Content from International Conference on Asphalt 4.0 2022 in Madrid

Dr. Juan Jose **Potti** @jjpotti
EAPA President @eapa_org

8th International conference ASPHALT PAVEMENTS 2023
Opatja 11. - 12.05.2023.

#ICA4point0

- Thank you for giving me the opportunity to be here, one more year, and especially in this year 2023.
- We celebrate the 50th Anniversary of EAPA and Asefma !!

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- On September 20 and 21, 2022, was the first **International Conference on Asphalt 4.0** was held in Madrid
  - organized by ASEFMA and ZAS with the support of EAPA
  - https://ica4point0.com/wp-content/uploads/2022/10/FinalReport-ICA4point0-_English.pdf
- the second edition will be on **September 26-27, 2023**
- The website of the event: https://ica4point0.com/

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- The main sponsor was MOBA and the bronze was Fliegl
  - 12 communications were received from 5 countries: 4 from Spain, 3 from Germany, 2 from Slovenia, 2 from the Netherlands and 1 from France
  - The **#ICA4point0** was developed in PDV format: Face-to-face (P) plus Digital (D) and also Virtual (V) App “PDV by itafec”

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- From the App “PDV by itafec”consult the abstracts at:
  - http://ow.ly/aVV350KMHzu
  - and download the papers from the App
  - or from:
    - https://ica4point0.com/

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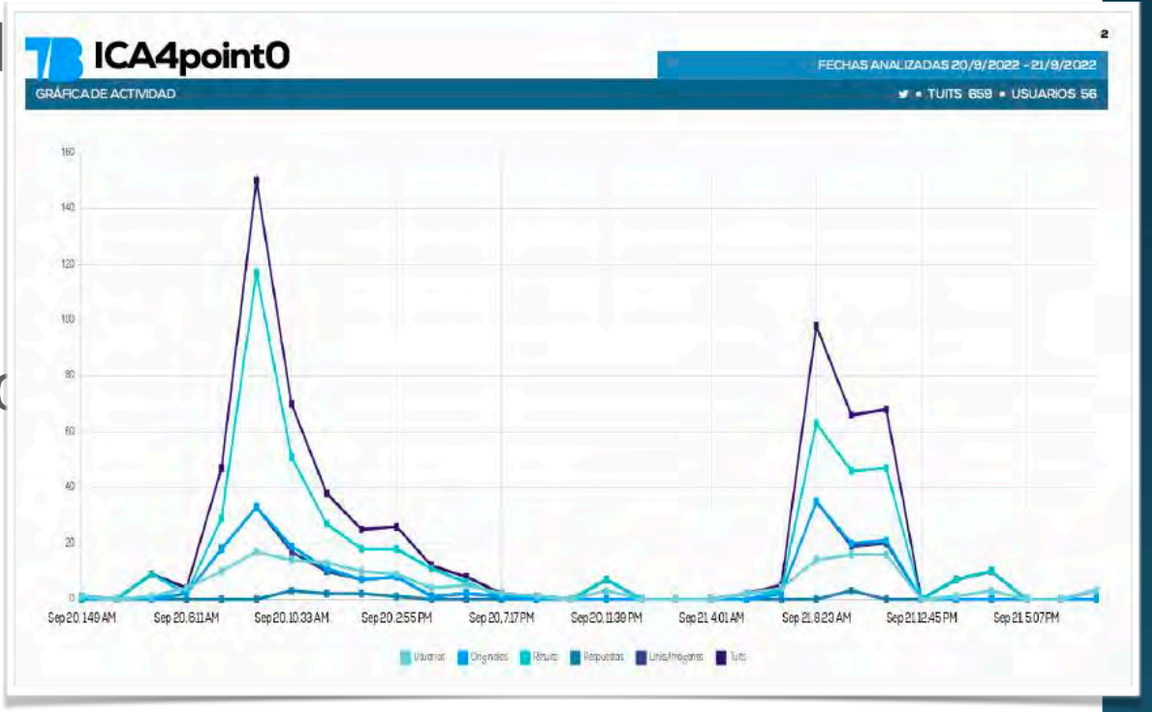
- From the App “PDV by itafec” you can access to the 12 abstracts, to the 12 complete papers and even, send a message to the authors

Digital activity #ICA4point0

- Sesión 1 "Digitalization: a shared space between road administrations and road contractors”
- sesión 4 "Digitalization applied to maintenance and use stage of roads"



Evolution of social media activity using #ICA4point0 during the 20 and 21 september

Ideas #ICA4point0

- There are 2 or 3 revolutions at the same time (digital, environmental and energy)
- Assess the effectiveness of investments with big data traffic behavior
- Include digital and environmental evaluation criteria in the offers:
- associated emissions or sectorial EPD

Presentations #ICA4point0

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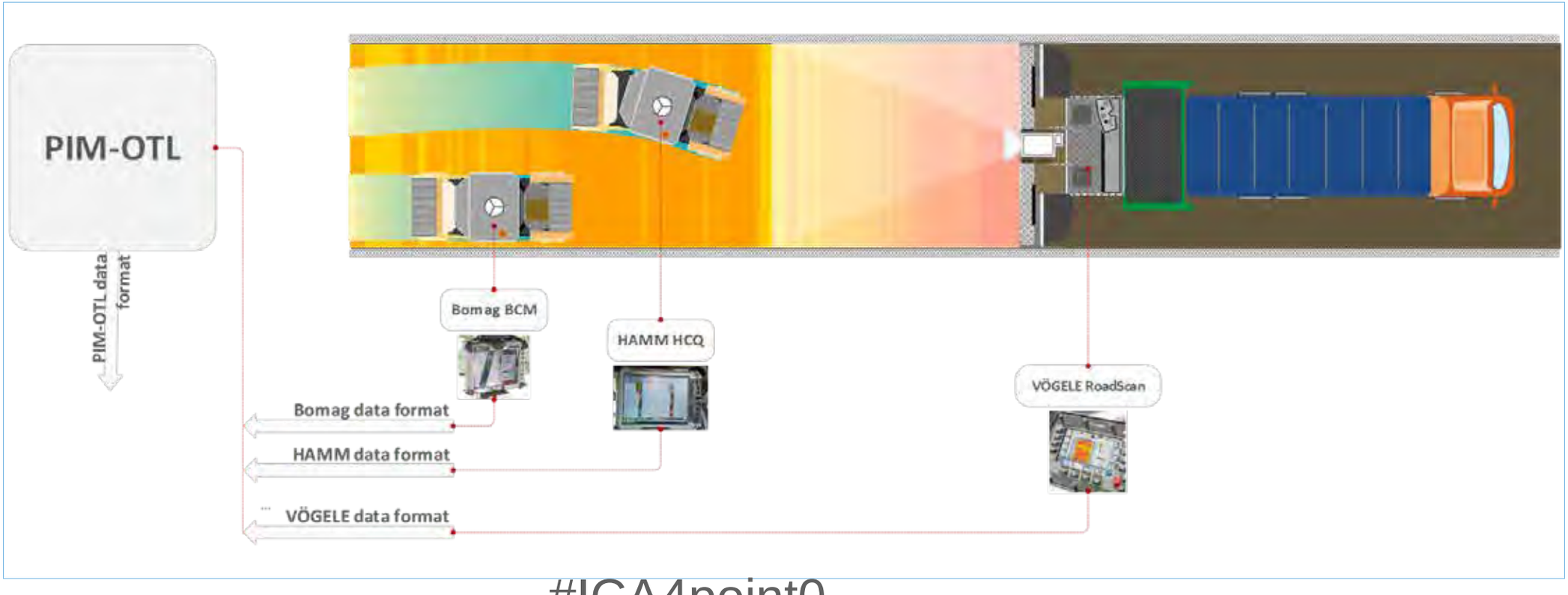
A practical application: Digital Twin



0
5
10
15
20
25
30
51°25'54"N
51°25'53"N
51°25'52"N
51°25'51"N
51°25'50"N
51°25'49"N
51°25'48"N
Latitude
4°16'18"E
4°16'20"E
4°16'22"E
4°16'24"E
4°16'26"E
4°16'28"E
4°16'30"E
4°16'32"E
Longitude
20 m
100 ft

A practical application: Digital Twin

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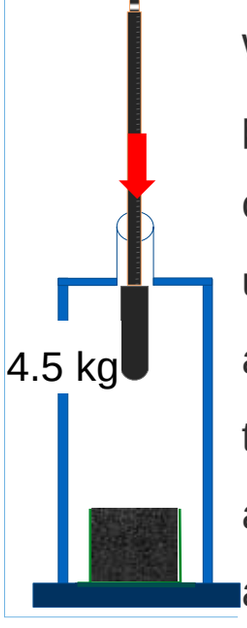
Digital design of asphalt

Alvaro Garcia Hernandez (alvaro.garcia@nottingham.ac.uk), Frank Awuah, Liyao Wan, Sonia Michot Roberto, Santiago Dopazo Hilario

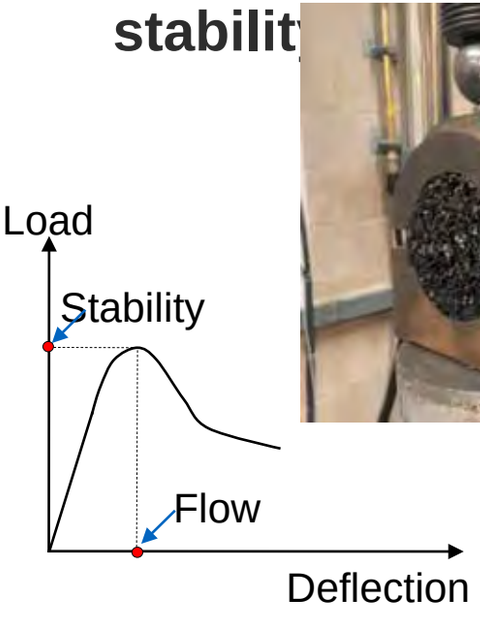
Asphalt mix design based on…

1. Workability



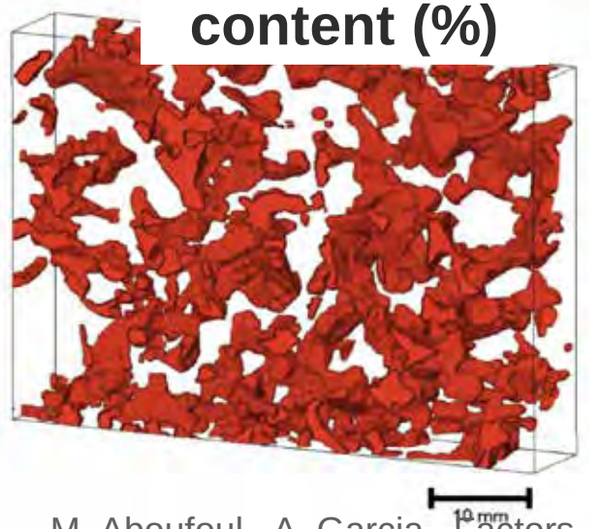
Workability is the penetration of the cylinder in uncompacted asphalt, divided by the penetration of a reference asphalt

2. Marshall stabilit



3. w

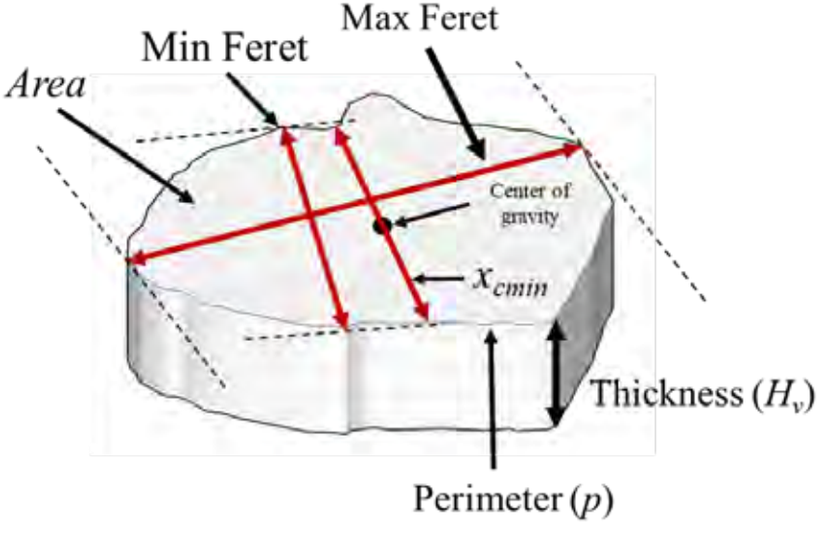
4. Air void content (%)



M. Aboufoul . A. Garcia, Factors affecting hydraulic conductivity of asphalt mixture, Materials and Structures (2017) 50:116

Step 1: Measure virtual aggregates

1. Photograph aggregates



2. Measure topologies:

- Aspect Ratio and Height (Weibull scale and shape factors)
- Minor Feret (Weibull scale and shape factors)
- Perimeter, median
- Area, median

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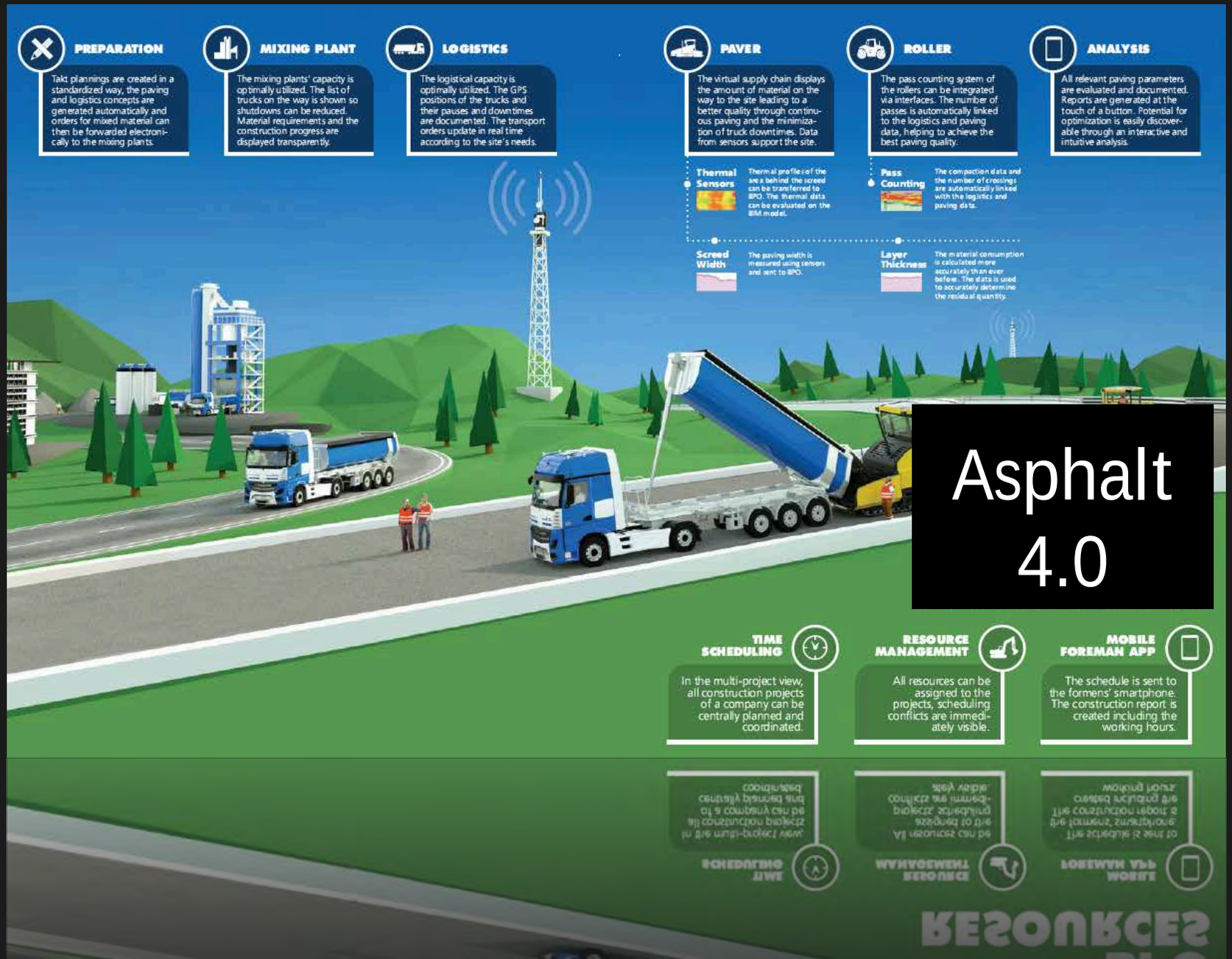
Conclusions

- We can combine data- and physics-based models to design asphalt.
- To create accurate asphalt recipes, collecting aggregate geometries is very important.
- We can paint realistic mastic skeletons, and have learned to paint the mastic over these skeletons.
- We may be able to use the 3D models of asphalt to calculate additional properties, such as macrotexture. However, this will be future research.

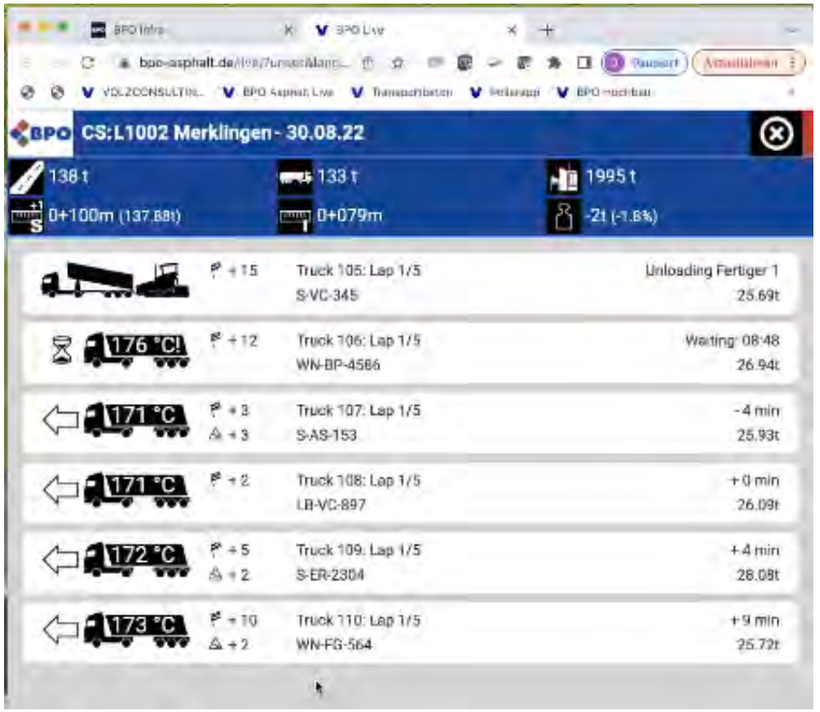
ASPHALT 4.0 APPLIED TO THE PAVING PROCESS



Developments #ICA4point0

- There are from project data
  - A BIM integration
  - Resource allocation
  - Management and monitoring in real time

Developments #ICA4point0



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ASPHALT 4.0 APPLIED TO THE PAVING PROCESS

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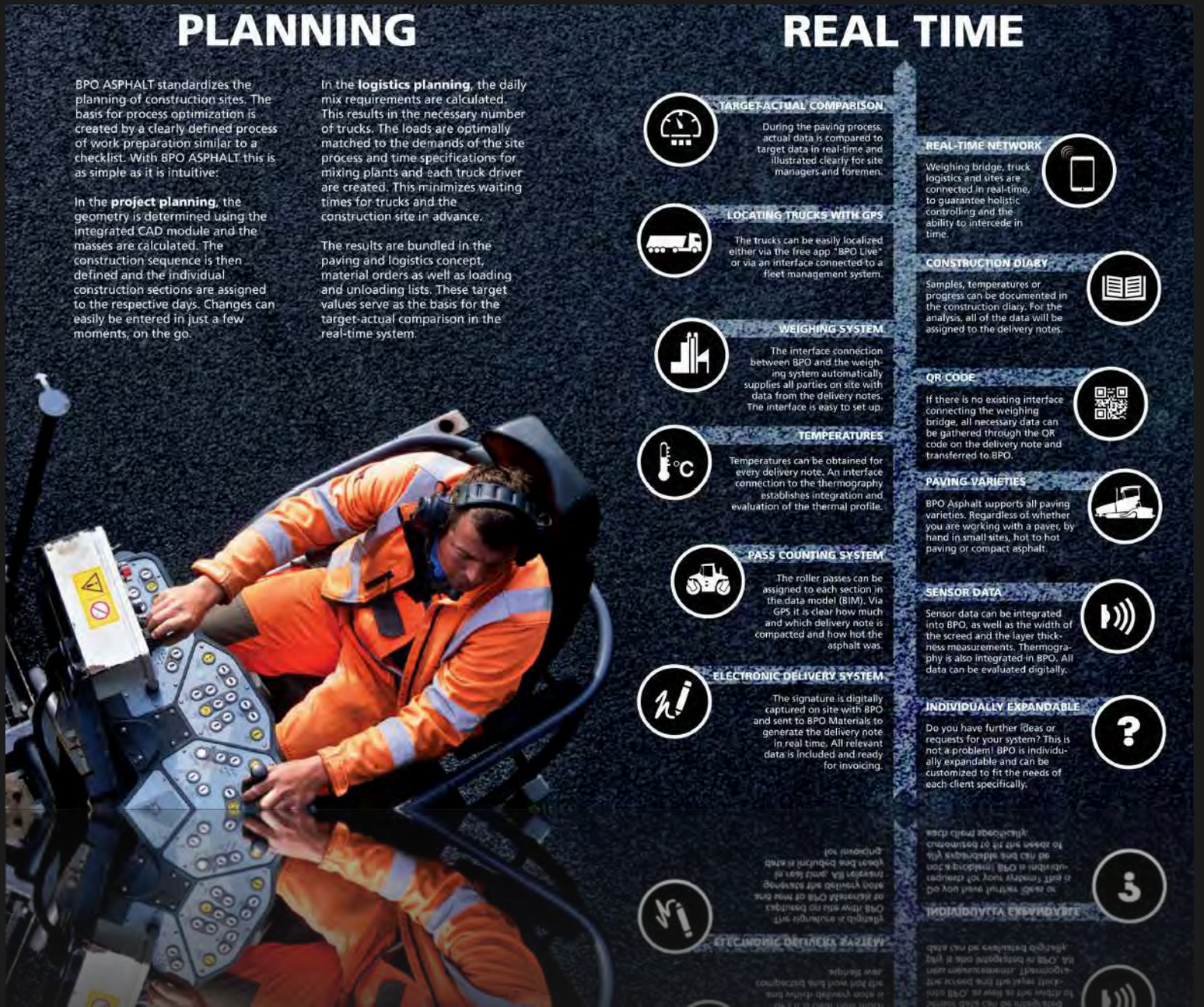

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Thank you very much for your attention !!

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