



Transport Delivery Committee

Date	10 September 2018
Report title	Metro Investment Programme
Accountable Director	Laura Shoaf, Managing Director Transport for West Midlands
Accountable Employee	Phil Hewitt, Metro Programme Director Email: phil.hewitt@westmidlands.com Tel: 0121 214 7254
Report to be/has been considered by	

Recommendation(s) for action or decision:

The Transport Delivery Committee is recommended to note the report:

1.0 Purpose

- 1.1 To report on matters relating to the Metro Investment Programme in the West Midlands.

2.0 Background

- 2.1 The Midland Metro investment programme has continued to make progress during the 3 months since the last update. This note provides an overview of the main activities of the West Midlands Metro team (comprising TfWM and the Midland Metro Alliance) and the actions being taken to manage the principal risks / issues and opportunities that have arisen.

- 2.2 Current funding secured for the Metro Investment Programme is [£665m] with additional funding required of up to £1,000m to complete the full programme by 2026. TfWM is currently completing a review of the programme costs and funding in order to confirm the extent of the expanded network that can be delivered within the existing funding envelope ahead of confirmation during 2018/9 of the planned mechanism for funding the full network.

Birmingham City Centre Extension

In this period there have been no further incidents to report on the completed scheme.

Minor defects have been raised formally with the Contractor and a schedule has been provided identifying the timescales for rectification. The defects correction period ends 1st September 2018, pending satisfactory completion of the defects retention monies will then be released.

Ongoing design work continues to mitigate vehicle incursions on the Snow hill Grass Track. Trial holes have been completed and the design is nearing completion for a “tank trap” style system. This work is scheduled for construction and completion around August.

Further design work is being undertaken for issues at Stephenson Place to control as far as reasonably practicable the pedestrian entrapment issue that has been previously identified. A joint workshop has been undertaken with representatives from BCC Highways and Planning departments to identify the possible and acceptable solutions. Works will be completed around the autumn after approval.

Handback of the highway to Birmingham City Council is being progressed with BCC. To date, discussions have focused on TfWM maintaining the highway around the Metro infrastructure with workshops scheduled to identify liabilities and obligations.

Catenary Free Trams

The first retrofitted CAT Free Tram (Tram 18) went back into passenger service on 20th April 2018 following investigations which closed out a minor irregularity on one of the commissioning tests. The tram runs between Soho, Benson Road and Handsworth, Booth Street on existing Line One using battery power to ensure that the system is in use during the warranty period. This will remain the case until the future permanent CAT Free sections are tested and commissioned into the expanded operational network as part of Centenary Square Extension, the extension to Wolverhampton Station and Birmingham Eastside

The retrofit roll out of the complete 21 tram fleet continues at Wednesday depot and requires 2 trams to be removed from passenger service at one time. The 2nd tram due to complete endurance testing and enter passenger service during June 2018. The 3rd tram is has been retrofitted and is currently being tested.



Picture: Tram 18 running on battery power with pantograph retracted on Soho, Benson Road

Bilston Road

Bilston Rd Project Cost	Construction Start	Completion
£16m	12 June 2017	1st December 2017
Powers	Midland Metro Act 1989	
Funding	Funded through HS2 Connectivity Debt	
	£650k contribution from City of Wolverhampton	
Programme		Completed [2 Weeks Early]
Cost		On Budget

Construction work is complete and the tramway is open for traffic.

Construction work progressed well and the Midland Metro Alliance completed the works with the road fully reopening to traffic on 2 December 2017, two-weeks ahead of programme. The Tramway service resumed on Friday 8 December 2017, following testing and commissioning and driver training.

During the Midland Metro Alliance electrical testing, issues were identified with the electrical insulation performance of the new trackform as a result of which the risk of stray currents arising from the operation of Metro maybe increased. A detailed review was undertaken by TfWM and the MMA's design and construction teams to amend the installation of the trackform. Although the revised design appears to have improved the situation, there are ongoing concerns around potential stray current leakage and further measurements are being taken to assess the need for any further remediation. The additional cost of the revised design has been accommodated within the project risk / contingency funding and provision has been made for cost of further stray current mitigation works if these prove necessary.

Westside Extension – Phase 2 – Centenary Square

West Side Programme Cost		
£149.2m		
Phase 2 Cost	Construction Start	Passenger Services
£65.8m	12 June 2017	Q4 2019
Powers	Midland Metro (Birmingham City Centre Extension Etc) Order 2005	
	Midland Metro (Birmingham City Centre Extension Etc), (Land Acquisition and Variation) Order 2016	
Funding	GBSLGF	£7.55m
	Enterprise Zone	£20.35m*
	Third Party	£3.6m
	HS2 Connectivity	£38.7m ¹
Schedule		On Programme (Dec 2019)
Cost		On Budget



Pictured: A CGI of the tram running past the Town Hall

¹ Additional funding of £4.4m has been approved by the EZ Board but is awaiting final approval of the Business Plan prior to formal confirmation.



Pictured: A CGI of the tram running past the Town Hall

This is the next stage of the Birmingham City Centre Extension original powers for which were granted in 2005 and extended in 2016. The extension runs for some 650 metres between Grand Central and a temporary terminus on Broad Street in Centenary Square. The short extension will have an additional stop at Victoria Square and will be operated entirely Catenary Free – a first for the UK.

Works commenced on schedule in Area 3 (Centenary Square) and Area 1 (Pinfold Street) and are generally progressing to programme despite the need to reschedule works in Area 3 to accommodate the requirements of the Arena Central (HSBC) development. Works in Area 2 remain dependent upon the handover of the worksite from the Paradise development following completion of demolition works at Fletchers Walk as part of the Paradise development. The final signing off of the Under Agreement between WMCA, Argent and BCC has delayed access to Easy Row subway extension works. Access originally planned for November 2017 was rescheduled for 27 April and subsequently rescheduled by Argent to 4th and 11th of June. At the time of writing access is forecast for 18th June 2018.

The Asset Protection and Remediation Agreement (APRA) is agreed in principal with BCC. The MMA have highlighted potential damage to the waterproofing on the A38 tunnel structure, caused during the Paradise development demolition works. BCC have confirmed that any potential damage will not hinder approval of MMA's APRA.

The Midland Metro Alliance continues to review opportunities to reschedule / redesign works to recover these delays and is currently firming up arrangements with TfWM and BCC to publicise and finalise the consultation on the planned closure of Paradise Circus for 10 months. This closure will be in place from 3rd September 2018 and will return the project completion date to December 2019. The Midland Metro Alliance has reported that they expect to substantially complete Areas 1 and 3 in 2018.

Works have progressed in Area 1 with the backfilling of cellars in Pinfold Street and drainage installation nearing completion. Construction works have now commenced in Victoria Square with the removal of the steps and excavations underway for deep drainage connections. Paradise Street has seen a lot of activity with the area excavated to expose utility apparatus for disconnection and re-routing. Works in Paradise Street have been delayed following the identification of several utility clashes that are being resolved. Works to realign the Hill Street / Navigation Street junction are nearing completion.

Progress in Area 3 remains dependent upon the completion of works by the HSBC Contractor, Galliford Try and Centenary Square contractor, Bouygues. A “one team” Director level weekly meeting has been implemented by BCC and TfWM to ensure activities are coordinated and that blocks to progress across all of the CSQ projects are identified and removed. The Metro works to the frontage of HSBC are now on hold pending agreement of a new 3 way programme with Millers and Bouygues which is due by the end of June. Area 3 works will gain momentum with the proposed closure of Paradise Circus in September 2018.

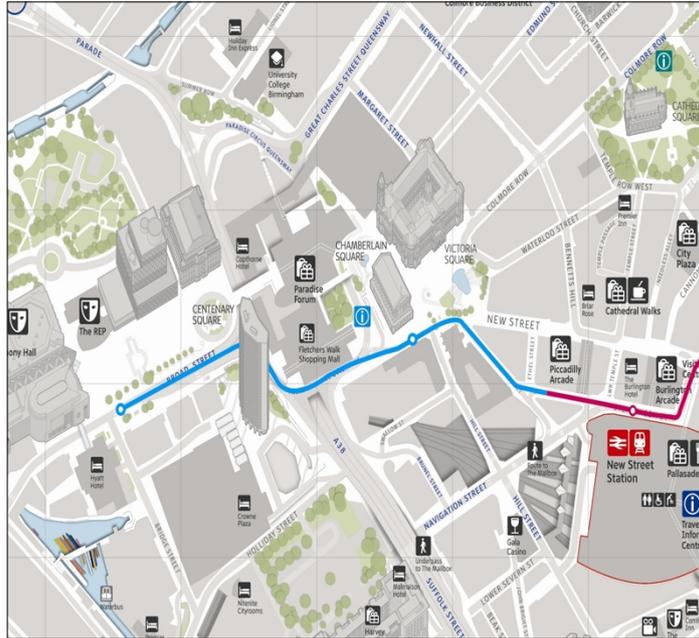
Engie Steam Main Diversion is required due to Engie objecting to the CSQ water feature being constructed on top of the existing. Diversion of this main will also facilitate Engie serving the new developments in the Centenary Square area and will facilitate the Metro construction through Broad Street and onto Five Ways. Engie are waiting the design completion before sending the quote. The estimated amount needed is £605k. The funding of these additional utilities works has yet to be confirmed but is not included in the Metro budget.

Additional funding (£4.4m) has been awarded by the Enterprise Zone to cover the additional Birmingham City Council requirements and Paradise Circus funding commitments. An offer letter will be issued once funding allocation is confirmed which is part of the new 2018 Enterprise Zone Investment Plan, to be approved by the GBSLEP and Council by the end of June. The amount of funding approved by the Board will be made available to the project by TfWM, after completing governance.

In the interim and to enable the commencement of design works and early procurement of the required materials, TfWM has released £200k.

First phase tie-in works are expected to take place on Pinfold Street in 2018. These will require the closure of the Line One head shunt which will mean all trams will be required to terminate and reverse in the platform at Grand Central tram stop. The Metro Change Board has asked the Midland Metro Alliance to submit its proposals (with a focus on operational safety and performance, pedestrian and vehicle management, communications) for consideration at the Change Board meeting.

Design costs are under pressure and reported to be running significantly ahead of budget whilst construction costs are increasing as a result of delays and site conflicts. Notwithstanding this the Alliance has advised that opportunities to achieve savings have been identified and that the Westside extension programme remains deliverable within the funding envelope of £149.2m.



Pictured: Phase one of the Birmingham Westside Extension from Grand Central to Centenary Square



Left:
Victoria
Right:
timber



Works progressing in Square, steps removed, Mailbox internal basement blockwork completed with studding.

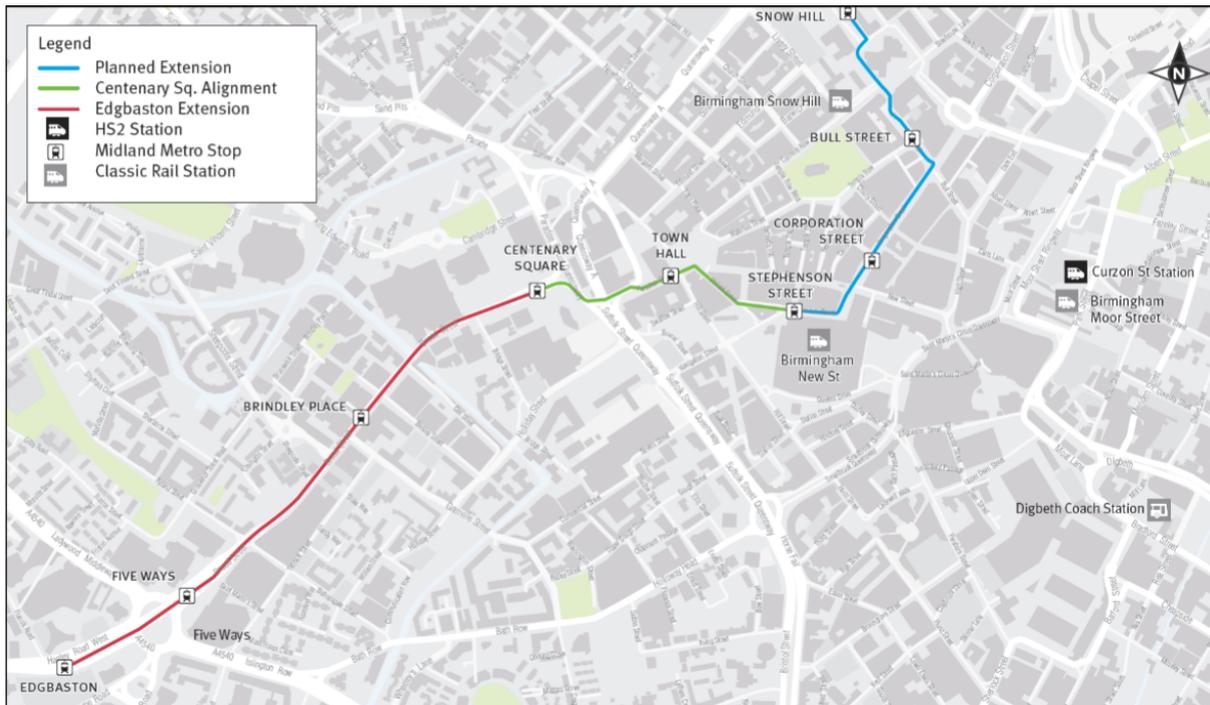
[PUBLIC]

Pictured: Midland Metro Alliance hoardings on Victoria Square, promoting Pride event

Westside Extension – Phase 3 – Edgbaston Five Ways

Programme Cost		
£149.2m		
Project Cost [TC1²]	Construction Start	Passenger Services
£83.4m	July 2019	December 2021
Powers	Midland Metro (Birmingham City Centre Extension Etc) Order 2005	
	<i>Midland Metro (Birmingham City Centre Extension, etc.) (Edgbaston Extension Land Acquisition) Order – Application Made – decision Q4 2018</i>	
Funding	Enterprise Zone	£1.3m
	Third Party	£2m
	HS2 Connectivity	£20.3m
	DfT Grant	£59.8m
Current Status	Design – ongoing – completes July 2019 Utilities Phase 2 – December 2017 to July 2019 Complimentary Highway Works – July 2018 to July 2019	
Programme		On Programme
Cost		On Budget

² This cost reflects further review and value engineering by the Midland Metro Alliance which has reduced the forecast out-turn cost of phase 3 relative to the TC1 figure



Pictured: Map showing the next two phases of the Birmingham Westside extension.

The final phase of the Birmingham City Centre extension, due to open in December 2021, is some 1.3 km long operating entirely on highway with stops at Brindley Place, Five Ways and Edgbaston (Hagley Road). The sections between Centenary Square and Brindley Place and between Five Ways and Hagley Road will be operated catenary free.

An application for powers to acquire the land to construct and operate the extension was approved by the WMCA Board at its meeting on 17 March 2017. Negotiations with landowners have continued to progress well and the Transport and Works Order processing unit has confirmed that the written representations process has been concluded. WMCA now await the DfT's decision whether to grant the Order. The Alliance continue to negotiate agreements on behalf of TfWM to acquire the land without compulsory purchase and this is expected to be concluded in summer 2018.

The Midland Metro Alliance has submitted an initial Project Proposal and Target Cost (TC1) for the Edgbaston Extension works and this was approved by the WMCA Board at its meeting on 17 March, with authority to approve the final Target Cost 2 delegated to the Metro Director and Corporate Services Director, subject to a satisfactory report from the Alliance Auditor. The final Project Proposal and Target Cost (TC2) is due to be submitted for the approval of the Owner's team in June 2019

Funding for the project is now committed by all parties following the formal announcement by DfT of their contribution. TfWM have released funding for the continuation of the project through to the submission of Target Cost 2 (Stage Gate C). Detailed design for the Bath Row and Sheepcote Street complementary highway works are complete and, following consultation on the proposals the Alliance is working with BCC to finalise arrangements to advertise the permanent TROs and to undertake the delivery of the two measures in

summer 2018. Phase 1 utility diversions are nearing completion as Phase 2 utility works pick-up pace in order to complete by July 2019.

An innovative solution has been identified in order to strengthen the Broad Street Canal Bridge and MMA are now in the process of finalising the detailed design in order to acquire technical approval from the relevant authorities. The innovation has the potential to save the project circa £700k when compared to the TC1 estimate.

An enhanced approach to communications is being developed on the Westside project for roll out across all schemes. Senior personnel from TfWM and the Alliance are walking the route regularly to meet with stakeholders. A new weekly update is being published with the intention of keeping residents and businesses informed about progress with the works and a quarterly newsletter will be produced to provide an overview of the project to stakeholders.

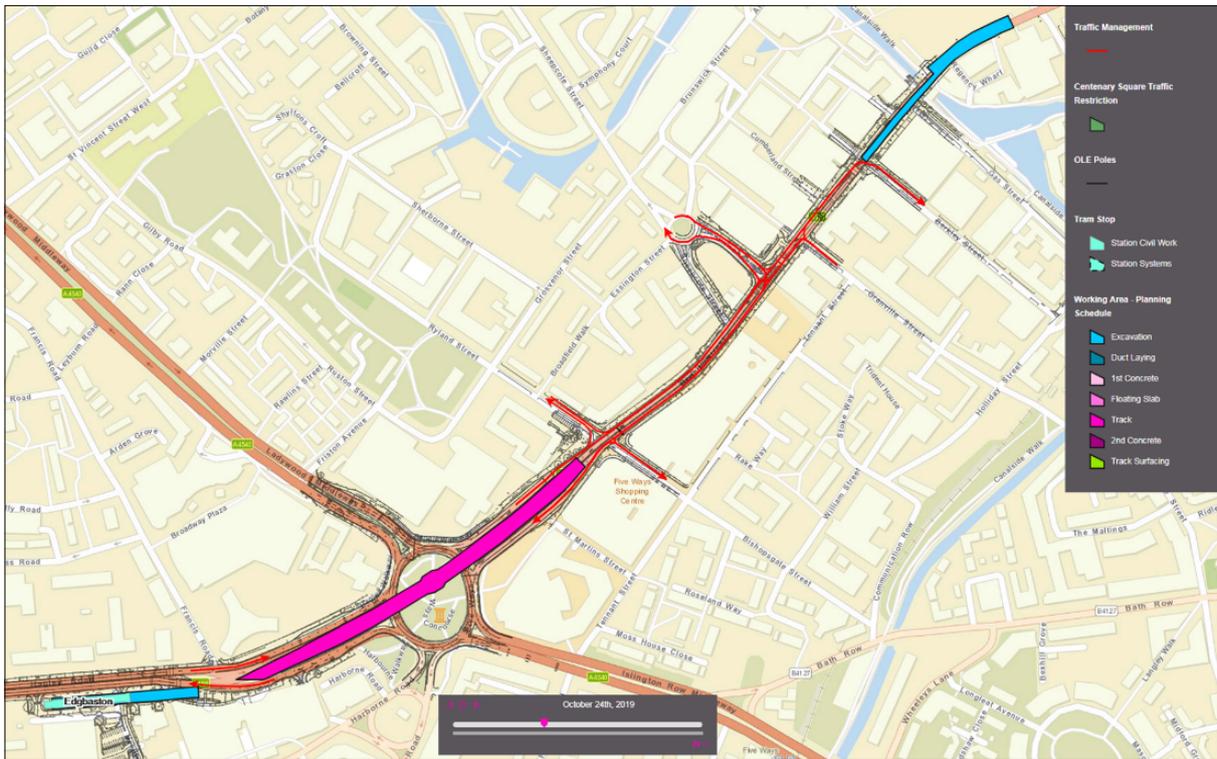
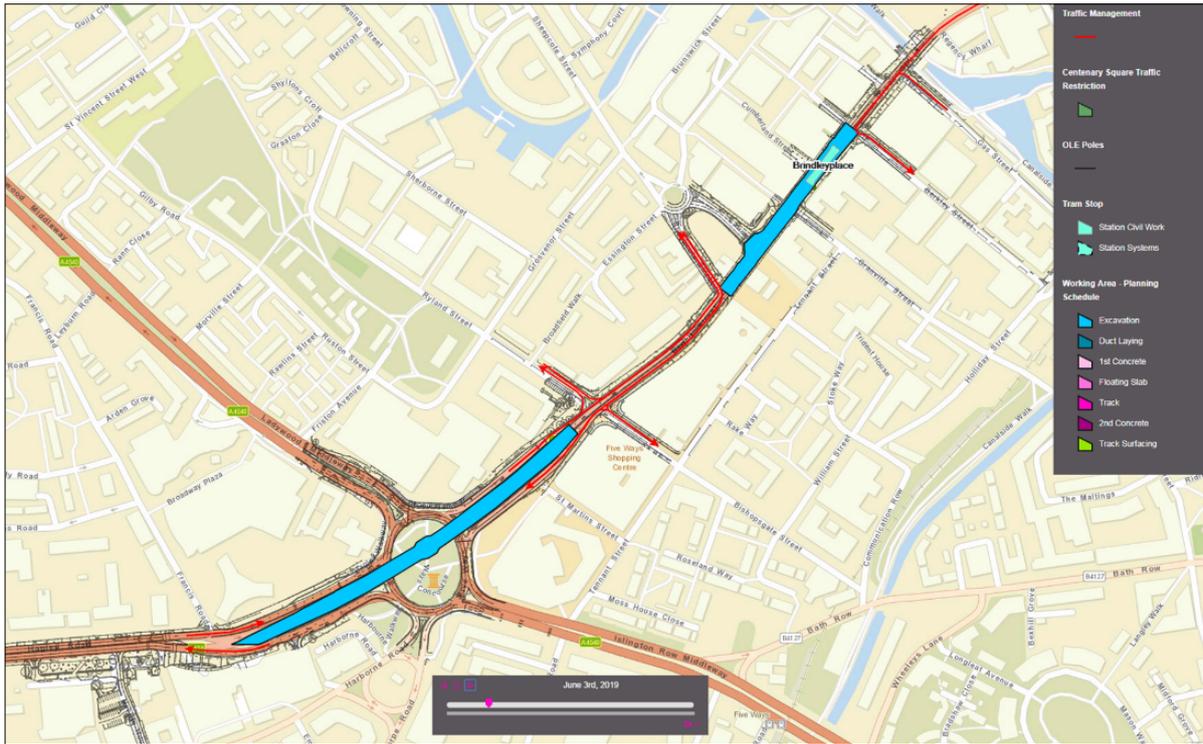
The Phase 3 Construction strategy has been produced using GIS technology that enables stakeholders to see how the works will be progressed between Centenary Square and Hagley Road between 2019 and 2021. Initial discussions have commenced with the Westside BID and Pubwatch ahead of more general consultation in the coming weeks.

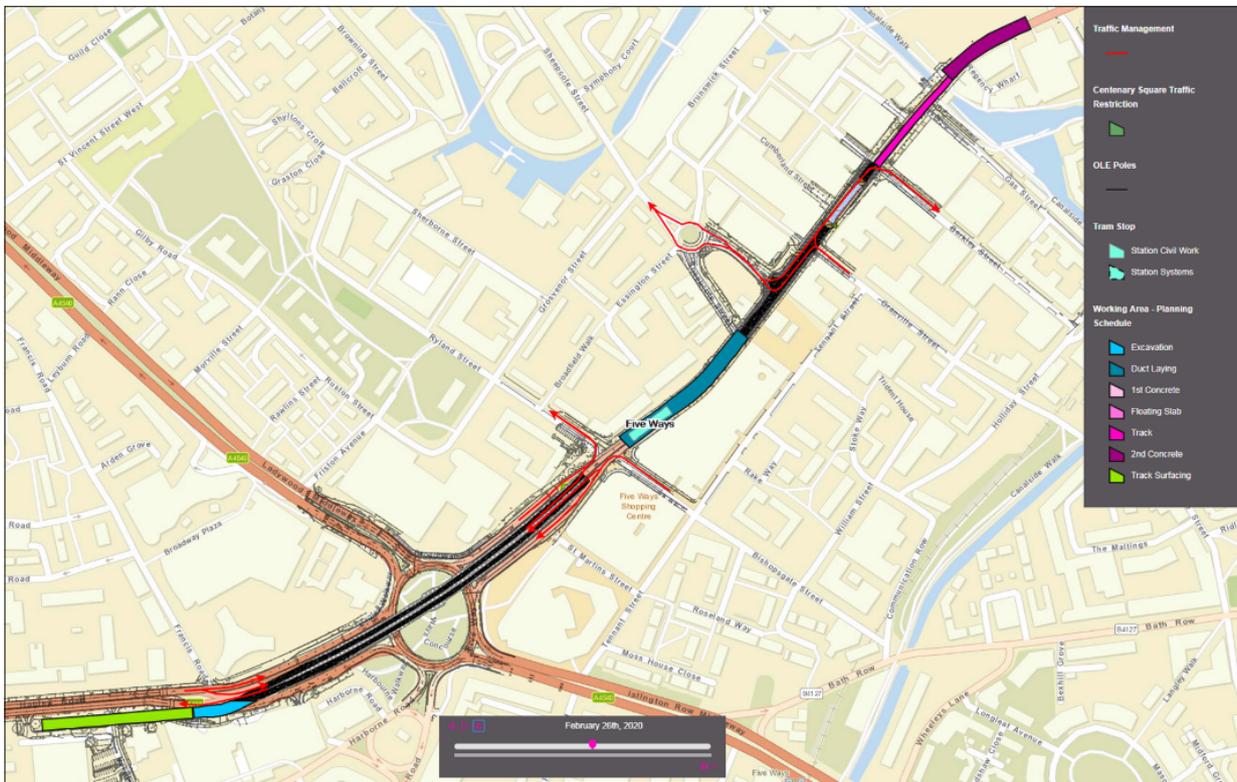
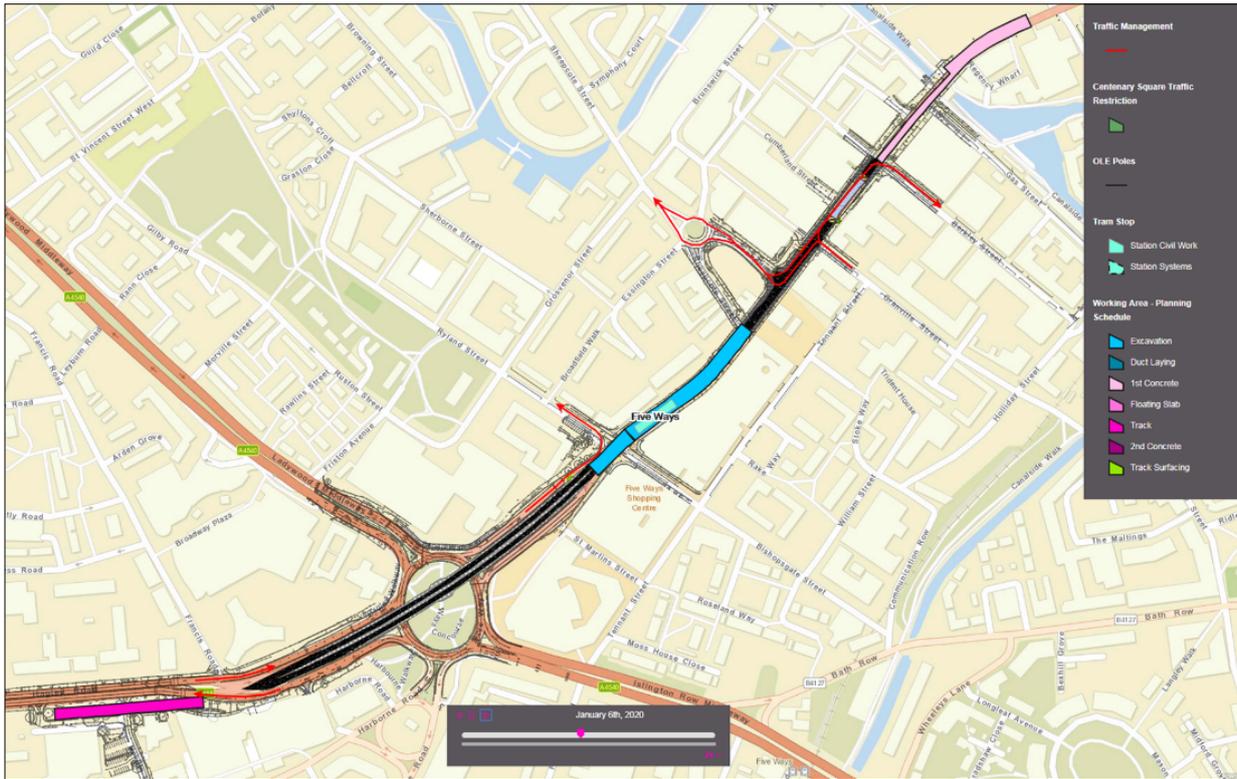
TRAMS

A review of tram performance characteristics and timetable development work has identified that additional trams will be required to ensure that the existing Line One service levels can reliably be maintained when the Edgbaston extension opens in full. It is anticipated that this will require the additional trams to be delivered in summer 2021.



Pictured: Advert so support businesses during construction.





Wolverhampton City Centre Extension

The extension is a core part of the Wolverhampton Interchange Programme – funding is for the overall WIP

Project Cost	Construction Start	Passenger Services
Programme £81.8m	August 2017	July 2020
Including Metro £33m		
Powers	Wolverhampton City Centre Extension Order 2016	
Funding	ITB	£3.0m
	LGF	£13.5m
	WMCA (DfT-MSCP)	£21.9m
	WMCA (HS2)	£12.4m
	CWC	£16.0m
	WMCA (IP)	£15.0m
Current Status	Phase 1 construction – ongoing due to complete October 2018. Project will be suspended pending completion of the Station Construction works. Project schedule rebaselined to reflect current overall WIP programme	
Programme		On Programme
Cost		On Budget



This is a short (850m) on street extension that will provide new stops at Wolverhampton Railway Station and at Pipers Row, where it will serve Wolverhampton Bus Station. The extension will connect with Metro Line One at Bilston Street between the Wolverhampton St Georges and The

Royal tram stops. Between Piper's Row and Wolverhampton Station the route will operate catenary free.

Following the Railway Station works contract being awarded to Galliford Try, it was agreed at the WIP January steering group that the Midland Metro Alliance would accelerate the tram extension works to run in parallel with the Galliford Try station works. These works started on Pipers Row in April 2018 and, access permitting and in co-ordination with Galliford Try, on Railway Drive from July 2018. These works will exclude the Station Plaza works that will be carried out on completion of the Galliford Try Railway Station project.

Utilities enabling works are now all completed with the remaining works being dealt with within the MMA main works programme. The main construction works have commenced on Piper's Row and have progressed to plan with first track construction due to commence in late June. Quality issues have been identified with the rail as delivered to site and a remediation plan has been implemented by the Alliance that will mitigate against delay to the works.

As the Metro works in the station forecourt cannot commence until the station works are completed, the Alliance has advised that on completion of Phase 1, the WCCE project will demobilise with only a limited design team remaining active to deal with any station interface issues. The Alliance will remobilise approximately six months prior to the completion of the Railway Station works which will allow the 12 month construction phase to run uninterrupted from Pipers Row to the station. This delay will increase the cost of the Metro extension by approximately £800k – this cost is included in the current overall WIP programme forecast.



Pictured: CGI of the future Wolverhampton station



Pictured: Various Wolverhampton Metro works

Birmingham Eastside Extension

Project Cost	Construction Start	Passenger Services
Programme £137m ³	Q3 2020	Q4 2022 ⁴
HS2 Interface £18.5m		
Powers	Midland Metro (Birmingham Eastside Extension) Order – Decision expected Q4 2018	
Funding	DfT / DCLG	£131.7m
	LGF	£5.5m
	WMCA	£18.5m [Underwriting to HS2]
Current Status	TWAO Decision – June / July 2018/9 Preliminary Design – complete September 2018 Preparation of Project Proposal (TC1) – Q3 2018	
Programme		On Programme
Cost		On Budget

This is a short 1.7km street running tram route that departs from Line One at Bull Street and runs to Digbeth where a temporary terminus will be provided pending the construction of the East Birmingham / Solihull (Airport) line. Four new stops will be provided at Albert Street, New Canal Street (HS2) Meriden Street and High Street Deritend (Coach Station) with the section between Albert Street and High Street being Catenary Free.

The Public Inquiry took place on 22/23 November 2018 and given the overwhelming case for the project and lack of objections at the Inquiry, the Inspector was able to submit his report in January via the Planning Inspectorate to the DfT TWA Orders Unit.

Based on the positive Inquiry and the timing of the Inspectors report the DfT Orders Unit have been requested to 'make' the Order in June (six months is the stipulated period although 12 months is more typical). This will enable the scheme to be brought forward with passenger services operating on the extension in time for the Commonwealth Games in July 2022.

³ With Optimism Bias included there is a potential additional funding requirement of £21.6m that would require WMCA funding

⁴ MMA have been requested to develop an accelerated programme that will ensure that the Eastside Extension to Digbeth Coach Station is open for the Commonwealth Games

With the shortening of the BEE project timescales activities associated with the Final Business Case have commenced in order to support this being submitted as soon as possible after the Order comes into force and a report will feed through WMCA Governance from August to November to approve the submission to Department for Transport. Following that, DfT have stated an 8 week minimum approval period.

A joint engagement event with HS2 and BCC will take place on 22 June as a symposium to promote the wider benefits of the major transport investment for the area to the landowners and key stakeholders along the route.

Trams

The funding package includes provision for procurement and supply of an additional nine trams that have been identified as necessary to allow services to be operated.

- Wolverhampton to Edgbaston
- Edgbaston to High St Deritend
- High St Deritend to Wolverhampton

Wednesbury to Brierley Hill Extension

Project Cost	Construction Start	Passenger Services
£343m ⁵	Q1 2021	Phase 1: Q1 2023
		Phase 2: Q4 2023
Powers	The Midland Metro (Wednesbury to Brierley Hill and Miscellaneous Amendments) Order granted in 2005 <i>Midland Metro (Wednesbury to Brierley Hill Land Acquisition) Order – submission December 2017</i>	
Funding	BCLGF	£0.4m
	Transforming Cities Fund	£207m
	WMCA	£103m
	Unfunded	£33.2m
	TOTAL	£343.6m
Current Status	Submission of TWA Land Acquisition Order December 2017 Design Development ongoing to Q4 2018 Outline cost estimate Q4 2018	
Programme	Opening of Passenger Service Phase 1 Dudley Town Centre Phase 2 Brierley Hill	On Programme
Cost	In stage approved budget leading up to Target Cost 1	On Budget

⁵ The forecast out turn cost including Optimism Bias is £420m – June 2017 Business Case’s Economic Case E4 - if realised any difference in cost would need to be funded from Alternative sources, As noted TfWM / MMA are completing a full review of programme / project costs.



Pictured: CGI of WBH extension

The Wednesbury to Brierley Hill Extension is 11km long and has the benefit of a Transport and Works Act Order, which was granted in 2005. 7km of the route runs along former railway corridor with the remainder running on street in Dudley town centre, Merry Hill and Brierley Hill. The scheme will provide up to 17 stops and will integrate with; Dudley Port train station; the new Dudley Bus Interchange and proposed Canal Street train station as well as improving accessibility to other public transport facilities accessed from the existing operational metro line and proposed extensions with in construction or being planned.

In accordance with current WMCA / NR policies the project is required to make passive provision for joint future freight train operation (forecast to be no earlier than 2040). The details of the passive provisions to be incorporated into the Metro design continue to be progressed as part of land acquisition discussions with Network Rail.

Funding

WMCA has approved the allocation of £207m of Transforming Cities Funding to the project with WMCA currently authorising the Alliance to spend a further £12m (cumulative £19.6m) on furthering the scheme development as outlined below.

Table 2. Proposed 2018/9 Funding Requirement

Activity	£m
Outline Design, Programme Management, Owners Costs	10,415
TWOA Processes	425
Business Case	200
Contingency	960
Sub Total for ongoing development	12,000



Pictured: Members of the WBHE construction & design teams walking the route at Eagle Lane, Tipton

Management of the Statutory Process

This workstream includes the activities needed to secure, by means of a TWA Order the Compulsory Purchase powers necessary to construct the line. MMA is managing the ongoing statutory processes, with its own experienced team working in partnership with Parliamentary Agents, Counsel, WMCA legal team and expert witnesses as necessary. The work includes

- Negotiation with objectors and achieving an agreed settlement via legal agreement or assurances prior to inquiry where possible,
- Preparation of Statement of Case
- Preparation of Proofs of Evidence
- Management of the public inquiry process
- Preparation of rebuttals
- Public Inquiry

There were 24 objections to the Draft Order (with a further objection logged after the deadline had passed) and 5 of these have been withdrawn. Good progress has been made with all the remaining 19 objectors and negotiations are progressing well. Under the TWA Guidance, the Secretary of State will decide if an inquiry or hearing should be held - whether a statutory objector wishes to be heard or because of the nature and extent of objections - written notice of this decision must be given by the Operative Date. This period has been extended to 30 July 2018 and a further extension is expected to be sought to allow time for negotiations to progress with all objectors in the expectation that agreement can be had with objectors.



Pictured: Abseiling/roped access to inspect the outer face of Parkhead Viaduct

Target Cost 1 (TC1)

TC1 is the first formal cost estimate provided to the WMCA within the MMA Programme Alliance Agreement and is a contractually committed cost from the Non-Owner Participants (designer and contractor). This requires outline design of the main scheme elements to be completed, and is planned to be available from October 2018. This will provide greater certainty of outturn costs and inform the Final Business Case.

Continuation of current outline design and investigation work

The MMA project team continues to progress outline design and extensive ground and structural investigations along the route to inform designs and future TC1 cost estimate. Key design areas include:

- Alignment and track design
- Traffic Assessment
- Systems design
- Environmental design
- Highway design
- Structures

- Urban Realm design

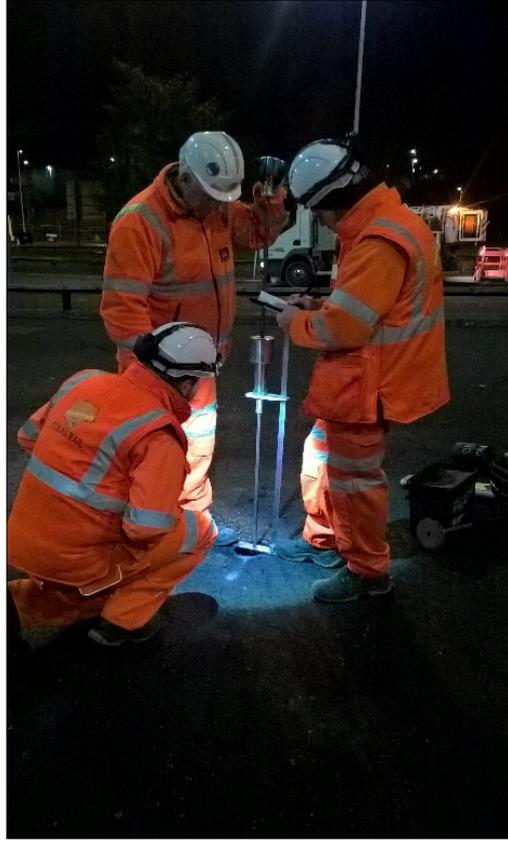
In addition to the above the MMA is progressing plans for utility diversions in Dudley town centre and detailed design for the new junction with Line One at Wednesbury as well as for other structures along the route.

Depot

The extension to Brierley hill will require additional stabling facilities to be provided for the 18 extra trams needed to run the services to Dudley / Brierley Hill and Birmingham Eastside. Two options are now under consideration by TfWM including a full facility adjacent to line one in Handsworth and a temporary facility adjacent to Wednesbury depot on the WBHE extension alignment. The depot strategy will be confirmed as part of the overall programme.



Pictured: Above Standard penetration testing rig used to ascertain ground conditions above piers on Parkhead Viaduct. Below: Coring at night in Dudley Town Centre to determine material pavement depths



East Birmingham Solihull Extension

Project Cost	Construction Start	Passenger Services
£735 ⁶	2023/4	2026
Powers	Midland Metro (East Birmingham & Solihull Extension) Order to be sought December 2018	
Funding	Enterprise Zone	£183m
	DfT Devolution Deal	£492m [TBC]
	Unfunded	£60m
Current Status	Preliminary Design and Outline Business Case development progressing Submission of Transport and Works Act Order – September 2018	
Programme		On Programme
Cost		On Budget



This 16.5km extension will link growing residential areas and key community destinations such as St Andrews, Bordesley Green, Heartlands Hospital and Meadway with existing and new growth areas including Curzon HS2, Birmingham City Centre office and retail districts, Paradise Circus/Arena Central developments and Brindley Place/Five Ways/Edgbaston to the west, and the NEC/Airport UK Central and HS2 Interchange Station to the east.

The extension of the Midland Metro from Digbeth to east Birmingham and north Solihull will play a key role in delivering the full potential for growth and jobs of HS2 and provide transformational benefits to areas with a persistent and high incidence of multiple deprivation

⁶ Target Cost is £508m – the full sum to be funded is inclusive of Optimism Bias at 50%

by giving people access to jobs and services, linked to the Greater Birmingham and Solihull Local Enterprise Partnership (GBSLEP) training and skills agenda.

The EBS project is much more than a transport project. By aligning initiatives promoted by a wide local partnership in Education, Health, Employment, Housing and Education it seeks to transform the East Birmingham and North Solihull areas, breaking the people of this area out of the past and present embedded high levels of incidence of multiple deprivation.

The Metro scheme is the key backbone for this transformation, not only providing local jobs in design and construction through the Midland Metro Alliance, but by linking people to major current centres for employment and the future jobs and growth hubs in the Birmingham City Centre Enterprise Zone and UK Central, and by providing a stimulus to development along the corridor.

Initial work in 2015-16 on the project focussed on high-level engineering studies to develop the indicative route with which to test the viability of the project through development of an Initial Outline Business Case (IOBC). This work demonstrates a good value for money case exists for the project, with a Benefit: Cost Ratio of 1.6:1, rising to around 2:1 when wider benefits are added to this initial assessment.

The project team remain committed to the delivery of the scheme in 2026, just prior to the opening of HS2, although there is no room for delay if this is to be achieved. The next key milestone is to submit an application for Transport and Works Act Order (TWAO) powers to build, maintain and operate the extension and to confirm the route for funding the full cost of the project.

Concept design has been completed and topographical surveys undertaken to allow the commencement of preliminary design to feed into the TWAO submission. PRISM traffic modelling necessary to assess the impacts of the scheme on the highway network is running behind schedule. This modelling will influence the design decisions in key constrained sections of the route, ahead of the public consultation on the preferred alignment option.

The TWAO submission has been deferred by 3 months to March 2019 to accommodate the public consultation and modelling work and subject to the necessary approvals from WMCA and confirmation of the overall funding package.

Briefings to ward councillors along the route commenced in November 2017 following agreement with the Cabinet members for Birmingham and Solihull. A project briefing for local MP's took place in Westminster on the 28th March 2018 to help build advocacy for the scheme. Public consultation on the preferred alignment for the scheme will take place during the autumn and is an essential precursor to the submission of the Transport and Works Order application.



In July 2017 the Investment Board approved funding of £9.5m to progress the project through the Transport and Works Act process.

Work has continued on the development of the Outline Business Case which will be submitted in September 2018. Work on the Environmental Statement Scoping Report is also underway and there has been ongoing consultation with key stakeholders to ensure collaboration and integration with other major projects along the route which are due to be developed and delivered within similar timescales



Pictured: Possible alignment of Metro at St Andrews

3rd Generation Trams (3GT) – TfWM Metro Team

Project Cost	ITN	First Tram In Service
c. £150m	Q1 2019	Q2 2021
Powers	N/A	
Funding	£1.5m Procurement funding included in Eastside Budget	
Current Status	Market Sounding Workshops completed in Q2 2018 Contract Notice Q2 2018 Invitation to Negotiate ITN Q3 2018 Contract Award Q3 2019	

This project will be progressed by TfWM's Metro team outside of, but with support from the Alliance and the Operator.

Modelling of the network has been undertaken and in order to operate the extended network with a five minute frequency service, TfWM will need to order a fleet of up to 50 additional trams capable of running catenary free.

The expectation is that the trams will be required to be delivered and commissioned in phases approximately 6 months prior to the opening of the following extensions

- Edgbaston: 6 Trams [Q3 2021]
- Eastside: 3 Trams [Q1 2022]
- Wednesbury Brierley Hill Phase 1: 9 Trams [Q3 2022] or earlier if further accelerated]
- Wednesbury Brierley Hill Phase 2: 7 Trams [Q2 2023]
- East Birmingham Solihull: 23 Trams [2025/2026]

Funding for these vehicles is included in the Eastside, Wednesbury Brierley Hill and East Birmingham project funding envelopes.

To operate the trams additional depot facilities will be required together with upgraded / new control and communications systems. These facilities and systems will need to be procured, delivered and commissioned in parallel with the 3GT procurement.

The first stage of the project is to evaluate the most appropriate offer to put to the market and to assess market appetite.

Market Sounding workshops were held with five suppliers who responded to the Market Sounding Questionnaire. The workshops covered technical, commercial, and risk and programme issues and also focused on the Catenary Free technologies available (e.g. batteries, super capacitors or a combination of technologies), battery maintenance and the infrastructure constraints. Discussions were held over the concerns on the extent to which the catenary free sections can be deployed on future extension because of range limitations

of vehicle power storage technologies and what could be done to improve this. One possibility being investigated is the use of dynamic pantograph transitions.

The information received indicates the market is very interested and has proven tram products to offer, albeit with some clear concerns on the extent to which catenary-free sections can be deployed on future extensions because of range limitations of vehicle power storage technologies.

Currently, there is a focus on establishing the new trams funding structure, and to prepare and issue the OJEU SQ (previously termed Prequalification) documentation.

Coventry Very Light Rail (VLR)



The Coventry Very Light Rail Research and Development Project is focussed around a proposal for the Development of a new Prototype vehicle along with a new form of thinner, lighter more easily laid, removable and replaceable trackform.

The smaller lighter vehicle is aimed at possible very light rail tramway schemes. It is proposed that ultimately a VLR route network would be operated in a fully autonomous manner. Currently Tramways including Very Light Rail operate in an urban highway environment on a line of sight basis like other road vehicles. Currently the regulatory requirements will not permit fully autonomous operation of tramcars in the highway, therefore requiring staffing of all of the vehicles with a Driver initially.

The preferred VLR vehicle to be developed through CCC, WMG and TDI International who are contracted to WMG, is a single unit of some circa 9m length with driver cab/s and a tram style cabin. A normal operating capacity of circa 50 passengers will be possible, with a crush loading of up to maximum passenger capacity of some 68 people per vehicle is expected. It is currently not intended to allow formations of multiple vehicles or recovery by another VLR vehicle.

It is being assumed the vehicles will be electrically powered through on board battery power storage. WMG with their Battery technology expertise are ideally suited to advise the project on the most appropriate specification of the Batteries, and re charging method.

A lighter, thinner, possibly modular trackform is also proposed to be developed by WMG that could minimise the need for utilities works associated with the construction of the scheme – a major cost elements in the provision of Light Rail Schemes in the UK. The principle of the acceptability of such a lighter thinner trackform avoiding the need to divert utilities apparatus is yet to be accepted by statutory undertakers.

To permit the testing of the new vehicle and trackform options, including its resistance to wear and the potentially higher loadings of heavy goods vehicle road traffic are a major consideration. A test track is proposed to be constructed at the location of the Very Light Rail National Innovation Centre at Castle Hill, Dudley, to allow the structural and wear related testing of the track form prototypes, in association with the prototype vehicle. In this regard the two projects are also linked from a delivery programme perspective.

The VLR Project is divided into four main work streams these are:-

- Vehicle – Development of a Prototype Vehicle – lead Organisation WMG
- Trackform – Research and development of options – Lead organisation WMG
- First Route - lead Coventry (in partnership with TfWM)
- VLR Operations - Lead organisation TfWM

Throughout the project, TfWM Metro Team have been providing support including Tramway related advice and guidance, including on Transport and Works Act Order acquisition process, and tramway related safety implications across the work streams.

Route development has been progressed and this has included the need to assess both the prime route option between the City Centre and University and a secondary option between the City Centre and the east of Coventry towards the University Hospital. This has been necessary to support business case assessment and provide evidence of alternative route corridor option assessment for any future TWA Order application process.

The initial approved funding of the project is identified in Table 1 below.

The trackform development has been identified to be one of the more challenging areas of the scheme development. It is likely that with the identified loading of the very light Rail vehicle of some 3T per axle, the normal loadings of heavy goods vehicles will be greater, requiring an appropriately resistant track construction.

The route assessment work stream has involved more work and expenditure than originally envisaged due to the need to undertake additional high level assessment of the Benefit Cost Ratio (BCR) and the need to assess both additional alignment options within the preferred corridor and additional corridor options. This has also adversely affected the initial route identification schedule. The high level Benefits Cost Ratio business case indicator figures for route options is expected to be provided on 5th July to the VLR Strategic Board.

From an operational work stream perspective, it is problematic to prepare necessary Operations strategy and requirements until there is further clarity about the outputs of the work streams 1 to 3. The current spending on this aspect has been low up to now for this reason. TfWM has continued to provide input and support where possible to the other work streams.

Funding

The project, is being funded by the Government's Local Growth Fund through the Coventry and Warwickshire Local Enterprise Partnership and West Midlands Combined Authority Devolution Deal. It is being managed by researchers from WMG at the University of Warwick in collaboration between Coventry City Council and Transport for West Midlands.

The project is also exploring options to bring WMCA Devolution Deal funding forward.