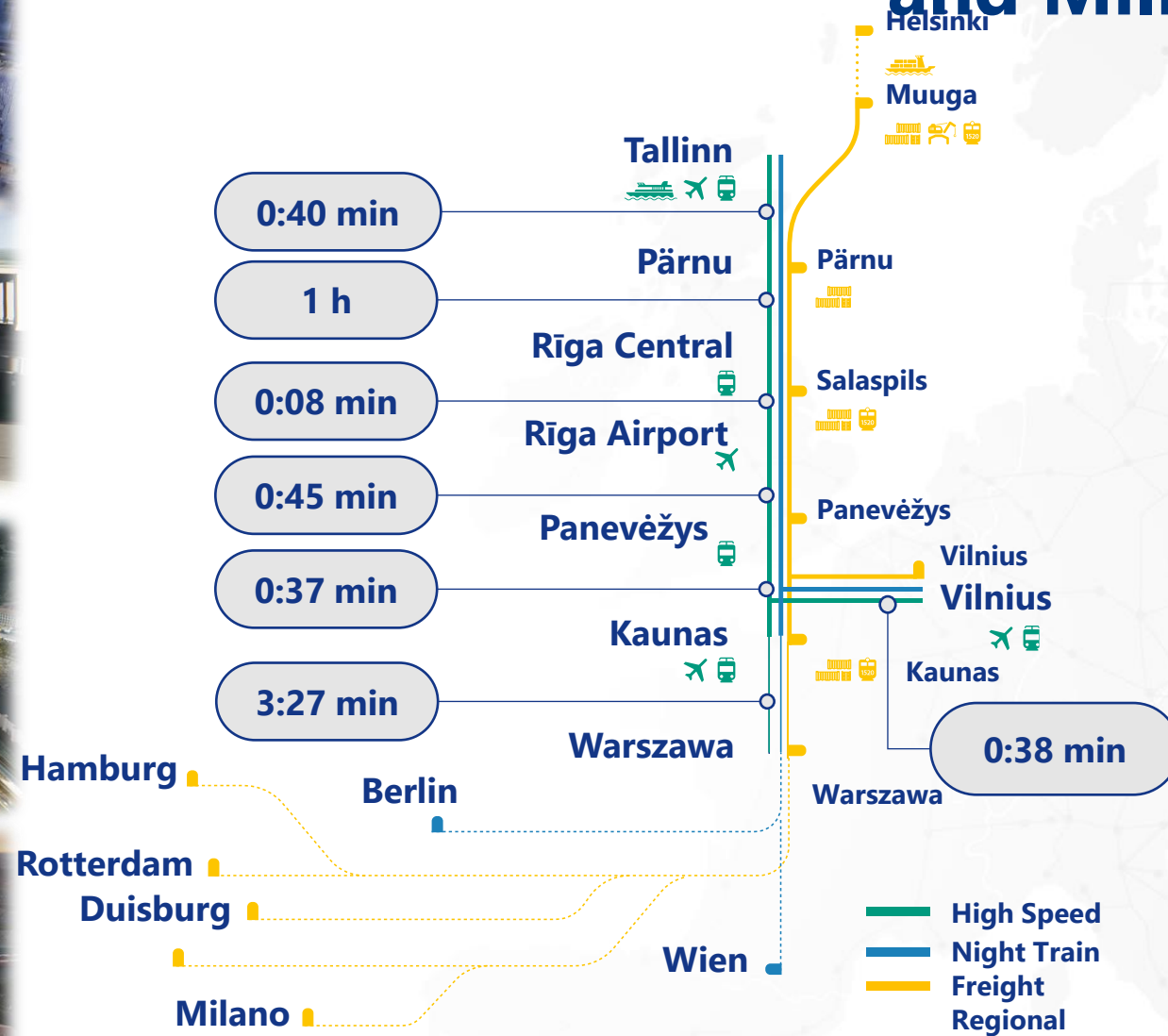
Specifications:
- 870 km greenfield railway infrastructure
- 1435 mm Double track
- ERTMS Level 2 + FRMCS*
- Electrified 2x25kV AC
- Maximum length of freight trains: 1050m
- Axle load 25t
- Design speed: 249 km/h for passenger trains 120 km/h for freight trains
- SE-C (Swedish) loading gauge

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Rail Baltica project timeline

2023

- Mainline designs' completetion
- Delivery programme 2030
- Market readiness for material supply & logistics (incl. consolidated material procurements)
- New generation Cost-Benefit Analysis and Business Plan
- Decisions to ensure operational readiness (IGA on infra management and exploitation model, rolling stock etc.)

2024-2027

- **Construction!**

2028-2030

- Testing
- Validation
- Operations & full interoperability ensured
- New economic and security network corridor developed

Construction in progress

Gradual start of operations

GIS - Significant Part of Rail Baltica Digital Twin

Internal & External training and Support service
- Provide basic training materials to RB GIS users

Operational & Maintenance
- Create Rail Baltica Digital Twin
- Prepare GIS for Infrastructure Manager

Monitoring the Construction process
- Collect and analyze data from the field to monitor the construction process
- Create assignments for field workers

BIG Data Management
- BIM
- AIM
- Raster
- LAS
- 3D

Data Management System
- Create, Collect internal and external GIS data
- Convert non-GIS data to GIS data
- GIS data accessibility
- GIS integration with other software's

Global Project Partners Engagement
- Create GIS connections between RB Rail AS and partners (BENs, IBs, Designers, etc.)
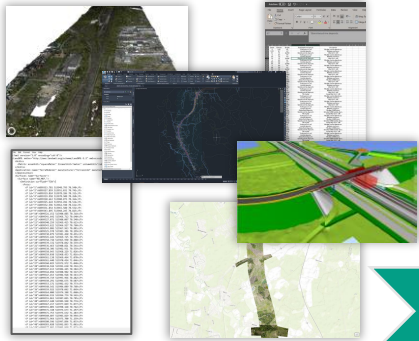
Public Engagement
- Provide official information about Rail Baltica Global Project to public and 3rd parties
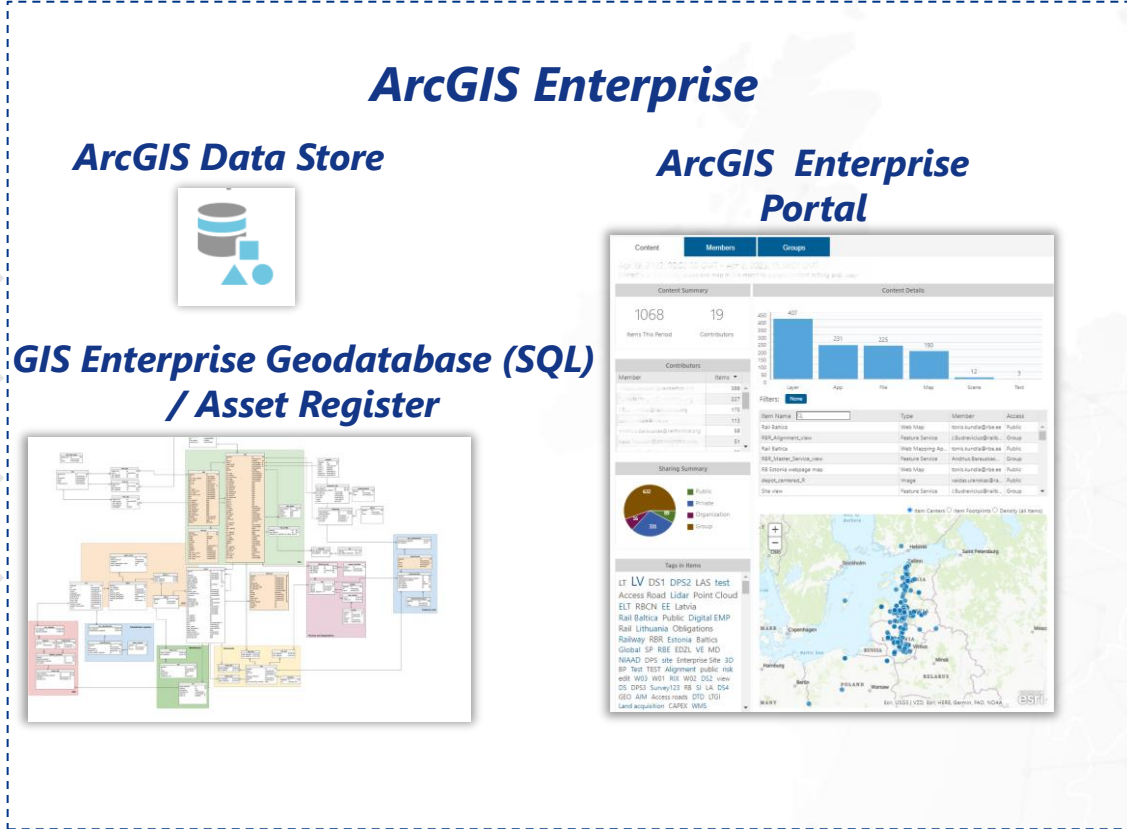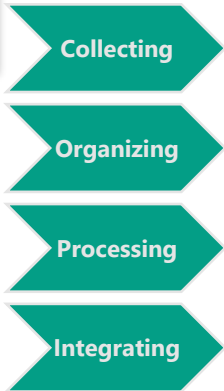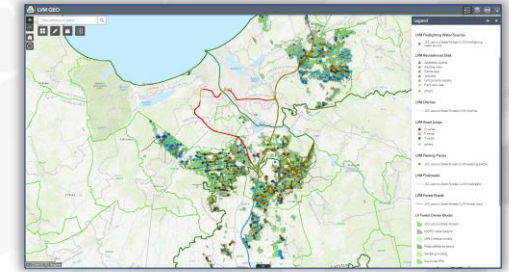- Open Data Portal

GIS

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ArcGIS Pro | ArcGIS Enterprise | ArcGIS Online | ArcGIS Field Maps | ArcGIS Collector | ArcGIS Survey123 | ArcGIS QuickCapture | Operational Dashboard | ArcGIS Sites | Story Maps | ArcGIS AppStudio | Workforce for ArcGIS | Insights for ArcGIS | Drone2Map for ArcGIS

Data Workflows

Design Data

National/Worldwide Databases Open Data Portals

Collecting

Organizing

Processing

Integrating
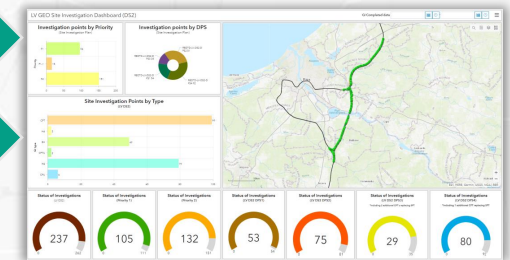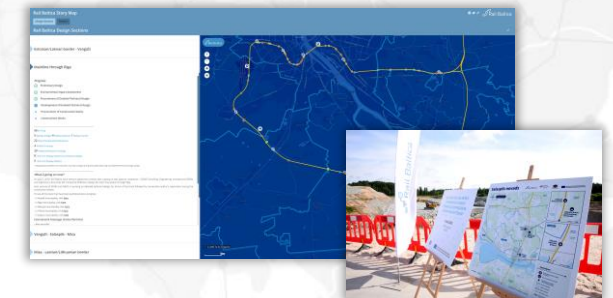
ArcGIS Enterprise

ArcGIS Data Store

GIS Enterprise Geodatabase (SQL) / Asset Register

ArcGIS Enterprise Portal

2D maps

3D Maps

Dashboards

Public Data

2D maps

3D maps

Dashboards

Public data
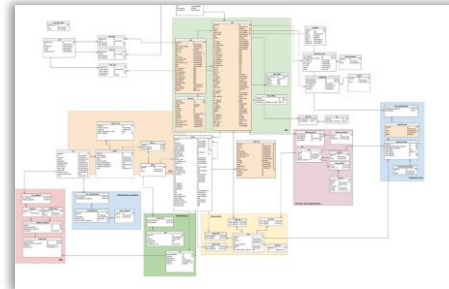
Most important Aspects of Meaningful Construction Supervision

Collecting the Design Data

Collection and Evaluation of Factual Data from Construction Sites

Scheduling and Reporting

Communication and Data Sharing

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Collecting the Design Data

CAD drawings

GIS data

Ortho

Tables

LandXML

BIM

Point Clouds

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Collection and Evaluation of Factual Data from Construction Sites

Field Applications. On-site Data Collection
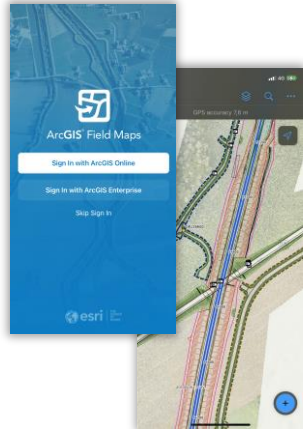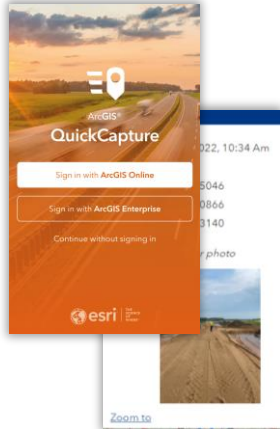
Drones. Quick and Eficient Assessment of the Situation and Data Collection
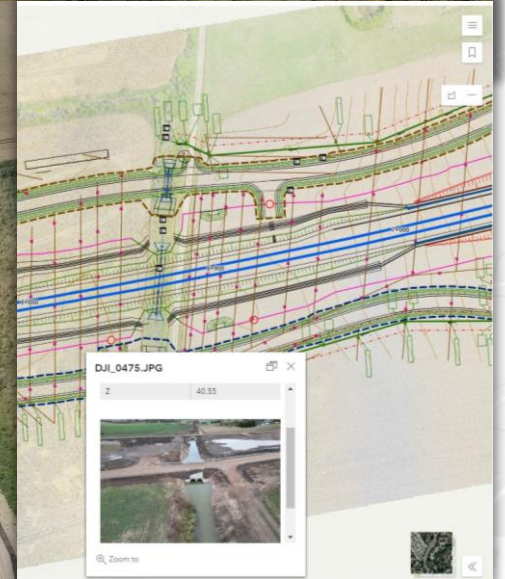
Collection and Evaluation of Factual Data from Construction Sites

BIM and Lidar integration allows a quick and simple comparison between what has been designed (BIM) and what has been built (Lidar)

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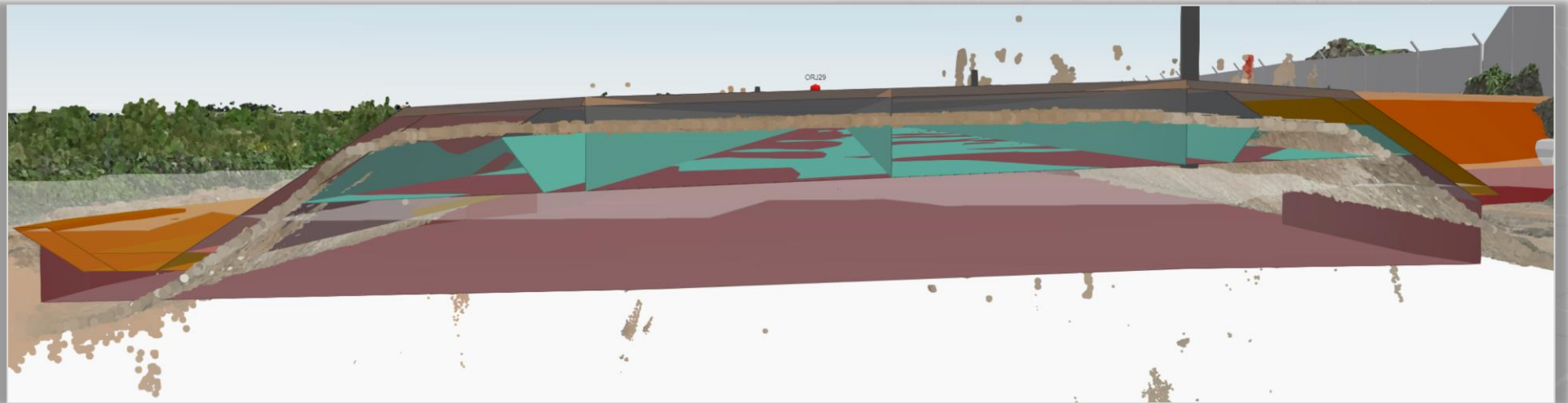
Scheduling & Reporting

Dashboards that provide key information and are available to all parties at any time and in any place
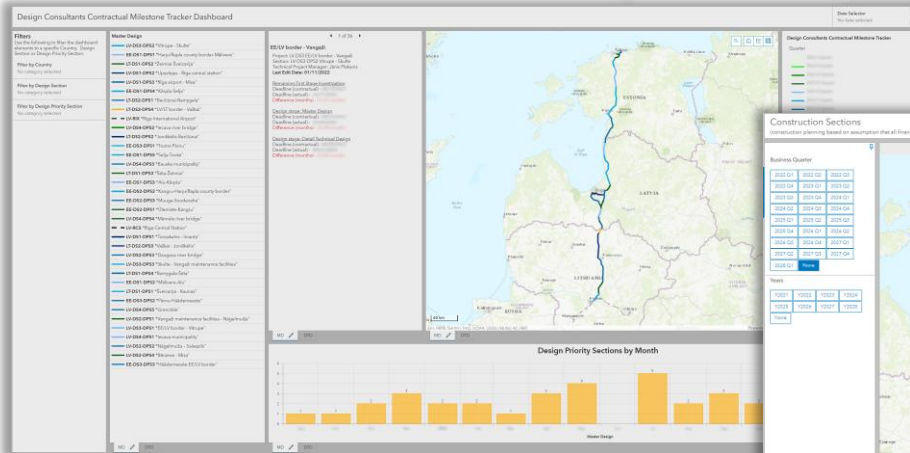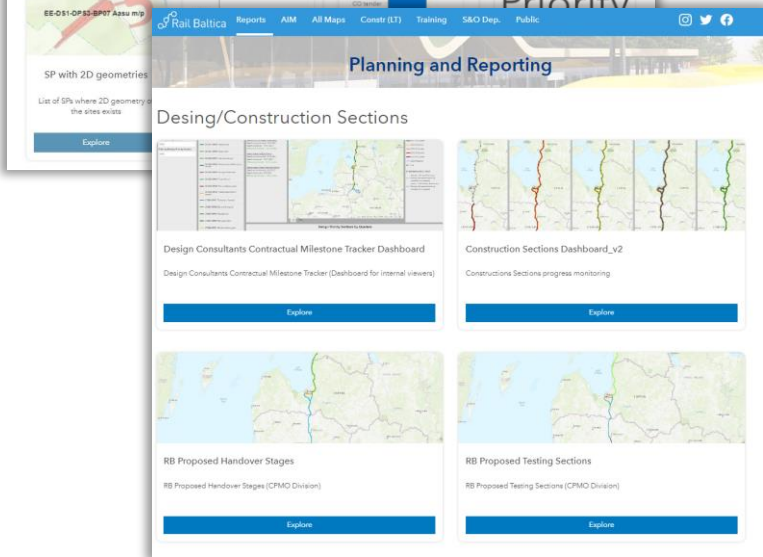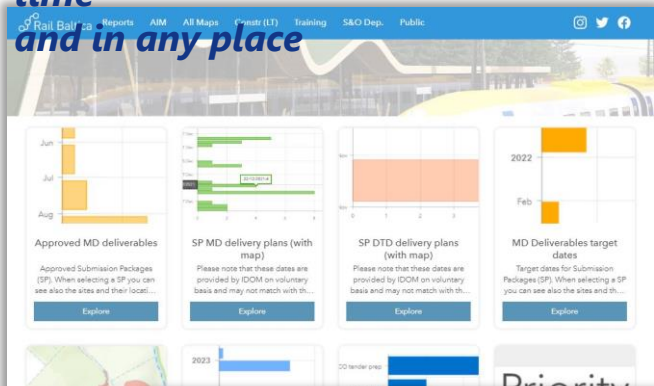
Chronology of Various types of construction work in all 3 countries
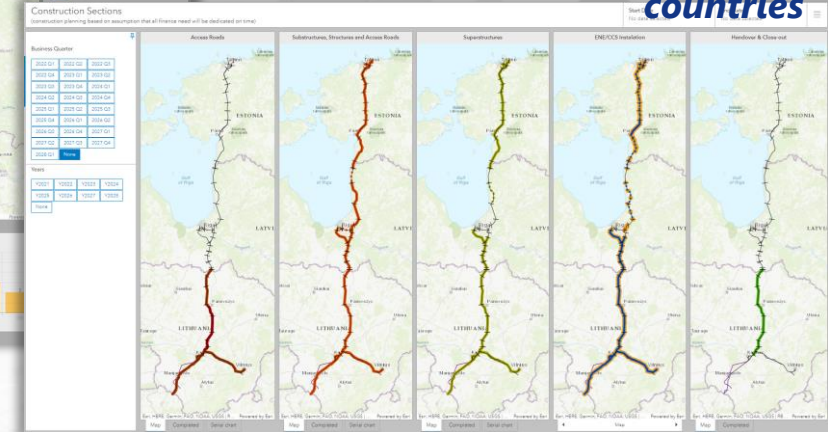
Monitoring the progress of geological investigation
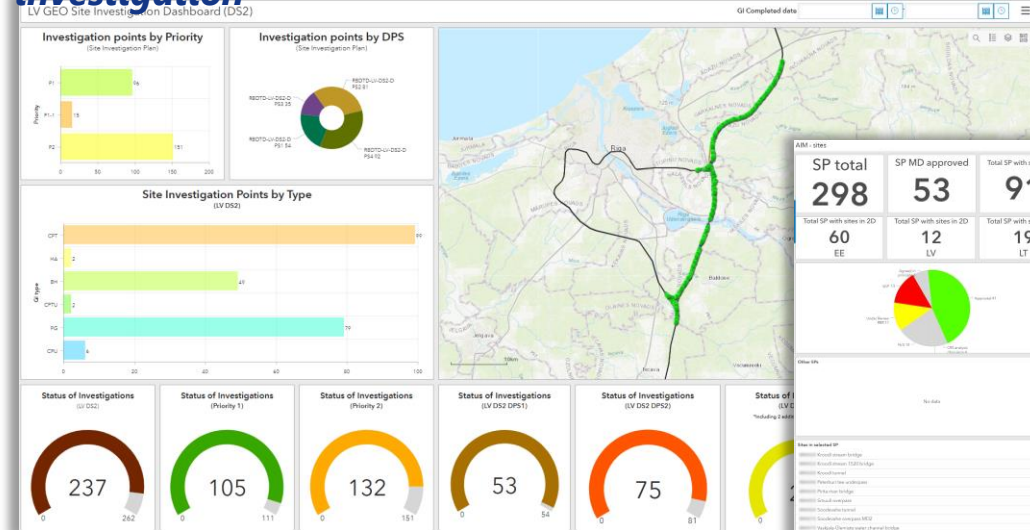
Monitoring the progress of internal processes
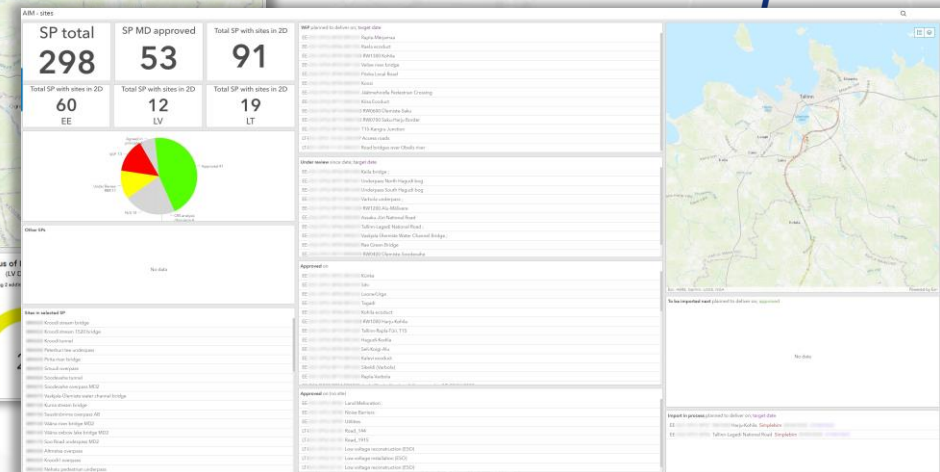
Communication & Data Sharing

2D/3D Maps

Fast and efficient information sharing between all participants in the construction process: implementing bodies, coordinators, contractors.

Sites for Data Sharing

Rail Baltica
Coordinated by RB Rail
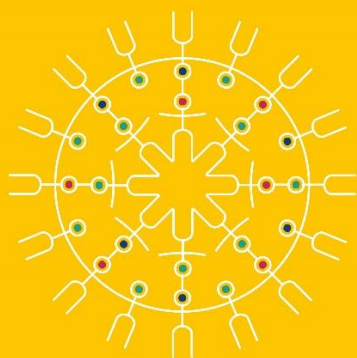
OUR VISION
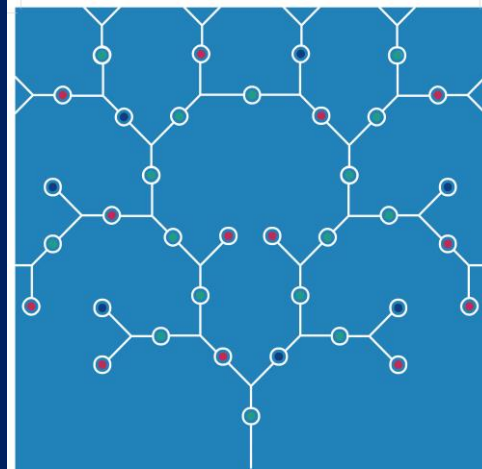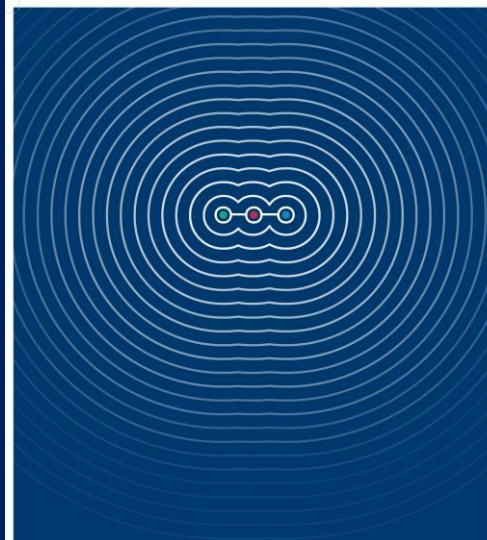
Connected Baltics in a connected Europe

OUR MISSION

We are delivering a seamless mobility for people, goods and services to accelerate social and economic development in the Baltics and beyond

WE VALUE **PEOPLE**

WE VALUE **PROFESSIONALISM**

WE VALUE **PURPOSE**

Thank you!