ASECAP DAYS
MADRID 2025

52nd ASECAP DAYS

Challenges of Future Mobility | The Role of Road Infrastructure

Organized by ASECAP

Hosted by seopan
Asociación de Empresas Constructoras y Concesionarias de Infraestructuras

26 - 28 May 2025 | Madrid
www.asecapdays.com

When Digital Twins Bring Together Motorway Concessionaire Staff Through International Initiatives: The A63 Pavement Renewal Capstone Project

Olivier Quoy – *Atlandes*
Maria E. Hernandez L – *Globalvia*
Federico Gulisano – *UPM*

Table of Contents

1. Introduction

The Team: *Bringing Concessionaires Together Through Digital Twins*

Professional Supervisors

O.Quoy
Atlandes, CEO

S.Krieff
EGIS Exploitation Aquitaine, GM

N. Ferrara
EGIS, BIM/ Digital Twin Expert

T. Bergerot
EEA, QSE Manager

S. Cudey
EGIS, Digital Project Manager

Academic Supervisor

D.Gruyer
Université Gustave Eiffel, Research Director

Capstone Project Students

V. Kovács
Unitef ‘83 Zrt, Road Designer

W. Guauque
HEBconstruction , BIM Expert

M. Hernandez
Globalvia, Demand Manager

1. Introduction

2. The Asset

3. The Project

4. Executive Master in Digital Twins for Infrastructures & Cities

2. The Asset

A63 Overview

A vital trans - European route with high freight volume and strategic connectivity.

104 km of motorway, including an associated alternative route

93 structures

103 hydraulic crossing structures

4 service areas

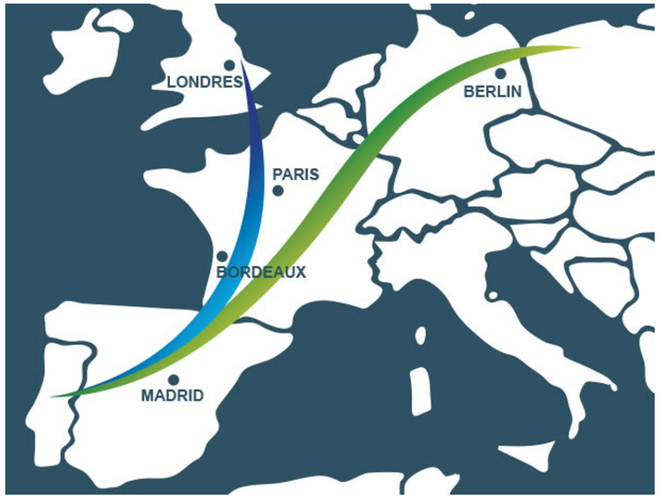
8 rest areas

12 junctions with the local road network

2 full - lane open - system toll plazas (no entry/exit ramps)

A key corridor between 🇫🇷 and 🇪🇸 carrying high traffic volumes: approximately 33,500 vehicles per day, including 9,500 trucks

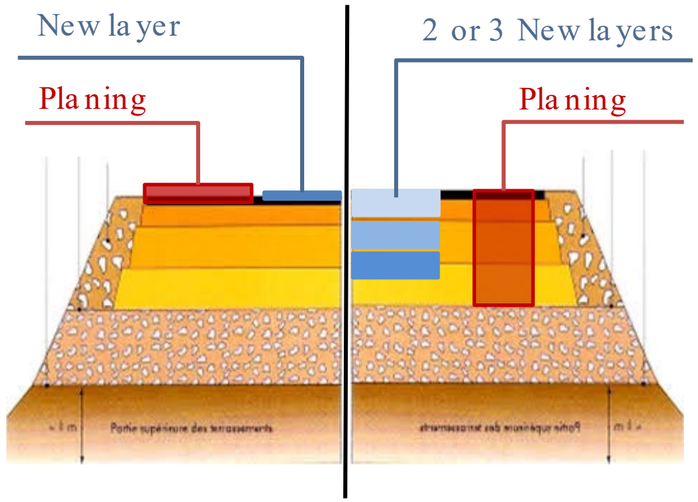
28.5% HGVs



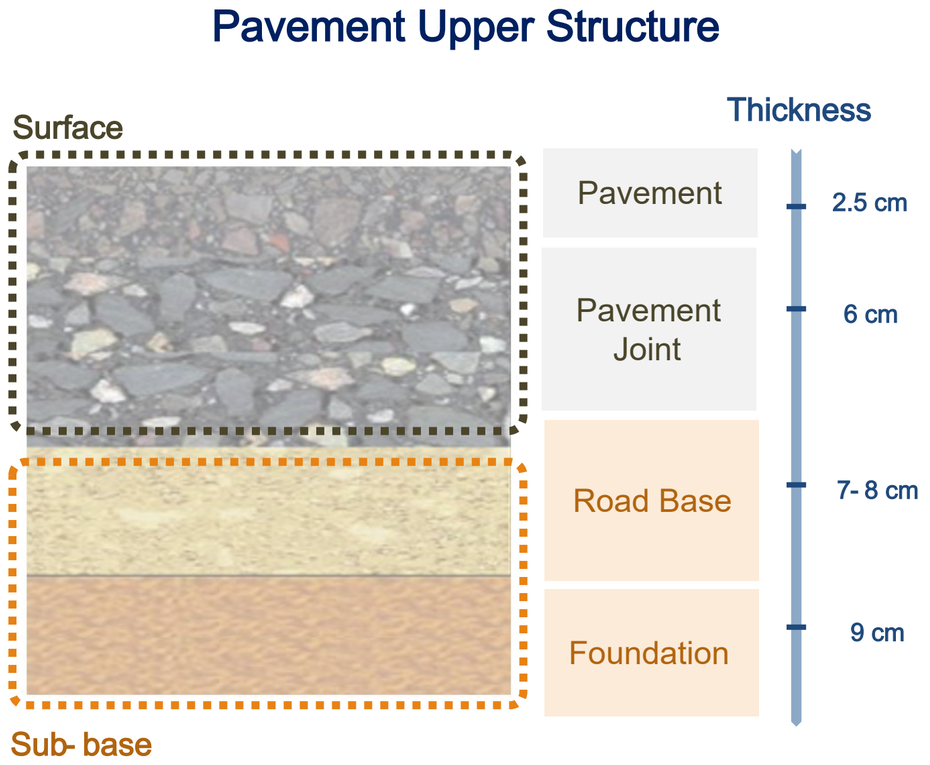
2. The Asset

A63 Pavement

Assets created through road enlargement and upgrades, built over ancient structures dating back to Roman times, with a variety of structures along the route.



Partial renewals are conducted every 8 to 16 years, depending on the type of lane



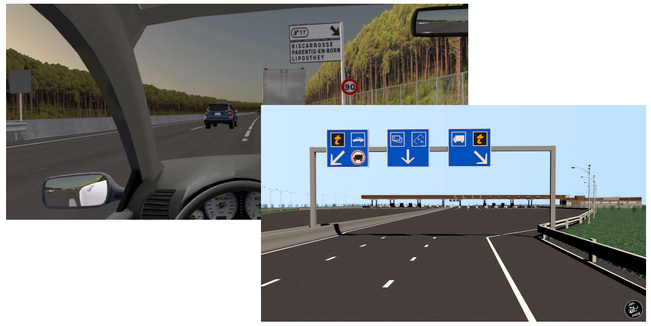
2. The Asset

A63 Digital Projects

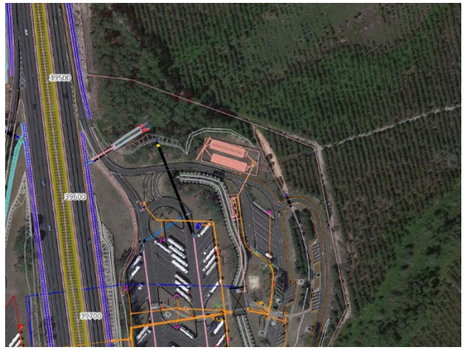
Some (limited) experience in the field of 3D modelling and digitization, which have paved the way toward Digital Twin

Virtual Reality training module for staff

Digital Infrastructure Enhancement for autonomous driving (A-CCAM project)



GIS and pavement description



1. Introduction

2. The Asset

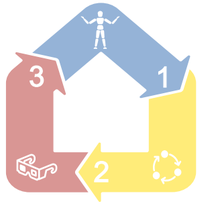
3. The Project

4. Executive Master in Digital Twins for Infrastructures & Cities

3. The Project

Objectives

Develop a DT for the concessioned section of the A63 highway to enhance monitoring, decision- making, and operational efficiency

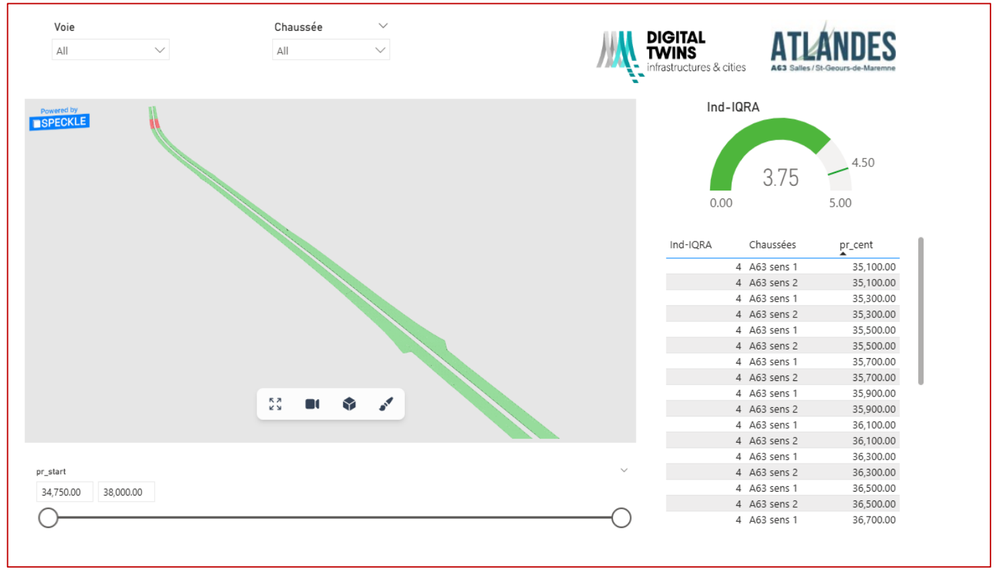


1– IFC MODEL

Representation of the pavement layers and relevant elements.

3 - VISUALIZATION

Interactive web platform for data visualization.



2 - USERCENTRIC APPROACH

Ensure covering the needs of the end- users.

3. The Project

The Solution

A cohesive platform integrating 3D visualization, analytics, and geospatial tools to support data-driven decision-making.

A63 Digital Twin

Core Functionalities (Driven by User Requirements)

IFC Model Viewer
Enables visualization of infrastructure models, creation of cross- sections, and extraction of detailed layer information.

GIS Geometry Operator (Pilot Feature)
Allows spatial testing and simulation of infrastructure upgrades or renewals.

Dynamic Dashboards
Visualization of key indicators and system metrics for informed decision - making.

Enhanced Capabilities

Contextual Visualization
Integration of environmental elements such as vegetation, buildings, and waterways to enrich spatial understanding.

GIS Updates
Synchronization with Atlandes' ArcGIS layer to ensure continuous data accuracy.

Model & KPI Integration
Seamless connectivity with operational models and KPI databases, enabling automatic updates and performance tracking.

Technology Stack

3D Visualization
Cesium / iTwin

Geospatial Integration
ArcGIS JS

Data Analytics & Reporting
Power BI connected to KPI database

3. The Project

User- Centric Approach

A collaborative process grounded in real user insights and design thinking principles.

IMPLEMENT

TEST

Iterative Process

- Maximizing impact by aligning the solution with stakeholder needs.

PROTOTYPE

Initial IFC Model

- Explore and iterate on various technical solutions & platforms, aligning with

IDEATE

Held a workshop

- Capture expectations and needs.
- Develop detailed User Stories.

As a Maintenance Manager, I want to easily access layer properties and run repavement modeling simulations so that I can plan and prioritize maintenance interventions effectively…

EMPATHIZE

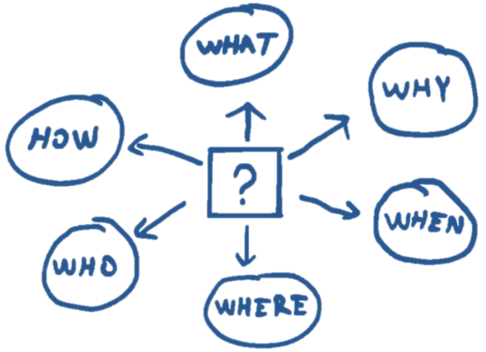
By understanding the users

- Interview potential users.
- Focus on roles, needs, and context to uncover key insights.

DEFINE

Define the needs: 5W1H Method

- Interview potential users.
- Focus on roles, needs, and context to uncover key insights.



3. The Project

User- Centric Approach

Digital solutions benchmark ensuring alignment between user needs and implemented DT features.

*Matching these features with the developed **User Stories***

	Overall Performance	Ease of Use	Ease of Maintenance	Pricing	Basemap	Search Engine	Dashboards	API Availability	Teleport to Chainage	Identify geometric elements & properties	Geometric operations	Do Queries	Track Record (Core Drilling & Pavement Campaigns)	Incorporate new data to elements
Bentley iTwin.js														
Power BI + Speckle														
GEO BIM														
Autodesk TANDEM														
Vektor.io														
Catenda														
Sensat														
dTwin (Nemetschek)														
usBIM.geoTWIN														
Unreal Engine														
Cesium JS														
ArcGIS JS														
That Open Platform														

3. The Project

Conclusions

COLLABORATIVE INNOVATION

The Executive Master in Digital Twins fosters cross-disciplinary collaboration, showing how diverse professional backgrounds can drive practical, impactful solutions.

USERCENTRIC DESIGN

Ensured the solution responds directly to end-user needs, improving operational efficiency and decision-making.

SCALABILITY & INTEGRATION

Building a solid foundation for future scaling, including connectivity with asset management systems and sensor networks.

PLATFORM BENCHMARKING

Focused research on tools and platforms suited for linear infrastructure to match technical and operational needs.

1. Introduction

2. The Asset

3. The Project

4. Executive Master in Digital Twins for Infrastructures & Cities

4. Executive Master in Digital Twins

The DIGITWIN4CIUE Project

Co-funded by the European Union

DIGITAL TWINS infrastructures & cities

ASECAP DAYS MADRID 2025

Consortium: Academy + Innovation

UNIVERSIDAD POLITÉCNICA DE MADRID

ÉCOLE NATIONALE DES PONTS ET CHAUSSÉES

IP PARIS

MŰEGYETEM 1782

EELISA European University

Civil Engineering & Architecture Schools of the EELISA alliance

POLITEHNICA UNIVERSITATEA DIN BUCUREȘTI UPB 1818

AI and CS research center

NOMMON

tyris.ai Predictive Analytics

ALTAMETRIS

Innovation SMEs

Fundación Agustín de Betancourt

OBJECTIVES

- Training on the application of digital technologies to the Built Environment
- Creation of a Centre of Excellence of digital twins
- Facilitate the digital transformation of the sector

4. Executive Master in Digital Twins

The Executive Master

Why?

Need to cover a gap of training of the new generations of civil engineers and architects to lead the digital transformation of the sector

This gap will be further implemented in the official degrees in the coming years

Who?

Mainly targeted to young professionals of the built environment: civil engineers, architects, industrial and mechanical engineers…

Also targeted to professionals with a wider experience who want to divert their career or need to lead digital teams

Students from worldwide

When?

Third edition starts on September 8th 2025

Admissions now open at www.digitwin4ciue.eu

4. Executive Master in Digital Twins

Academic program – The courses

Digital Basic Skills
27 ECTS

Digital models & networks for DT

- Principles of BIM and GIS
- GIS in digital twin cities
- Advanced BIM
- Networks design for digital twins

Programming & software development

- Introduction to programming
- Python programming
- IoT and signal processing
- Relational databases and SQL

Data Science & artificial intelligence for DT

- Big Data technologies and applications for DT
- Cloud computing and cybersecurity
- Knowledge representation and semantic interoperability
- Machine learning and data analysis

Applied Digital Twins: Core Skills – Management and Innovation for Digital Twins
9 ECTS

Management & Innovation for DT

- Design and deployment of Digital Twins
- Validation and Operation of Digital Twins
- Innovation and Industry 5.0

Applied Digital Skills Specialization courses
6 ECTS

DT for Transport and Mobility

- Intelligent transport systems
- Mobility data analysis
- DT of railways and roads

DT for Energy & Water Management

- Optimization models for hydropower reservoir operation
- DT for energy generation
- DT for management of water resources

DT for Urban Design & Building Management

- Smart building management
- Smart cities design
- Structural sensing and monitoring

4. Executive Master in Digital Twins

Academic program – The project

Conference Cycle

A cycle of 15-20 weekly lectures of 60-90 min by leading experts of the industry and academia, between November and June.

The lectures will address the application of digital twins to different fields of the built environment, especially those not included in the elective courses.

Capstone Projects

Hands-on real-world cases of applied digital twins, proposed and mentored by 1-2 industrial partners, and coordinated by faculty of the Master Program.

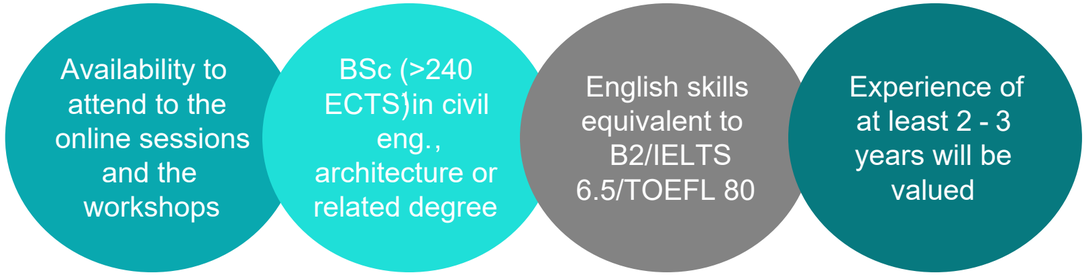
Developed in groups of 3-4 students between November and July, with 2 onsite workshops and a final presentation at the closing ceremony

An excellent sandbox to test your innovation projects

4. Executive Master in Digital Twins

How to Apply?

Entry requirements



- Web: https://www.digitwin4ciue.eu/
- Linkedin: https://www.linkedin.com/company/digital-twins-for-infrastructures-cities/
  // @Digital Twins for Infrastructures & Cities
- Instagram: https://www.instagram.com/digitwin4ciue/
  // @digitwin4ciue
- Youtube: https://www.youtube.com/@DigiTwin4CIUE
  // @DigiTwin4CIUE
- Email: info@digitwin4ciue.eu

Tuition Fees 25/26

Fees are subsidised by the project DIGITWIN4CIUE, with a 50% co-funding by the EU

Fees for the edition 2025/26 are as follows:

	Tuition fee	Early bird[2]
Self financed or financed by a partner entity [3]	€ 10,500	€ 9,000
Financed by a non-partner entity	€ 11,750	€ 10,000

[1] Applicants with BSc of 180 ECTS may be accepted subject to a minimum working experience of 2 years in the built environment

[2] **Early bird** will apply to applications received before **June 15h 2025**

[3] Partner companies include members of DIGITWIN4CIUE, companies participating in the master program and any company sponsoring more than 1 applicant.

ASECAP DAYS

MADRID 2025

Thank You

Contact Us

phone number

email address

website