



Working with innovation development and innovation integration in to the Ramboll work process. Also leading for InfraWorks development team, working with data management and data flow, conceptualization and data visualization, also working in identification of value in innovative engineering opportunities or solutions. Chairing and driving innovation and digitalization workshops and meetings. I'm working with design reviews for both coordination and management parts. Working on production and management of the innovation program.





• Independent engineering and design consultancy and provider of management consultancy

• Founded 1945 in Denmark

• 14,000 experts

• Close to 300 offices in 35 countries

• Particularly strong presence in the Nordics, the UK, North America, Continental Europe, Middle East and Asia Pacific

• EUR 1.4 billion revenue

Owned by Rambøll Fonden



GEOGRAPHICAL FOOTPRINT



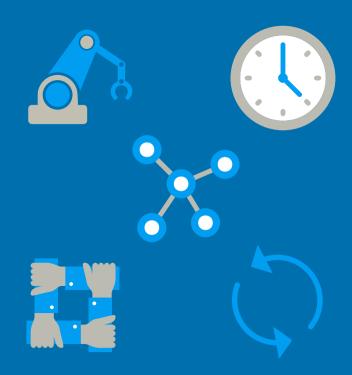
MARKETS





ADVANCED DATA FLOWS AND VISUALIZATION THROUGH INFRAWORKS

- How to accelerate the transition to connected BIM for infrastructure with improved efficiency and project approvals through an end-to end design approach using InfraWorks software as the aggregator and design data visualizer.
- We will walk through one of our road projects where I'll try to demonstrate the data collection solutions we're using in our daily data flow.
- What is our techniques and workflow include high-end existing modelling conditions, road design representations in InfraWorks combined with built-in road and bridge design tools, ArcGIS Data collection and presentation in InfraWorks, Ramboll Risk Management data representation in InfraWorks, BIM 360 as collaboration tool for InfraWorks, InfraWorks data flow for 3ds Max software or Forge in the future, advanced visualization—virtual reality (VR), augmented reality (AR)—and more.
- What is our leading practices using InfraWorks for data visualization and aggregation.



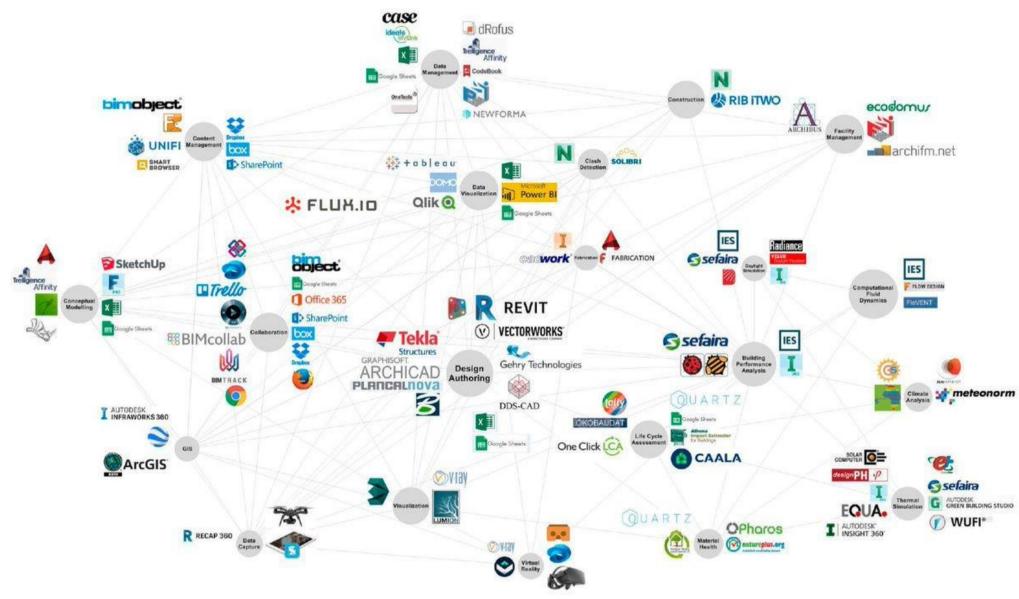


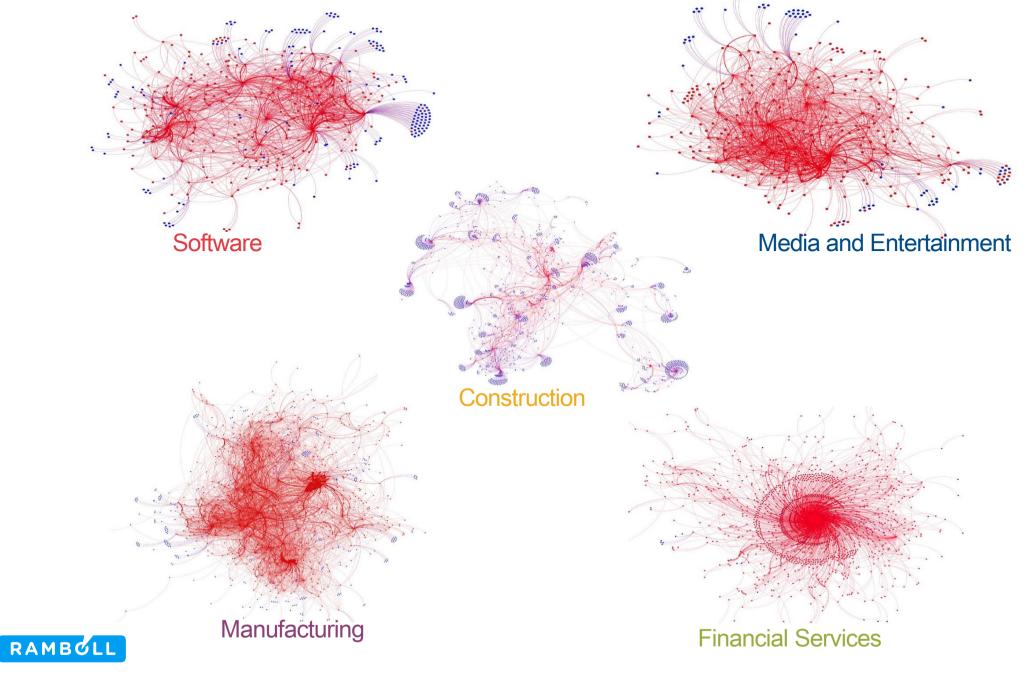


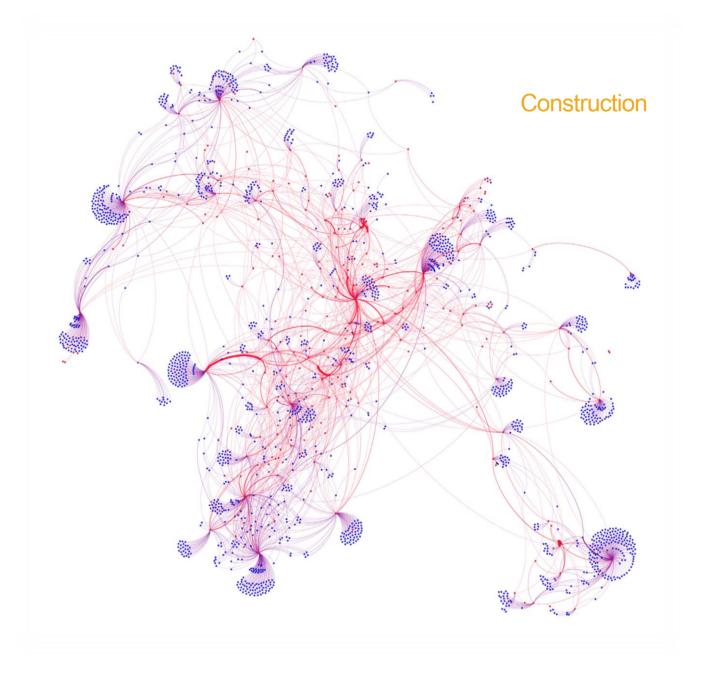
We Have The Tools

Concentration on PROBLEM









DESIGN PHASE

VISUALIZATION

CONSTRUCTION PHASE

DESIGN REVIEW

COMMUNICATION

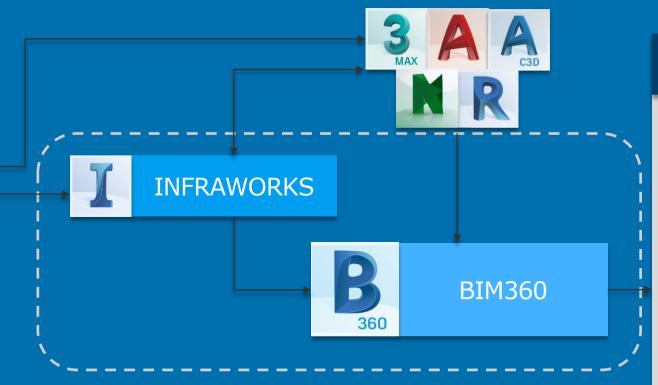
DRAWINGS - DOCUMENTATION

Visualize / Comment / Adjust / Share

Client / Public

Client / Building Operations





Manage the entire project lifecycle with BIM 360

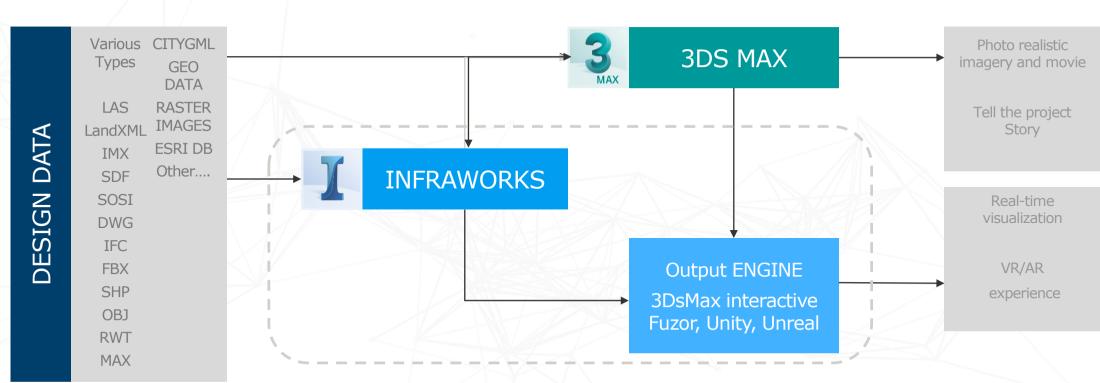
- **Controlled Work-sharing**
- Deliverable Coordination
- **Design Review**
- BIM Coordination
- Change Visualization
- Quality Management
- Construction Safety
- Issue Management
- RFIs Submittals



CASES

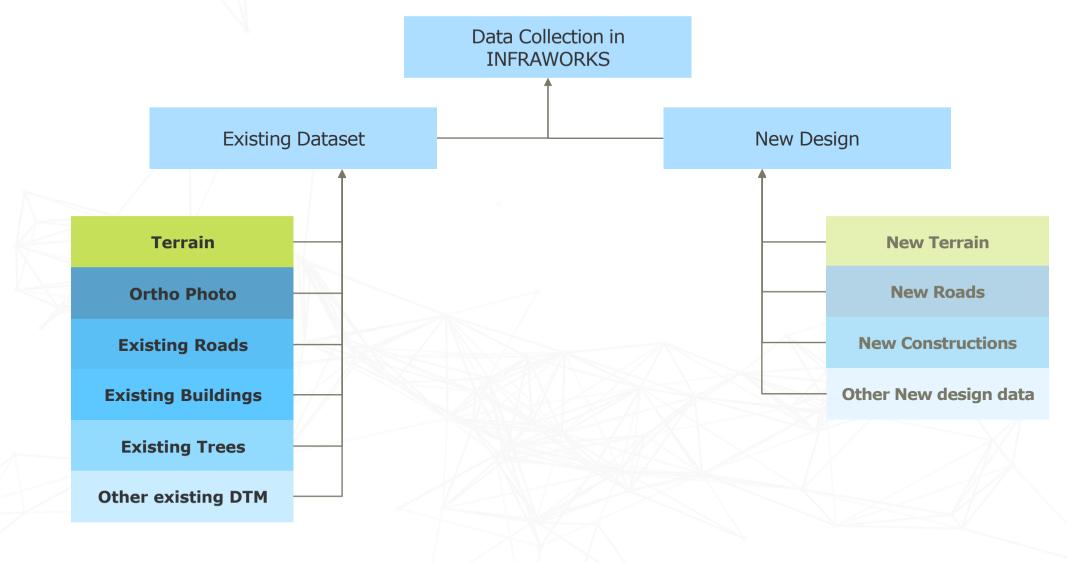
USE



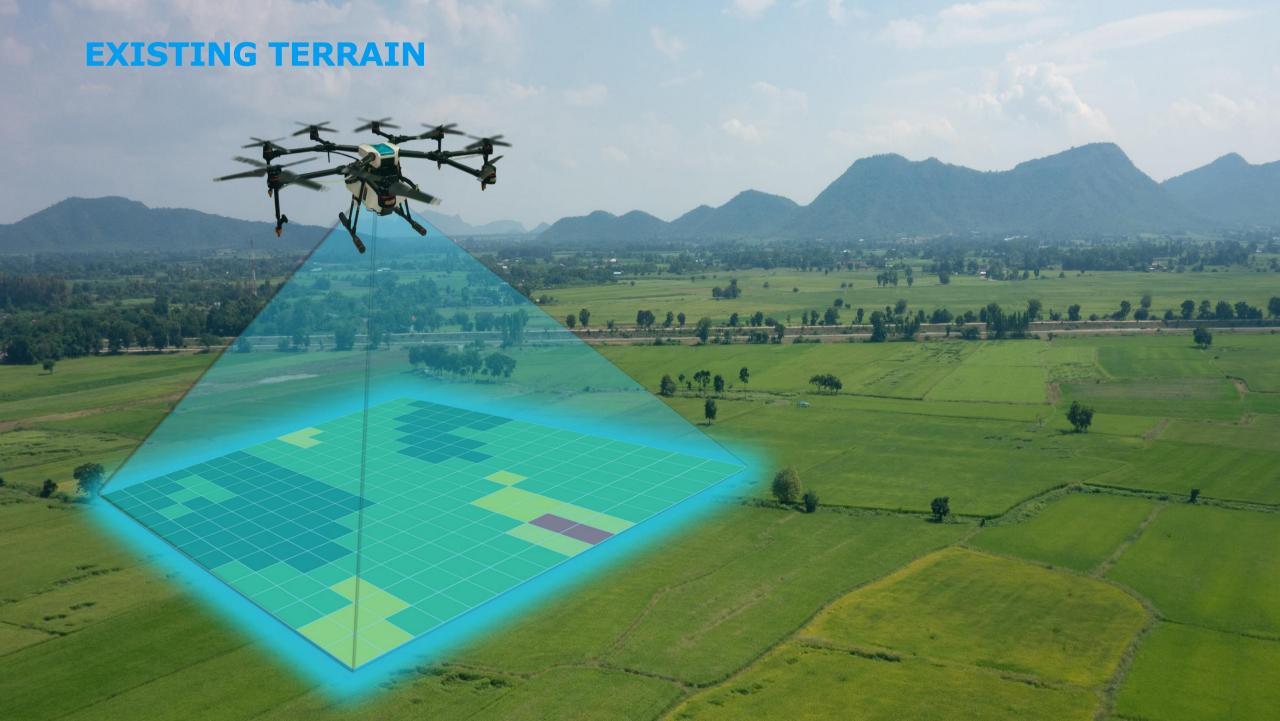




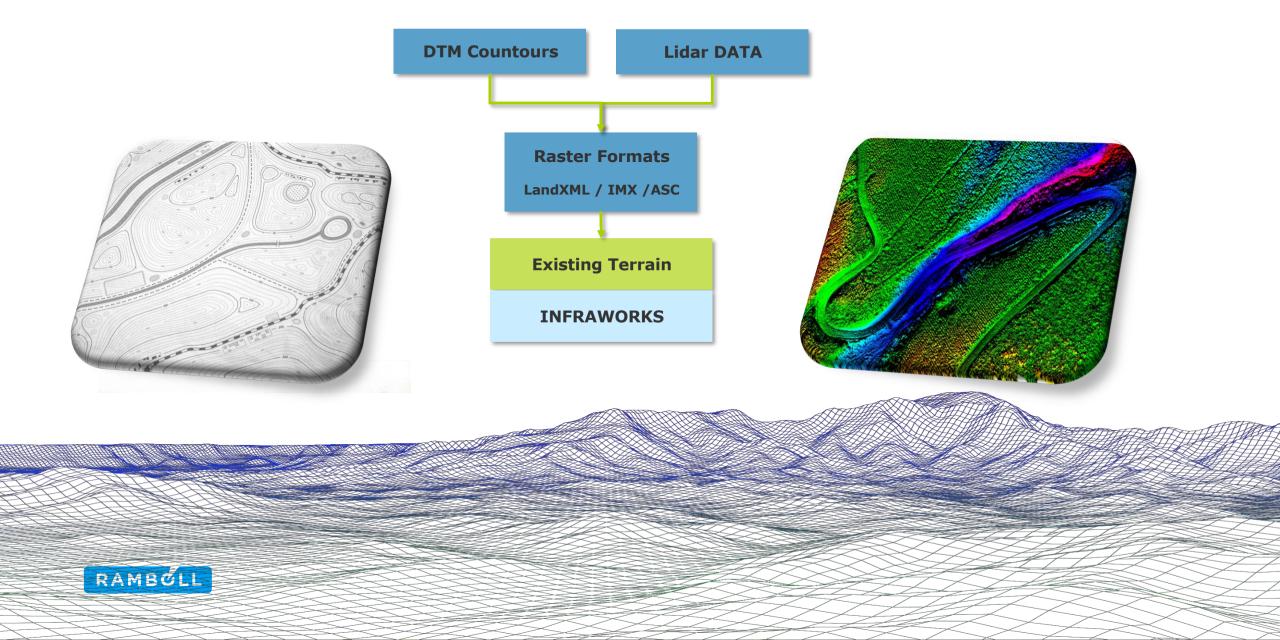
STRUCTURE

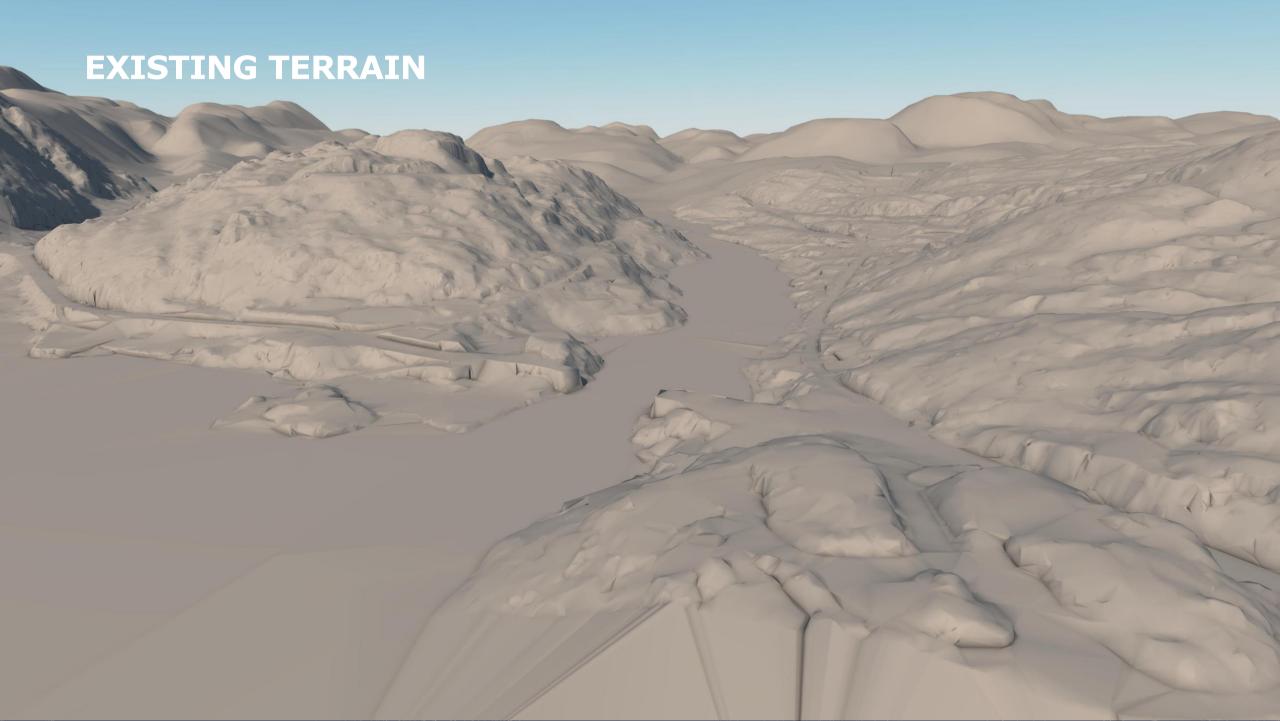


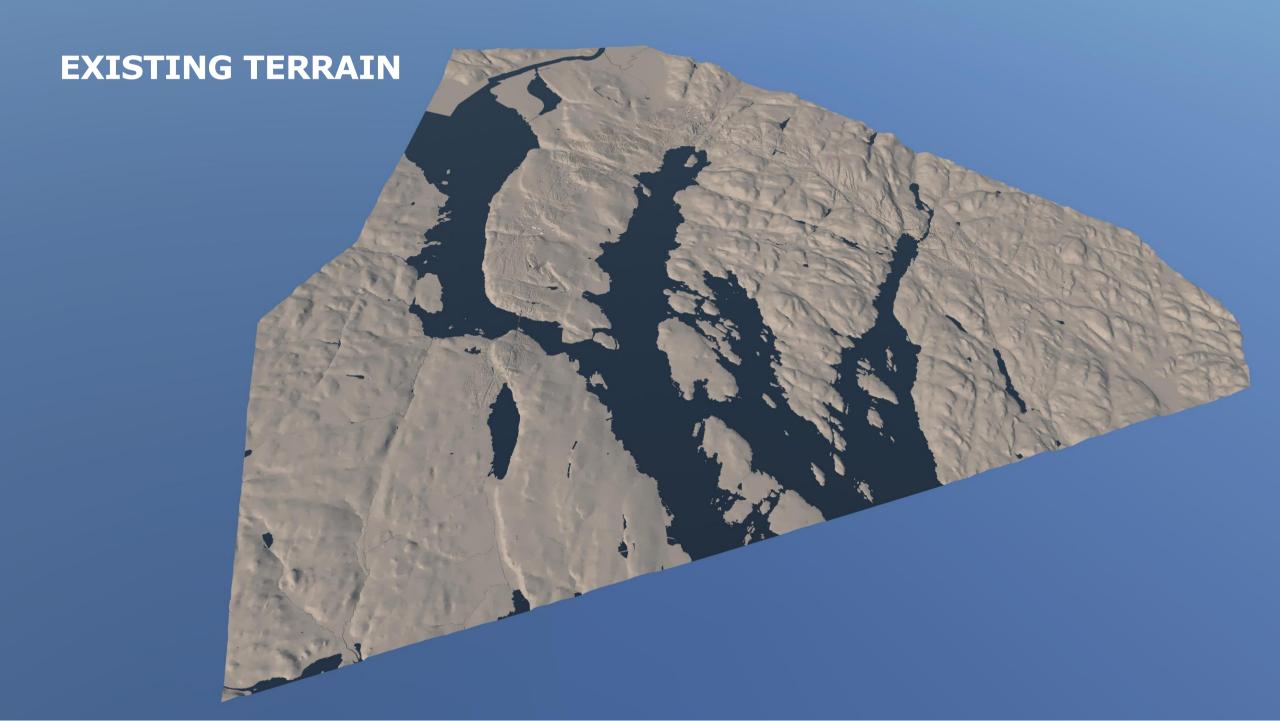




EXISTING TERRAIN





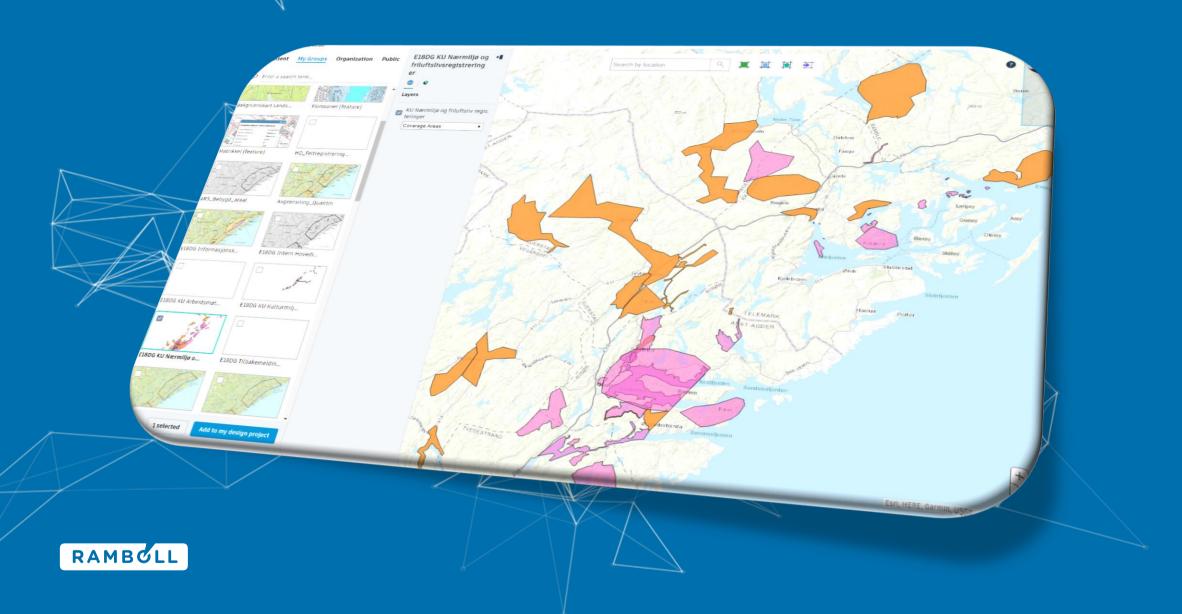


ARCGIS TOOL IN INFRAWORKS

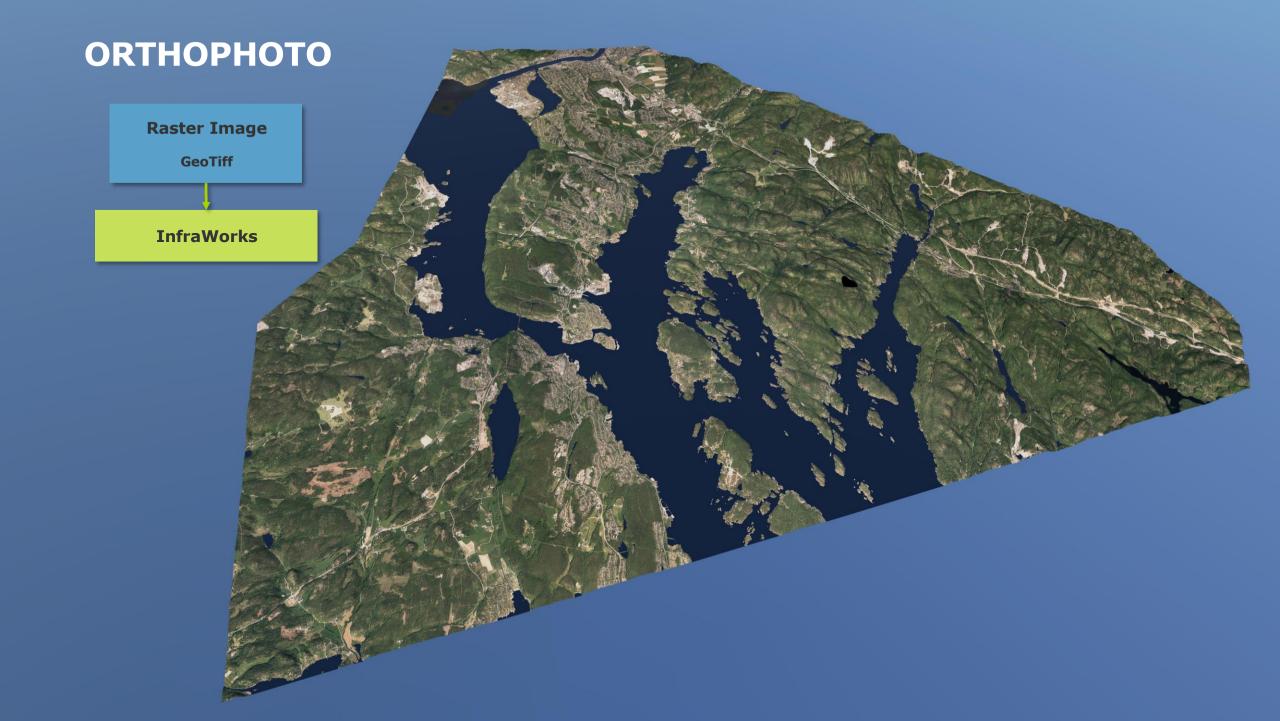
BEFORE NOW DTM data (water contours DTM data (islands contours) **ArcGIS** IW ArcGIS tool *.dgn or *.dwg *.dgn or *.dwg **INFRAWORKS FME** *.sdf Infraworks



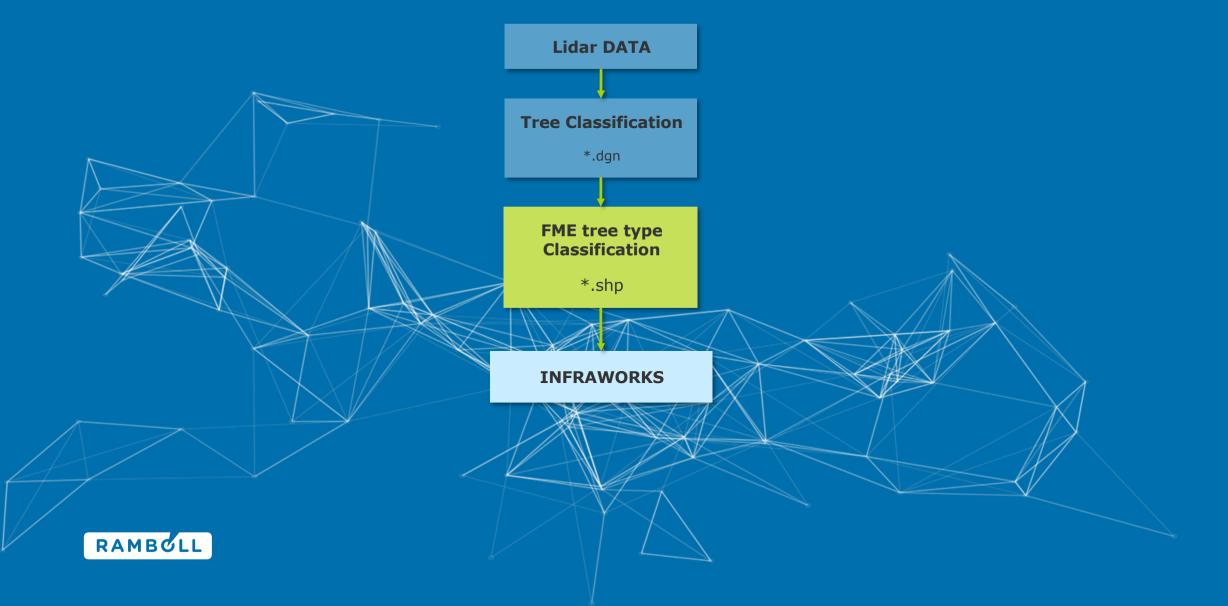
ARCGIS TOOL IN INFRAWORKS





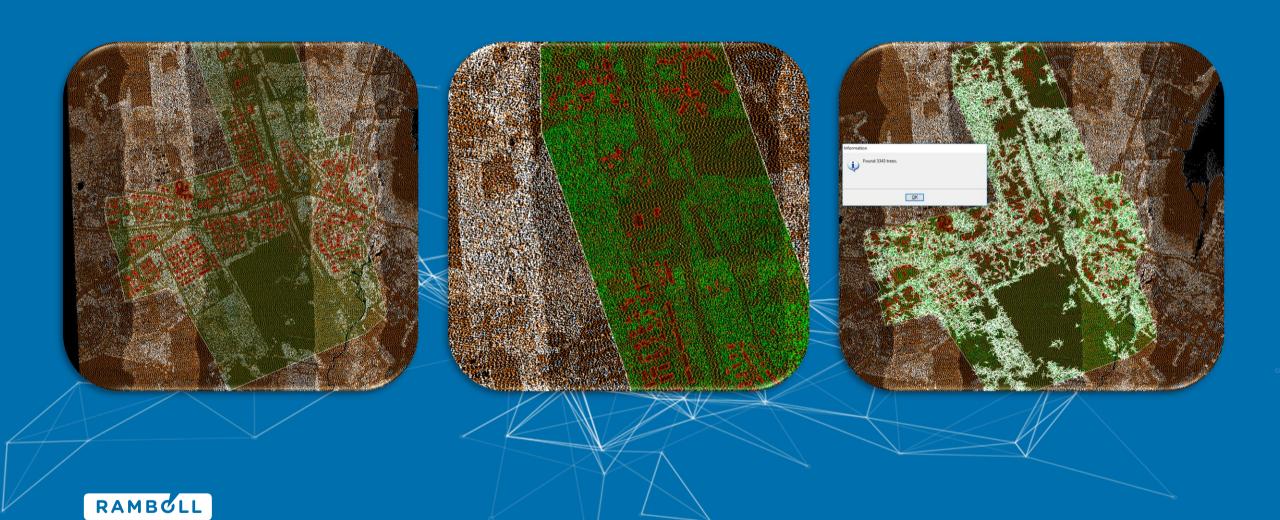


EXISTING TREES

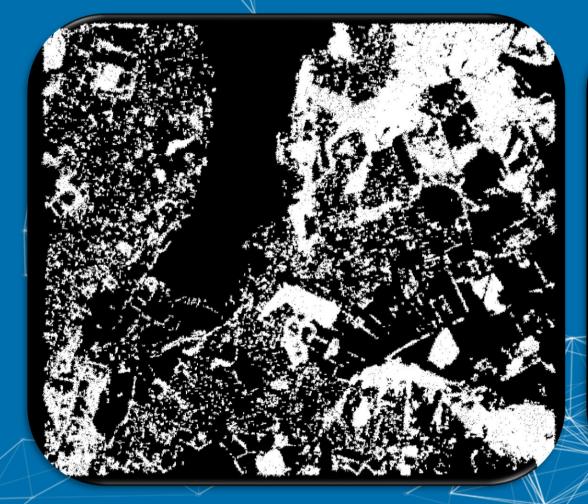


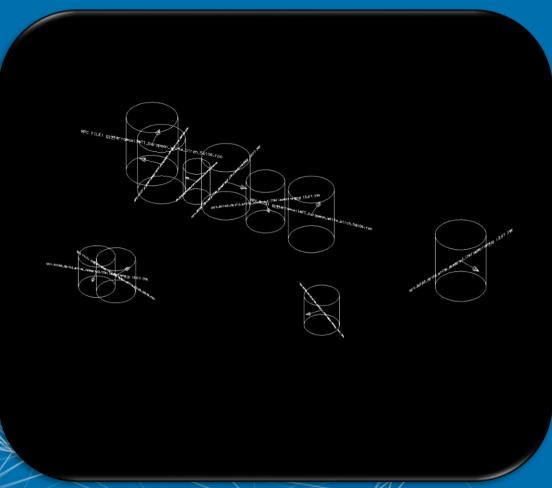


EXISTING TREES

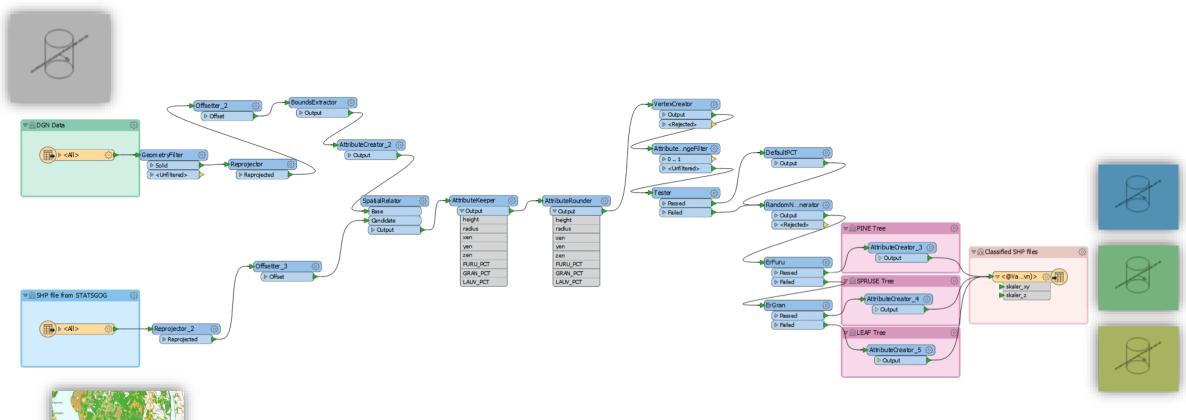


EXISTING TREES





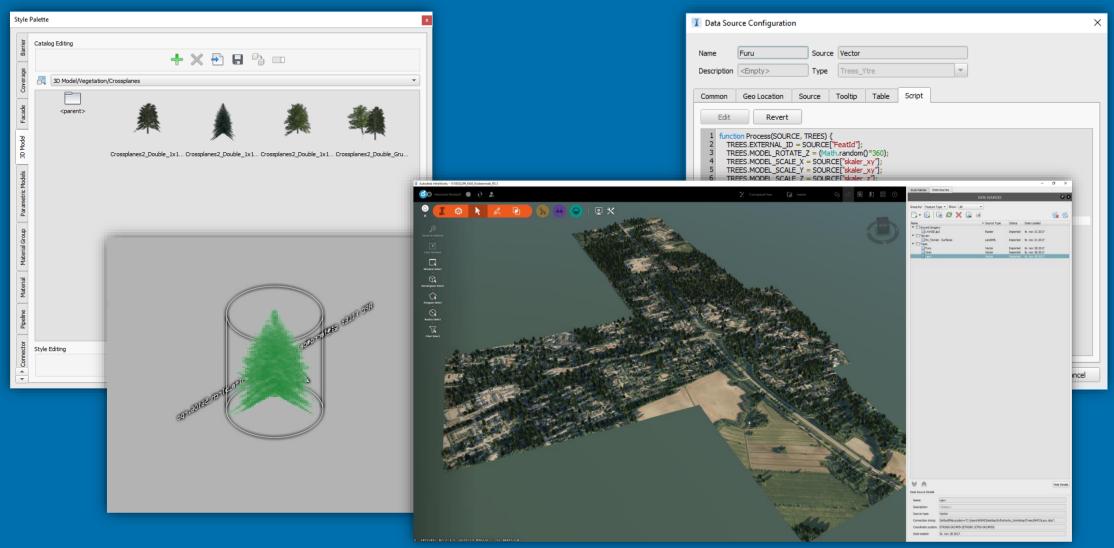
TREES CLASSIFICATION



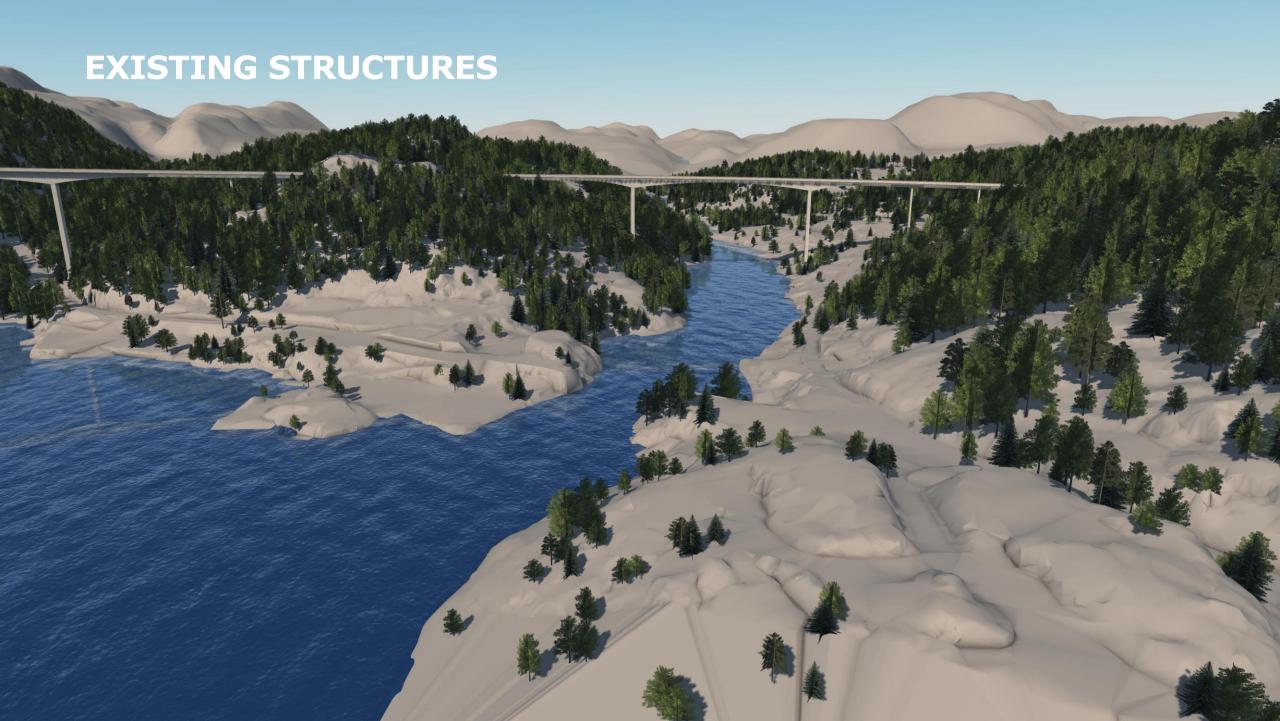




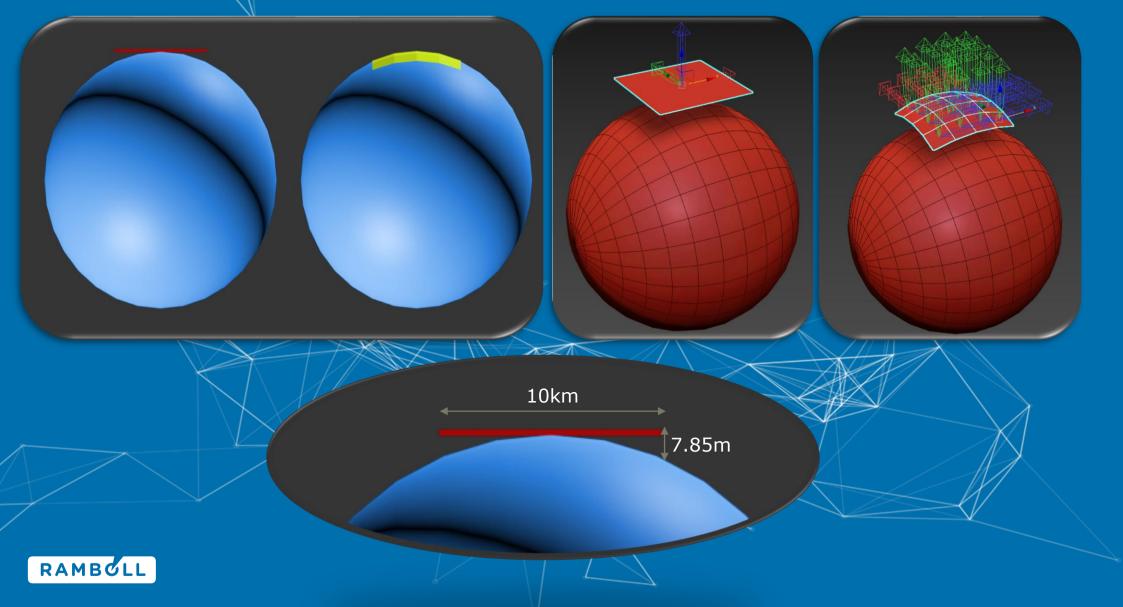
IMPORT EXISTING TREES IN INFRAWORKS







LARGE SCALE 3D OBJECTS



Earth Curvature Calculator

Accurately calculate the curvature you are supposed to see on the ball Earth.

Distance: 10 Kilometers ✓ Calculate

0.00785 km = 7.85 meters

Distance	Curvature
1 km	0.00008 km = 0.08 meters
2 km	0.00031 km = 0.31 meters
5 km	0.00196 km = 1.96 meters
10 km	0.00785 km = 7.85 meters

Explanation:

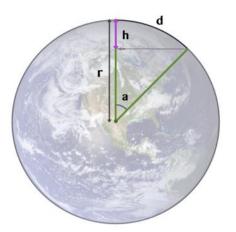
The Earth's radius (\mathbf{r}) is 6371 km or 3959 miles, based on numbers from <u>Wikipedia</u>. which gives a circumference (\mathbf{c}) of $\mathbf{c} = 2 * \pi * \mathbf{r} = 40 030 \text{ km}$

We wish to find the height (h) which is the drop in curvature over the distance (d)

Using the circumference we find that 1 kilometer has the angle

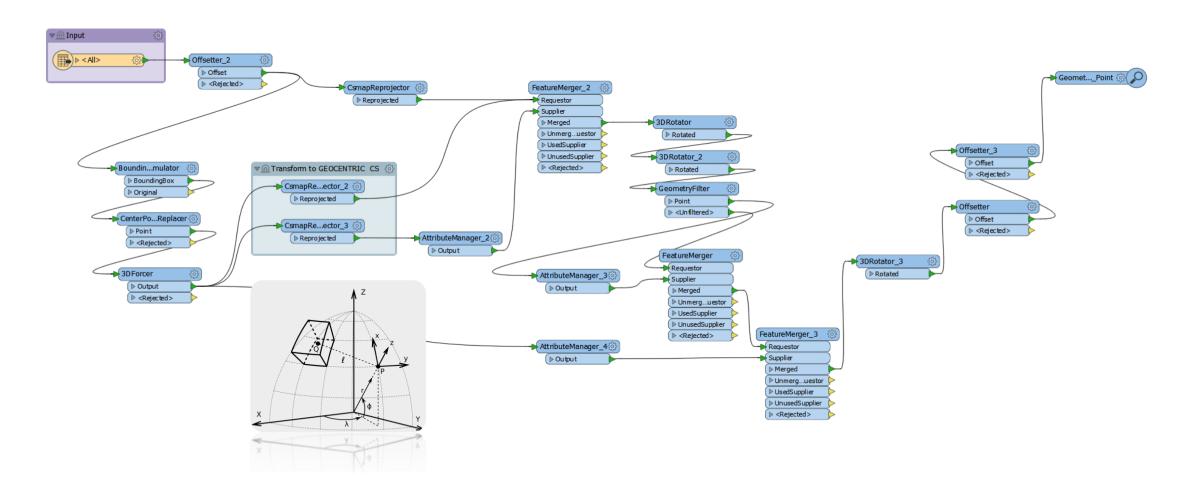
 360° / 40 030 km = 0.009° The angle (a) is then a = 0.009° * distance (d)

The derived formula $h = r * (1 - \cos a)$ is accurate for any distance (d)





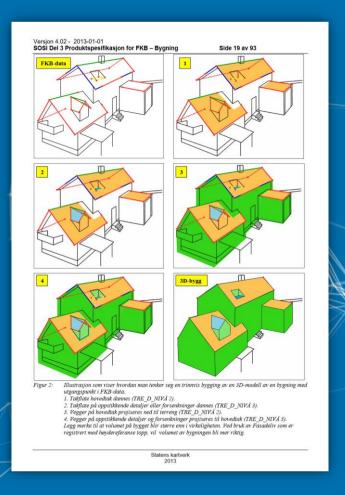
LARGE SCALE 3D OBJECTS

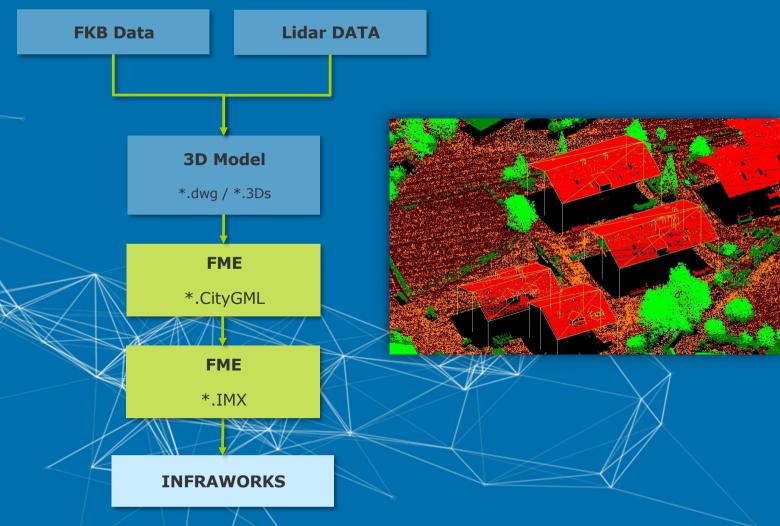






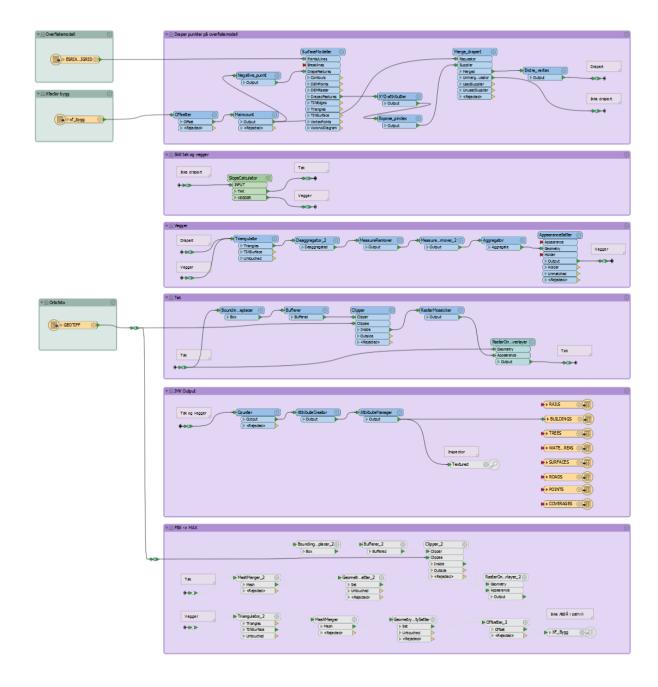
EXISTING BUILDINGS





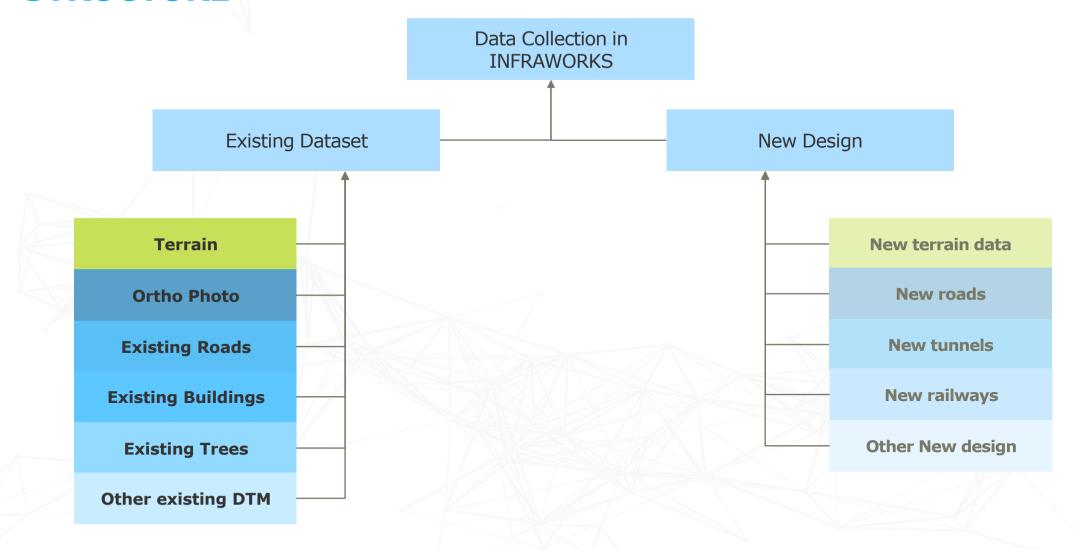


FME WORKSPACE



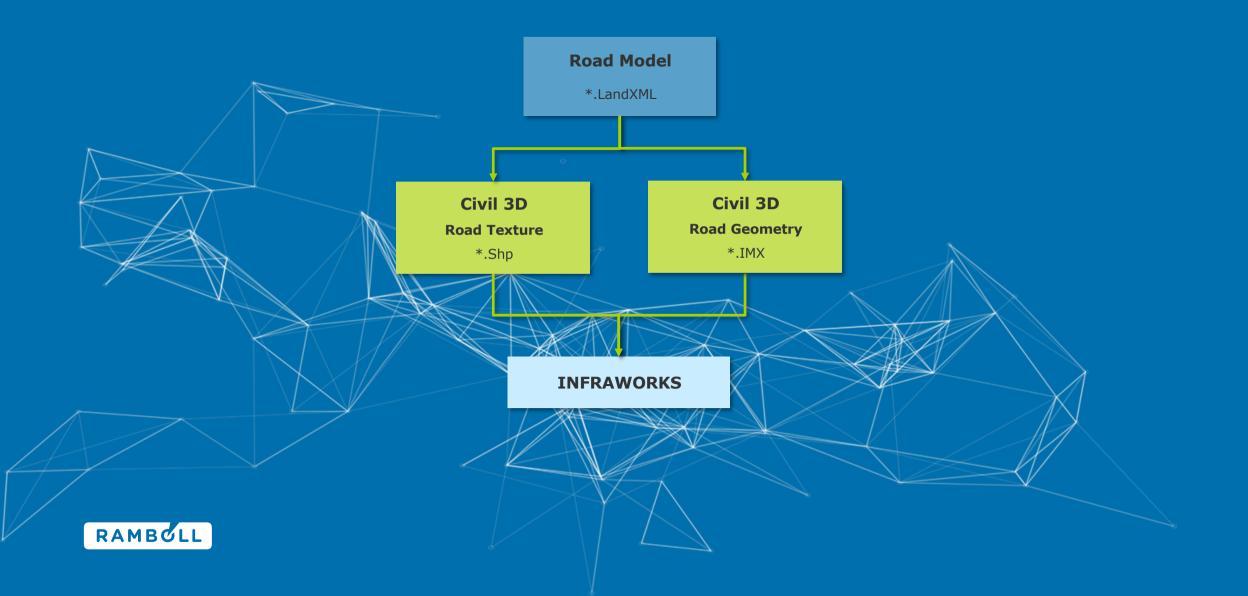


STRUCTURE

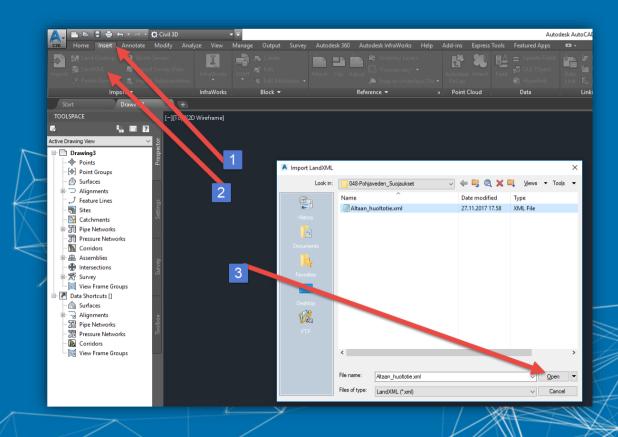


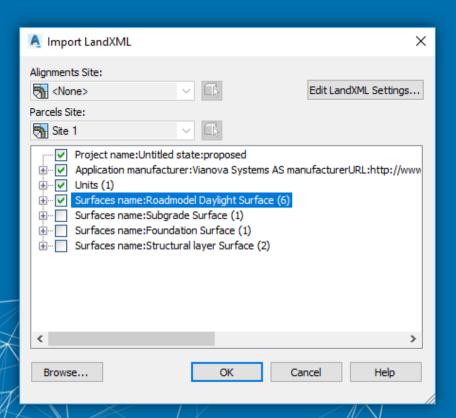


NEW ROADS FROM THIRD PARTIES



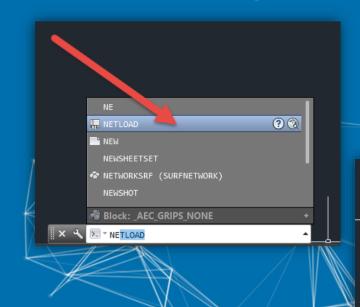
NEW ROADS FROM THIRD PARTIES

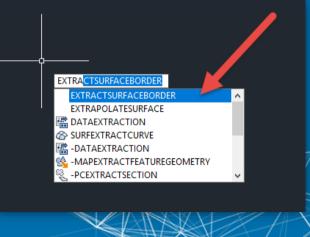


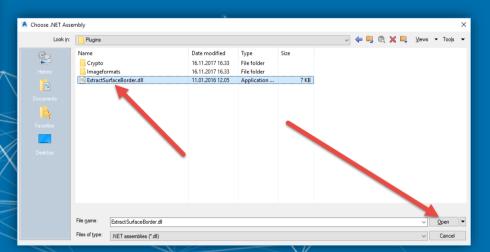




TEXTURE EXPORT

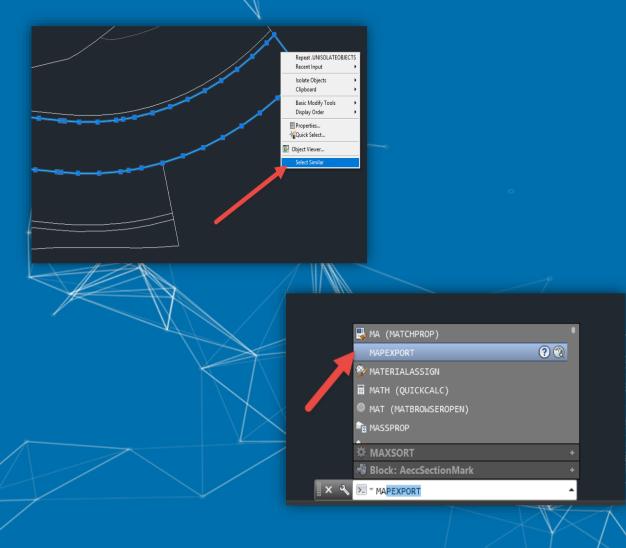


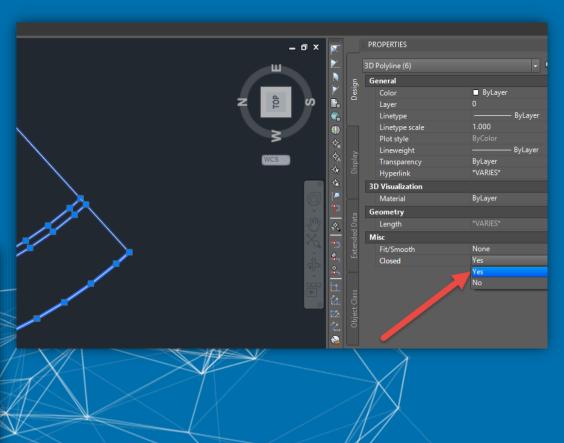






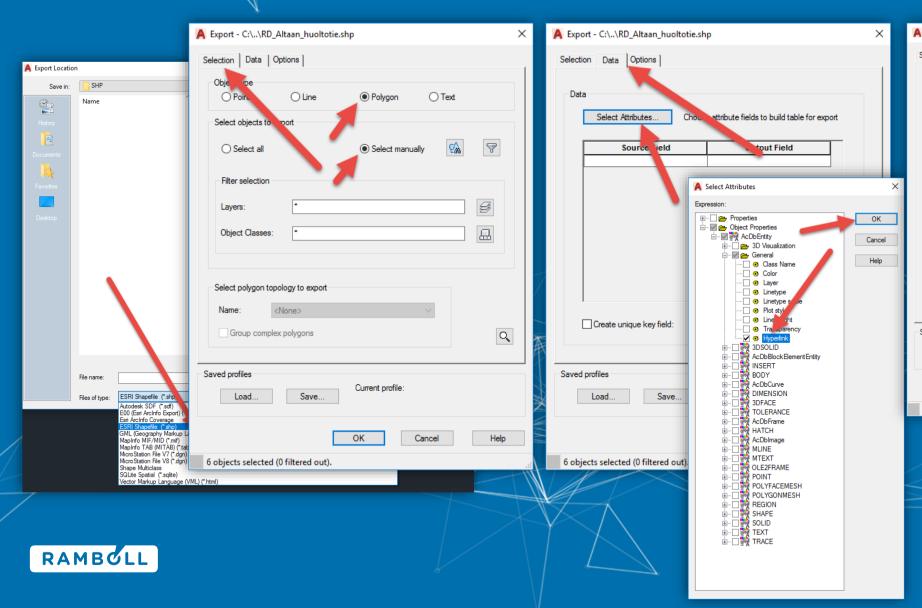
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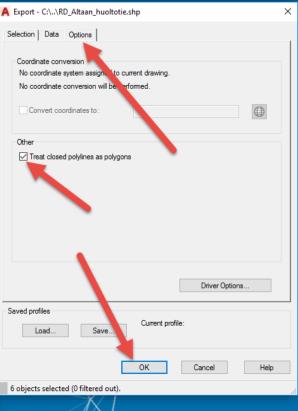




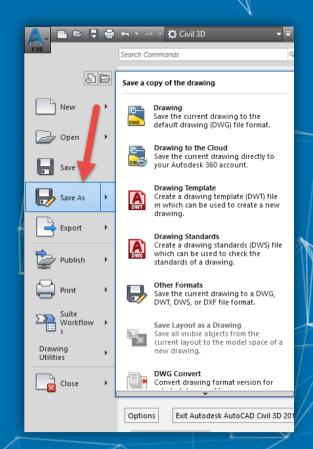


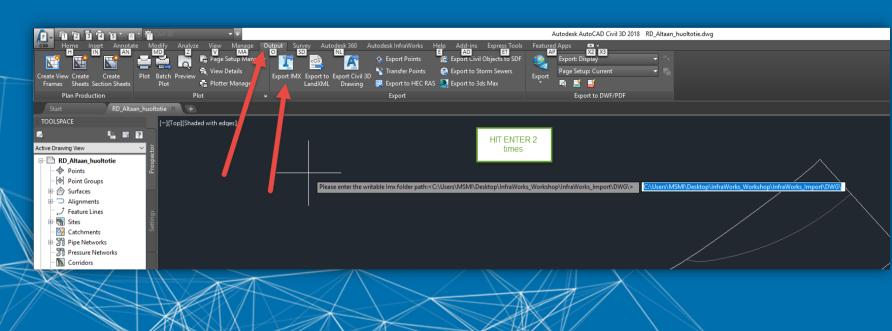
TEXTURE EXPORT



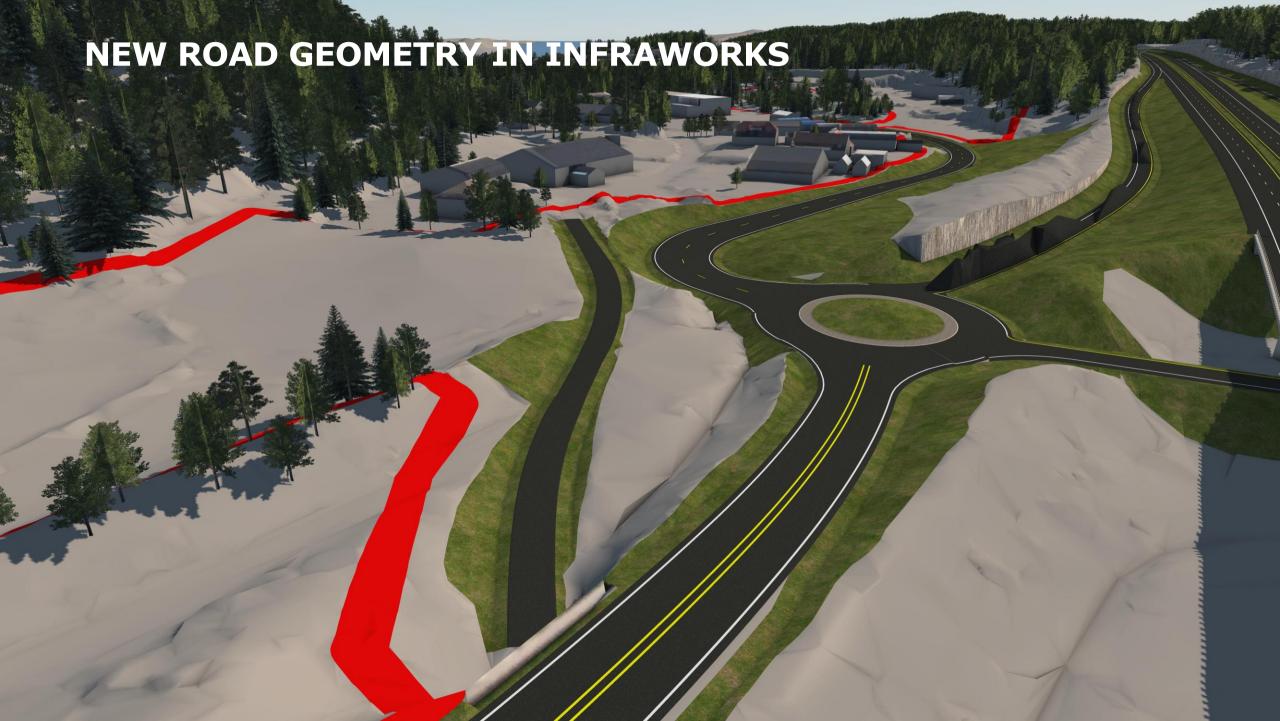


ROAD GEOMETRY EXPORT

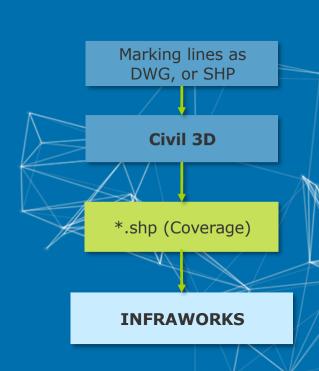








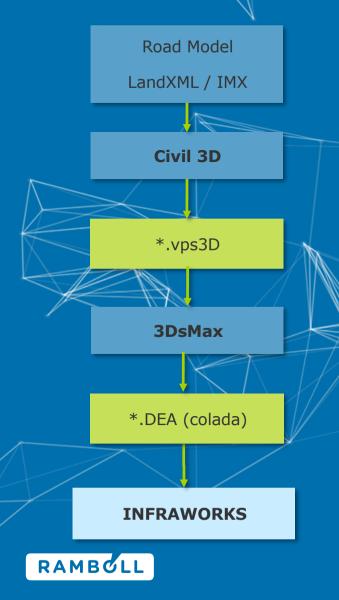
MARKING LINE DATAFLOW







IMPORTING ANIMATED CARS





RAMRISK TOOL IN INFRAWORKS

RAMRISK

<

Professional risk management tool, developed, hosted and fully supported by Ramboll

a

Add risk

Level

 \blacksquare

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PROFTI F

RESPONSIBILITIES

Owner

Mantas Smidtas

Mantas Smidtas

Mantas Smidtas

Tom Daniel Berg Enger

Mantas Smidtas

Mantas Smidtas

Mantas Smidtas

Mantas Smidtas

Mantas Smidtas

Tom Daniel Berg Enger

Mantas Smidtas

Mantas Smidtas

Rune Berge

Tom Daniel Berg Enger

Copy from project Export to Excel

Status

Open

New

Open

New

New

New

New

New

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ADMIN

Last modified

2018-08-29 14:11

2018-04-19 12:13

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LOCOUT

12>

Search

PROJECTS OVERVIEW RISKS CONTROLS ACTIONS REPORTS LOG

Risk Filter

2 status(es) selected

Select confidentiality

Select evaluations

Select owners

Select tags

Search

Number of risks in current filtering: 132

Test risk 001

Test risk 002

Test risk 003

Test risk 004

Test risk 005

Test risk 005

Test risk 007

Test risk 008

Test risk 009

Test risk 010

Test risk 011

Industrial disputes

Lack of approval

Potential pollution of clear water

Tog / skiftevbevegelser

Tog / skiftevbevegelser

Tog / skiftevbevegelser

Tog / skiftevbevegelser

Brennbare materialer/bygninger og tennkilder

Lokfører feilberegner bremselengde på vei inn i spor 6 og kolliderer med endebutt

Løpsk materiell (med eller uten motorkraft) triller/kjører ut av spor 6 når sporsperre ligger av.

Lokfører feilberegner bremselengde på vei inn i spor 6 og kolliderer med hensatt materiell

<u>Interferens</u>

Bortfall av strøm

Trykk og sugkrefter

Trykk og sugkrefter

Hærverk

Skipskollisjon

Risk 0012

Risks

Id 🕶

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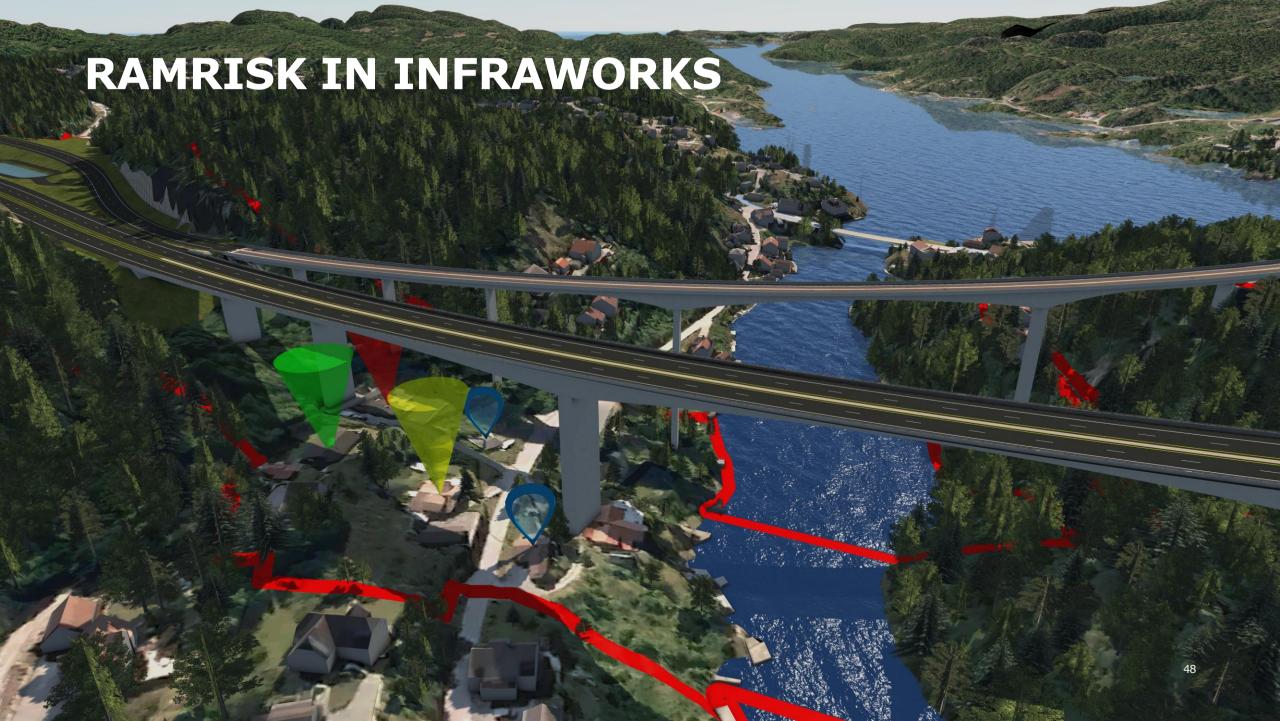
Faulty or insufficient specifications, design or timetables

Lack of oversight or level of cooperation at main contractor

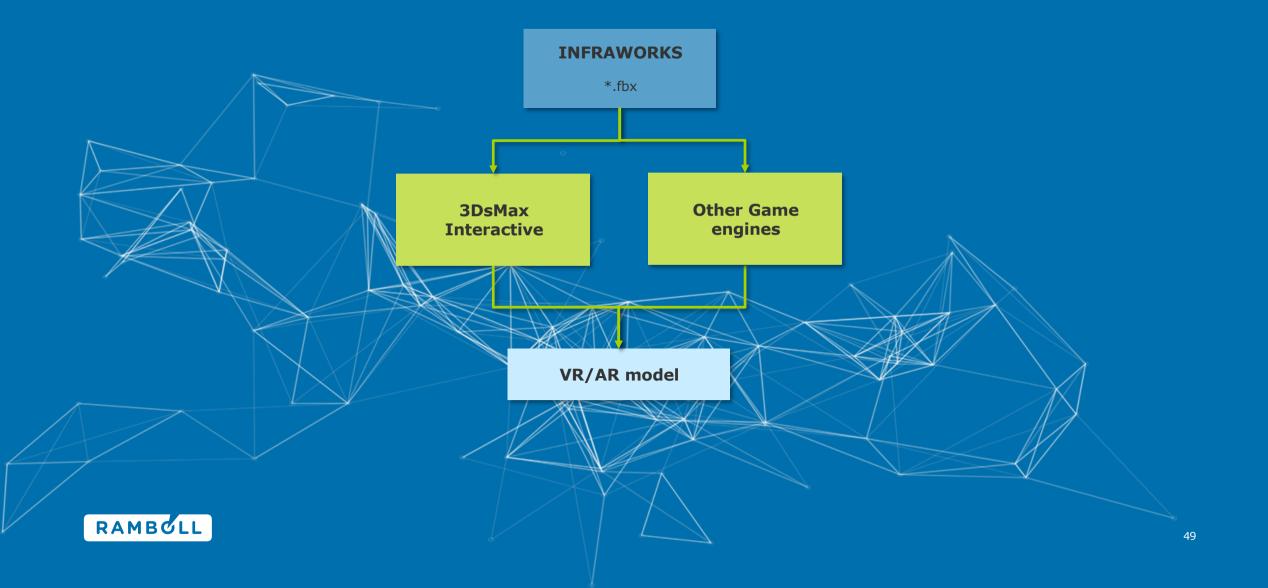
Lokfører feilberegner bremselengde ved kjøring fra spor 5 eller 6 til spor bak spy 8 (retning venstre) og kolliderer med endebutt.

Lack of clarity regarding the limits of the contract

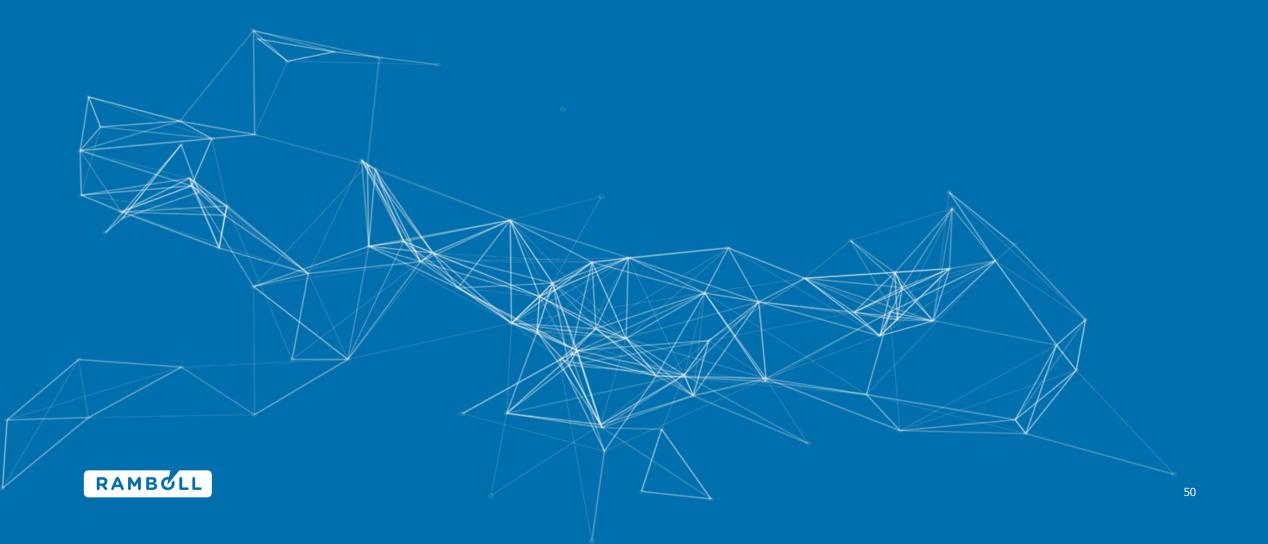
Title



VR/AR POSSIBILITIES IN INFRAWORKS



VR/AR POSSIBILITIES IN INFRAWORKS









WHY DO WE NEED THAT

ENGINEERING BENEFITS

- GIVES POSSIBILITY FOR A FASTER PARAMETRIC ROAD MODELING WITH MORE ACCURATE EXISTING SITUATION
- SIMPLIFIES THE WAY USER INTERACT WITH SPACES
- SIMPLIFIES COMMUNICATION BETWEEN DIFFERENT DISCIPLINES
- LEADS TO DESIGN OF ENGINEERING ASSEMBLY

COMMERCIAL BENEFITS

- FOR CLIENT FASTER DESIGN PROCESS MEANS LES EXPENSES
- PARAMETRIC DESIGN PROCESS HELPS TO IDENTIFY AND ELIMINATE ERRORS IN EARLY FACE
- EARLY FACE OPERATIONS WITH LESS RECOURSE

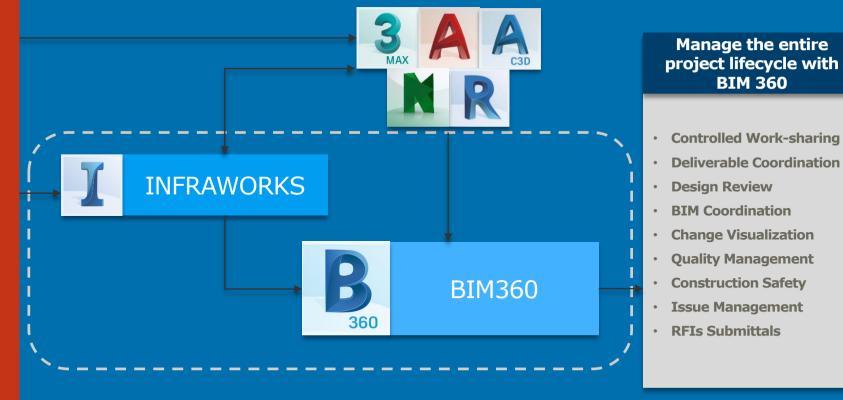
OPERATIONAL BENEFITS

- EASY ACCESS TO THE DATA
- FULLY CONNECTED MANAGEMENT TEAM
- VR/AR SAFETY ANALYSIS OPTION



DESIGN PHASE VISUALIZATION CONSTRUCTION PHASE DESIGN REVIEW COMMUNICATION DRAWINGS - DOCUMENTATION Visualize / Comment / Adjust / Share Client / Public Client / Public

Various CITYGML Types GEO LAS DATA LandXML RASTER **IMAGES** DATA IMX ESRI DB SDF Other.... SOSI DESIGN DWG IFC FBX SHP OB.I RWT MAX



THANK YOU

