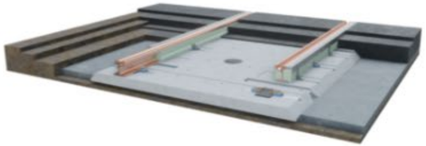
COVENTRY
VERYLIGHTRAIL



A novel track system to enable sustainable and affordable LRT implementation

LIGHT RAIL: MAKING CITY RAIL TRAVEL MORE SUSTAINABLE

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Consultant to Coventry City Council

RailEI
Formerly known as the PWI
RAILWAY ENGINEERING INSTITUTION

14th May 2026, Leeds

Coventry City Council

www.coventry.gov.uk/verylightrail

Document Setup

Section 1

Introduction:

What is the CVLR Programme?

Section 2

Track Specification and Installation method:

The scope of this section is to provide a high-level overview of the CVLR Track configuration and the main installation phases which are necessary to install the CVLR track system in a typical urban highway environment

Section 3

Pilot Installation and Testing:

Overview of the performance verification testing and pilot installations delivered to date

Section 1
Introduction:

What is the CVLR Track Programme?

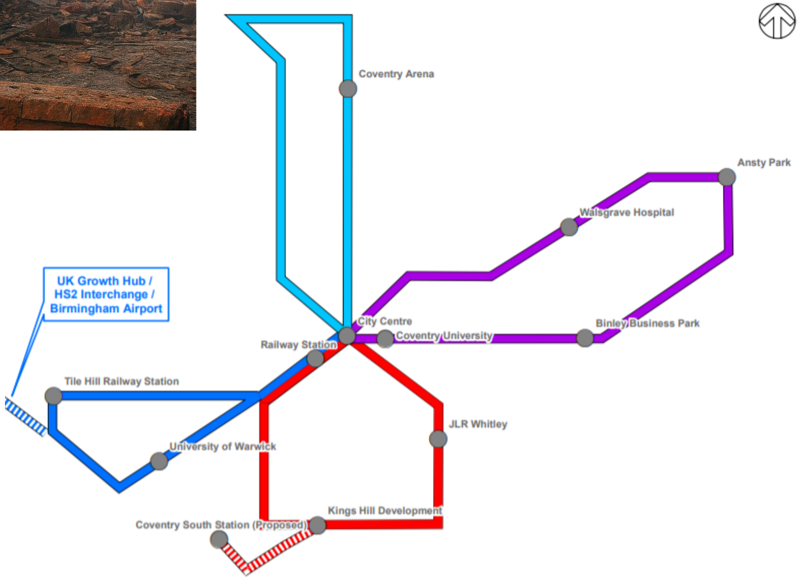
1

Coventry Very Light Rail [VLR]: The Vision

Coventry had a Tram network of 22km

1884 - 1940

Vision for a full-city clover-leaf style network serving the entire city of Coventry



Light rail systems: Why so costly?

Diagnosis of the issue

65% – 80% of typical complex urban-environment light-rail projects CAPEX directly related to the track build

Trackform structure supply & installation direct costs

≈ £3 - 4 million / km double track

+

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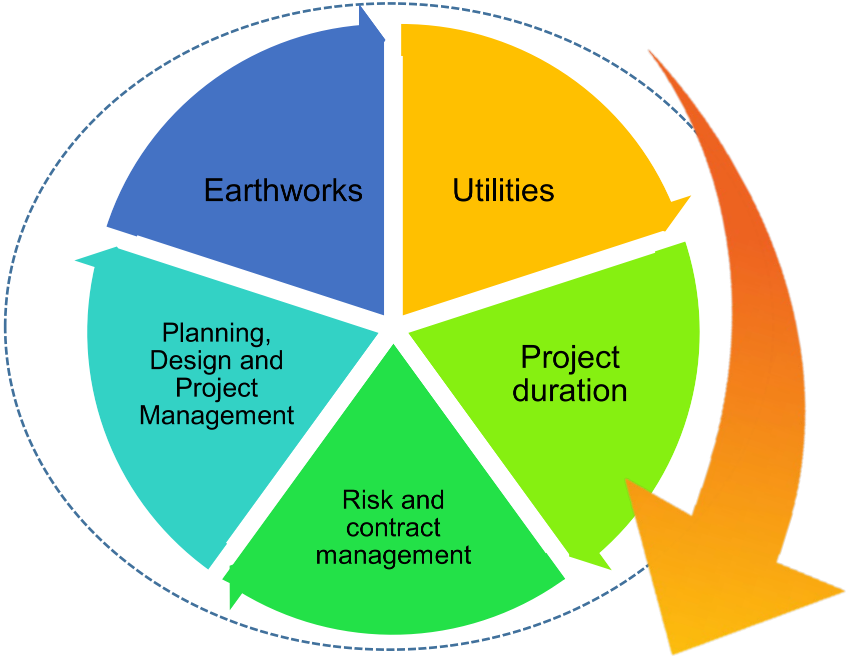


CVLR track research

Development of an innovative track system focused on holistic reduction of cost; specifically, a trackform structure meticulously designed from the ground up to minimize the traditionally escalating costs, risks, and timeframes associated with enabling works.

CVLR Programme: A genuine government, academic and industrial collaboration

COLAS RAIL

WMG
THE UNIVERSITY OF WARWICK

University of HUDDERSFIELD

INGEROP Inventing for tomorrow

MOTT MACDONALD

AtkinsRéalis

ARUP

Tony Gee

Coventry City Council

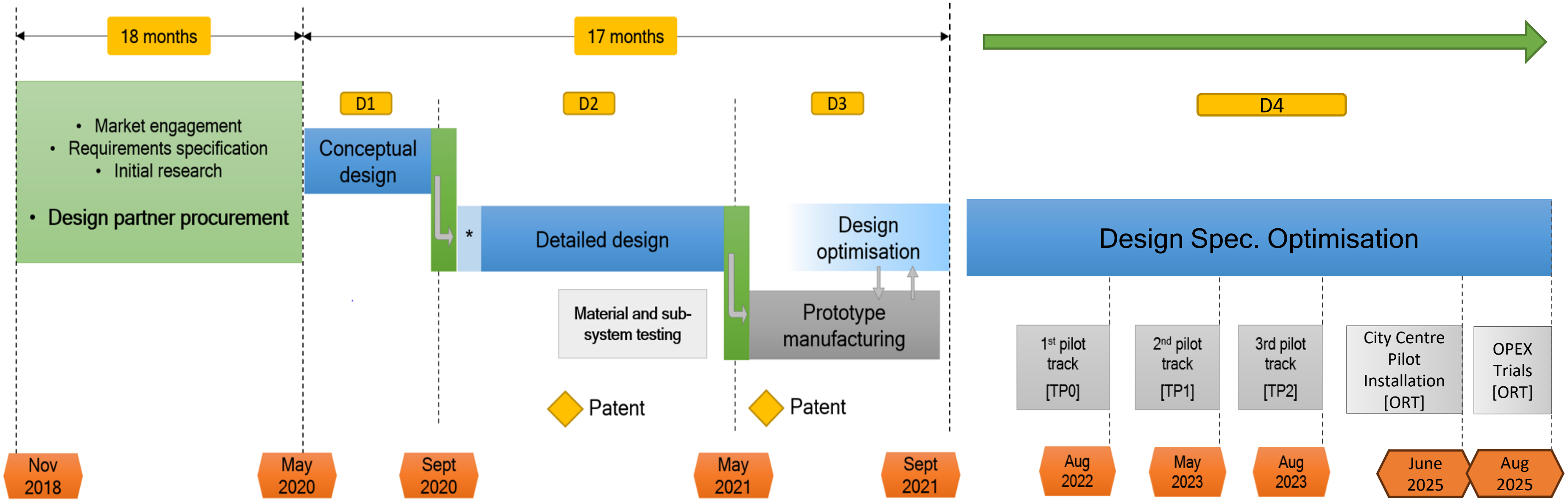
Transport for West Midlands

Interactions with over

50 companies

£50+ million 'invested' to date over the past 8 years

CVLR track: The journey so far



A robust design process of a novel track system starting from fundamental principles

Section 2
Track Specification and Installation method:

The scope of this section is to provide a high-level overview of the CVLR Track configuration and the main installation phases which are necessary to install the CVLR track system in a typical urban highway environment

2

CVLR Track System: the strategic Dig-Depth Advantage

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Traditional Track System

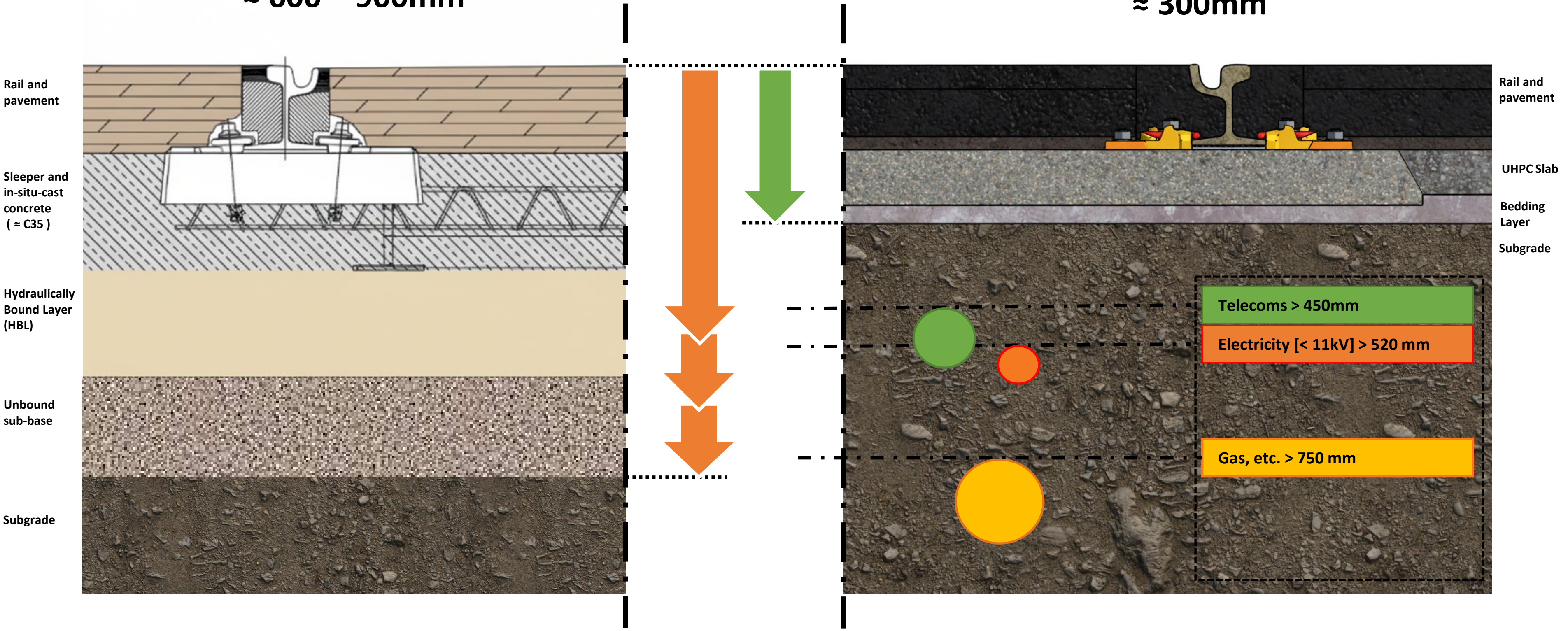
DIG DEPTH from Top of Rail

≈ 600 – 900mm

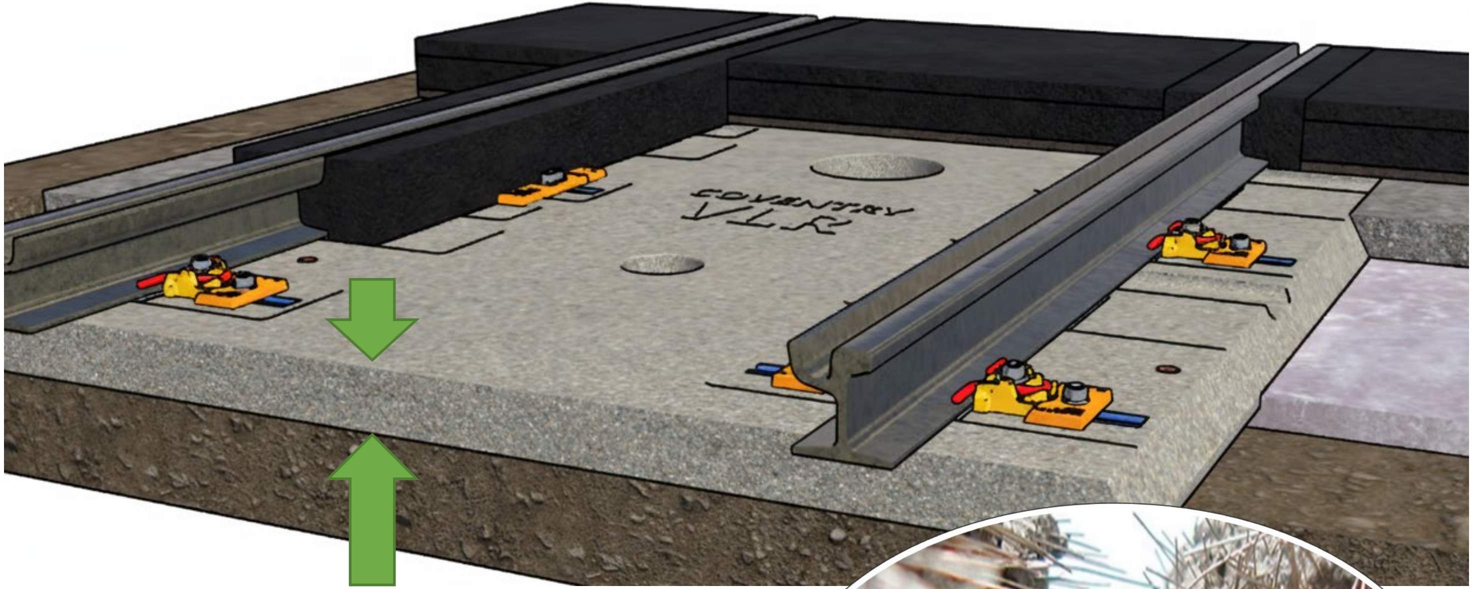
CVLR Track System

DIG DEPTH from Top of Rail

≈ 300mm



CVLR track system: an integrated product development



105mm SLAB

CVLR Slab's high flexural strength extended fatigue-loading lifetime requirements can be achieved Ultra-high-performance fibre-reinforced concrete (UHPFRC)

CVLR Track system

One singular CVLR Track slab can be utilized for any route alignment, which is especially advantageous in urban environments where significant portions of curvature and surface utility access chambers are typically encountered.

CVLR track – Installation Methodology

1/5

Milling to a controlled surface profile as per design spec; nominal at -300 mm

CVLR track – Installation Methodology

2/5

Slab positioning and setting-out

CVLR track – Installation Methodology

3/5

Rail Installation

CVLR track – Installation Methodology

4/5

Bedding of CVLR slabs

CVLR track – Installation Methodology

Coventry City Council

CVLR track – Installation Methodology

5/5

Rail-to-pavement interface and building up of the pavement system

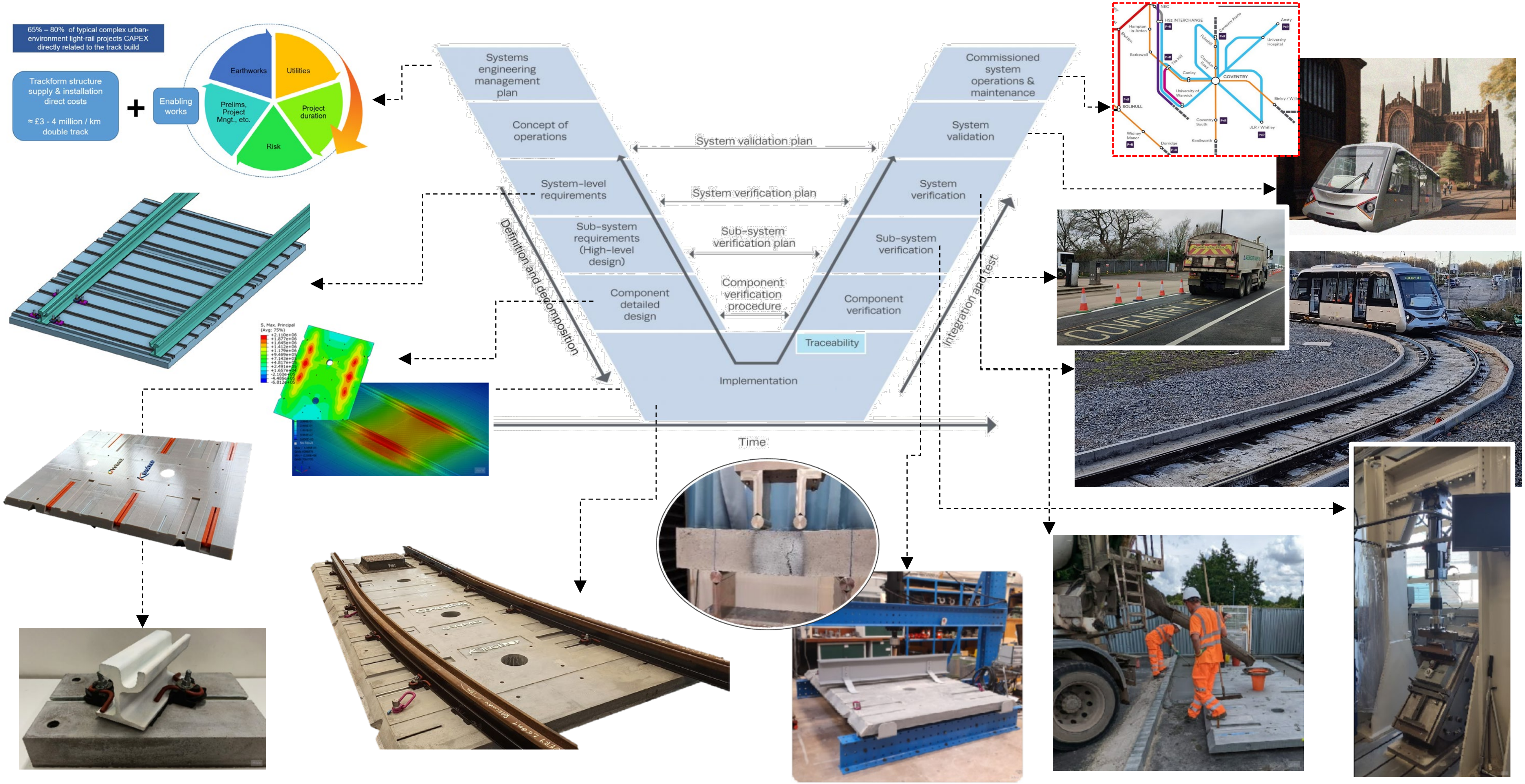
Section 3

Pilot installations and testing

"Proving out of the system"

3

CVLR track – system development methodology



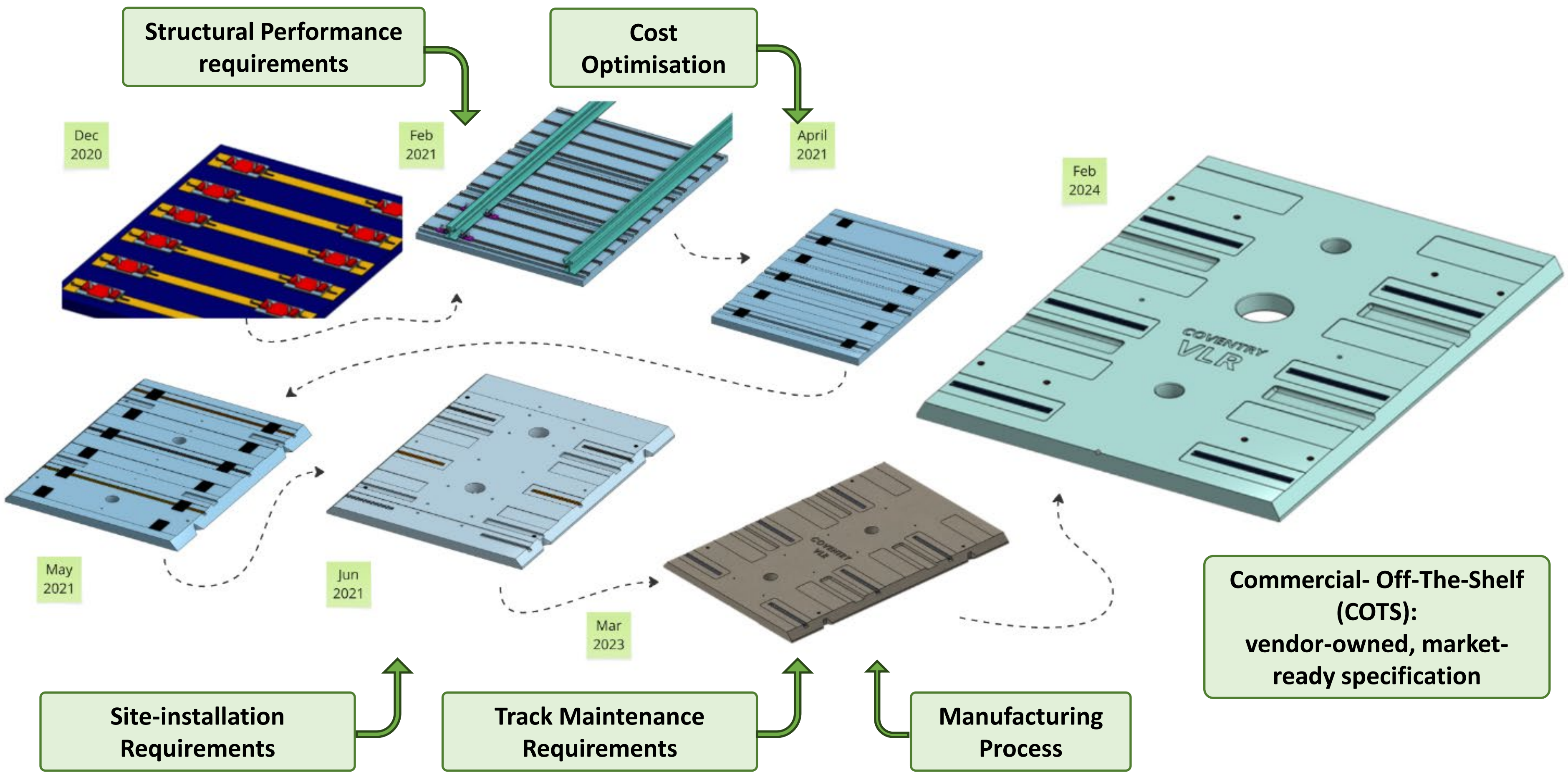
3 test installations prior to live-environment pilot installation

Installation Methodology

HGV loading test site

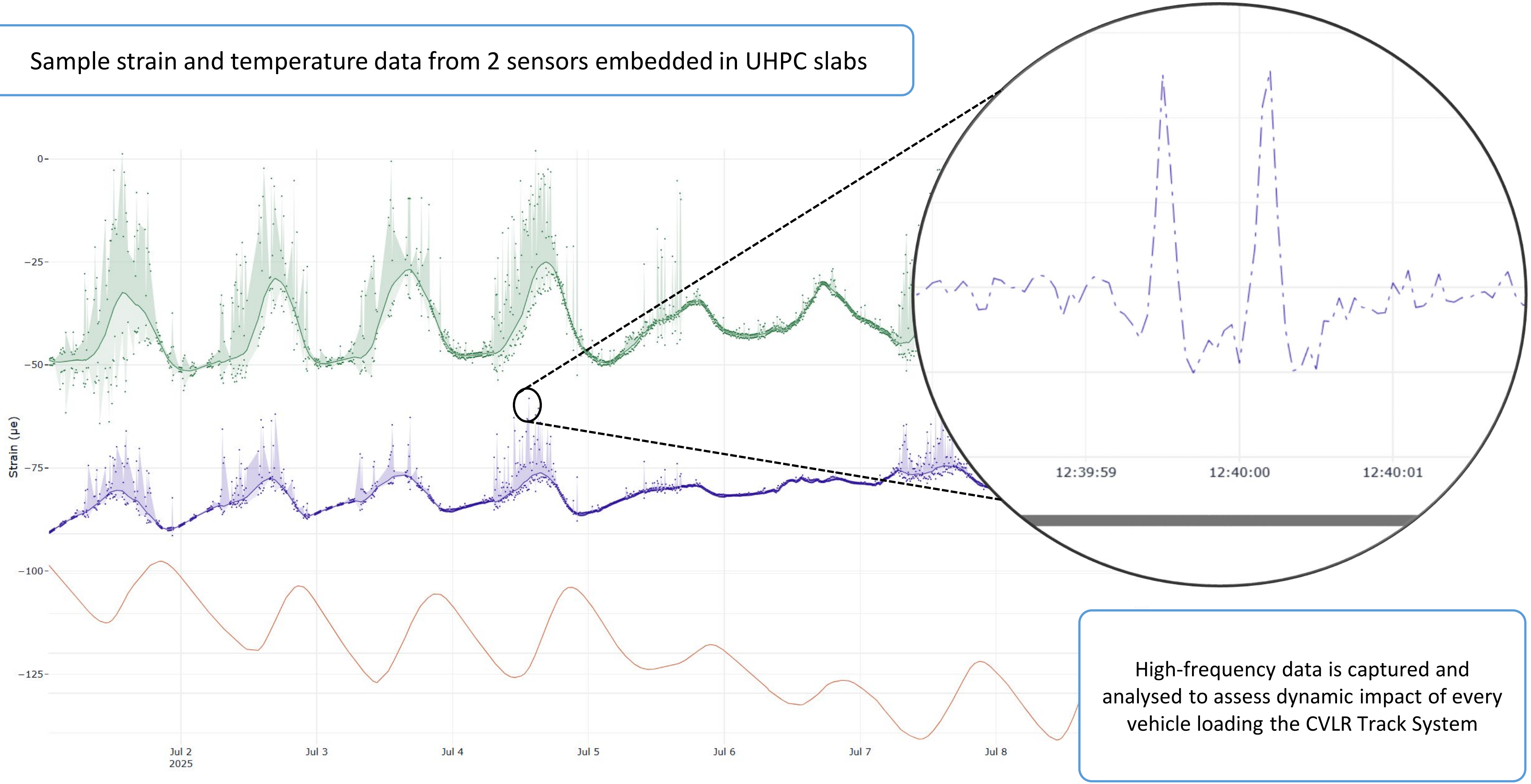
CVLR vehicle loading test site

CVLR track slab: iterative design evolution of all key sub-systems



CVLR Track: Proving long-term performance; 3+ Years of SHM data

Sample strain and temperature data from 2 sensors embedded in UHPC slabs



High-frequency data is captured and analysed to assess dynamic impact of every vehicle loading the CVLR Track System

CVLR: Enabling a strategic step-change reduction in light rail project delivery timelines

City-centre live-environment delivery trial

10 weeks from occupying the highway to tram running on tracks

13th March 2025

23th May 2025

City-centre live-environment delivery trial

COVENTRY

VERY LIGHT RAIL

Coventry "On-Road Test"

Coventry City Council

West Midlands Combined Authority

Funded by UK Government

CVLR – Utility access strategy

Design → **Planned Access** → **New Service introduction** → **Existing service access** → **Full-slab Removal**

Design

- State-of-the-art surveying and recording of existing utility location
- Detailed assessment of existing utilities – risk-based decision making on which utilities to relocate
- Accurate as-built survey database

Planned Access

- Man-hole slab with access chambers
- Installation of provisional ducting where high-degree of certainty on future requirement exists
- Specialist access provision slab

New Service introduction

- Impact Moling
- Pipe Ramming
- Pit-launched Mini Horizontal directional drilling

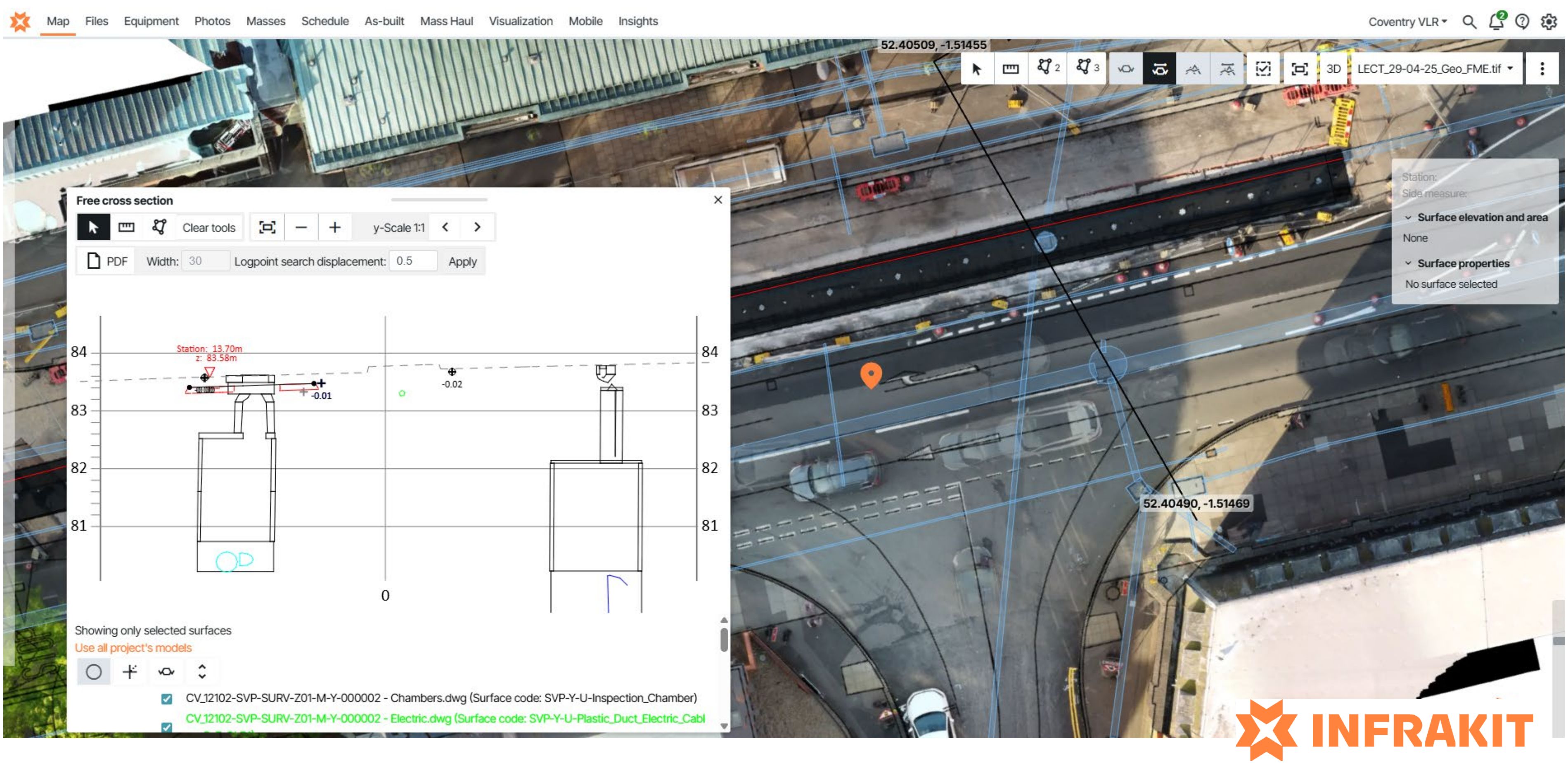
Existing service access

- Key-hole access via coring of pavement and slab
- Water-jet cutting and vacuum excavation
- side excavation and access to buried utility [high-integrity slab system allows for undermining digging]

Full-slab Removal

- Quick rail-cutting and slab removal possible as a last resort option

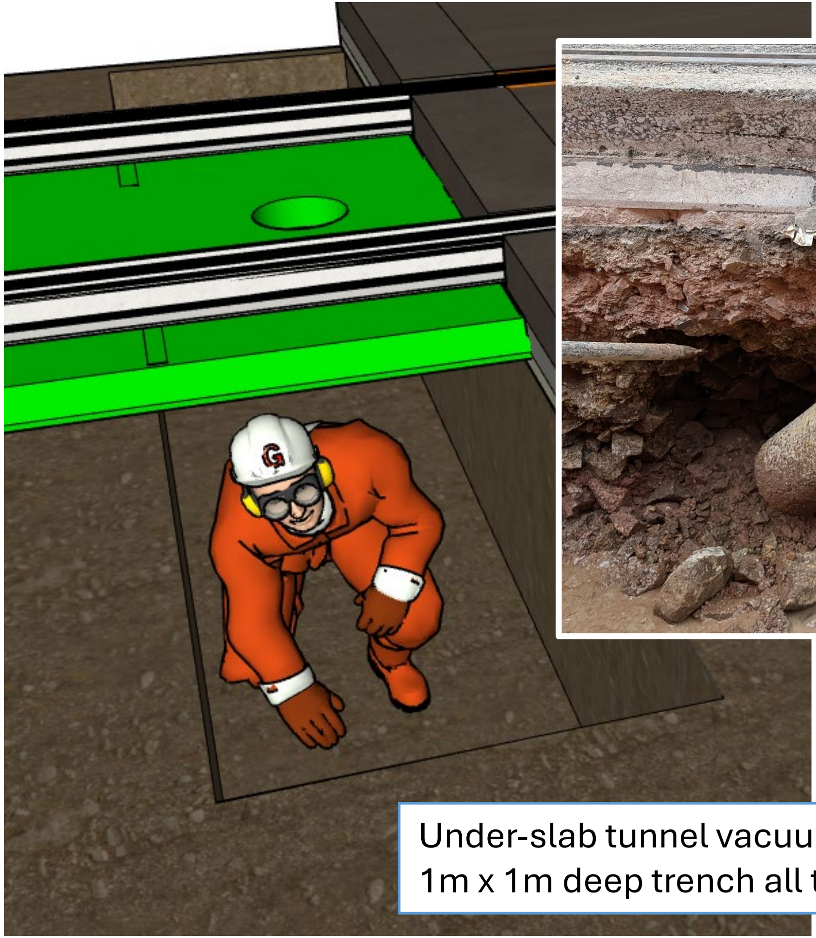
Design: Digital Construction Platform – ensuring accurate "as-builts"



New-Service Introduction / Maintenance Access to existing

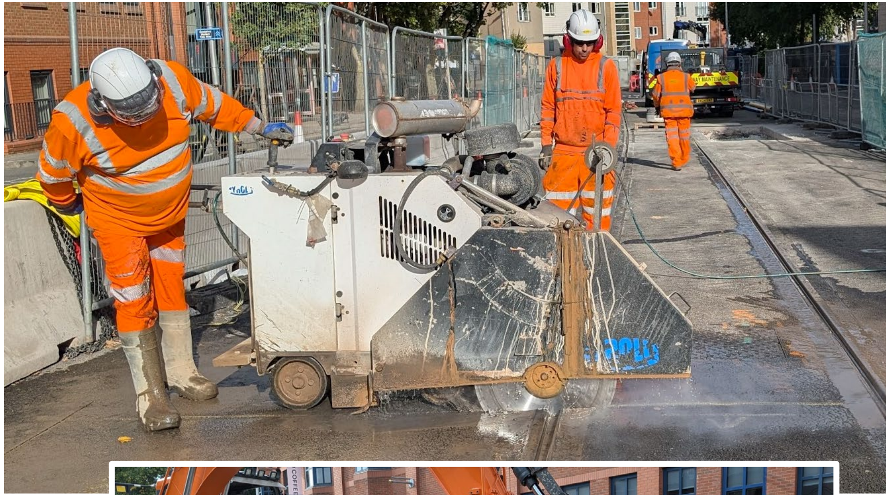
New-Service Introduction / Maintenance Access to existing

New-Service Introduction / Maintenance Access to existing



Under-slab tunnel vacuum excavation
1m x 1m deep trench all the way under the slab.

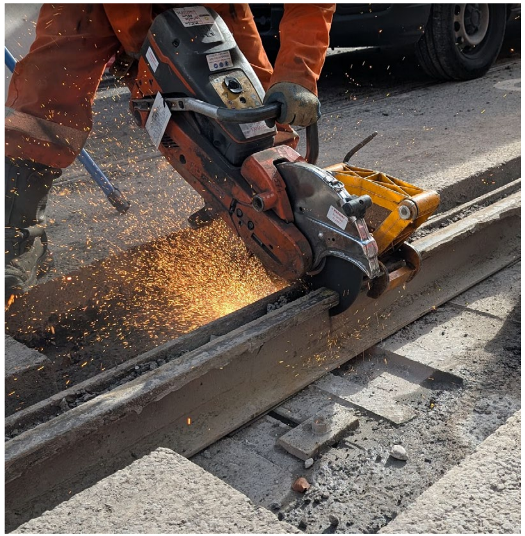
CVLR track: Rapid access to buried utility in case of emergency



In emergency scenarios, access to any buried utilities under the track can be granted very quickly. Trial successfully delivered in < 1hr

Rail Replacement Demonstrator

Demonstrated rapid rail replacement validates a trackform designed not only to reduce CAPEX, but to minimise whole-life cost.



Final Pilot installation

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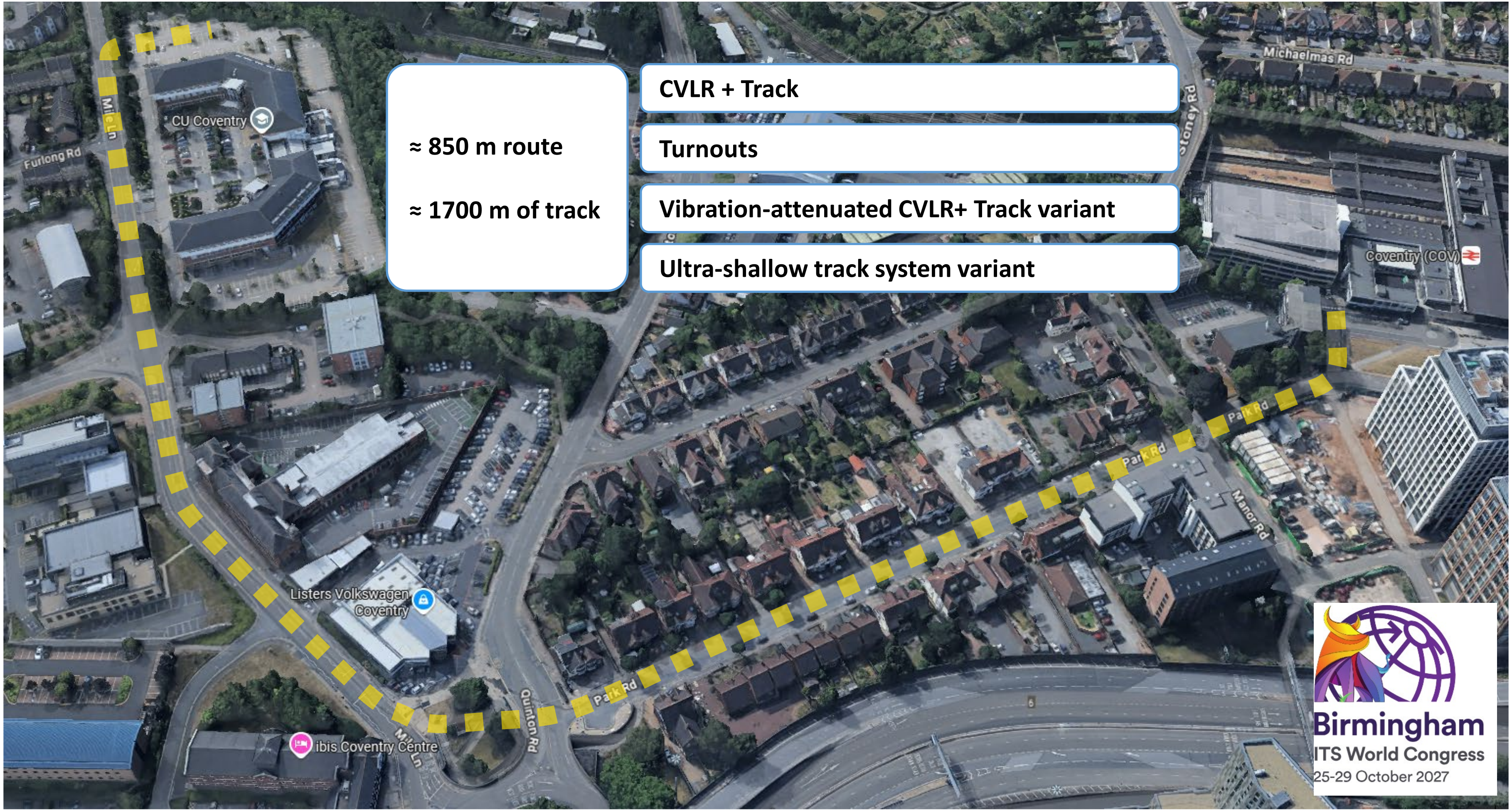
≈ 850 m route

≈ 1700 m of track

- CVLR + Track
- Turnouts
- Vibration-attenuated CVLR+ Track variant
- Ultra-shallow track system variant

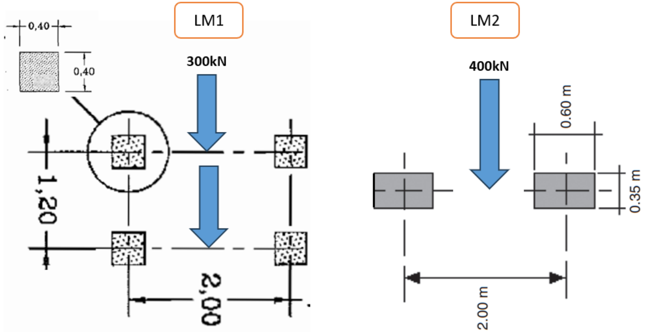


Birmingham
ITS World Congress
25-29 October 2027

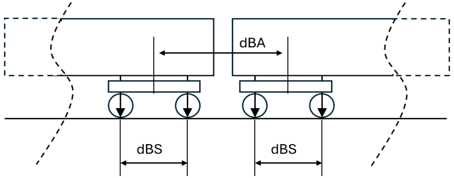
CVLR Track: Only for CVLR Vehicle?

EUROCODES
Background and Applications

EN 1991-2 « Traffic Loads on Bridges »



0.95 MPa



Vmax	80	km/h
Q_{axle}	100	kN
Q_0	50	kN
dBS	1.6	m
dBA	3.2	m

RAIL SAFETY AND STANDARDS BOARD

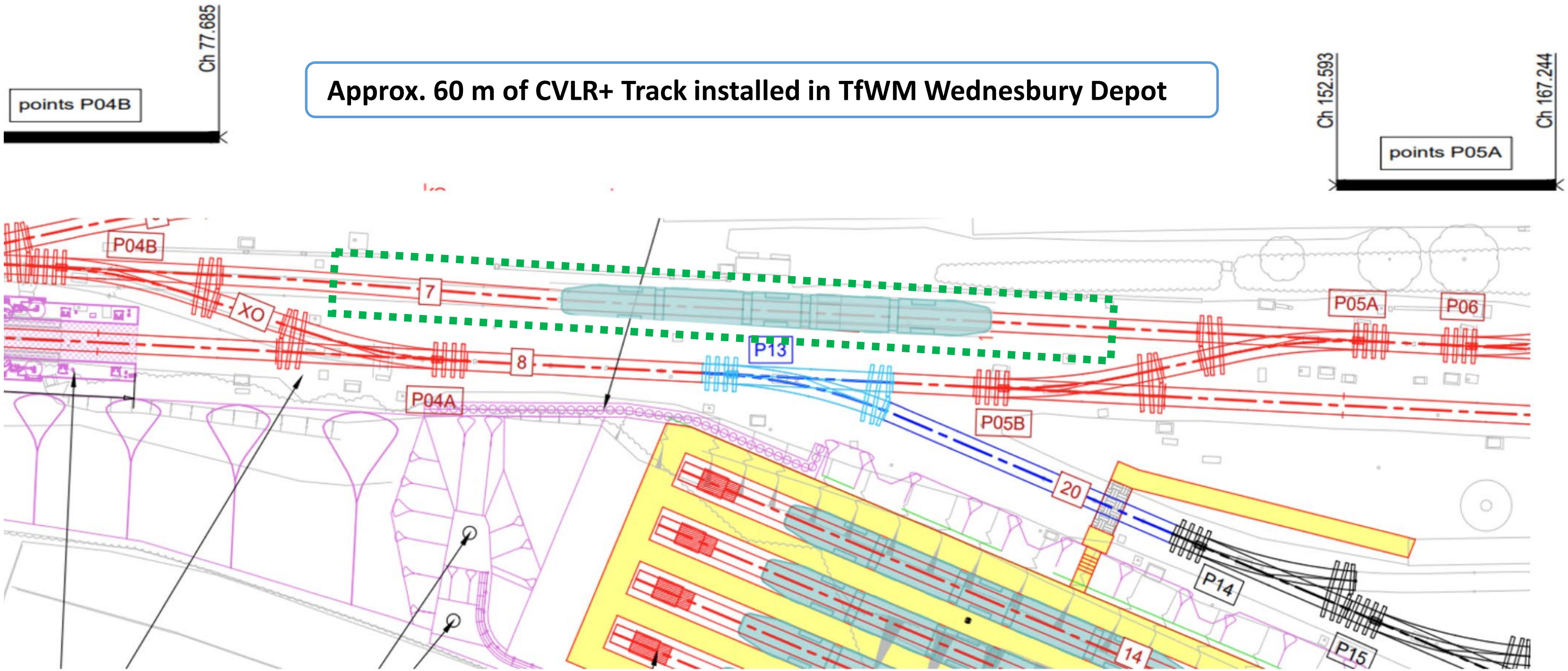
University of HUDDERSFIELD
Inspiring global professionals

Loading Requirement for Track Systems
COF-UOH-59

0.24 MPa

Assuming all load from 2 x 100kN axles on 1 x slab

Approx. 60 m of CVLR+ Track installed in TfWM Wednesbury Depot



Transport for West Midlands

MOTT MACDONALD

COLAS RAIL

Thank you !

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