

RHOMBERG

A photograph of a modern building facade with a grid of windows. A large, dark blue sign is mounted on the building, featuring white text. The text reads 'Construction Industry Digitalization' in a large, bold, sans-serif font, and 'DI Hubert Rhomberg' in a smaller font below it.

# Construction Industry Digitalization

DI Hubert Rhomberg

**Climate Crisis**

**Everybody already knows.**

The problem is that the problem is too big.  
The problem is that different people want different things.  
The problem is that nobody has the real answers.

**The problem is, that the problem is us.**

Roy Scranton | Learning to Die in the Anthropocene



There is  
NO Planet B



# Construction Industry uses 40% of all resources

# Reducing construction's ecological footprint

January 28, 2021

The construction industry is one of the most resource-intensive sectors. Buildings and structures account for 36% of global energy consumption and nearly 40% of energy-related CO2 emissions. In addition, the construction industry is not as productive and sustainable as other industries. Of all materials used in construction, 10% are unnecessary or are wasted and 30% of all construction work is spent fixing errors. Also, 90% of all large construction projects overrun in terms of time or cost. A construction project that takes just one month longer also consumes an enormous amount of additional energy and electricity.

source: <https://www.pbctoday.co.uk/news/energy-news/construction-ecological-footprint/88192/>


GAME REAR

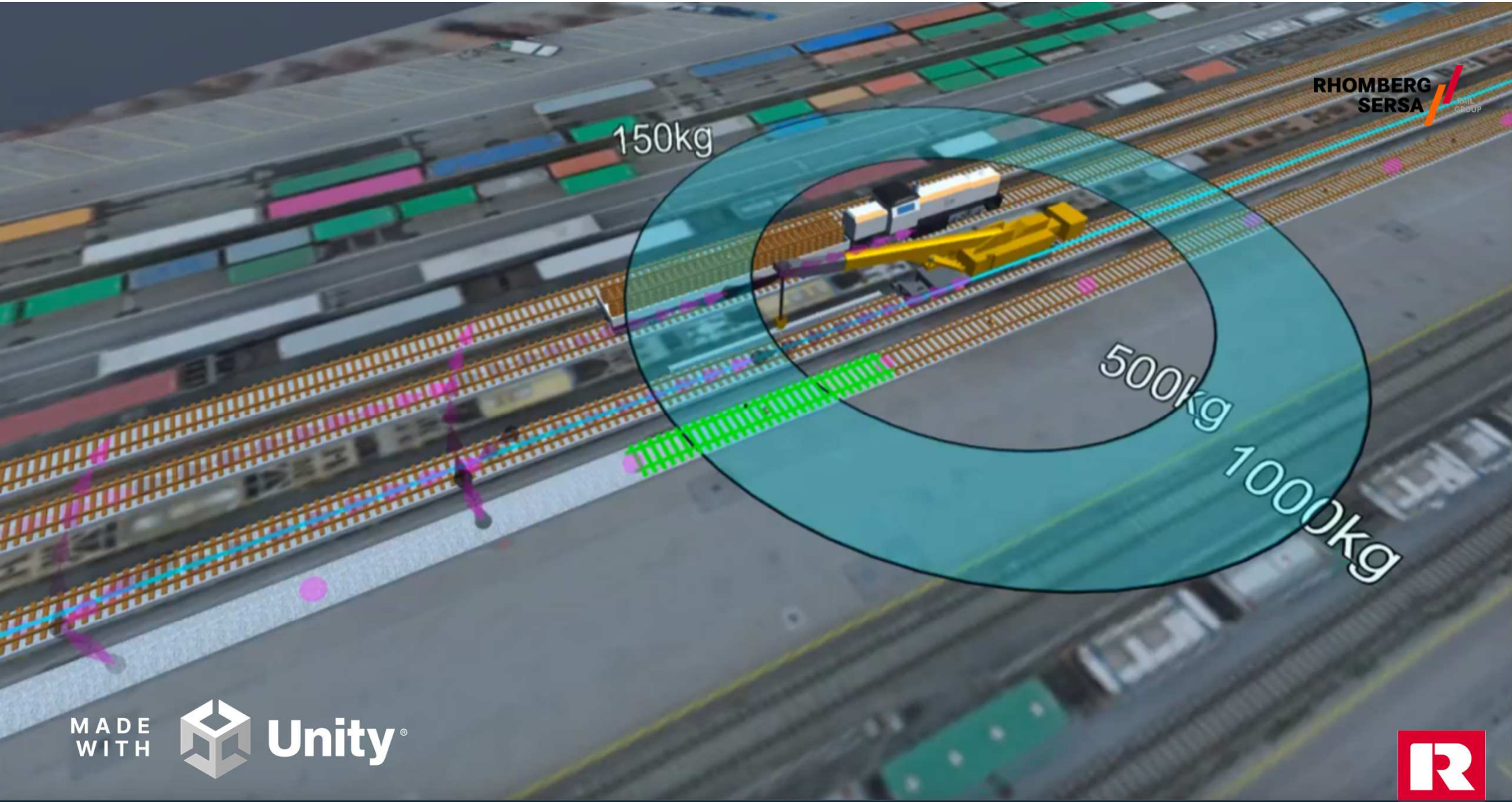


**Game on!**

Cr 93.360



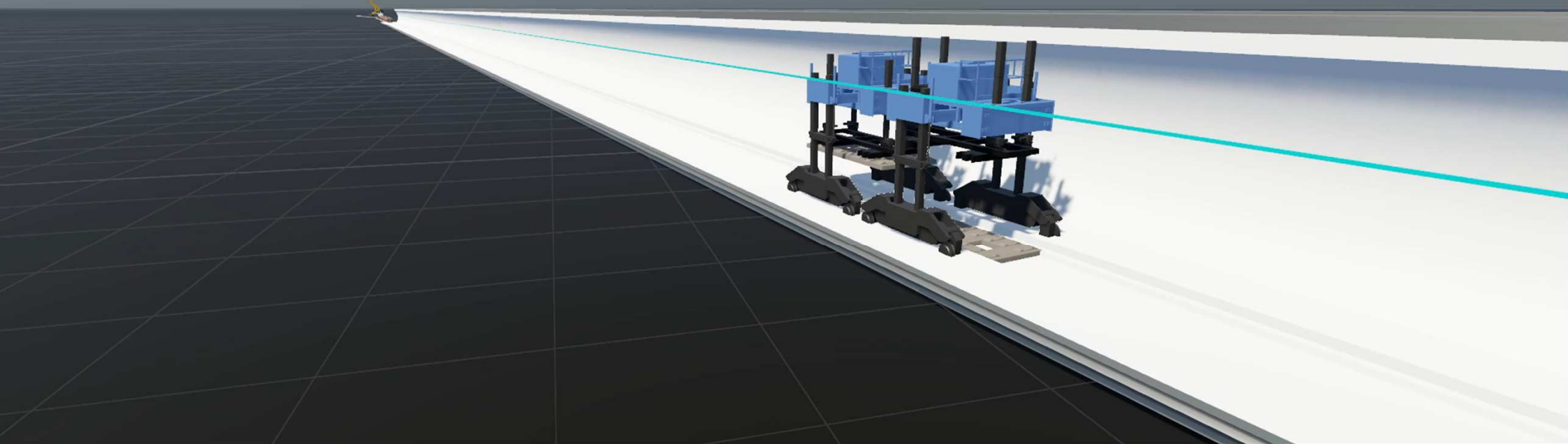
Help 



150kg

500kg

1000kg



16x

1d 03:26:37

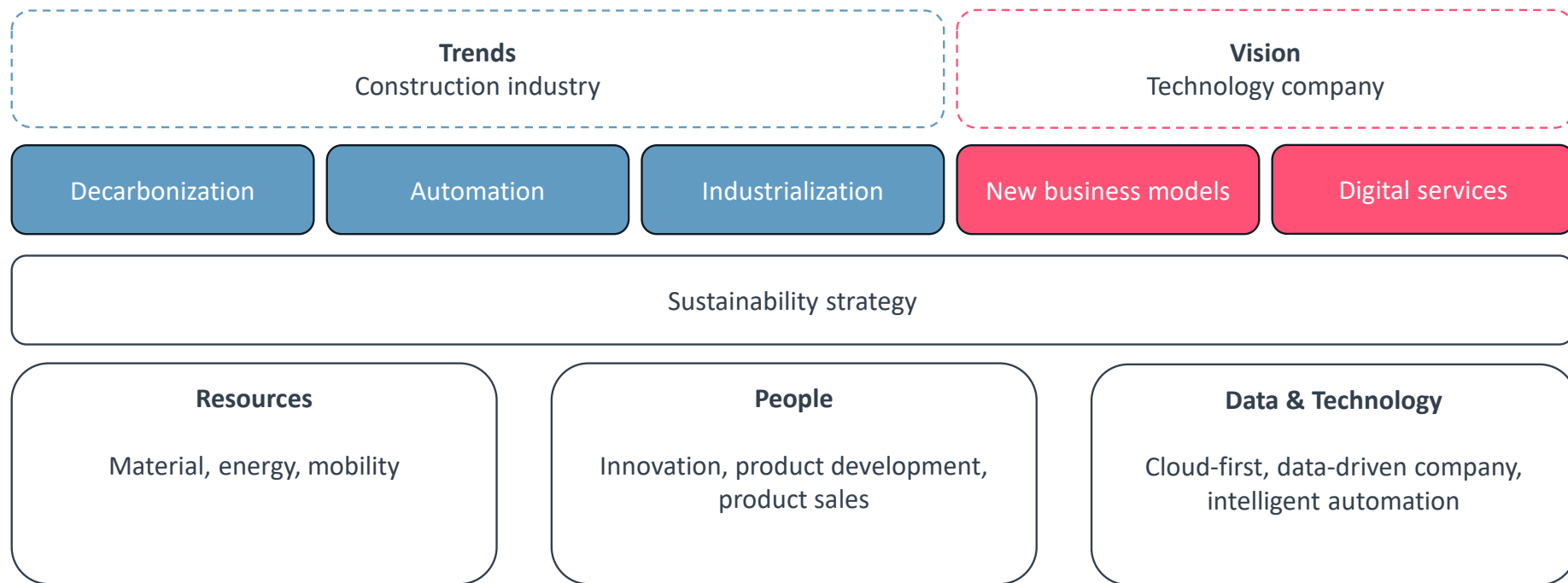
3h 15min 0s 20min 0s 25min 0s 30min 0s 35min 0s 40min 0s 3h

Row 1 Compact Bar	Delive	Lift car	Delive	Rail	Lift cargo	Drive on rail	Deliver cargo	Deliver cargo	Drive on rail	Lift cargo	Lift cargo	Drive on rail
Row 2 Compact Bar					Lift cargo	Drive on rail			Drive on rail		Deliver cargo	

Speed: 30x

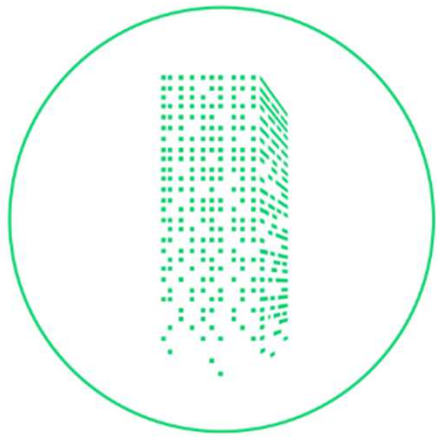
# Construction Industry Digitalization

## Where are we going?



# Digital Planning Process

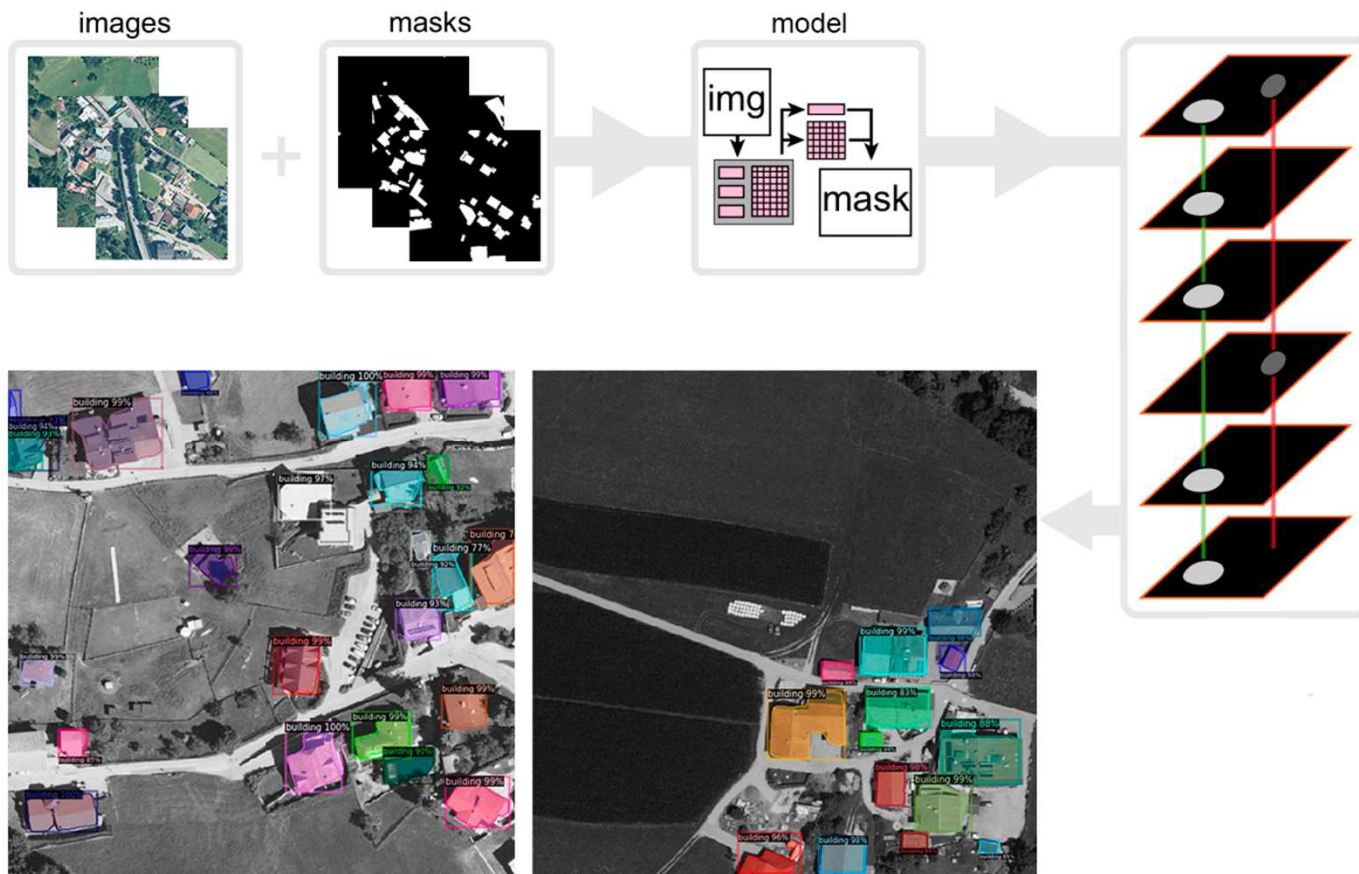
## Digital Twin



source: Nomoko

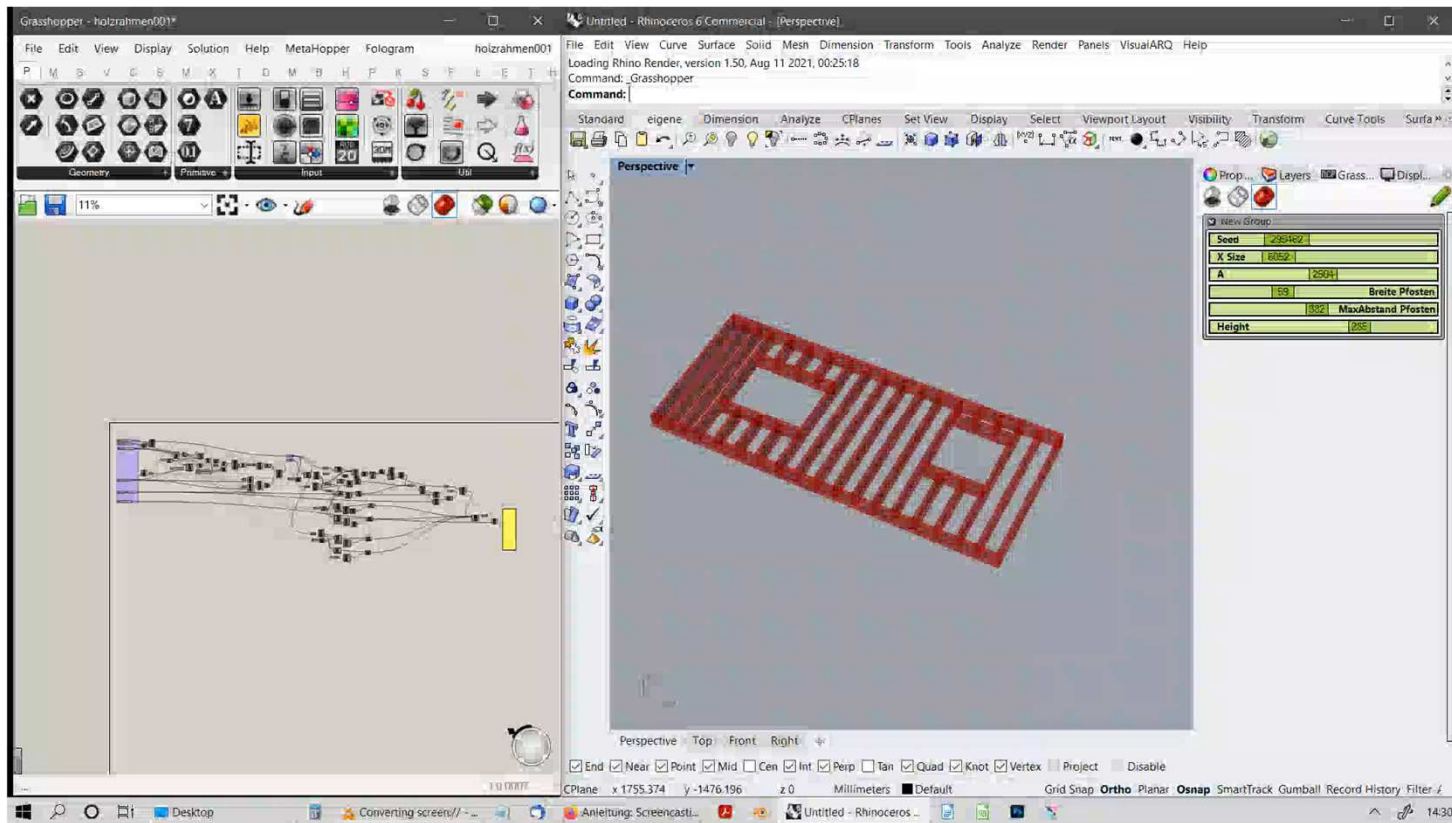
# Digital Project Development

## Aerial Photography Analysis



## Digital Planning Process

# Parametric Models | Generative Design



# Time Schedule Simulation

## EDGE Suedkreuz Berlin

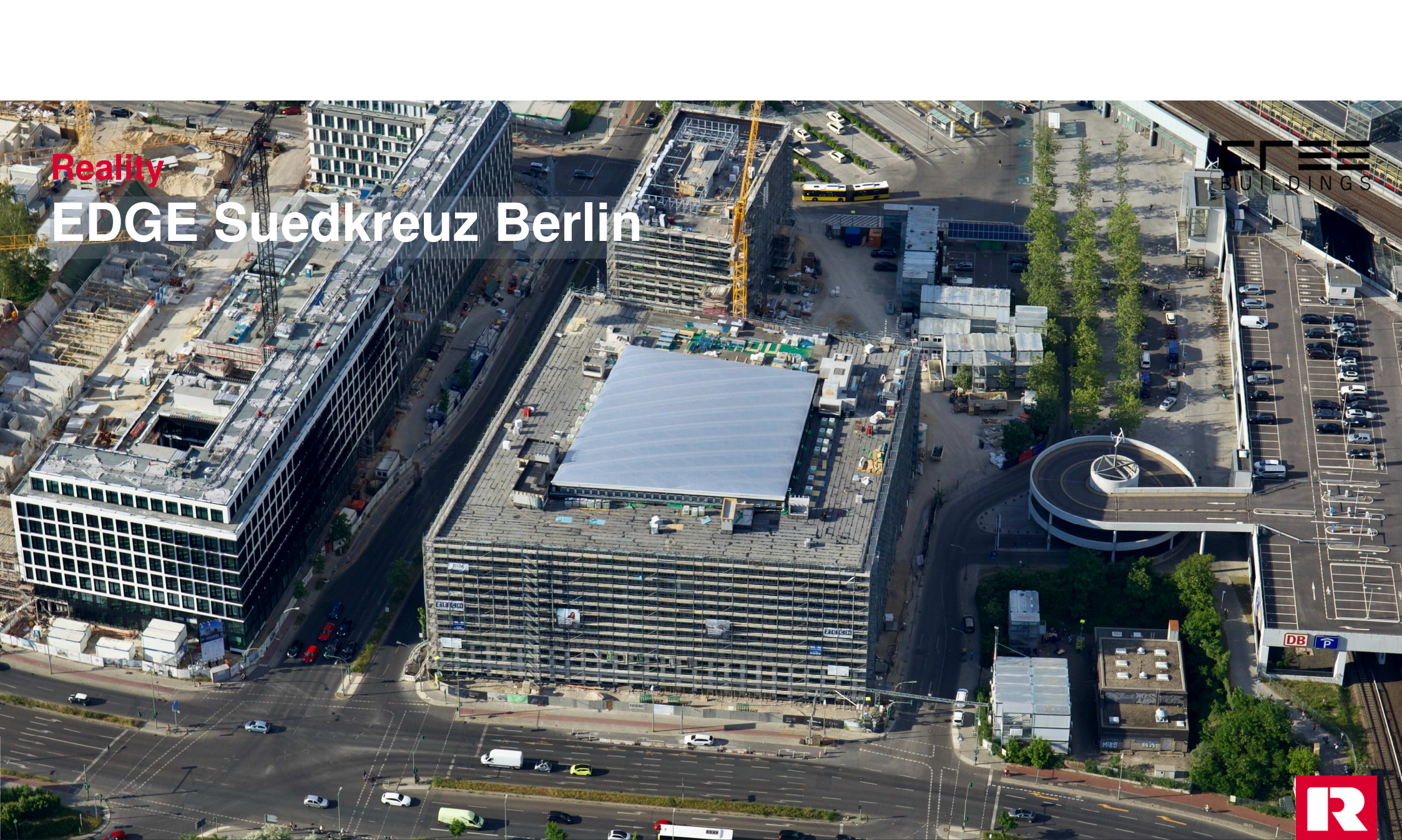
Woche 36 - 03.09.2018

PSP	Name	Start	Finish	Duration	Progress
11	TG+UG MK 2+MK1 in 4 BA + TH	03.09.2018	04.02.2019	104 Tage	1 %
11.1	Fundament Bodenplatte	03.09.2018	28.12.2018	90 Tage	1 %
14	Produktion Cree Systembauteile	03.07.2018	20.05.2019	220 Tage	20 %
14.1	Holzbauplanung	26.07.2018	02.11.2018	70 Tage	40 %
14.5	Abbund Deckenbalken	03.07.2018	17.04.2019	200 Tage	22 %

Reality

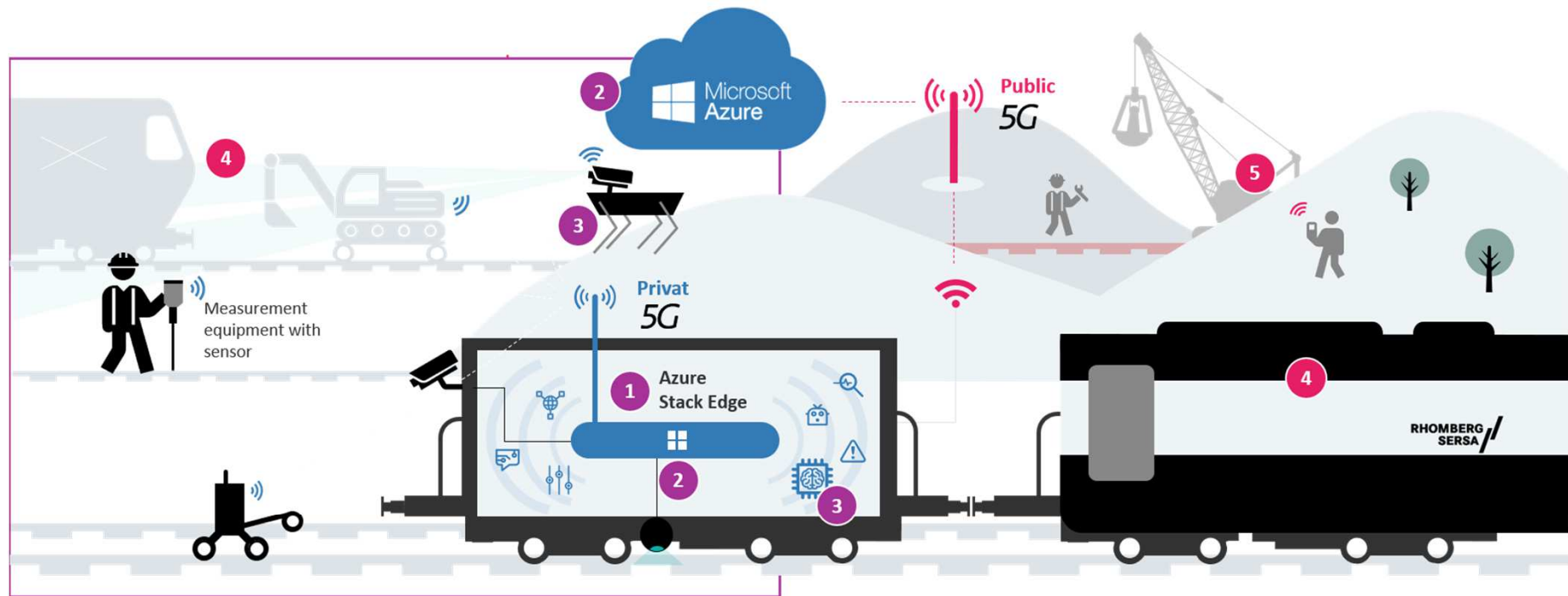
# EDGE Suedkreuz Berlin

RE  
BUILDINGS



# Digital Construction Site

## IOT – 5G – Edge Computing



**5G/4G Mobile Private Network on Azure Stack Edge (ASE).**  
Networking people and things, e.g., z.B. construction equipment, machines and robots .

1

**Local processing of data**  
on ASE enables data processing even under deteriorating or lost Connectivity and synchronizes with a centralized database1.

2

**Processing of live streams:**  
Thanks to ASE, ML Modelles can be executed locally. Analysis of Construction progress for billing, safety and documentation

3

**Individualized localization and tracking solutions**  
for construction equipment and machines (international)

4

**Machine monitoring based on Azure**  
(e.g., usage analys, condition monitoring, limits analysis, alarms)

5



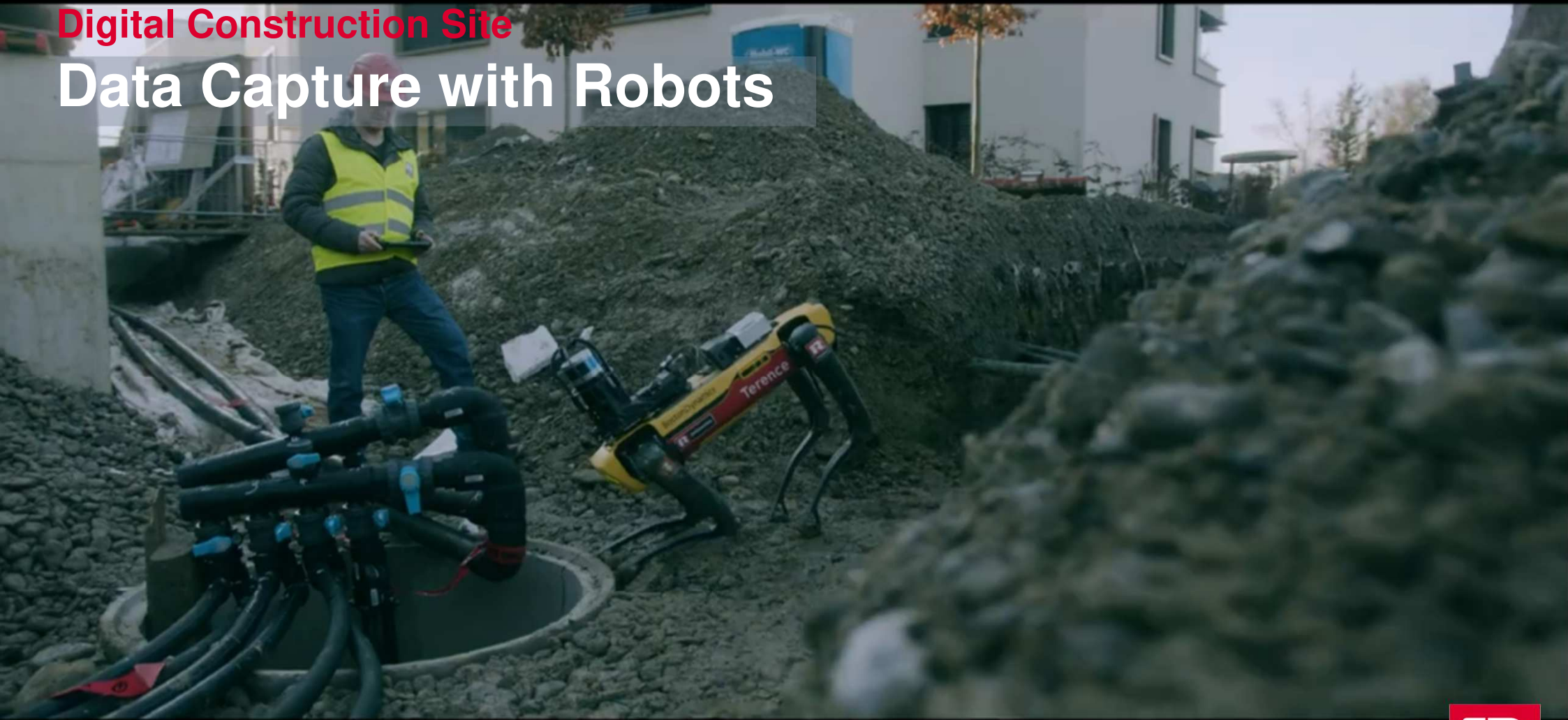
# Digital Construction Site Global MS IOT Award

RHOMBERG  
SERSA

Bregenz/Zurich, 9<sup>th</sup> of July 2021 – For the Rhomberg Sersa Rail Group and Swisscom, the digital construction site is already a reality: In a total of five digitalisation projects, the partners are developing and testing how in future the industry can make rail construction safer, more economical and more efficient. This has not gone unnoticed: Swisscom has now been awarded the global "Internet of Things" Partner Award by Microsoft for its cooperation. The "Digital Construction Site" concurred against a worldwide total of 4,400 applications and prevailed in this category.

source: <https://rhomberg-rail.rhomberg-sersa.com/en/news/digitalisation-brought-to-life>

# Digital Construction Site Data Capture with Robots



# Digital Construction Site On-site training with XR

**RHOMBERG  
SERSA** RAIL GROUP

**NXRT**  
**R**  
RHOMBERG

# Digital Construction Site Machine Detection



Browse local files

File formats accepted: jpg, png, bmp  
File size should not exceed: 4mb

Using model trained in :

Iteration

Iteration 1

Predictions:

Tag	Probability
Excavator Liebherr	95.8%
Rail Crane KRC1200	94.5%
Tamping Machine B66U	6%
Tamping Machine DS09-4X	2.9%
Rail Crane KRC910	0.7%

# Digital Construction Site Augmented Reality

RHOMBERG  
SERSA

Play

Start End

Undo Redo

Copy steps

Current Total Cost: 14804.85 / 14804.85 €

Cut Rate

Reset Scrolling

06:00	0m	25m	50m	75m	100m	125m	150m	175m	200m	225m	250m	275m	300m	325m	350m
06:10	Step 0														
06:30	Step 1														
06:40	Step 2														
06:50	Step 3														
07:00	Step 4														
07:10	Step 5														
07:20	Step 6														

12 / 47

3 / 14



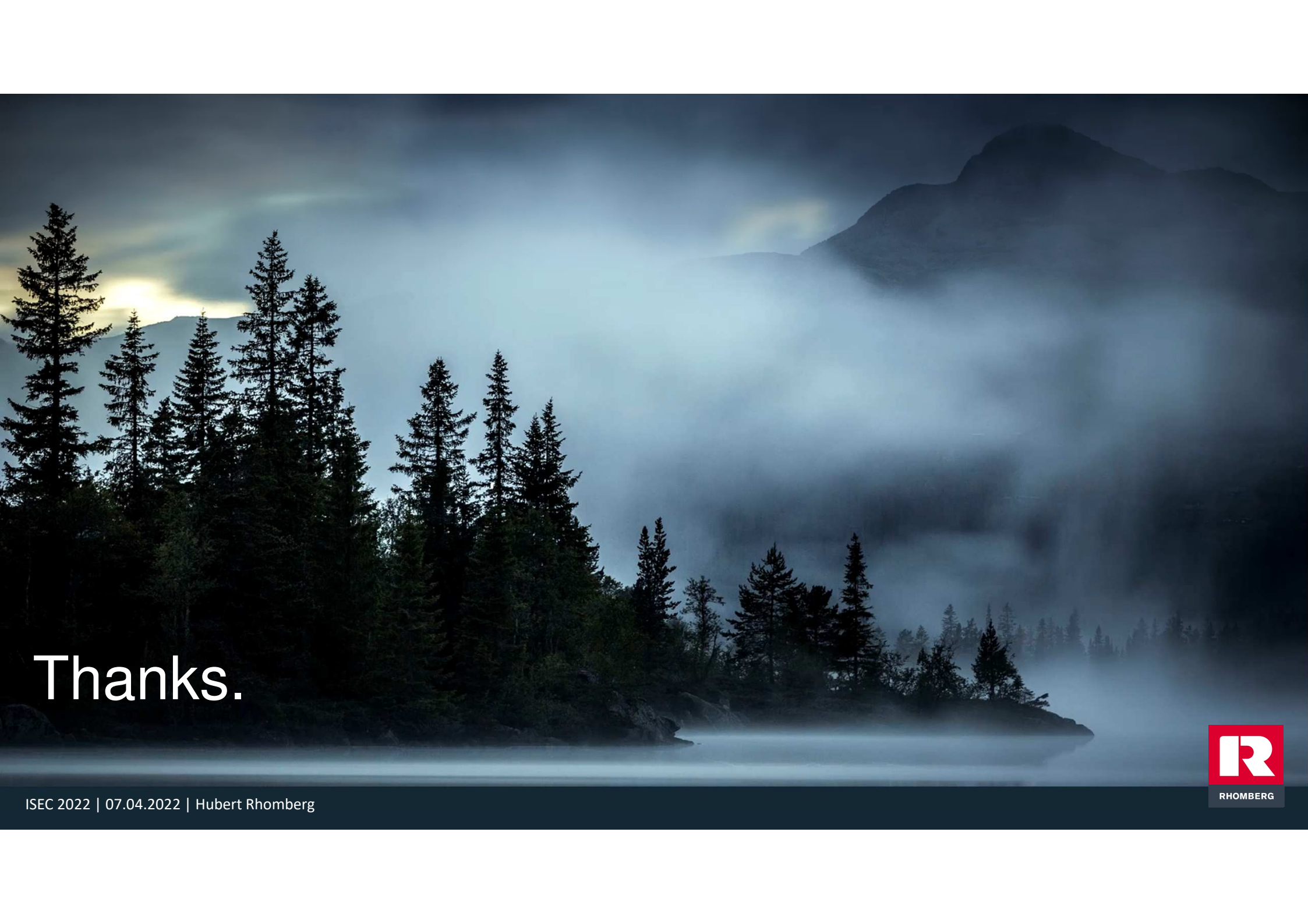
# Rhomberg Group in 30 Seconds



[www.rhomberg.com](http://www.rhomberg.com)

6. | 7.  
OKT  
2022





Thanks.