



the role of ITS in changing the game

Jorge Lopes, APCAP



APCAP - Portuguese Association of Toll Road or Bridge Concessionaires

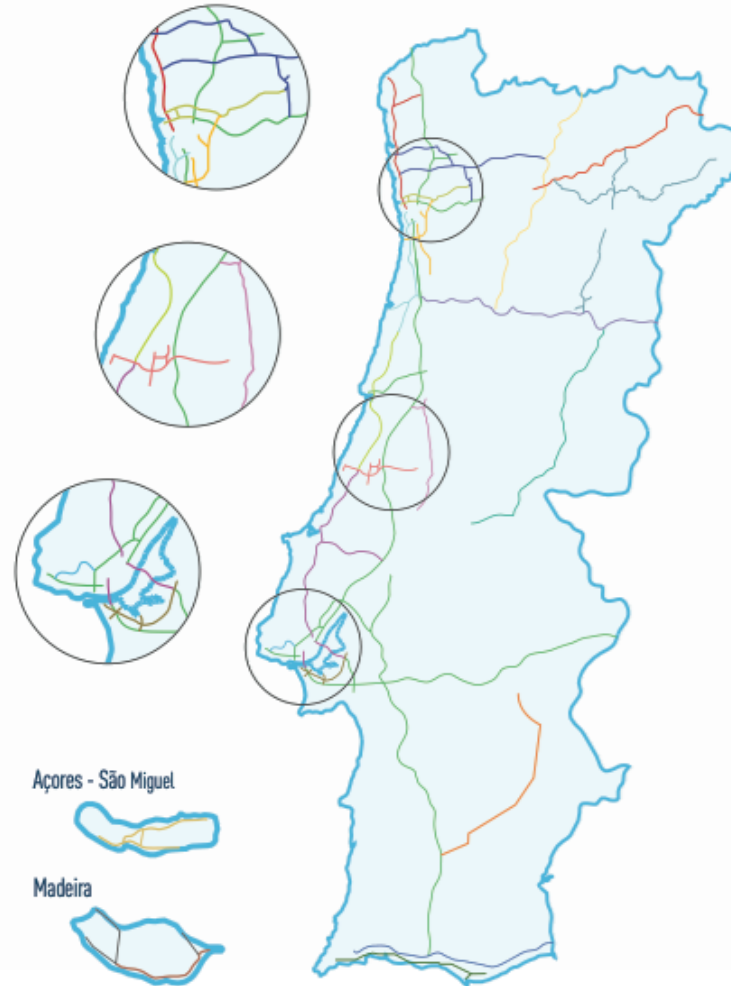


Now 24 associates on APCAP: 3580km
(25% of Portuguese National Network)

2540 km of tolled network
505 km of single lanes

AA_{DT} 2018 = 15,764
AA_{DT} 2019/2018: +5%

Quality of Road Infrastructure: Ranking 8
Source: World Economic Forum



LEGENDA

- Algarve Litoral
- Autoestrada do Algarve - Via do Infante
- Auto-Estradas do Atlântico
- Auto-Estradas do Baixo Tejo
- Auto-Estradas do Douro Litoral
- Auto-Estradas do Litoral Oeste
- Auto-Estradas Norte Litoral
- Globalvia Transmontana
- Ascendi Beiras Litoral e Alta
- Ascendi Costa de Prata
- Ascendi Douro Interior
- Ascendi Grande Lisboa
- Ascendi Grande Porto
- Ascendi Norte
- Ascendi Pinhal Interior
- Brisa Concessão Rodoviária
- Brisal
- Euroscut Açores
- Lusoponte
- Norscut
- Globalvia A23 Beira Interior
- Via Expresso
- ViaLitoral
- Estradas da Planície

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Digital infrastructures



Automated operations



Data value chain

APCAP collection

Digital infrastructures

1. Digitalization and virtualization (Brisa)

1. Extension

34,5 km

2. Duration

2h30m

3. Volume

995GB raw

536GB final



Capture

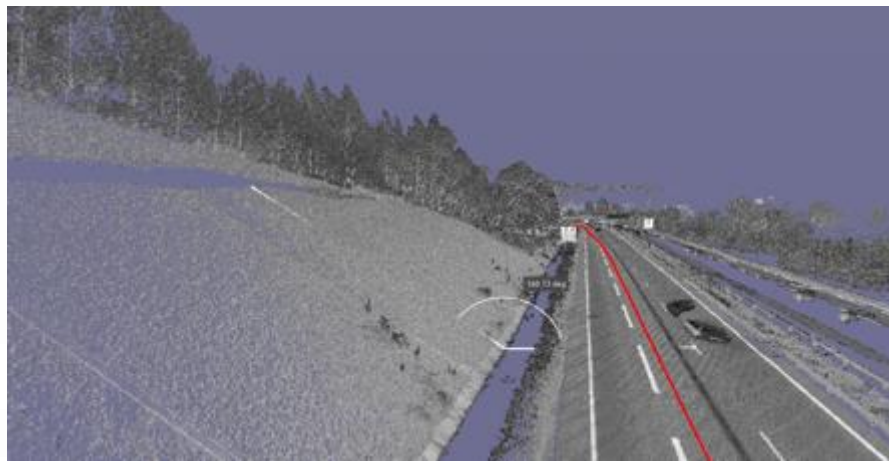
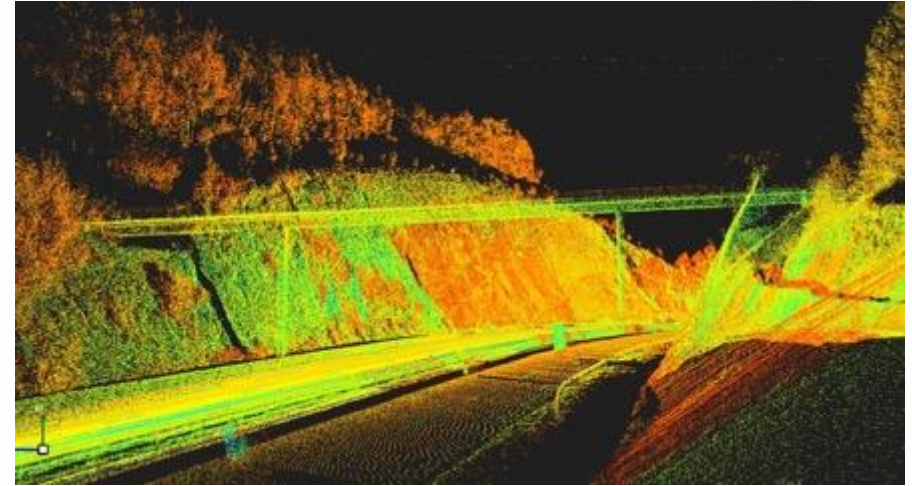
Data mngt

Digital twins

Analytics

Digital infrastructures

1. Digitalization and virtualization (Brisa)



2. Slope monitorization with remote sensing (Ascendi)

102 METODOLOGIA – DESLOCAMENTO InSAR NA A13

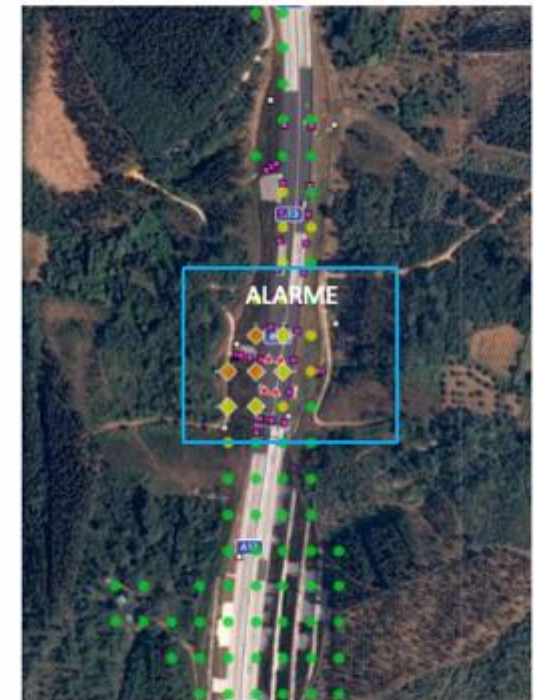
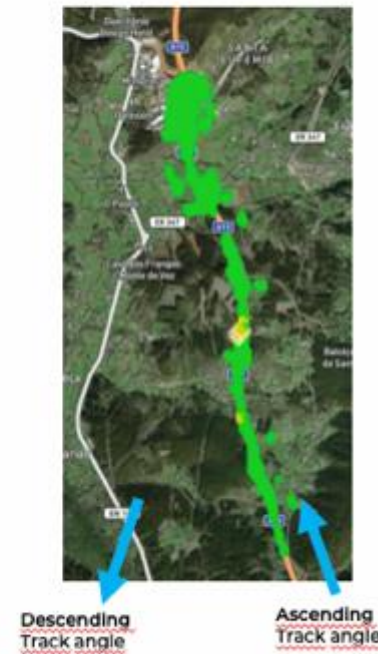
DADOS ADQUIRIDOS DE 2 ÓRBITAS COM PROCESSAMENTO InSAR

- Órbita Ascendente: 237 imagens, Track angle 345° (ou -15°)
- Órbita Descendente: 230 imagens, Track angle 190°
- Total de 467 imagens de 2014 a 2022.

DADOS CONSOLIDADOS COM DESLOCAMENTOS

- Vertical
- Horizontal.

Histórico de deteção de deslocamentos (PoC 4km)



ALERTAS AUTOMÁTICOS. Vista de geral, pontos Descending com cores default.

Digital infrastructures

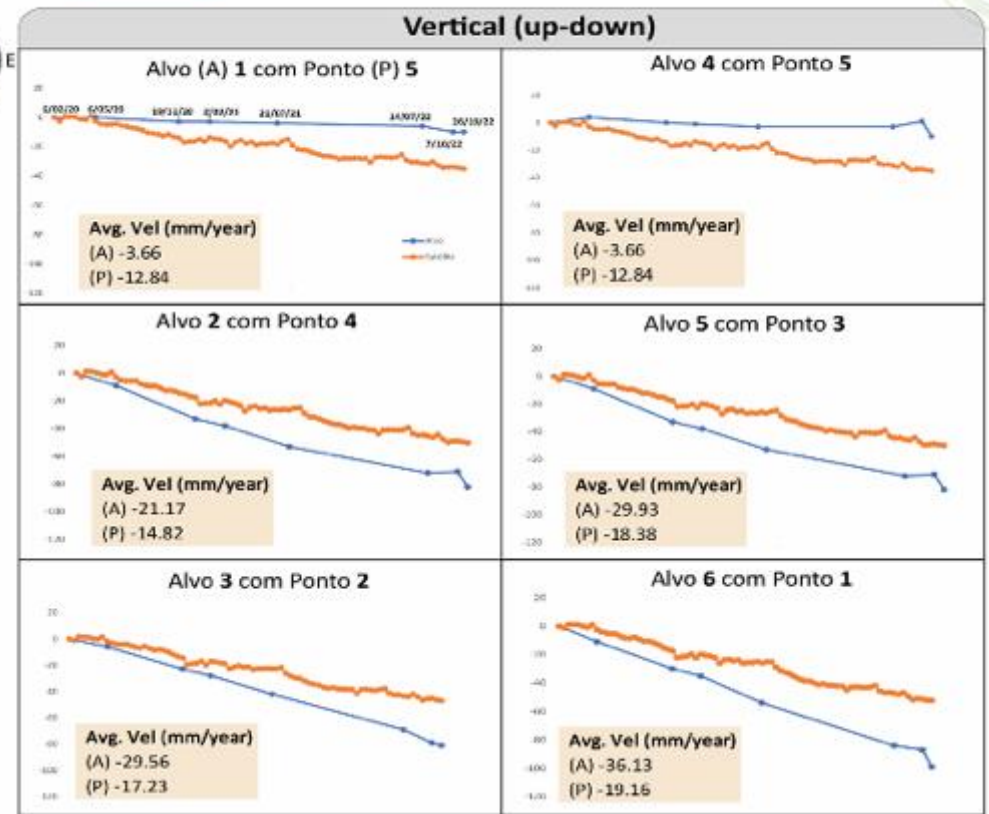
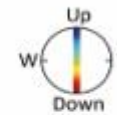
2. Slope monitorization with remote sensing (Ascendi)

/ 03 RESULTADOS – DESLOCAMENTOS InSAR na A13

Comparação instrumentação/ satélite
 2020-2022 Cobertura



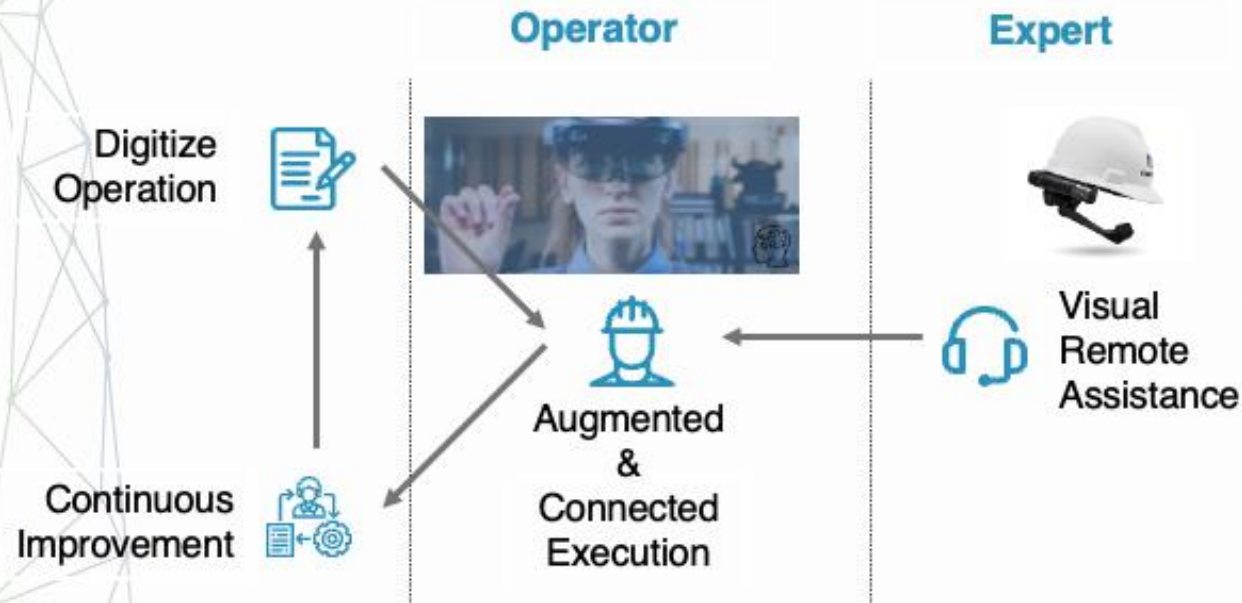
○ Pontos de satélite
 □ Alvos topográficos



Digital infrastructures



3. Augmented reality and remote assistance (Brisa)



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Digital infrastructures



Automated operations

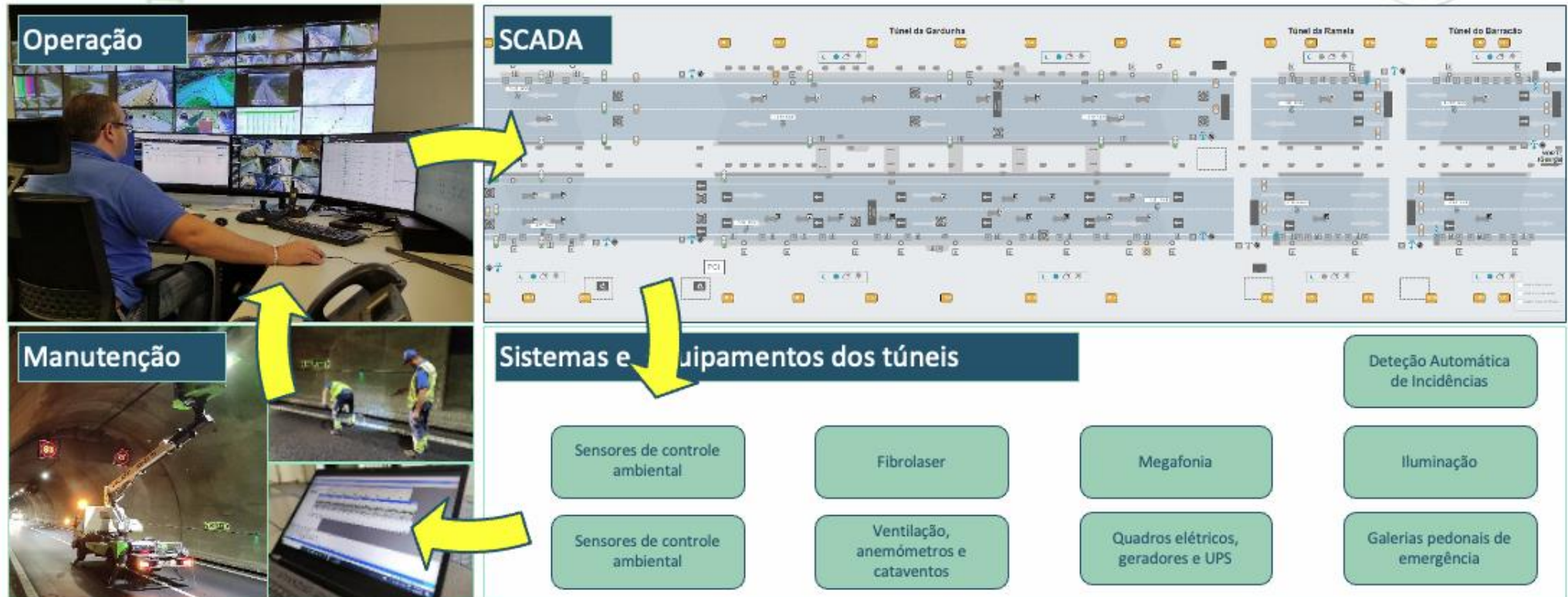


Data value chain

APCAP collection

Automated operations

1. Integrated operation and maintenance in tunnels (Globalvia)



Automated operations

1. Integrated operation and maintenance in tunnels (Globalvia)

Cooperative systems (C-ROADS)



Centro de Control

RSU

Use Case: Road works warning

Waze beacons

Use Case: Emergency vehicle

Plataforma C-ITS

OBU

Use Case: Accident

Automated operations

2. Connected emergency beacons (Brisa)

Ativação HF IoT

Comunica dados de partida, a 1ª geoposição e encerramento:

- IMEI (único por beacon)
- Latitude-longitude
- Data/hora de geoposição
- Data/Hora de receção do lote
- Tipo de frame (0-Start, 1-In progress, 2-Off)
- Grupos Brisa por IMEI para alterar o status do incidente (iniciado, em andamento, fechado)



Automated operations



3. Training simulators (EGIS)

- Using simulators for training
 - Simulator for the continuous training of patrolling and maintenance agents;



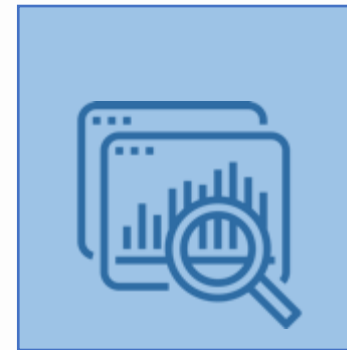
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Digital infrastructures



Automated operations

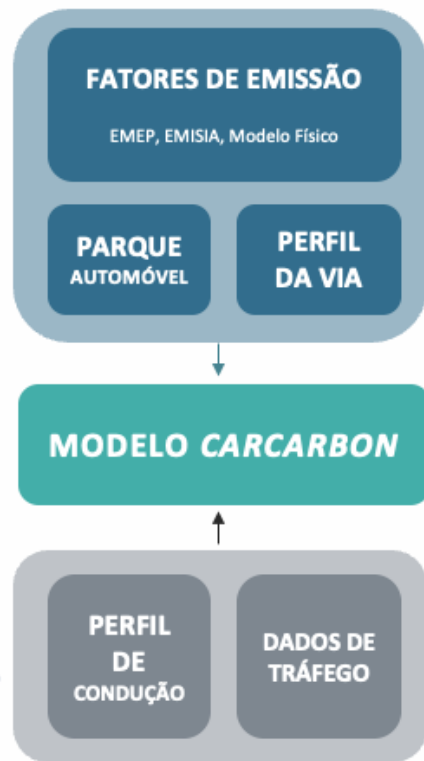


Data value chain

APCAP collection

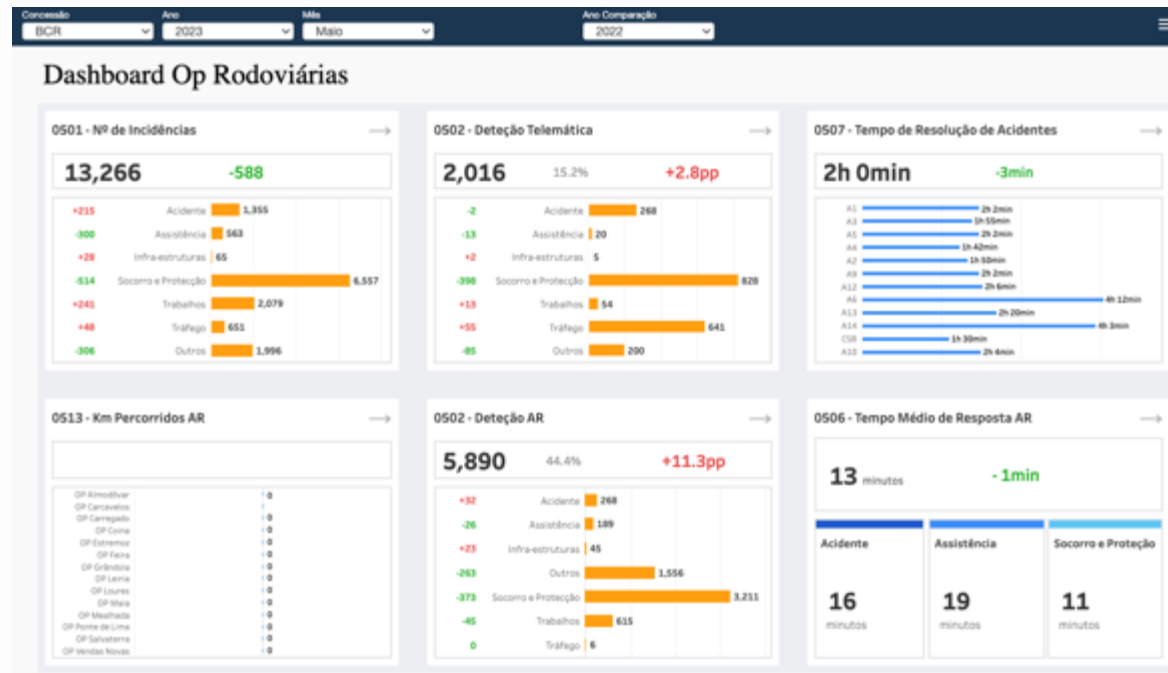
Data value chain

1. Carbon Emissions Calculation (Ascendi)



Data value chain

2. Big data advanced analytics (Brisa)



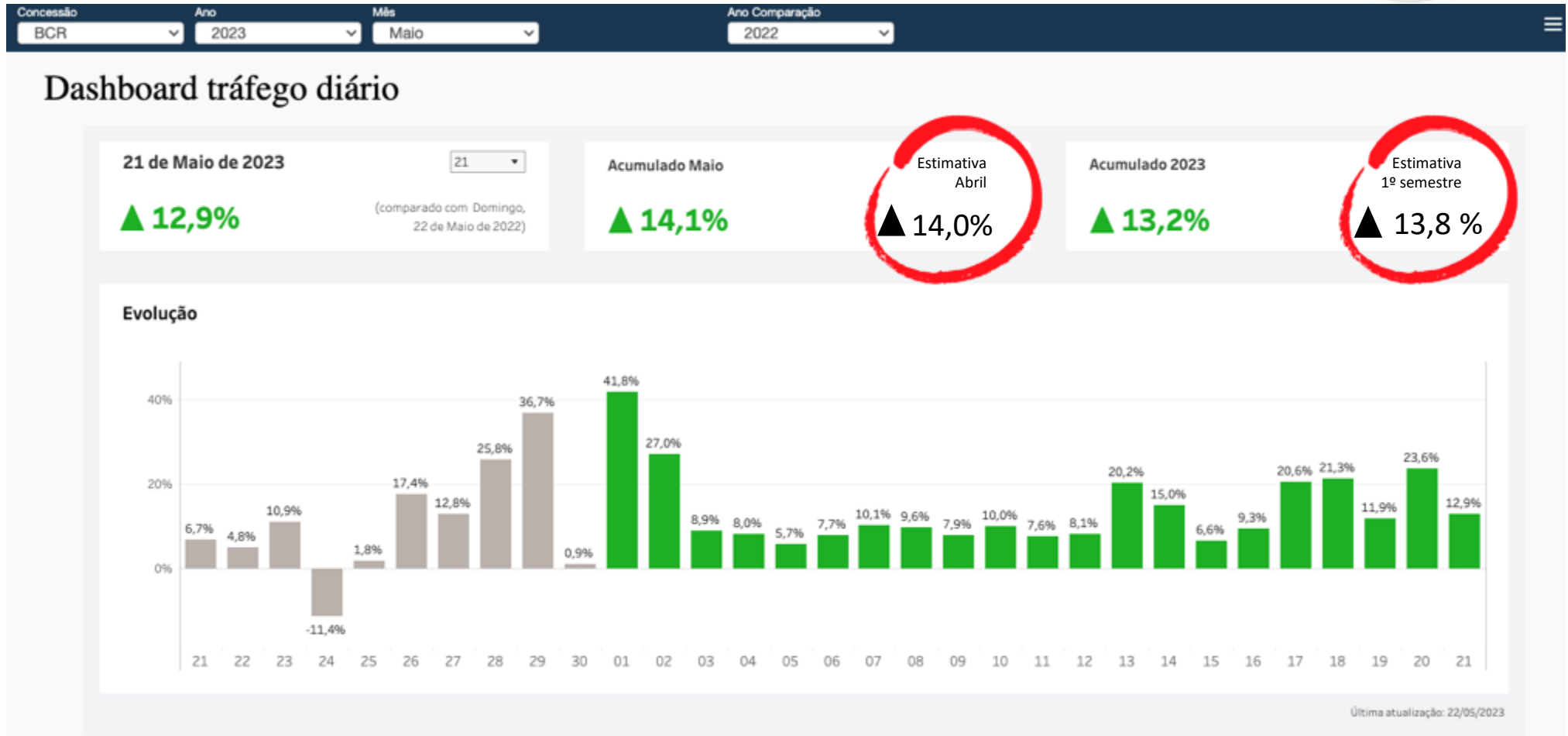
ZERO-BASED DESIGN (ZBD)

DATA GOVERNANCE PROGRAM

ANALYTICS OPERATING MODEL

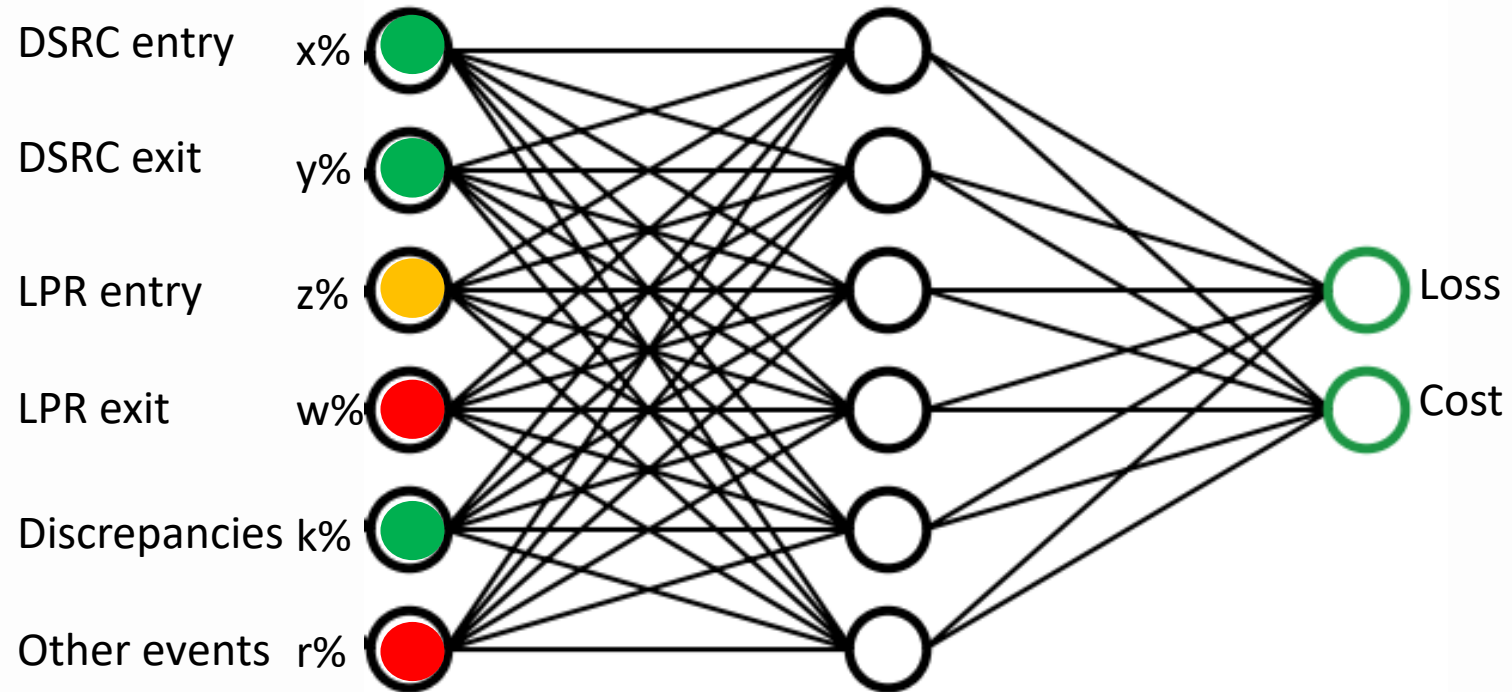
Data value chain

2. Advanced analytics – data forecasting (Brisa)



Data value chain

2. Advanced analytics – *deep learning* (Brisa)



What will happen ← → How to make it not happen?

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Data value chain