

O FUTURO JÁ ESTÁ EM MOVIMENTO

HSWIM: a primeira balança de pesagem em movimento na velocidade da via do Brasil.

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PESAGEM EM MOVIMENTO



Viaje com mais *agilidade* e menos paradas.

HS WIM IN BRAZIL

An Overview of the Current Use of WIM for Weight Enforcement in Brazil

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Innovation and Technology Director at Ecorodovias





AGENDA

- EcoRodovias Group
- LS-WIM
- HS-WIM
 - Challenges
 - EcoRodovias Project
 - Results & Next Steps

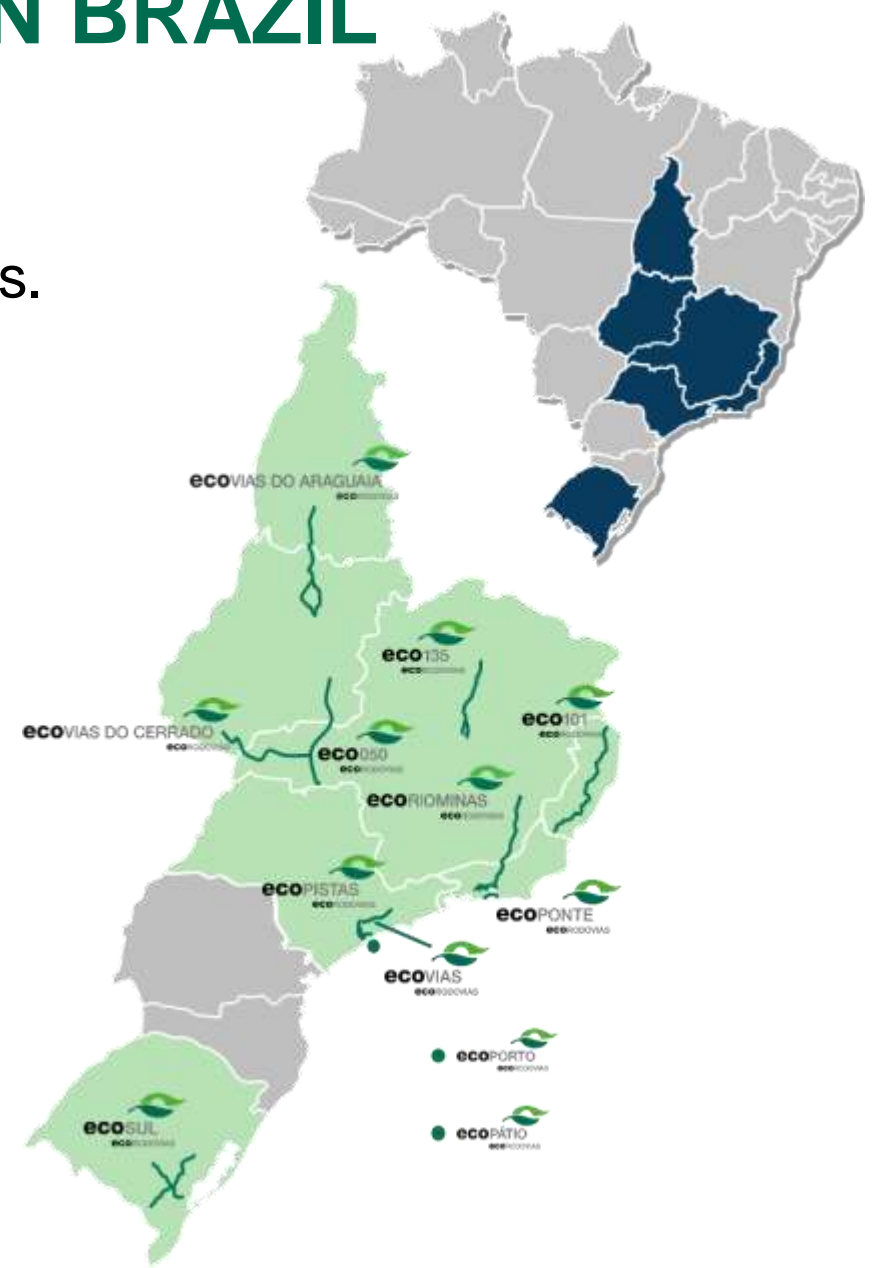
BIGGEST TOLL ROAD OPERATOR IN BRAZIL



We operate the main road corridors in South, Southeast, North, Northeast and Midwest regions.

- 4,7 thousand kilometers of highway;
- + of 5.4 thousand employees;
- R\$ 4.2 billions invested in 2023;

To be the best road infrastructure manager in Brazil, with sustainability



A LOOK INTO THE PAST....

HELPS US UNDERSTAND THAT THE ONLY CERTAINTY WE HAVE ABOUT THE FUTURE IS THAT IT WILL BE DIFFERENT

Early contracts: scales and tolls were the only technological requirements in some contracts.

Until 1997

CCTV, VMS, SATs, and Callboxes are included, along with the provision for automatic lanes.

1998

Automatic lanes become a reality, with 15 days allowed for sending a transaction.

2000

The world's highways becomes connected

Agencies begin online monitoring model - tolls, ITS, and scales

2009

Studies and implementation of the first HS WIM with selective function at the EcoRodovias Group (BR-101/ES km 304)

2019
2020

SandBox ANTT – Direct enforcement HSWIM Operation

2023
2024

SMART ROADS



Low Speed Weigh in Motion carries a lot of issues and

disadvantages.

- **Inefficiency** - Fraud and evasion: drivers use alternative routes or use methods to escape/manipulate weighing process
- **Road Safety:** Overloaded vehicles are more likely to cause accidents due to road wear, increased braking distances, and loss of control
- **Road Deterioration:** Vehicle overloading contributes to pavement deterioration and consequently, increases maintenance and repair costs;
- **Limited coverage:** The vehicle weighing enforcement infrastructure is still insufficient (few scales)
- **Environmental Impacts:**
 - Higher fuel consumption,
 - additional pavement repairs.



HS-WIM CHALLENGES

Connectivity

Location

Road/Pavement Quality (Cost 323 Class I)

Transshipment

High quality sensors and complex software integration

Regulation / direct enforcement

ANTT REGULATORY SANDBOX

An efficient initiative that enables HS-WIM Introduction in Brazil

Project has started in Sep/2023 it was enabled by **ANTT Regulatory Sandbox**, an experimental environment that will provides information for a new regulation.

Implementation made in partnership with Sinelec (Italy) with Kistler sensors;

In June, field solution (weighing gantry) **passed on INMETRO* field certification test**, overtaking the minimum performance required in a rigorous test. IPEM (*Instituto de Pesos e Medidas* – Institute of Weights and Measures)

 MINISTÉRIO DO DESENVOLVIMENTO, INDÚSTRIA, COMÉRCIO E SERVIÇOS INSTITUTO NACIONAL DE METROLOGIA, QUALIDADE E TECNOLOGIA - INMETRO		Doc. 19	
CERTIFICADO DE VERIFICAÇÃO:		13644455010824	Executor: 200
Instrumento: IPA de Veículos Rodoviários em Movimento		Marca: ECORODOVIAS KISTLER	Modelo: 9195GC5X
Dados Complementares		Código Serviço: 233 (Inicial)	Valor: R\$ 4.639,36
Carga(s) Máxima(s): 25.000kg Carga(s) Mínima(s): 100kg Valor de Divisão Real (d): 10kg		Número do Documento de Arrecadação: 294103235001900438	
Classe de Exatidão: 1A Velocidade Máx: 90 km/h - Velocidade Min: 7 km/h		CNPJ ou CPF: 08.873.873/0001-10	
Marca de Verificação: 12756341-6		Data: Verificado em 01/08/2024 conforme regulamentação aplicável sendo APROVADO	
Data de Emissão: 01/08/2024		 Agente Metrologista 1364445-3 JUNIOR FERREIRA DE PAULA	
Nome/Razão Social: ECORODOVIAS CONCESSOES E SERVICOS S/A			
Endereço: RODOVIA DOS IMIGRANTES S/N KM 28,5 1 E 2 ANDAR			
Bairro: ALVARENGA	CEP: 09843-000		
Município: SÃO BERNARDO DO CAMPO	U.F.: SP	Telefone: (11) 4359-6000	

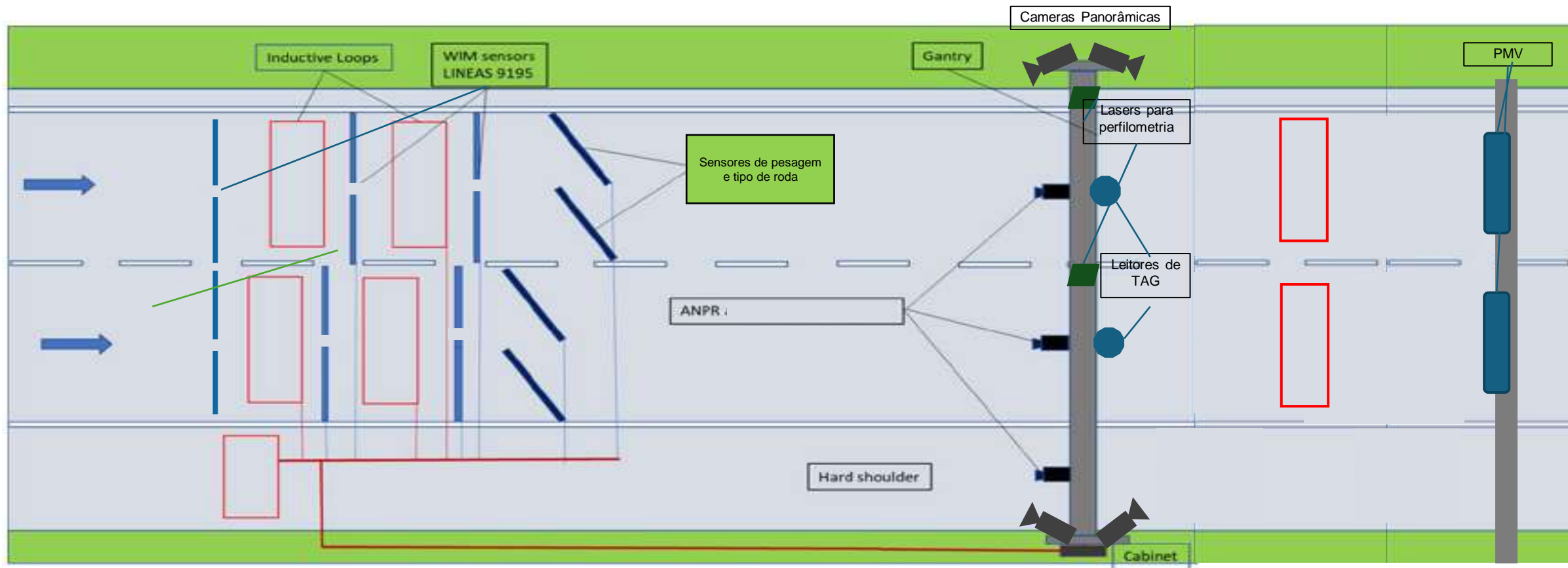
Next Steps:

Government regulations for enforcement (requires change of law).

Implementation Pipeline	2024	2025	2026	2027
	<ul style="list-style-type: none"> ▪ 4 Ecovias do Cerrado ▪ 2 EcoRioMinas ▪ 1 EcoNoroeste 	<ul style="list-style-type: none"> ▪ 1 Eco135 ▪ 2 EcoNoroeste 	<ul style="list-style-type: none"> ▪ 3 EcoRioMinas ▪ 3 Ecovias do Araguaia 	<ul style="list-style-type: none"> ▪ 4 Eco050

*Subject to change

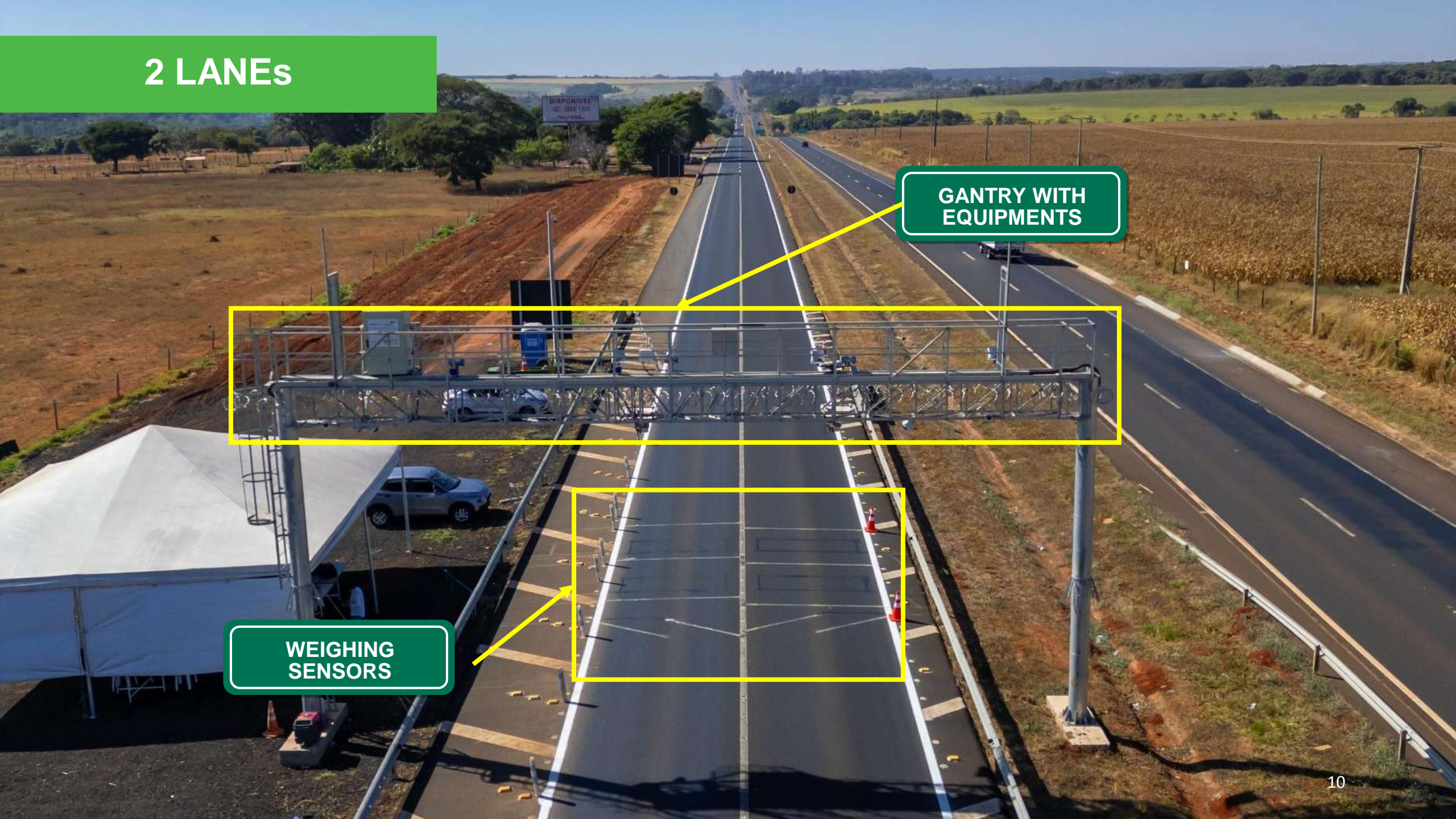
2 LANES



2 LANES

GANTRY WITH EQUIPMENTS

WEIGHING SENSORS

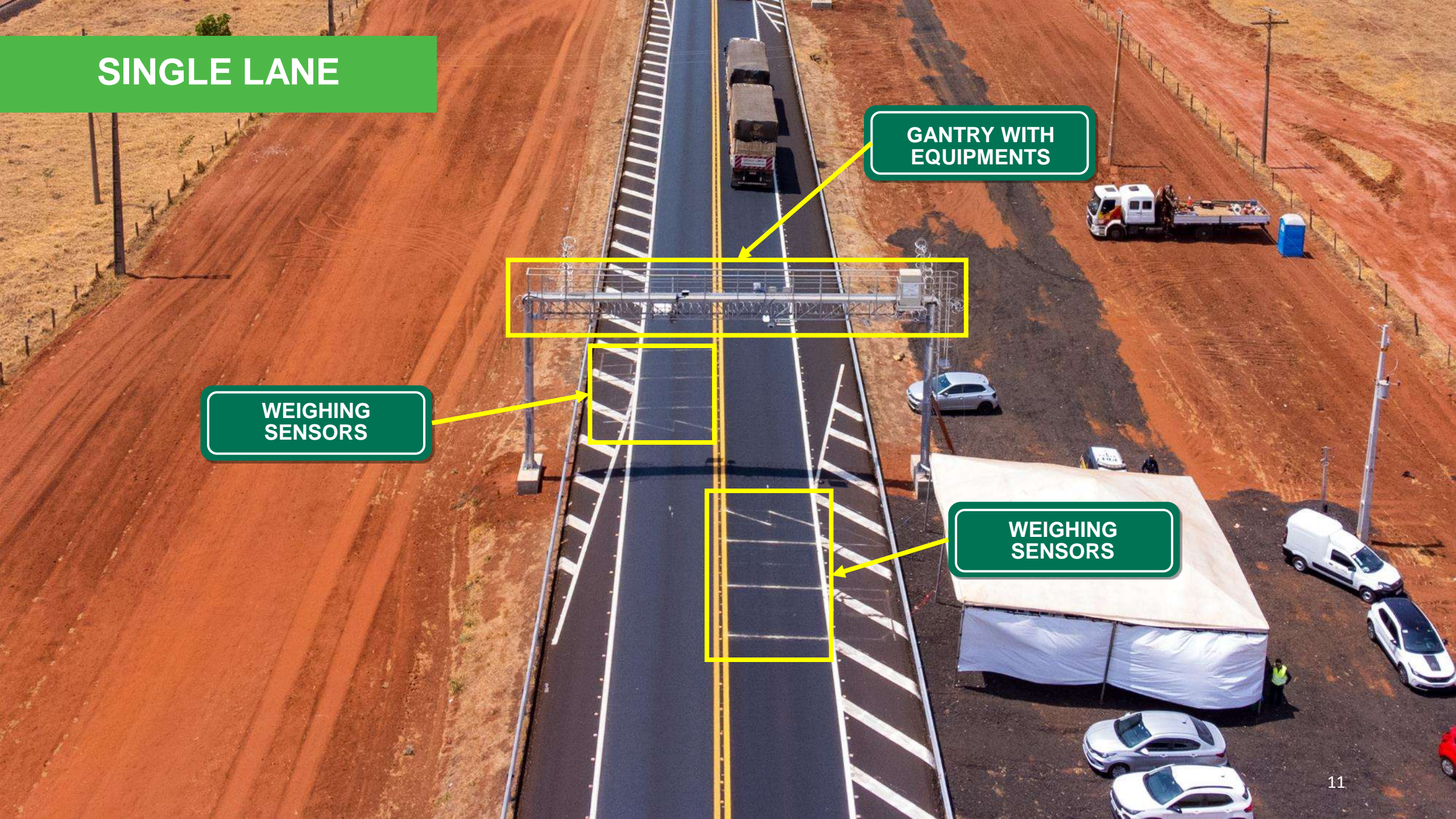


SINGLE LANE

GANTRY WITH EQUIPMENTS

WEIGHING SENSORS

WEIGHING SENSORS



SENSORS



EC
Vendo 10.287

Tempo real

Dados históricos

Estatísticas

Configuração do siste...

Admin

Document

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Rogério Silva

30/10/2024 06:32:35 Data/Hora

7614308 Trânsito Id

EcoCerrado-BR011101-0641Dot850-W Localidade

Faixa 2 de condução Pista

CR6 Classe

BRA País

N/A Tag ID

43 Velocidade (km/h)

63.880 Peso Bruto Total (kg)

NO PLATE Pista ADR

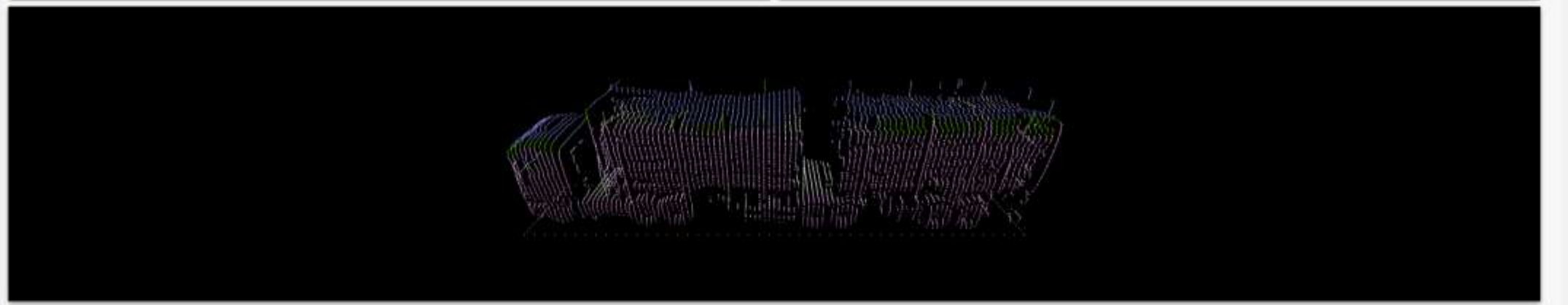
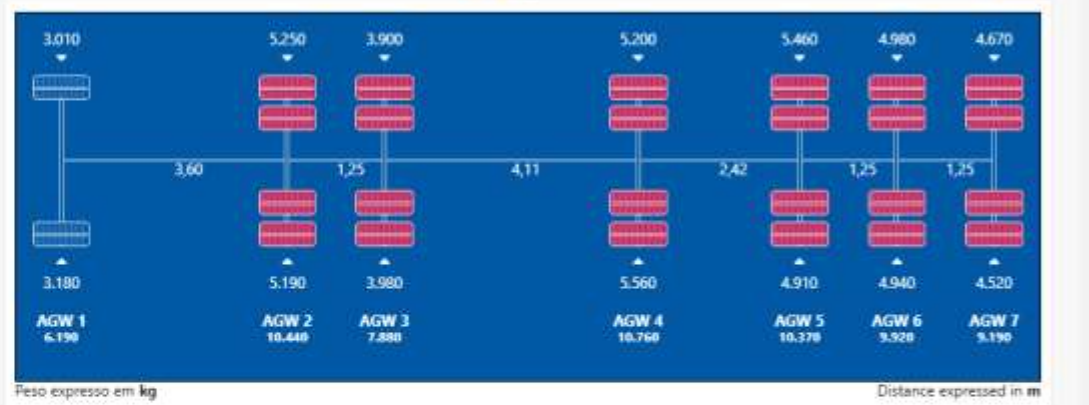
7 Contagem de eixos

20,74 Comprimento do veículo (m)

4,50 Altura veículo (m)

2,55 Largura veículo (m)

0xDA76BAA4 Metrological Id



2,5%

**GVW
TOLERANCE**

4,0%

**AXLE
TOLERANCE**

7

km/h

MINIMUM SPEED

90

km/h

**MAXIMUM
SPEED**

TRADITIONAL SCALE VS HS-WIM



- Significant reduction regarding CO₂ emission: decrease of 20,4% of CO₂*;
- Significant reduction of evasions: 0,6% in HS-WIM compared to 22%;
- Efficiency on weighting: 1,7 seg non-stop travel vs 4min -12min.



**CONNECTED
SIMPLE
EFFICIENT**

**MULTIPLE SERVICES IN
ONE GANTRY**



**Tolling
MLFF**

**Weighting
HS-WIM**

**Chain Efficiency | Automated Inspection, enforcement,
| Gov integration, traffic flow, safety**



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THANK YOU!