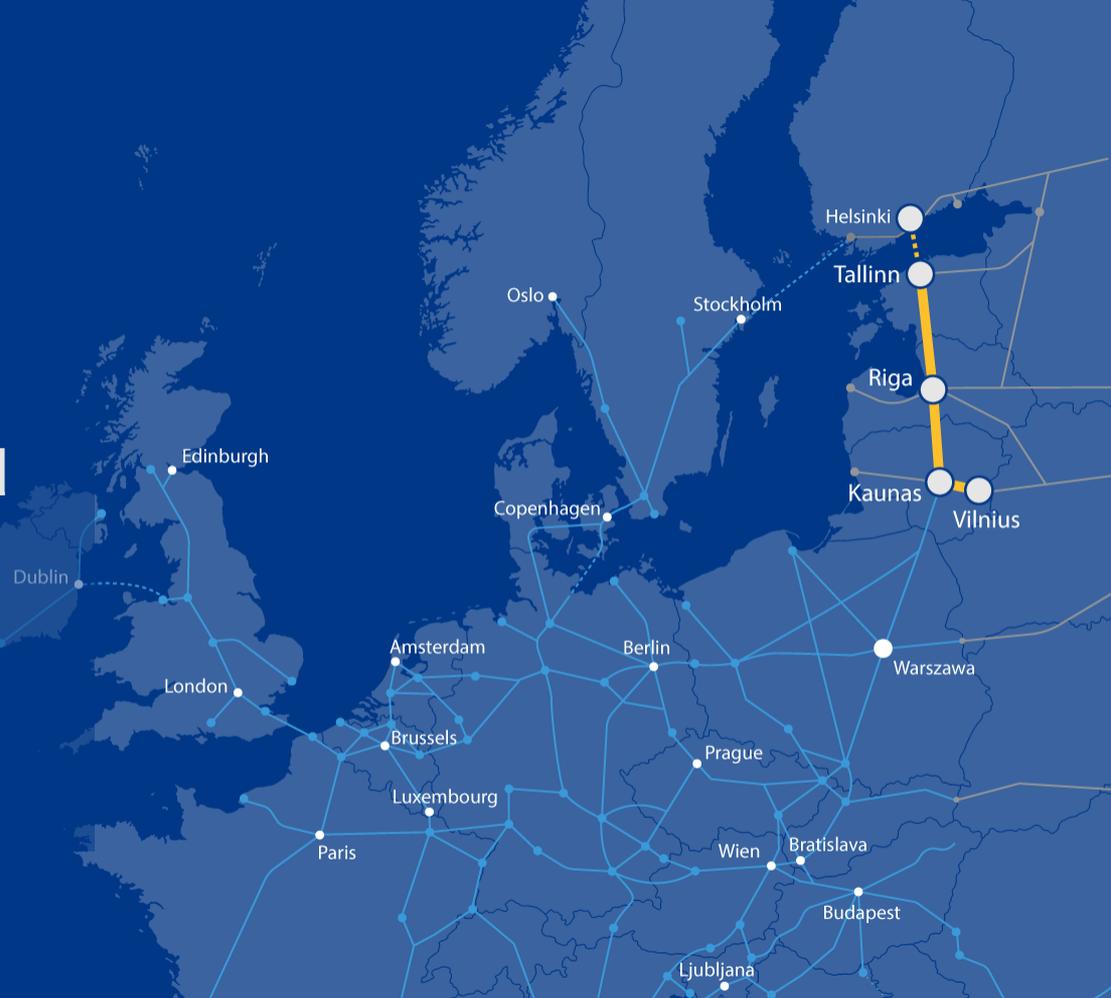


Digitālu procesu ieviešana Rail Baltica projekta ietvaros





Par mani



Raitis Bušmanis

Virtuālās projektēšanas un būvniecības departamenta vadītājs

- RB Rail AS kopš 2018.gada janvāra
- Pirms tam Trimble Solutions Oy
- «Kopā ar BIM» no 2012.gada

Tootsi Station

Kilksama Regional Stop

Rapla <<

Rail Baltica

Turpinās pasažieru termināļu būvprojektēšana un sagatavošanās būvniecībai Ulemistē un Pērnāvā



Sākta būvniecība Rīgas Centrālās stacijas posmā un parakstīts līgums par būvniecības sākšanu RIX



Kaunas

Vilnius

Tallinn

Pärnu

Rīga

RIX



Mūga

Sākta kravas termināļu projektēšana Mūgā un Salaspilī



Salaspils



Kauņa

Projekta statuss 2021



Būvniecība uzsākta visās Baltijas valstīs



Projektam piešķirti papildu EUR 214,3 miljoni no CEF un valstu valdībām, kas kopumā nodrošina EUR 1,2 miljardus globālā projekta īstenošanai



Sākti reģionālo staciju būvprojektu sagatavošanas darbi



Izstrādāta enerģijas apakšsistēmu stratēģija



Izstrādāta Rail Baltica vadības un signalizācijas apakšsistēmu iepirkuma un izvietojanas stratēģija



Nostiprināta globālā projekta plānošanas un riska atskaites ziņojumu sistēma

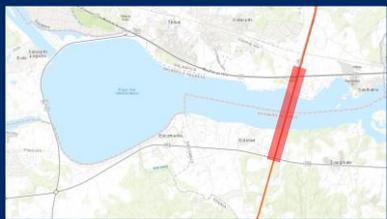
Būvprojekts attīstās 643 km garā pamattrases posmā

Turpinās speciālā plāna izstrāde un ietekmes uz vidi novērtējums



Līdzfinansē Eiropas Savienības Eiropas infrastruktūras savienošanas instruments

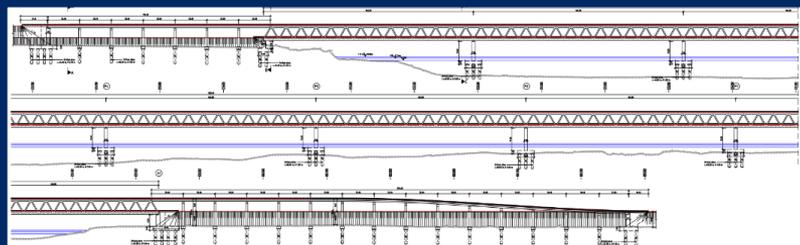
Vairāk par projektu uzzini šeit:
<http://info.railbaltica.org/lv/>

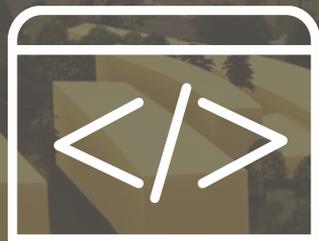


LVC un RB sadarbība Apvienotais tilts pār Daugavu

Galvenie kombinētā tilta tehniskie parametri

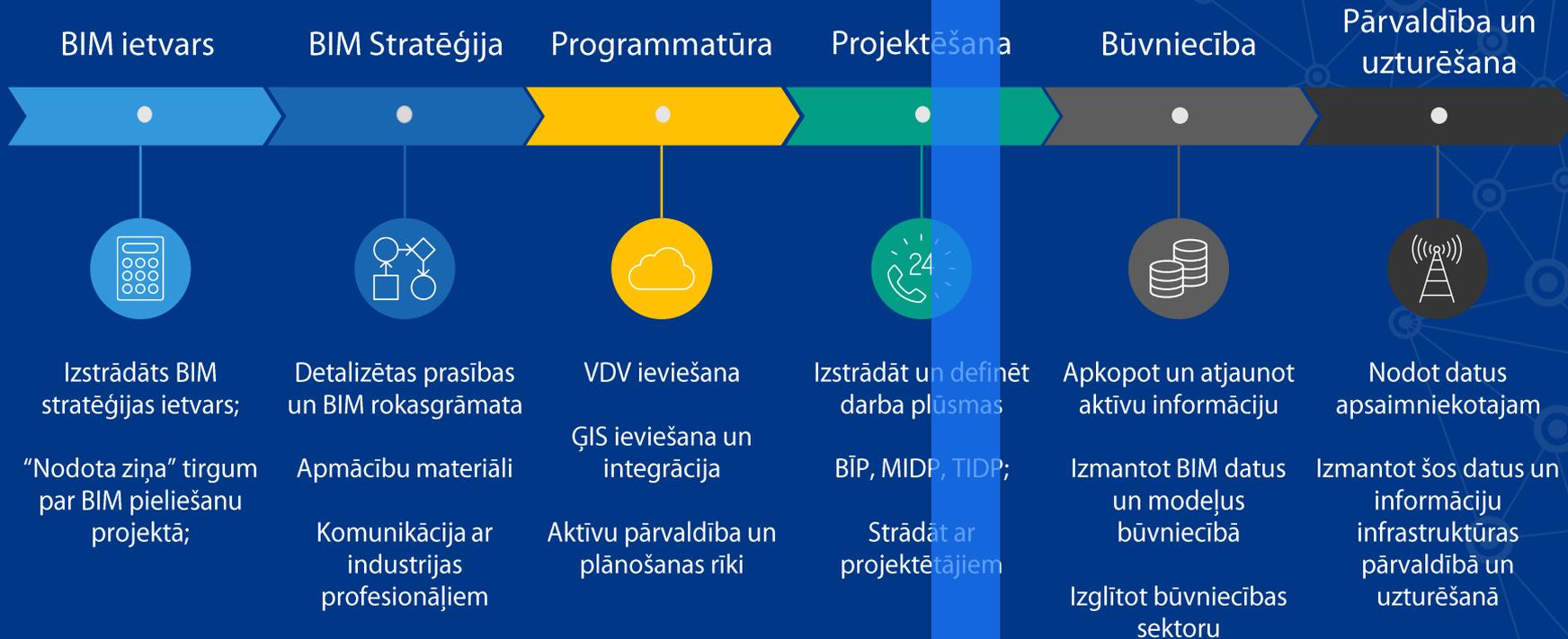
- 2+2 joslu autoceļš,
- 2 ātrvilciena līnijas
- Tērauda kopņu sijas ar 12,00m augstumu
- 7 laidumi (7x165,00m)
- Tilta augstums virs ūdens līmeņa 12,5m





Digitalizācija

Rail Baltica BIM ceļa karte



This is the official website of the Rail Baltica Global Project

Search ... EN

ABOUT RAIL BALTICA BENEFITS NEWS & EVENTS PROJECT IMPLEMENTERS PROCUREMENT **INFO CENTRE →**

RB Rail's BIM documentation

RB Rail AS is currently working towards implementing the BIM Strategy for the Rail Baltica Global Project. The information on the page will be updated regularly to keep you up to date as the project progresses.

DOCUMENTS

Detailed BIM Strategy

A general document that describes the BIM approach for Rail Baltica Global Project. This document sets out a detailed strategy framework for implementing Building Information Management (BIM) on the Rail Baltica Projects. It outlines the strategic BIM goals, defines processes, standards and protocols for the capture, coordination, management and delivery of digital information throughout the lifecycle of design, construction and operation of the assets being delivered.

This document is a part of Design Guidelines.

[Download the file here](#)

BIM Manual (v.18-04-2019)

This document and its supporting ecosystem of documents, forms and templates describe and provide the BIM Strategic processes and workflows to be followed by both Rail Baltica and the Supply Chain during the Lifecycle of the projects, being this ecosystem a live documentation that will evolve during the lifecycle of the Rail Baltica BIM program to capture technological and methodology advancements.

The BIM Manual documentation should be used for all the project phases. Primarily it focuses on the design process and we are continuing to improve it.

This document will be a part of Design Guidelines.

[Download the file here](#)

Building Information Management (BIM) Employer's Information Requirements v2.1

This document sets the requirements according to which the supply chain shall work with BIM systems in order to deliver information to Client – RB Rail or National Implementing Bodies.

This document is a part of Design Guidelines.

[Download the file here](#)

CAD Standards

These standards apply to all drawings (sketches, preliminary, detailed design, construction, shop drawings and asbuilt drawings) and CAD Data (2D or 3D) produced. The intent of these CAD standards is to provide guidelines to ensure that all drawings are prepared to a standard and uniform appearance and reflect high quality workmanship, and that data created by CAD systems is correctly structured and classified to facilitate re-use and understanding by others. This document is not related to any particular Authoring Tool and it will be each Supplier who develops a specific practical standardization for the Authoring Tool to be used in their project, taking as a base this documentation.

This document will be a part of Design Guidelines.

[Download the file here](#)

BEP Template

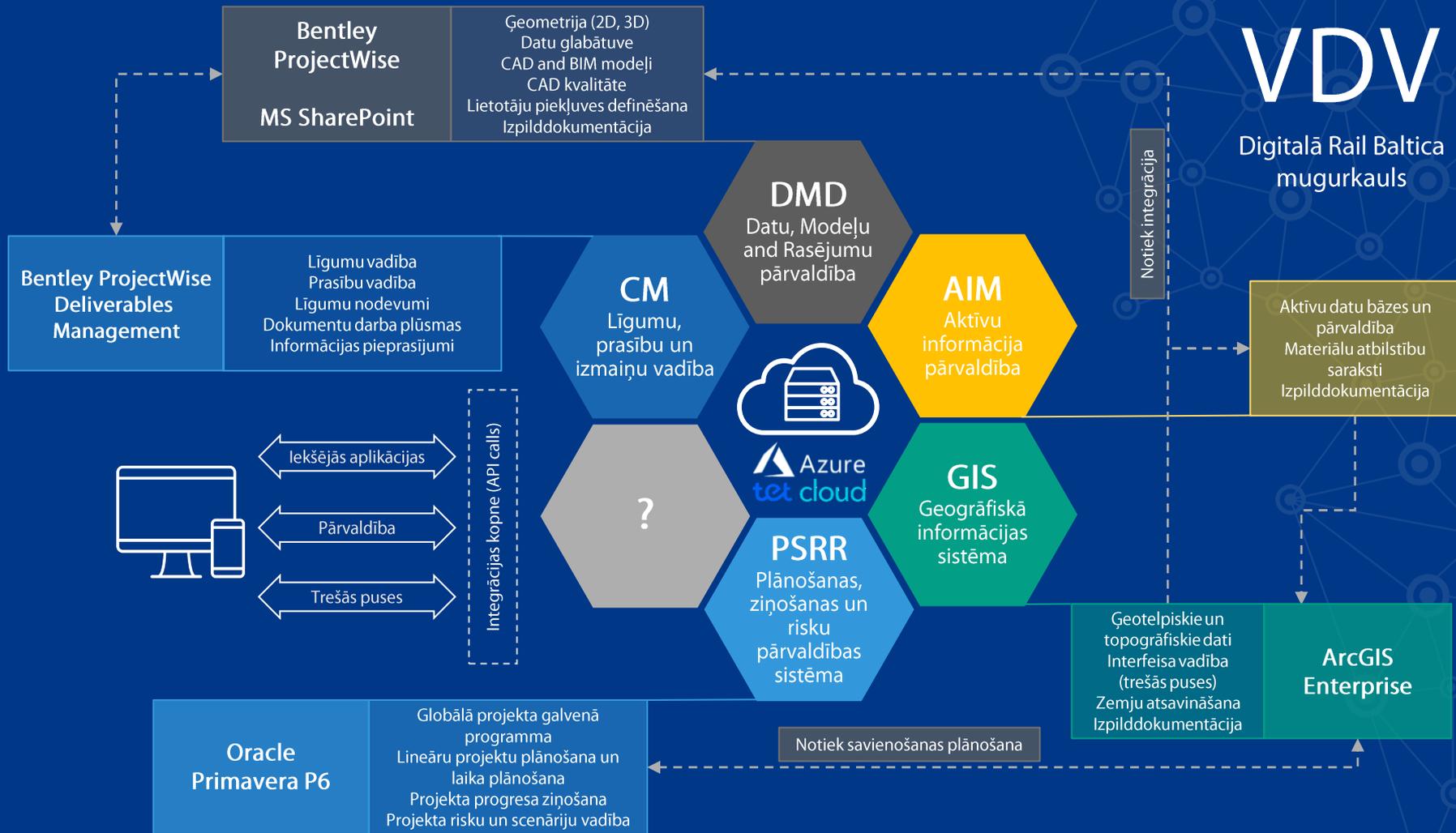
This BIM Execution Plan (BEP) template has been elaborated to be used as the basis for the post-contract BEP. It has to be prepared as a direct response to the BIM EIR and Technical Specifications. The Supplier shall fulfill all the required information in order to show their intention to comply with all the standards and procedures described in the BIM Manual. The Supplier is free to add extra information.

This document is a part of Design Guidelines.

[Download the file here](#)

VDV

Digitalā Rail Baltica mugurkauls

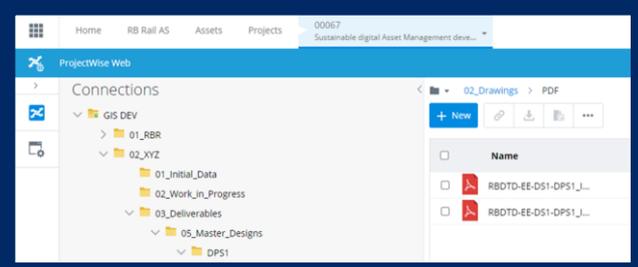
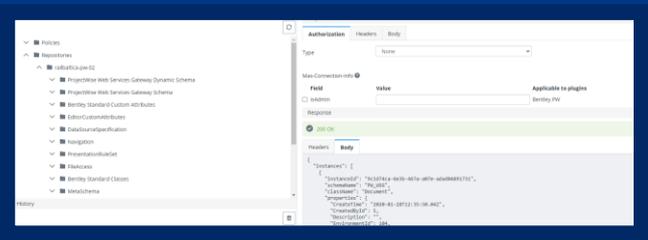
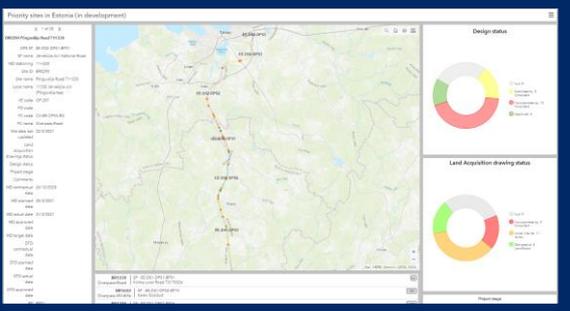


VDV integrācijas plāns

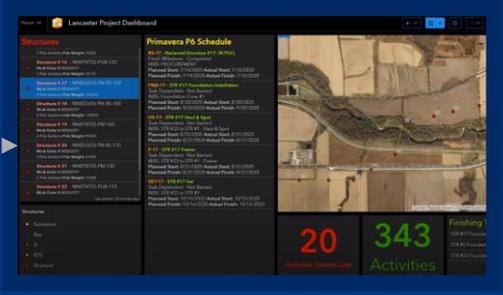
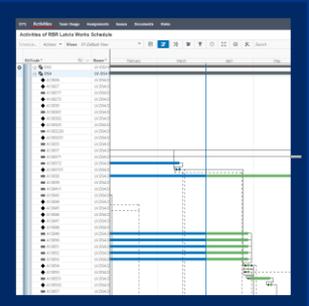
ArcGIS Online

API

Pieklūt informācijai
PW vidē



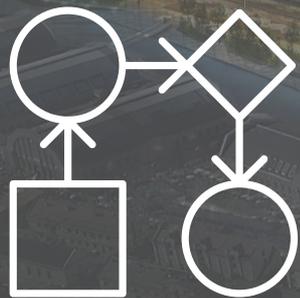
ArcGIS and P6 integrācija



The Solution

- Oracle Primavera P6 EPPM (Enterprise)
- ArcGIS Pro Geoprocessing tool
- Uses P6 web services to retrieve data
- Direct integration with P6 from ArcGIS Pro (no manual export of schedules)
- Supports a large portion of the P6 data model (hundreds of different fields)
- Automated join to a specified feature layer
- Integration with 2D & 3D data
- Geoprocessing tool can be schedule to run at a specified frequency

<https://www.youtube.com/watch?v=3AgxBVEnbCw&t=1035s>
- Integrate Project Schedules with ArcGIS; David Reeves



Rezultāti (līdz šim)

Rīga Central
Station

Projektēšanas posmi

01



Inženierizpētes

Ģeotehniskās inženierizpētes, topogrāfiskie uzmērījumi, Hidroloģiskās izpētes, lāzerskenēšana, utt.

02



Vērtību inženīrija (MBP) (Value Engineering)

Konceptuāla projekta risinājumu izstrāde, lai izvēlētos ekonomiski izdevīgāko vertikālo un horizontālo profilu, būvju tipus, utt. IIA, CAPEX, OPEX.

03



Būvprojekta pamatrisinājumi (Master Design)

Gelvenie būvprojekta pamatrisinājumi ar mērķi uzsākt būvniecības iepirkumu procedūras, precīzāki CAPEX aprēķini, utt.

04



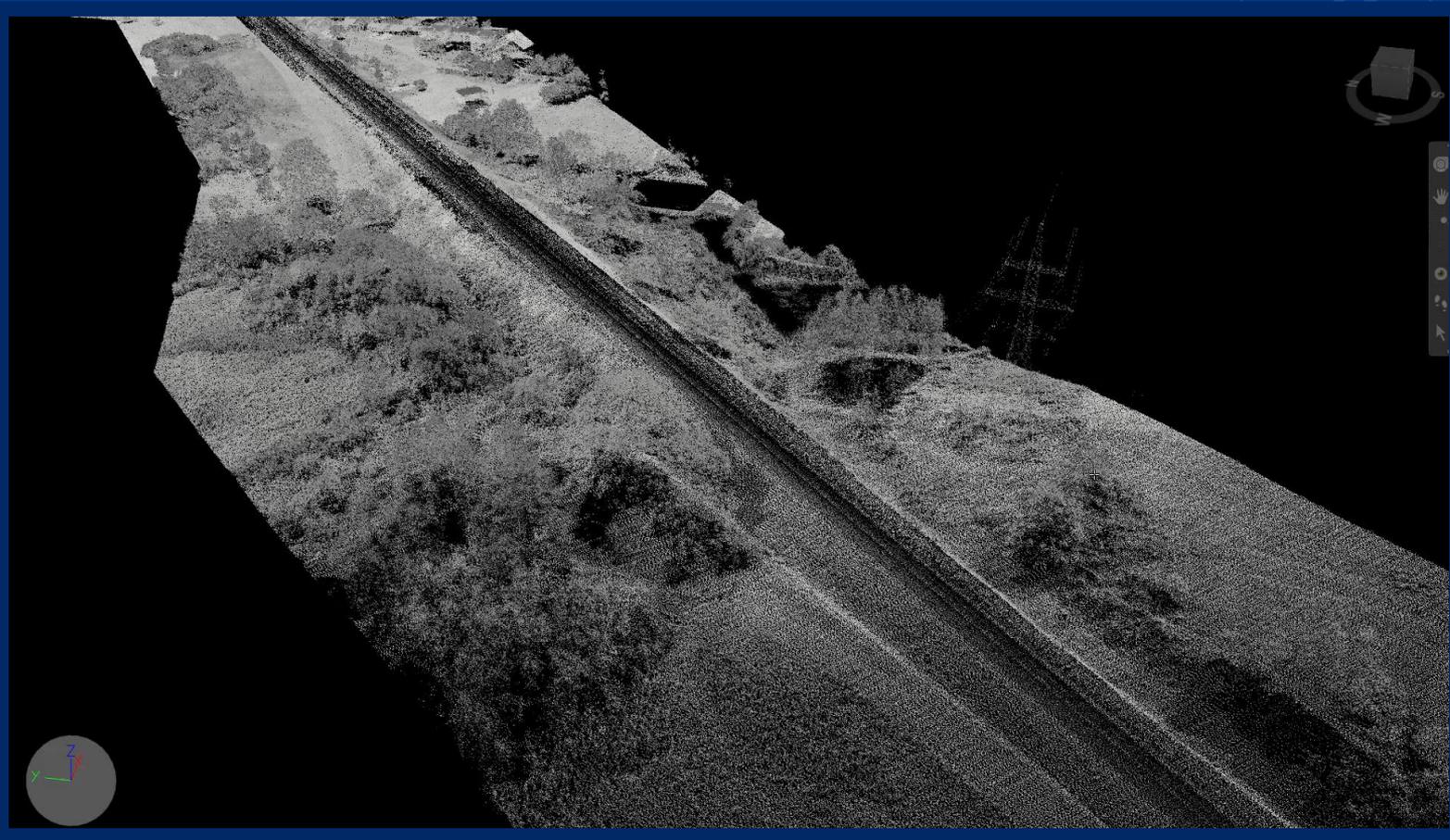
Būvprojekts (Detailed Technical Design)

Detalizēti būvprojekta risinājumi

~LOD 200

~LOD 300

~LOD 400





Filters
Use the following to filter the dashboard elements to a specific Country, Design Section or Design Priority Section.

Filter by Country

None

Filter by Design Section

None

Filter by Design Priority Section

None

Master Design

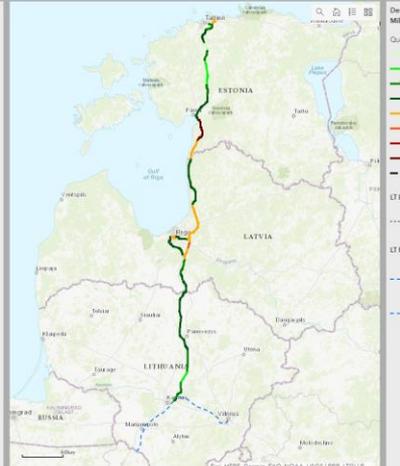
- EE-DS1-DPS1 *Härju/Rapla county border-Mälinvere
- EE-DS1-DPS2 *Mälinvere-Aku
- EE-DS1-DPS3 *Aku-Karula
- EE-DS1-DPS4 *Karula-Saia
- EE-DS1-DPS5 *Saia-Tusti
- EE-DS2-DPS1 *Jämsite-Känguru
- EE-DS2-DPS2 *Känguru/Härju/Rapla county border
- EE-DS2-DPS3 *Mauga-Sooderavahe
- EE-DS3-DPS1 *Tooti-Pärnu
- EE-DS3-DPS2 *Pärnu-Häädemeeste
- EE-DS3-DPS3 *Häädemeeste-EE/LV border
- LT-DS1-DPS1 *Šveicarja - Kaunas
- LT-DS1-DPS2 *Žemaiš-Sveicarja
- LT-DS1-DPS3 *Šeta-Zemaiš
- LT-DS1-DPS4 *Ramygala-Šeta
- LT-DS2-DPS1 *Berčiūnai-Ramygala
- LT-DS2-DPS2 *Joniskėlis-Berčiūnai
- LT-DS2-DPS3 *Vidukai - Joniskėlis
- LT-DS2-DPS4 *LVL17 border - Vaskai
- LV-DS1-DPS1 *Horsalkains -Imanta
- LV-DS1-DPS2 *Opatšalkas -Rīga central station
- LV-DS1-DPS3 *Rīga airport - Mītaš
- LV-DS2-DPS1 *Vangadi maintenance facilities -Nāgelmūža
- LV-DS2-DPS2 *Nāgelmūža - Salaspils
- LV-DS2-DPS3 *Daugava river bridge

EE/LV border - Vangadi
Project: LV-DS2-DPS2 Vihur - Skulte
Technical Project Manager: Jānis Piskars
Last Edit Date: 9/4/2021

Remaining First Stage Investigation
Deadline (contractual): 8/12/2021
Deadline (actual): 18/11/2021
Difference (months): -0.62 months

Design stages: Master Design
Deadline (contractual): 8/12/2021
Deadline (actual): 15/11/2021
Difference (months): -0.75 months

Design stages: Detail Technical Design
Deadline (contractual): 8/9/2022
Deadline (actual): 8/8/2022
Difference (months): -1.02 months



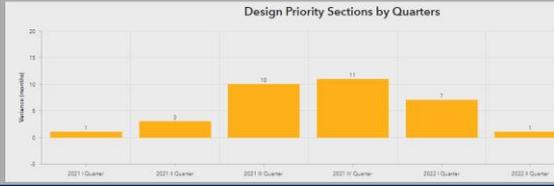
Design Consultants Contractual Milestone Tracker

Quarter (MD)

- 2021 I Quarter
- 2021 II Quarter
- 2021 III Quarter
- 2021 IV Quarter
- 2022 I Quarter
- 2022 II Quarter
- 2022 III Quarter
- 2022 IV Quarter
- None

LT DPS Borders

- Borders of Design Priority Sections
- Kaunas - Vilnius, Preliminary
- Design the spatial planning process is in progress
- Jaisa - LT/PL border
- Preliminary Design (the spatial planning process is in progress)



GIS – Nodevumu «izsekošana»

Priority sites in Estonia (in development)

1 of 23

880290 Põrguajä Road T11330

DPS ID: EE-DS2-DPS1-8P01
 SP name: Jämsite-Joni National Road
 MD stationing: 1+1000
 Sit ID: 880290
 Site name: Põrguajä Road T11330
 Local name: 11330 Jämsite-Joni Põrguajä tee
 VE code: OP-207
 PD code: -
 FC code: CV-88-OP50-RD
 FC name: Overseas Road
 Site data last updated: 22/3/2021
 Land acquisition drawing status: -
 Design status: -
 Project stage: -
 Comments: -
 MD approved date: 24/10/2020
 MD planned date: 25/3/2021
 MD actual date: 31/5/2021
 DTD contractual date: -
 DTD planned date: -
 DTD actual date: -
 DTD approved date: -
 SP: 8P01
 CO: 880
 Type: 0
 DPS: EE-DS2-DPS1
 DS: EE-DS2
 GIS ID: 1316

Design status

- Not 0
- Submitted to 5 Customers
- Supplements to 11 owner
- Approved 4

Land Acquisition drawing status

- Not 0
- Submitted to 5 Customers
- Approved to 5 Land Owner

Project stage

Site ID	Count
Not	1
MD	20

Site List:

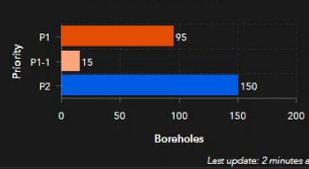
- BR2230** | SP: EE-DS1-DPS1-8P01 | Overpass Road | Kõrva Looke Road T3170206
- BR1650** | SP: EE-DS1-DPS2-8P10 | Overpass Wildlife | Põrguajä National Road T201113 | Kõrva Eelalust
- BR2745** | SP: EE-DS1-DPS2-8P06 | Overpass Wildlife | Põrguajä National Road T201113
- BR2710** | SP: EE-DS1-DPS1-8P04 | Overpass Road | Tõlgil Looke Road T11701199
- BR1300** | SP: EE-DS1-DPS3-8P08 | Overpass Road | Kärme-Põlme National Road T201149
- BR0380** | SP: EE-DS2-DPS2-8P02 | Overpass Road | Kõrva-Ciela National Road T11182
- BR1220** | SP: EE-DS1-DPS1-8P10 | Overpass Road | Põlme-Põlme National Road T16 Kõrva
- BR1285** | SP: EE-DS1-DPS1-8P04 | Overpass Road | Põlme-Põlme National Road T27
- BR1420** | SP: EE-DS1-DPS1-8P03 | Overpass Wildlife | Kõrva Eelalust

LV DS1 GI Status monitoring

GI Completed date: [Calendar icon] [Clock icon]

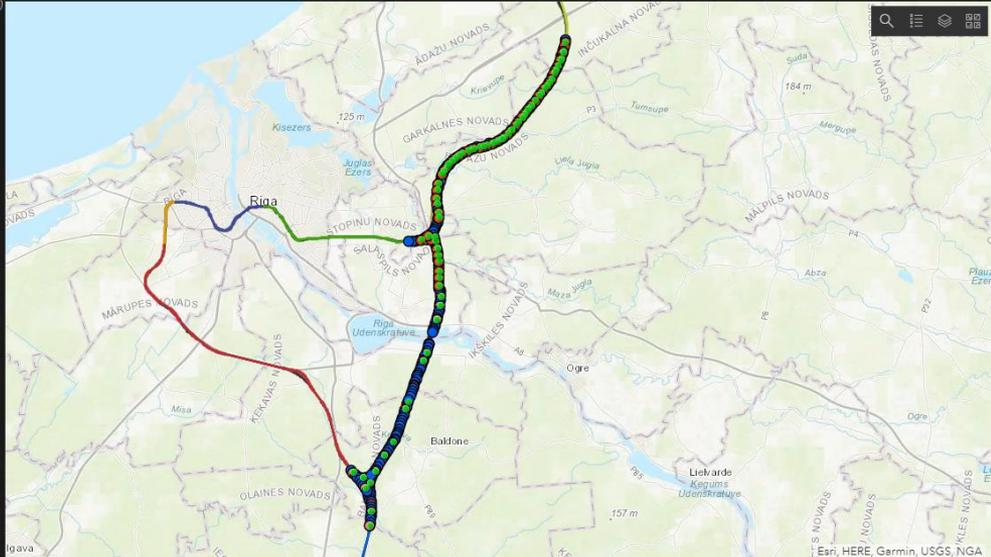
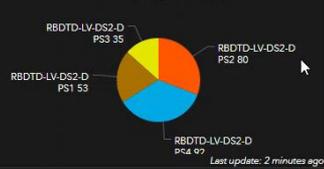
Investigation points by Priority

(Site Investigation Plan)



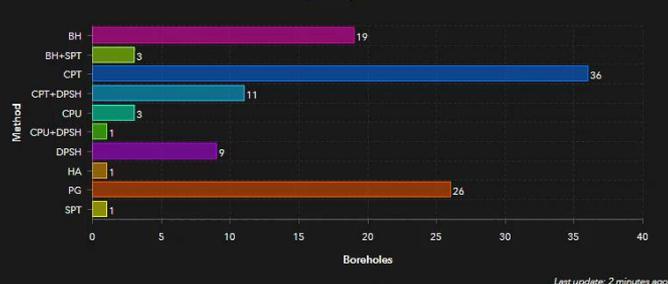
Investigation points by DPS

(Site Investigation Plan)



Geotechnical Investigation points by Method

(LV DS2)



Geotechnical Investigation Completed

(LV DS2)



Geotechnical Investigation Completed P1

(LV DS2)



Geotechnical Investigation Completed P2

(LV DS2)



Geotechnical Investigation Completed

(LV DS2 DPS1)



Geotechnical Investigation Completed

(LV DS2 DPS2)



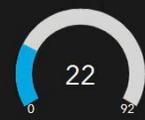
Geotechnical Investigation Completed

(LV DS2 DPS3)



Geotechnical Investigation Completed

(LV DS2 DPS4)

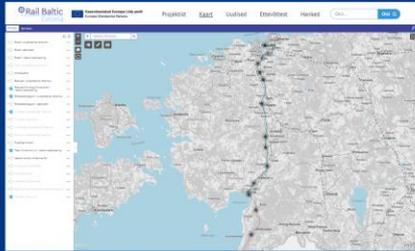


Global Project Partners Engagement

RB Rail AS & Rail Baltic Estonia OÜ

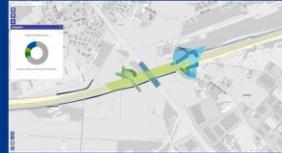
Sharing common environment and data creates new cooperation opportunities between project coordinators and implementing bodies

Public Map



<https://rbestonia.ee/>

Land Acquisition

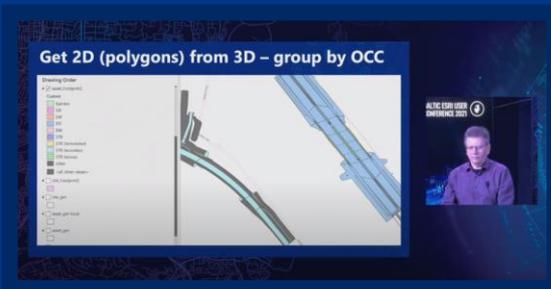
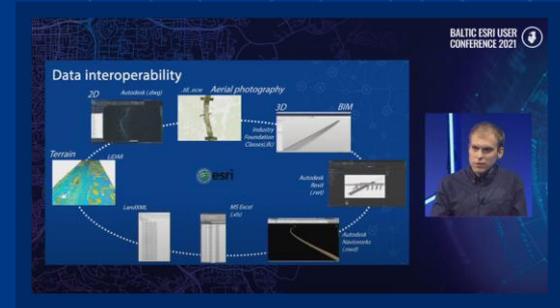


3D
BIM + GIS data



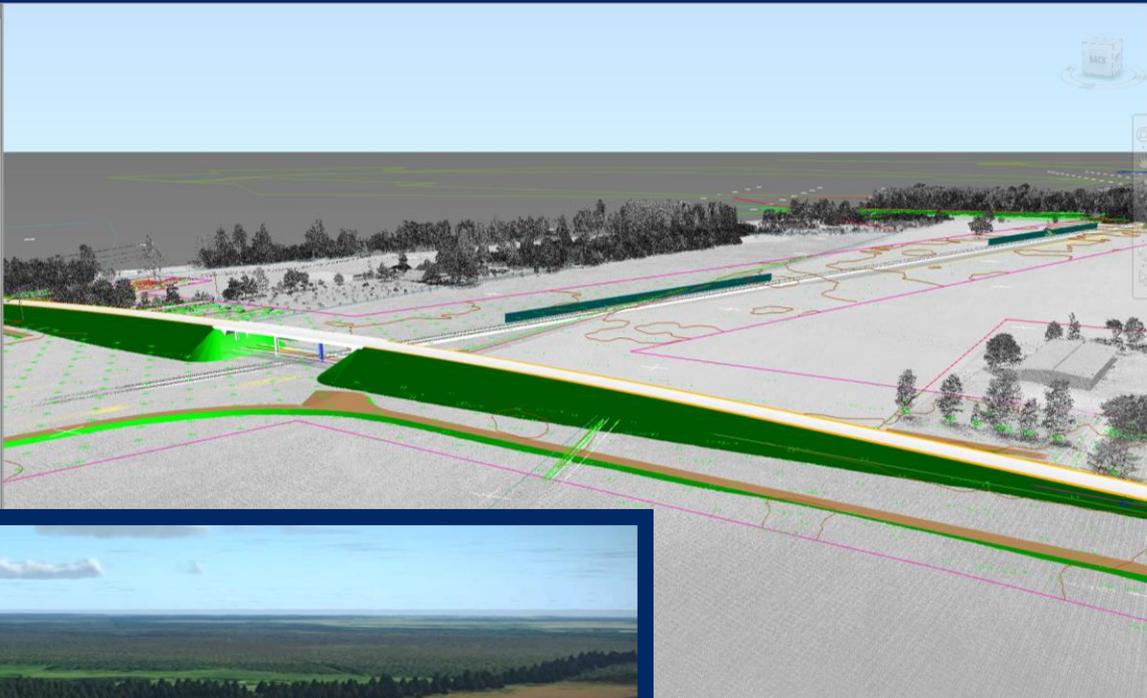
Rail Baltic Estonia OÜ
Tõnis Kundla
GIS Specialist
E-mail: tonis.kundla@rbe.ee

Baltic Esri User Conference
<https://youtu.be/ahAEmb0sRVU?t=6407>



Selection Tree

- EE DTD DSI-DPS2.rcp
 - RRBTD-EE-DS1-DPS2_IDO_1111-11_1111_11_11_11_AA_VI_00001_002.rwd
 - RRBTD-EE-DS1-DPS2_SKP_0000-11_1111-11_RTI-11_VE_00001_002.rfc
 - RRBTD-EE-DS1-DPS2_IDO_CP-636-11_0004_B_STR-1S_VE_00001_001.rfc
 - RRBTD-EE-DS1-DPS2_SKP_OV-232-11_0017_B_BR-1S_VE_00001_002.rfc
 - RRBTD-EE-DS1-DPS2_SKP_OV-337-11_0001_B_BR-1S_VE_00001_002.rfc
 - RRBTD-EE-DS1-DPS2_IDO_CP-616-11_0016_B_BR-1S_VE_00001_002.rfc
 - RRBTD-EE-DS1-DPS2_IDO_OV-004-11_0005_B_BR-1S_VE_00001_002.rfc
 - RRBTD-EE-DS1-DPS2_IDO_BR-102-11_0006_B_BR-1S_VE_00001_001.rfc
 - RRBTD-EE-DS1-DPS2_IDO_0000-11_1111_B_GP-AA_VE_00001_001.rfc
 - RRBTD-EE-DS1-DPS2_IDO_0000-11_1111_B_RTI-TR_VE_00001_001.rfc
 - RRBTD-EE-DS1-DPS2_SKP_OV-014-11_0015_B_BR-1S_VE_00001_001.rfc
 - RRBTD-EE-DS1-DPS2_SKP_OV-235-11_0014_B_BR-1S_VE_00001_001.rfc
 - RRBTD-EE-DS1-DPS2_IDO_0000-11_1111_B_RW-TR_VE_00001_002.rfc
 - RRBTD-EE-DS1-DPS2_SKP_OV-335-11_0006_B_BR-1S_VE_00001_002.rfc
 - RRBTD-EE-DS1-DPS2_TO.dwg

Properties

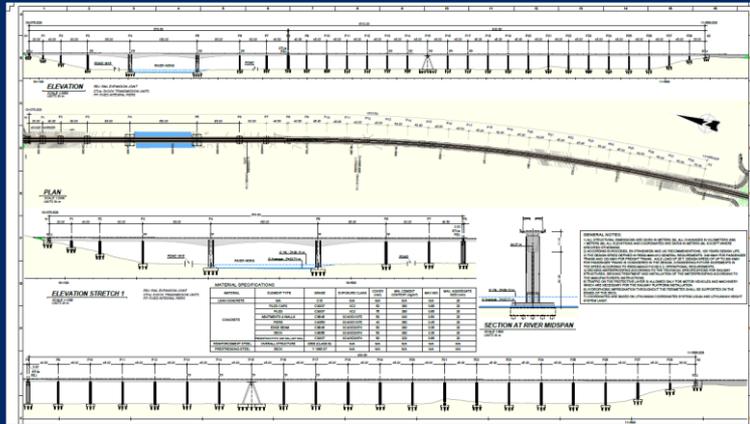
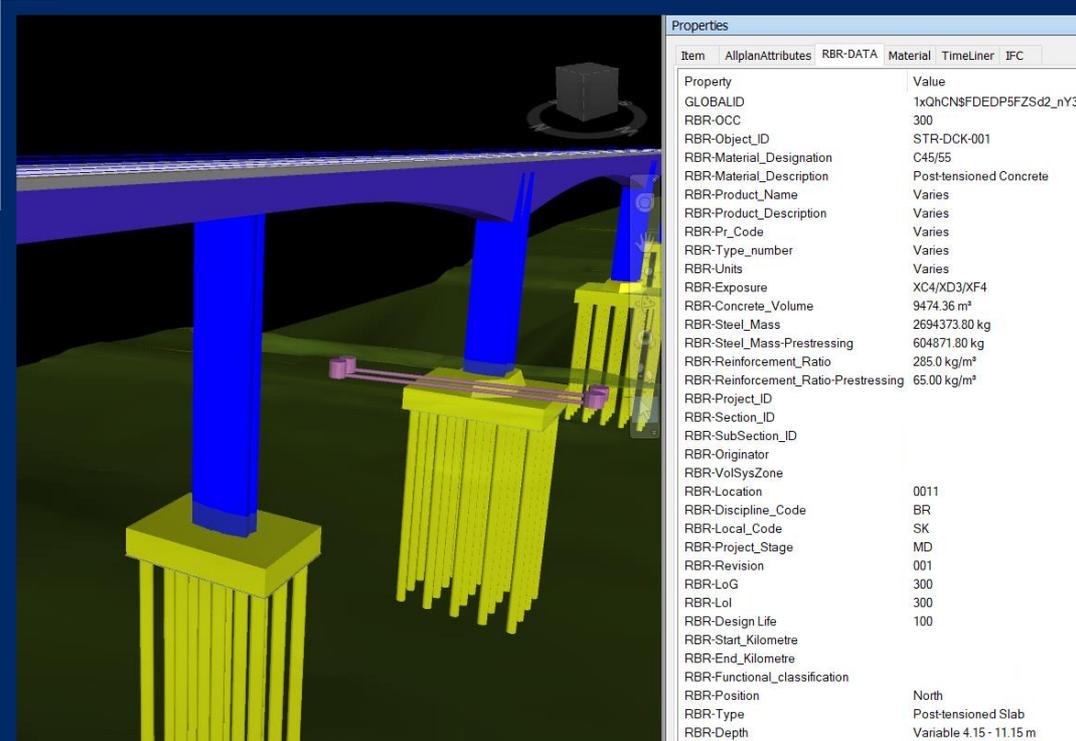
Item	Material	IFC	Member_Mark	Member_Mark	LOD	Spei
GLOBALID						3ary_5u7v5bwoP3G09jggT
RBR-Project_ID						RBDT-EE
RBR-Station_ID						DS1
RBR-SubSection_ID						DPS2
RBR-Originator						SKP
RBR-VolSysZone						OV-337-ZZ
RBR-Discipline_Code						BR
RBR-Location						0001
RBR-Functional_classification						CV-6R-OBSU-00

IDOM

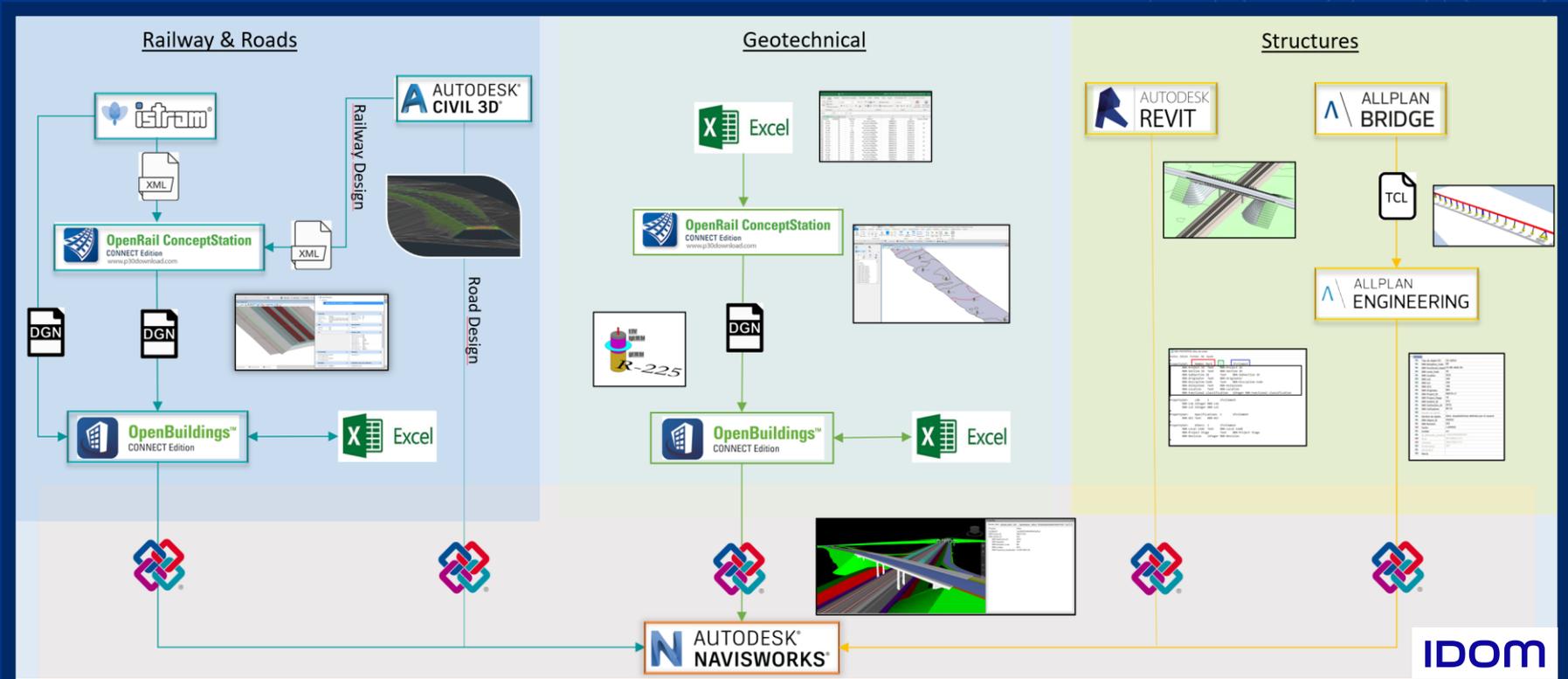


Savietotais modelis tiek izmantots vizualizāciju izveidei

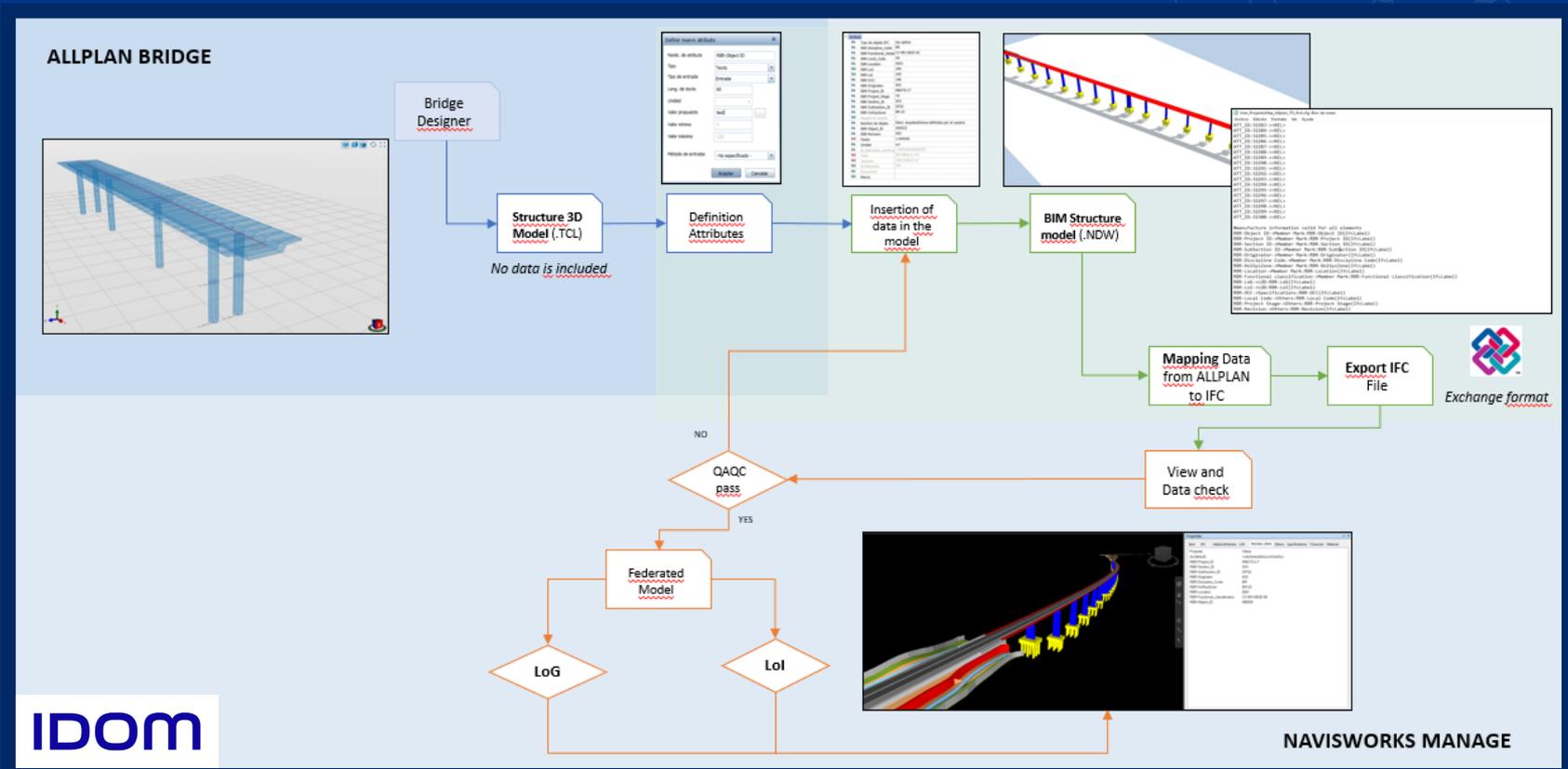
BIM process – rasējumi un modeļi



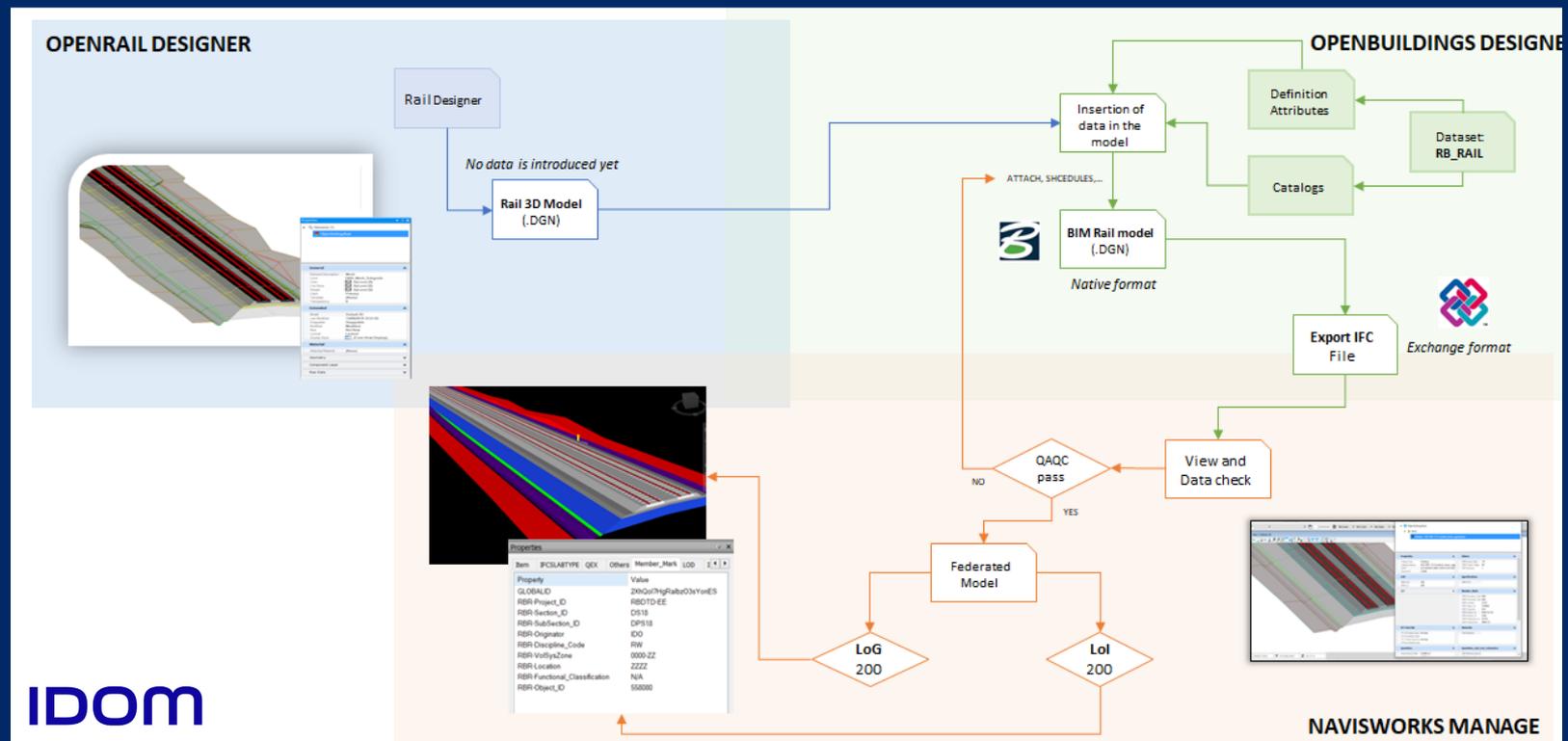
Disciplīnu modeļi – darbaplūsma, lai radītu BIM modeļus

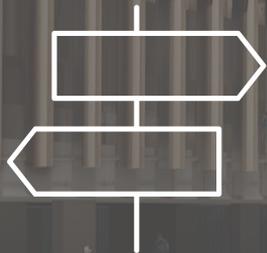


Disciplīnu modeļi – darbapļūsma, lai radītu BIM modeļus



Disciplīnu modeļi – darbaplūsma, lai radītu BIM modeļus





Atziņas

RIX Airport
Station

Atziņas

01



Skaidra prasību definēšana

BĪP

Tam ir jāatspoguļo BIM PIP un līgumā iesaistītajām pusēm tas ir jāapstiprina projekta sākuma fāzē, bet projektam progresējot, tas ir jāpārskata un jāatjauno ar aktuālo informāciju.

02



Sekot līdzī progresam

Pasūtītāja uzdevums

Pasūtītājam ir jāseko līdzī progresam. Pasūtītājam ir jābūt iesaistītam un jābūt attiecīgām zināšanām Pasūtītājam ir jāsaprot, kas tiek piegādāts.

03



Visiem ir jānācās

Pasūtītājs un piegādātājs

Visu pušu iesaistītajām komandām ir jānācās, Sākuma fāzes un pilotprojekti kalpo kā mācību process tālākām attīstības fāzēm.

04



Pieprasīt rezultātus

Līgums ir jāpilda

«...mēs tā parasti nedarām...» nav pieļaujams. Ja līguma prasība ir ievērot BĪP, tad tas ir jādara. Abām pusēm jāievēro līgumsaistības.

Atziņas

05



Elastība

Līdz zināmai robežai

Pārāk liela elastība, ļauj lietas interpretēt, bet kopīgi risinājumi ir jāatrod.

Komunikācija ir ļoti svarīga.

06



Kopaina

Pasūtītājam ir skaidri jāsaprot, kāpēc tas tiek darīts

Projektētāji un būvnieki mainās, bet pasūtītājam ir jāzin kāpēc tas ievieš digitalizāciju un kā šī informācija tiks izmantota.

07



BIM nav viens pats

AIM, ĢIS, etc.

Aktīvu vadības sistēmas, ĢIS, projektu plānošana un vadība. Dažādu sistēmu lietošana dažādiem mērķiem, bet izmantojot vienu un to pašu informāciju.

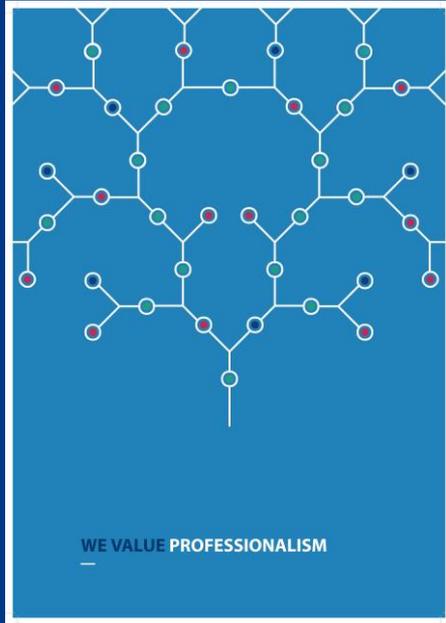
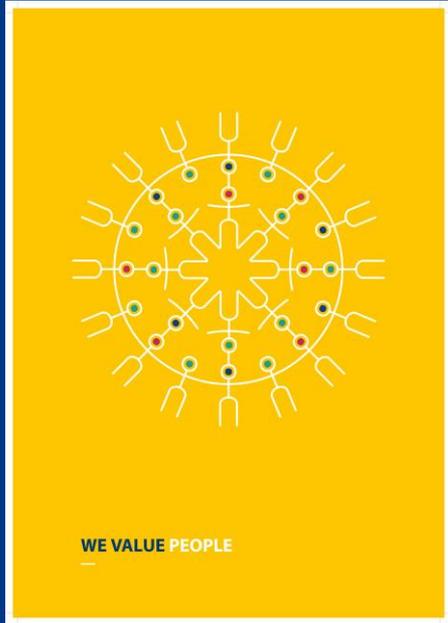
08



Tas nav vienkārši

Jaunas lietas ir sarežģītas

Tas prasa laiku un resursus. Ir ļoti viegli pazaudēt mērķi un padoties. Pareizie cilvēki ļoti palīdz, bet lielākā daļa sākumā pretojas. Pareizos cilvēkus ir ļoti grūti atrast.



Paldies!

