



Investment Board Meeting

Date	27 November 2017
Report title	Very Light Rail: Transforming Connectivity West Midlands (VLR: TCWM)
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Report to be/has been considered by	Report has been considered by WMCA Technical Approval Panel and WMCA Investment Advisory Group

Recommendation(s) for action or decision:

The Combined Authority Board is recommended to:

1. Approve the award of £12,204,821 Devolution Deal funding to the Very Light Rail: Transforming Connectivity West Midlands programme, which is jointly promoted by Coventry City Council and Dudley Metropolitan Borough Council. The allocation falls within Coventry's UK Central Plus Programme.

1.0 Purpose

- 1.1 This report seeks the approval of £12.2m for the Very Light Rail: Transforming Connectivity West Midlands (VLR: TCWM) programme, requested via a Strategic Outline Business Case.

1.2 VLR:TCWM is a programme of activity to help establish the West Midlands as a world-class business investment location by supporting urban public transport connectivity, developing significant supply chain opportunities and providing a focus for driving up skill levels, focusing on the development of VLR technology. The programme is promoted by Coventry City Council (CCC) and Dudley Metropolitan Borough Council (DMBC), with support from Transport for West Midlands.

2.0 Background

2.1 The VLR:TCWM programme consists of a number of projects which focus on the development of VLR technology as per Figure 1. Warwick Manufacturing Group (WMG) are involved in each of the projects, and are market leaders in VLR Research and Development (R&D) and have the necessary technical expertise to turn VLR from concept into reality.

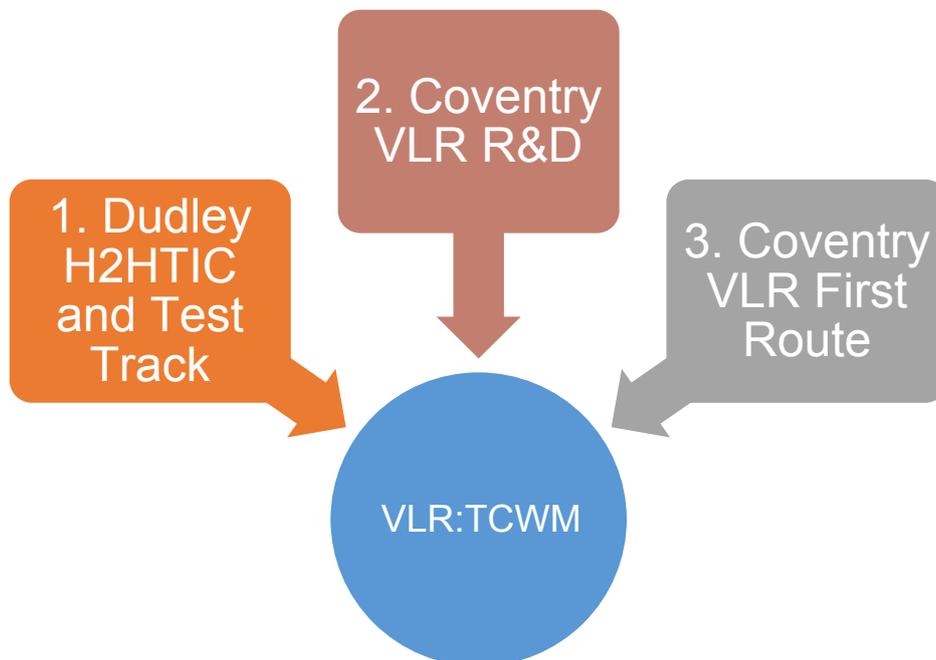


Figure 1: Very Light Rail: Transforming West Midlands Programme Components

2.2 The programme comprises of the following:

(1) Dudley H2HTIC and Test Track

This project includes (a) Hub to Home Transport Innovation Centre and Test Track and encompasses (b) a retaining structure linked to Midlands Metro.

(a) The Hub to Home Transport Innovation Centre and Test Track Project: Very Light Rail and Autonomous Technologies (H2HTIC)

Located in Dudley, this is a strategically important project to support the development of the Very Light Rail and autonomous technology sector which will provide growth for new UK industries supplying domestic and international light rail schemes. The facilities will provide opportunities to develop and test new solutions, predominately for VLR, but also autonomous pod vehicles which focus on the last few miles of any passenger's journey, from a station or 'hub' to the front door, 'home'.

The project supports a wider programme of transport improvements in the Black Country including helping to tackle some of the congestion problems facing both businesses and visitors to the area and providing access to key employment sites. In addition, a new supply chain will be created to support the ongoing needs of this innovative sector.

Specifically the Dudley H2HTIC centre will:

- i. Support the emergence of new technologies based around very lightweight railway carriages with an overall objective to significantly reduce costs, save energy and lighten corresponding rail infrastructure;
- ii. Provide opportunities to work with local businesses in the development of autonomous technologies; and support Dudley in becoming a demonstrator town for such technologies, similar to Milton Keynes and Coventry. (A proposal for the first demonstrator route is being submitted in collaboration with Dudley College and Westfield Racing to Centre for Connected and Autonomous Vehicles (CCAV) Test Bed call);
- iii. Create a hub for the industry offering: world class research, development and education focused around very light rail vehicles, autonomous vehicles, skilled personnel and essential incubation space;
- iv. Boost innovation in SMEs through market ready New Product Development and collaboration with the University of Warwick and other similar HEIs;
- v. Support the development of an immature supply chain which is fragmented and lacking critical mass while providing an opportunity for UK companies to develop new products serving a number of emerging markets both in the UK and abroad;
- vi. Provide a base location for existing projects e.g. the Product Innovation Accelerator (PIA) which enables SMEs to participate in Research and Development and create, test and demonstrate new marketable products that are based on the new technology and applications; and

- vii. Work in partnership with Dudley College and specifically their University Centre Dudley to offer higher level apprenticeships, specialist undergraduate and post graduate courses for individuals and companies seeking training and education in key aspects related to the value chain for VLR and autonomous pods, plus other selected aspects of advanced manufacturing relevant to the Black Country.

(b) Metro Retaining Structure (Shared Wall)

The Midland Metro's Wednesbury to Brierley Hill Extension (WBHE) alignment will pass very close to the H2HTIC; it has to go up a 250m long slope from Tipton Road to Station Drive and there will be two tram stops behind the H2HTIC building. There is a 10m height difference between the two stops.

A large retaining wall is required for the H2HTIC and Midland Metro WBHE projects to coexist, given their close proximity. The embankment solution authorised in the Midland Metro (Wednesbury to Brierley Hill and Miscellaneous Amendments) TWAO SI2005/927 Order would effectively prevent the H2HTIC and the access road running parallel to the Centre, from being constructed. As this project will remove (or unlock) the technical constraints for both H2HTIC and Midland Metro WBHE, the parties have therefore agreed to work together to develop an integrated design solution.

The SOBC is seeking approval of £4.33m for this element of the project.

(2) Coventry VLR Phase 1: Research & Development

Coventry City Council's Strategic Transport Investment Programme 'UKC+' is an ambitious 10 year programme to drive sustainable high value economic growth and to maximise the opportunities offered by the opening of HS2 and the Growth Hub at UK Central.

The local transport network has finite capacity and, as one of the UK's fastest growing cities, it is essential Coventry develops an efficient mass transit system which encourages people to use low emission public transport – to keep the city moving as well as to address air quality and public health concerns.

Bus travel, even when enhanced, does not encourage the same modal shift as rail-based modes. However, conventional street tramways are tremendously expensive (from around £15m/km up to around £100m/km within city centres) meaning it is virtually impossible to generate a positive business case in cities the size of Coventry.

The purpose of the Coventry VLR project is to develop an alternative form of light rapid transit system that is affordable and attractive to users. It is essential that the final product functions as a complete system – not just discrete elements. The project will need to meet the following overarching objectives:

- i. Marketable to the general public as an attractive alternative to the private car;
- ii. Value for money – capable of generating a favourable Benefit to Cost Ratio (BCR) in cities of similar size to Coventry;
- iii. Interoperability with Midland Metro;
- iv. Able to run both on and off the existing highway, using an innovative modular slab track and simple signalling technology (for the on-highway sections, the lightweight track could be installed using shallow excavations – thereby leaving pre-existing utility equipment in place).
- v. Capable of being produced to modular standards by local manufacturers;
- vi. Potential for autonomous operation in the future; and

- vii. Self-propelled using battery technology only – no overhead line equipment and no internal combustion engine based hybrid operation (which means zero emissions at source).

In order to deliver phase 2 all of the objectives need to be met to deliver a low cost solution. The aim is to achieve a total whole system target cost of around £7m per kilometre (at 2017 prices). This would be substantially cheaper than most conventional light rail systems.

The Coventry VLR project provides the opportunity for an initial production run of locally manufactured vehicles, batteries and track. The R&D project is made up of four work streams:

- Design, construction and testing of a VLR vehicle prototype;
- Development and testing of an innovative low cost modular track;
- Development of a design and business case for the first route in Coventry; and
- Co-ordination of measures to deliver an operational system with an excellent passenger experience.

The Coventry VLR R&D project aims to utilise innovative vehicle, battery and track technology to deliver a route network that is a more sustainable and attractive alternative to conventional bus; at an affordable price.

Cost efficiencies can be achieved through collaboration with DMBC, where the Coventry VLR vehicle is facilitated and tested at the VLR Innovation Centre.

The Coventry project also aims to develop autonomous operation in order to take advantage of the existing West Midlands' capability and status as a "living lab". The VLR Innovation Centre will develop a testing facility for autonomous pods and the Coventry VLR project will consider the potential either for

- "Last mile" journeys at either end of the route (e.g. in the city centre); or
- Full autonomous operation of the whole route.

The key deliverables of the R&D stage of the projects will be a prototype vehicle, track and charging system, subject to full testing, which if successful will proceed to Phase 2.

(3) Coventry VLR Phase 2: First Route

Subject to the success of Phase 1 R&D and approval of a robust full business case (FBC), Coventry would seek WMCA to release the residual funding (£42.8M) from the £55M allocation for delivery of Phase 2 of the project. Phase 2 will involve construction and operation of the first route and all constituent components. These will include:

- Detailed civil engineering and ground works;
- Installation of track in the highway and on segregated routes;
- Stops design and installation;
- Charging facilities for the vehicle;
- Manufacturing of vehicles.

The Transport and Work Act Order (TWAO) is a lengthy process which can take between 3-5 years. Following approval of funding and consent granted under the TWAO procurement will commence. Construction of the first route is due to start to in 2023 with works to be

completed in 2025, with anticipated operation of service commencing in 2025/2026. If the timescales for obtaining the TWAO can be expedited, it is anticipated that operation of service can be brought forward to 2024.

3.0 Impact on the Delivery of the Strategic Transport Plan

3.1 The programme supports the delivery of the following tiers of the Movement for Growth Strategy, and is included as a priority in the 2026 Delivery Plan:

National & Regional: *Improved Connections to the UK Central Hub Area* through the aspiration to connect Coventry to UKC via VLR as a future phase;

Metropolitan: *HS2 Connectivity Programme* through a future phase of VLR to connect to the HS2 Interchange and complement the wider HS2 Connectivity Programme through interoperability with Metro, along with supporting the Metro Wednesbury to Brierly Hill extension through construction of the retaining wall and links to the Innovation Centre;

Smart Mobility: *Connected and Autonomous Vehicles* through working with industry experts in research and development and creation of real world test environments through both the Innovation Centre and Coventry VLR scheme to support industry investment and applied CAV technology.

4.0 Wider WMCA Implications

4.1 This project presents an opportunity in terms developing an affordable rail based rapid transit system that if successful could be used in other areas across the West Midlands. The Coventry VLR project is being developed to be interoperable with Midlands Metro. The Dudley Innovation Centre will include a retaining wall which futureproofs the Metro extension and will also provide an opportunity to test vehicle prototypes on Metro track. The project also presents job and skills opportunities in the advanced manufacturing sector, using a supply chain based in the region.

5.0 Progress, options, discussion, etc.

5.1 The programme is progressing well. The DMBC and CCC elements are at different stages, as outlined below. Programme governance has been established, which includes representation at Board level from both CCC, DMBC along with TfWM, WMG and WMCA.

5.2 The Dudley project is currently at design stage for the retaining wall. It is expected that by the end of November, options for the wall's design will have been tabled and progressed. Design and logistic meetings are being held every 2 weeks between Dudley MBC, WSP and MMA. DMBC have gone out to tender for the construction of the Innovation Centre, which makes provision for Coventry's prototype track.

5.3 The Coventry VLR R&D project is at concept development stage. The project has attracted £2.46m from DfT Growth Deal, which has enabled feasibility studies to be commissioned for both the vehicle and track, led by WMG. A preferred vehicle option has been selected and is now out to tender for development, while a feasibility report on the track options is currently being considered, with a view to making a formal decision on the preferred option by the end of the year. Work on the route development and business case is ongoing, a consultant has been procured to undertake a detailed modelling exercise to explore a number of route

options, the results of which are anticipated in January 2018. TfWM are providing technical advice and support on the project. DfT are closely engaged in the project, and engagement has been undertaken with Network Rail and the ORR. Engagement with Utility Companies, a key stakeholder, will commence in the next few months.

6.0 Financial implications

6.1 A total of £12.2m is sought from WMCA which will specifically fund both the shared retaining wall and Coventry VLR Phase 1 R&D. It is proposed Coventry City Council will be the accountable body for the funding, under its UKC+ and HS2 programme allocations. Funding will be managed via a grant aid agreement between the parties.

Coventry is seeking a contribution of £7.87m to deliver Coventry VLR Phase 1. The nature of this project is Research and Development. Coventry is seeking assurance from WMCA that in the event of the R&D project outcome being unsuccessful, the funding allocation will not be recovered. Coventry notes that in this event the remaining £42.8m funding of the £55m WMCA funding package will no longer be required to spend on Phase 2 for delivery of the first route, and would seek approval via the WMCA assurance framework to reallocate the funding to another project within the UKC+ programme.

Other funding sources are also being pursued, including European Funding through a recent ESIF funding call, along with private industry investment.

7.0 Legal implications

7.1 H2HTIC

State Aid Advice through DEF in August 2016 states that the VLR Innovation Centre project is deliverable through a 'no aid' conclusion from the 'research infrastructure' provisions in the European Commission's 2014 R&D Framework. The ERDF and other public funding for the project is likely to be 'state aid' justified which through its 'no aid' basis is not limited in terms of aid intensity. (Further details can be submitted if required).

7.2 Coventry VLR Phase 1 & 2

The funding for the design concept will be provided by way of a grant funding agreement made between CCC and UoW. As the funding is coming from public funds, any potential risk of State Aid has to be addressed.

State aid does not arise under the proposed grant being given to UoW for research and development of the very light rail project. This is because where a University carries out almost exclusively non-economic activities or research infrastructure is used almost exclusively for non-economic purposes, the funding may fall outside State Aid Rules, so long as any economic activity is purely ancillary. In this case, a case can be made on the basis that the UOW are undertaking this R&D for purely non-economic purposes.

Notwithstanding the above, the Department for Business and Innovation (BIS) issued guidance in July 2014 which states that under the section R&D and Innovation support that funding is not considered to constitute State aid "Where a University/non-profit research organisation effectively collaborates in business research projects, this will not constitute

state aid provided the organisation is paid market rates by business partners for its share of the project work or results, or is given on-going ownership of the results generated by its share of the work (Intellectual Property)". It is only where these conditions are not met, the organisation's contribution to the project will constitute State aid."

As stated above, this project will be underpinned by a collaboration and grant agreement with UoW. Within those agreements and in order to address the State Aid risks, it will a condition of the collaboration agreement that all intellectual property which arises out of the research and development will be shared between the parties. Therefore the condition is met within BIS guidance and therefore it can be said state aid does not apply.

It should be noted that the Research and Development and Innovation (R&D&I) Framework does not provide an exemption from notifying the Commission before the aid is granted. The purpose of the Framework is to inform the public of the criteria which the Commission will apply if proposed State Aid is notified to the Commission (by way of a challenge) and the Commission has to decide whether or not to permit that aid. In making that assessment the Commission balances the positive impact of the aid in reaching an objective of common interest against its potentially negative effects of distorting trade and competition. The R&D&I Framework has a section on collaborative research. The arrangement which is being discussed on VLR falls within category as it satisfies the condition "any IPR resulting from the project and access rights are allocated between the collaborators so as to reflect adequately their work packages, contributions and respective interests". As a result if the Commission had to decide whether it was to permit the aid, in Coventry's Legal Services' opinion it would so long as the collaborative agreement specifies any intellectual property rights resulting from the project and access rights are shared.

A collaboration agreement will be in place between the parties with the shared intellectual property rights specified simultaneously with the grant agreement and before any grant monies are given.

8.0 Equalities implications

8.1 The programme will ensure that both the facility and transport infrastructure are developed in line with the Equality Act 2010. An Equality Impact Assessment will be developed accordingly and stakeholder engagement will include accessibility and disability groups.

9.0 Schedule of background papers

9.1 DMBC Cabinet Approval 'External Funding Applications – Black Country Growth Deal/West Midlands Combined Authority Investment Fund, 29th June, 2016

CCC Cabinet Approval 'Connecting Coventry – Strategic Transport Investment Programme', 24th January, 2017