BEARING CAPACITY ASSESSMENT OF THE NORWEGIAN ROAD NETWORK USING RAMBOLL RAPTOR

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THE ASSIGNMENT

1.1 The purpose, nature and scope of the procurement

The Norwegian Public Roads Administration (NPRA) wants to measure deflections for the national road network in the whole of Norway in order to plan and prioritise maintenance and reinforcement measures based on the results.

Customer requires information about deflections in order to calculate bearing capacity among with other parameteres and plan maintenance measures.

Statens vegvesen

Conditions of contract for procurement of services

Procurement of Deflection Measurements with RWD – Rolling Wheel Deflectometer – Framework agreement

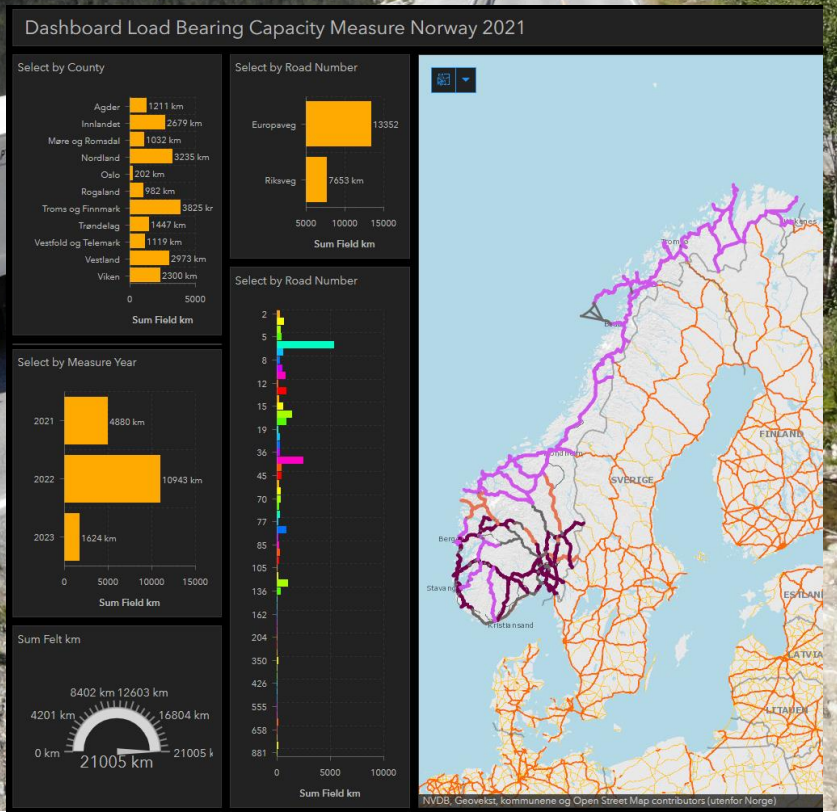
Three year contract to measure the entire Norwegian state owned road network with a rolling deflectometer (RWD)

Georadar (GPR) ordered as a complimentary service

2021 5000 km

2022 8500 km

2023 6500 km



RAMBOLL RAPTOR

Ramboll acquired the RAPTOR project from Dynatest in 2020

2011

Dynatest initiates a project together with the Technical University of Denmark for delevoping an RWD, partially funded by the Danish Innovation Fund

2013

Dynatest aquires a patent on the new principle of the RWD, utilizing image correlation for deriving deflection data

2015

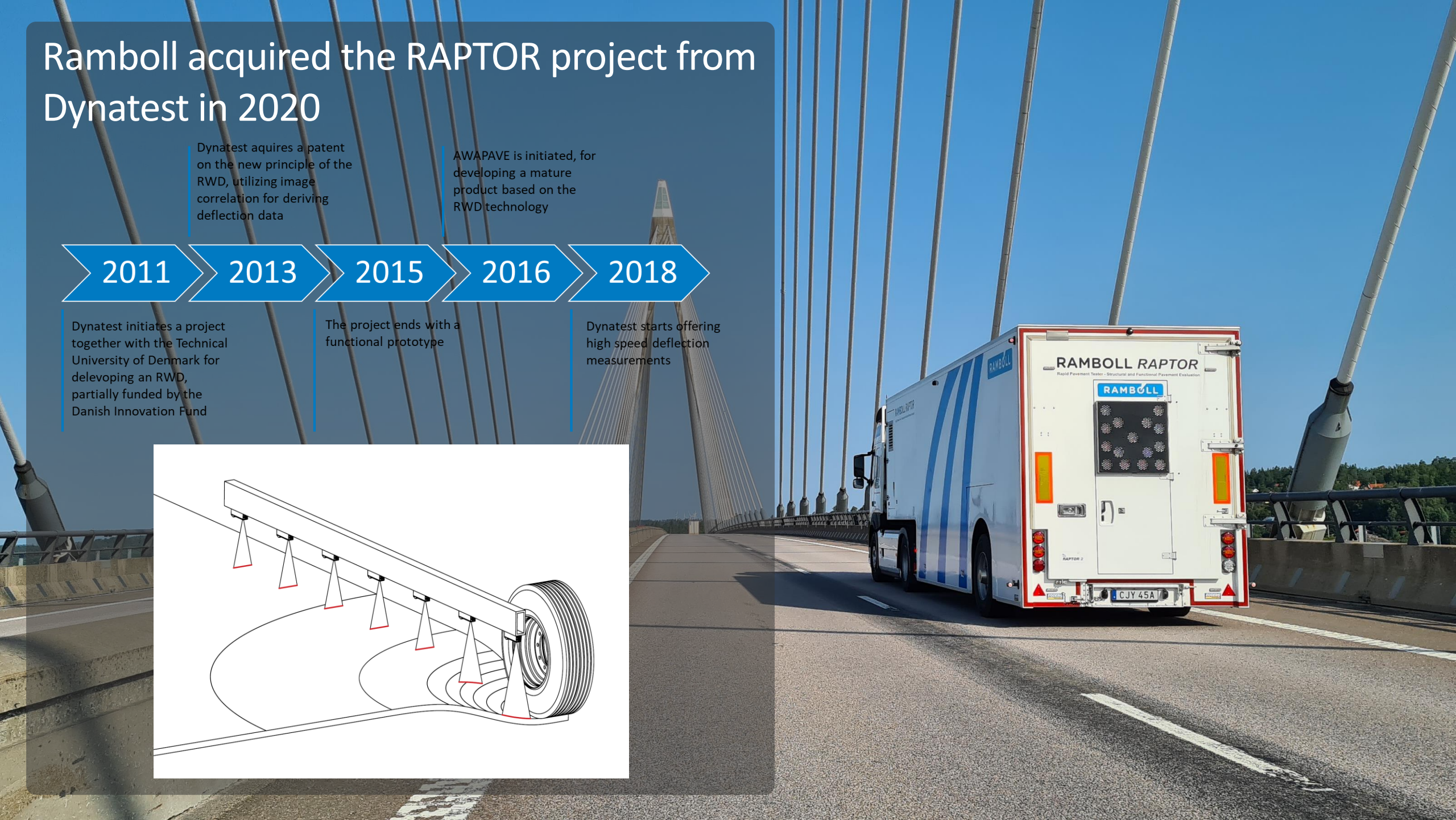
The project ends with a functional prototype

2016

AWAPAVE is initiated, for developing a mature product based on the RWD technology

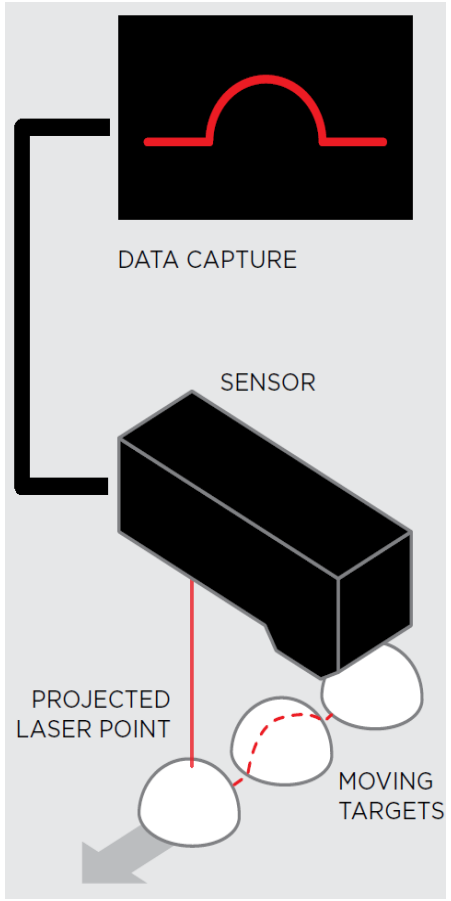
2018

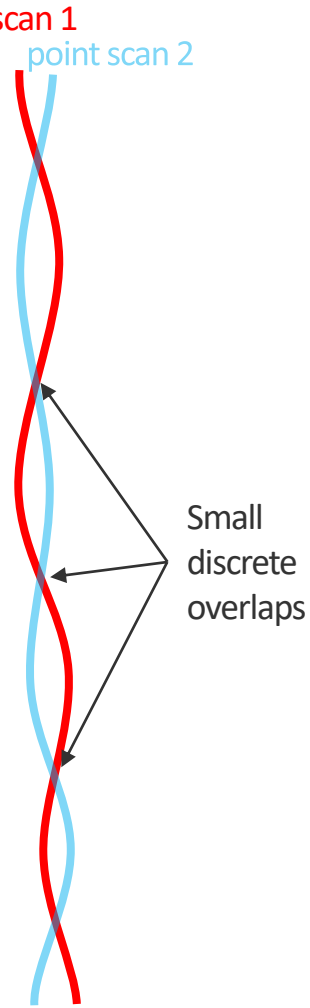
Dynatest starts offering high speed deflection measurements



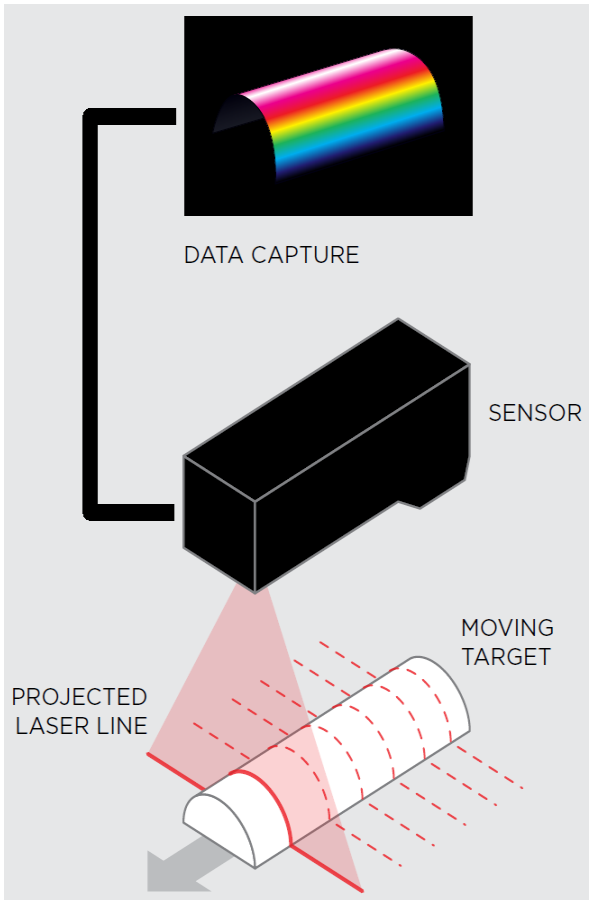
THE RAPTOR TECHNOLOGY

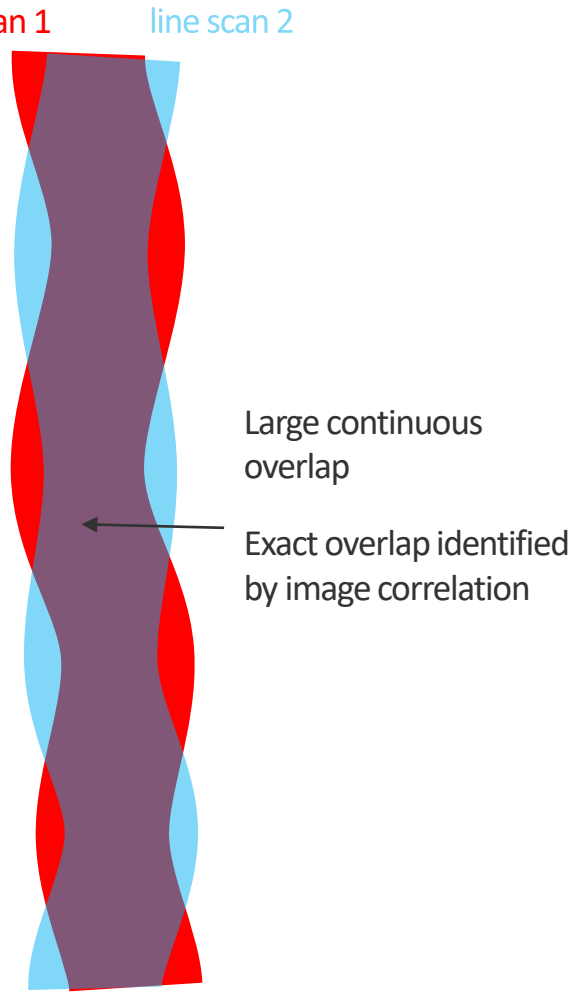
Point laser





Line laser





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THE RAPTOR TECHNOLOGY

Image *i*

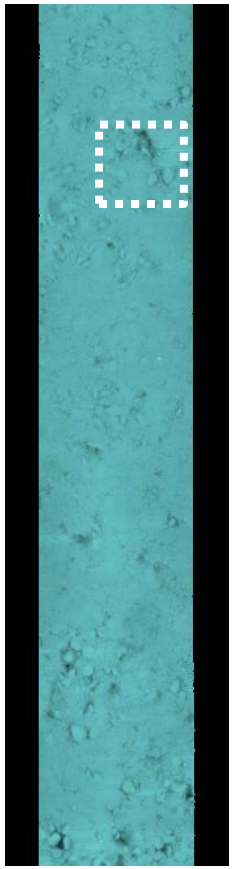
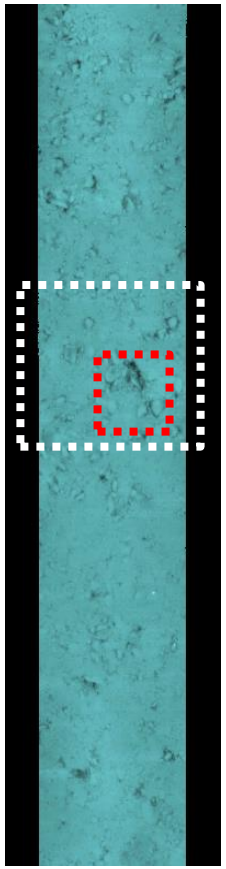
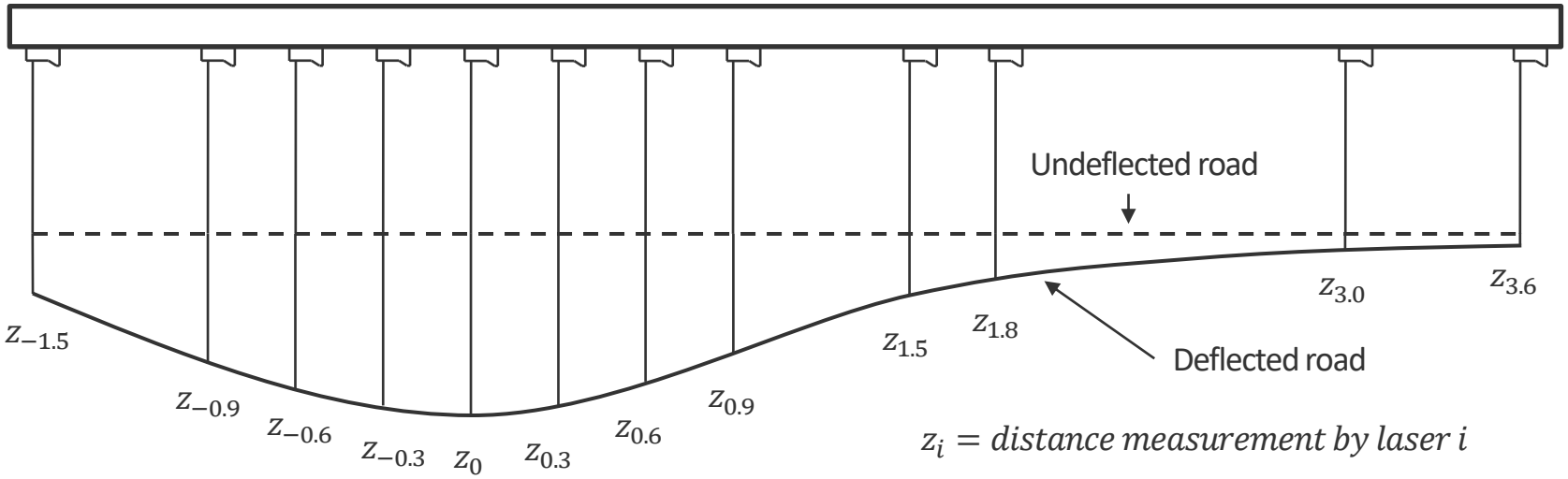


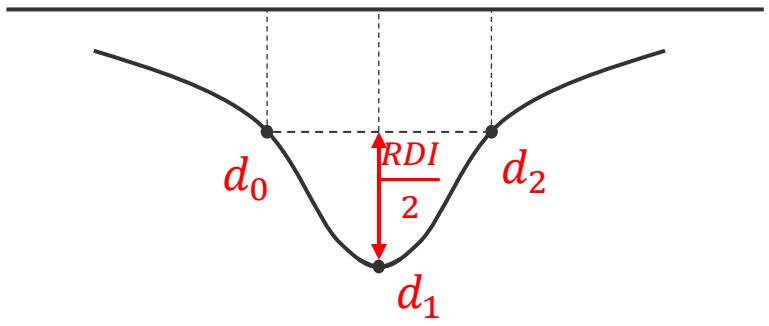
Image *i + 1*



Carbon fiber beam carrying 12 line lasers



$z_i = distance\ measurement\ by\ laser\ i$



Data from 12 sensors is combined to calculate 22 different RDI´s

$$Raptor\ Deflection\ Index, RDI = d_0 - 2d_1 + d_2$$

Position + Chainage

FWD equivalent deflections

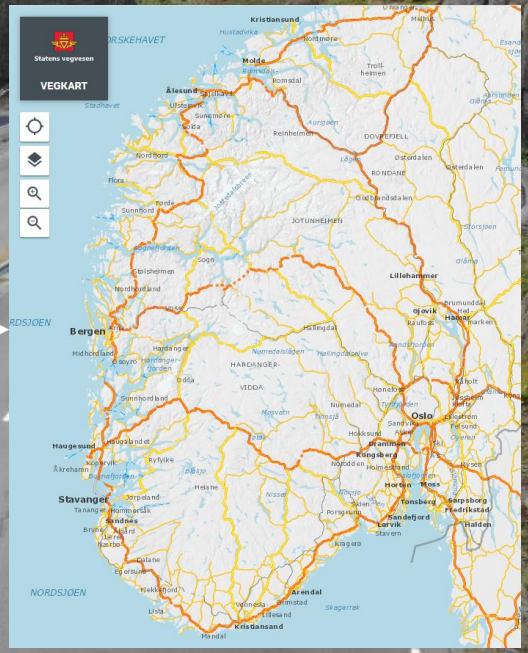
Structural parameters

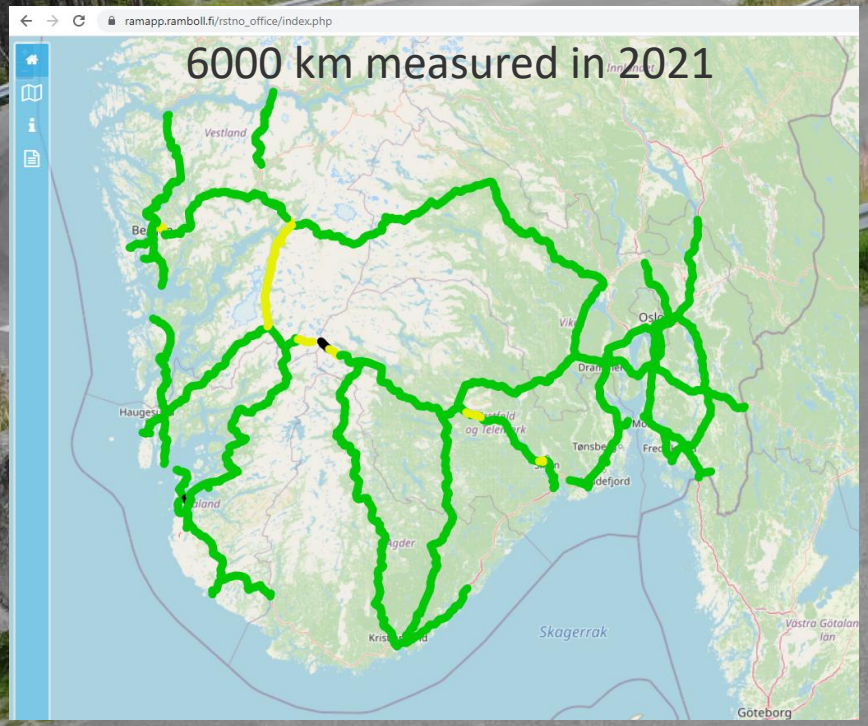
Layer thicknesses

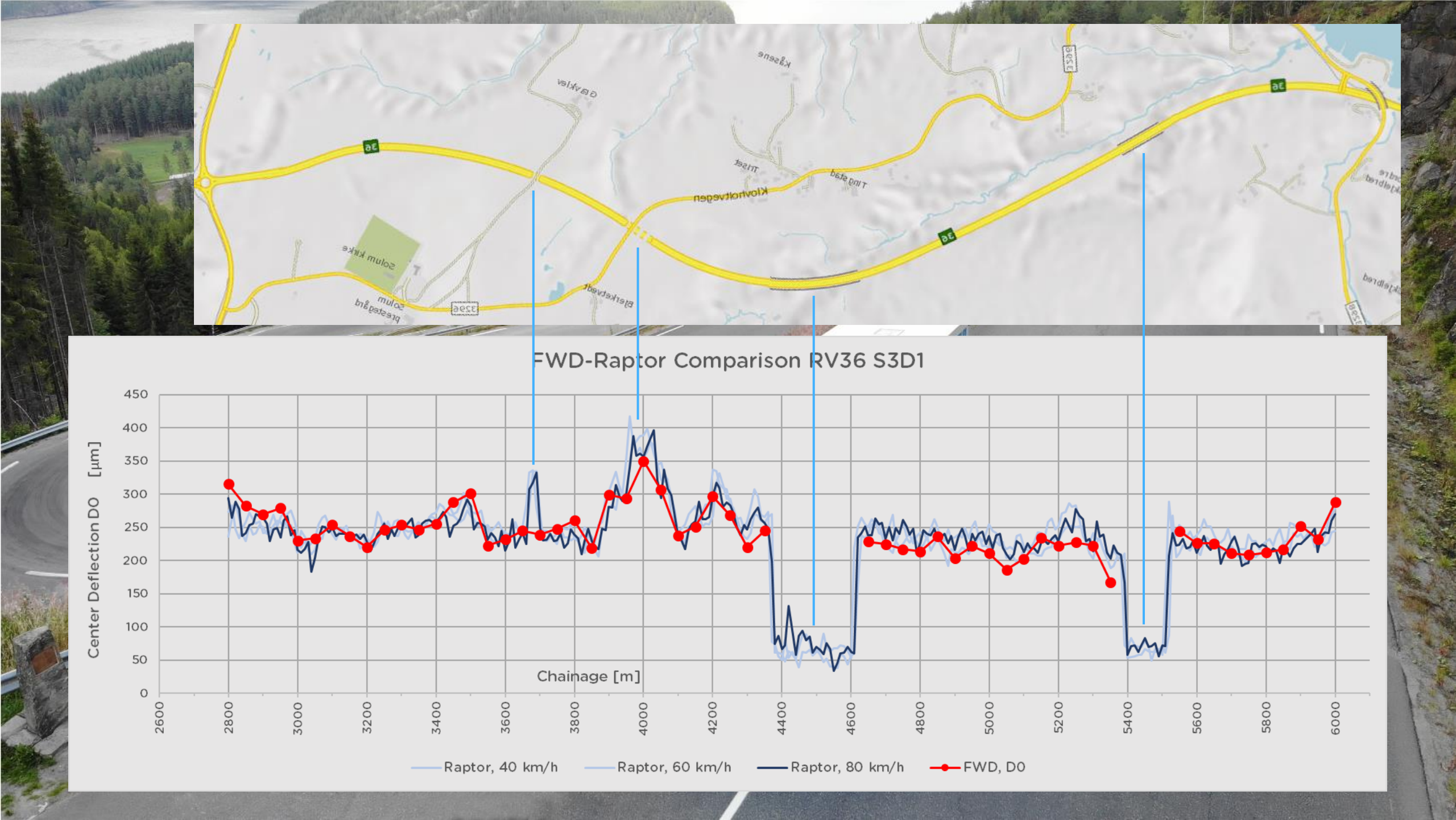
NVDB

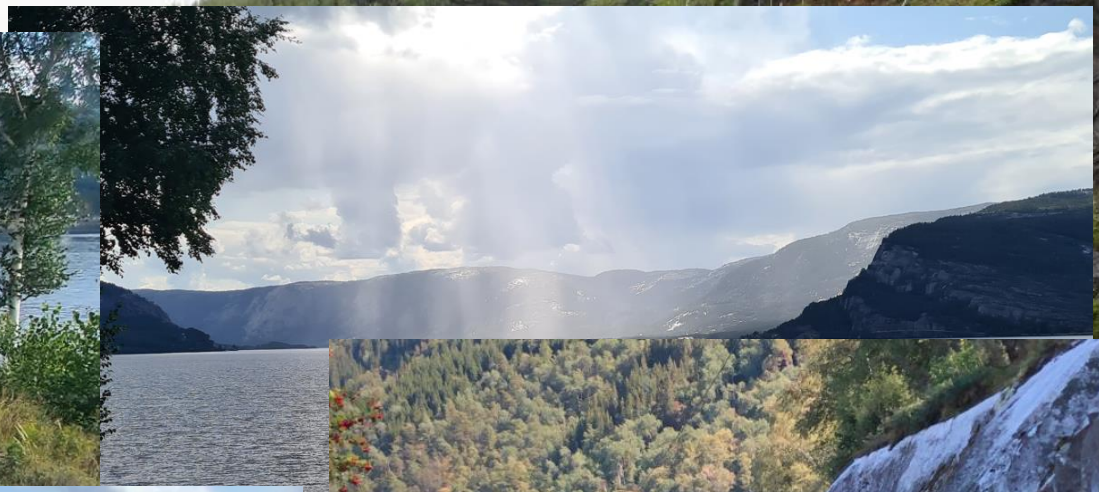
API

ASSET MANAGEMENT DASHBOARD






FWD-Raptor Comparison RV36 S3D1
Center Deflection D0 [µm]
Chainage [m]
0
50
100
150
200
250
300
350
400
450
2600
2800
3000
3200
3400
3600
3800
4000
4200
4400
4600
4800
5000
5200
5400
5600
5800
6000
Raptor, 40 km/h
Raptor, 60 km/h
Raptor, 80 km/h
FWD, D0



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RAPTOR
VOLVO
JK 458
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