West Midlands Combined Authority

APP/P3.1

19 February 2019

Wednesbury to Brierley Hill Extension

Evidence Given on Behalf of the Applicant: WMCA
Civil Engineering
Main Proof of Evidence
Ian Collins

Transport and Works Act 1992

The Transport and Works
(Inquiries Procedure) Rules 2004

1. CONTENTS

2. QUALIFICATIONS AND EXPERIENCE

2.1.1 My name is Ian Collins. I am a Project Director with Colas Rail, an international railway infrastructure services provider. Colas Rail is one of Europe's leading suppliers of railway infrastructure services, constructing and renewing all forms of railways across Europe and the UK. Colas Rail is one of three participant organisations making up the Midland Metro Alliance (MMA). I am working on secondment for MMA as the Project Director for both Wednesbury to Brierley Hill and Birmingham Eastside Extensions. I provide leadership and direction for the development, design and construction of the projects. I am a member of the Alliance Management Team, the senior management team that provides leadership across all Midland Metro extension projects.

2.1.2 I am a Chartered Fellow of the Institution of Civil Engineers, a Chartered Member of the Chartered Institution of Highways and Transportation and a Member of the Association for Project Management. I hold a Bachelor of Engineering honours degree in Civil Engineering from The University of Birmingham.

2.1.3 I have over 25 years of construction experience and in 2016 was featured in Birmingham Post West Midlands "Who's Who in Civil Engineering" supplement. For a period of 4 years, between 2004 and 2008, I was employed by Centro, the predecessor organisation of the West Midlands Combined Authority (WMCA), in the role of Metro Implementation Senior Project Manager where I was primarily tasked with preparing both Birmingham City Centre and Wednesbury to Brierley Hill Extensions (WBHE) for a future design and build tender.

2.1.4 In this matter, WMCA have instructed me to act as expert witness on civil engineering matters for the Public Inquiry in respect of the application for the proposed Midland Metro (Wednesbury to Brierley Hill Land Acquisition) Order.

3. SCOPE OF EVIDENCE

3.1.1 My evidence covers the civil engineering aspects of the scheme and layout of the elements of the project.

3.1.2 In response to the Statement of Matters [GEN/3] my evidence addresses:

- Matter 4a – the impacts on access to and within the area, including the effects on local road networks, access to businesses and car parks, and access by emergency vehicles.
- Matter 4c – the impacts on members of the general public, including users of the Churchill Shopping Centre in Dudley and the Merry Hill Shopping Centre in Brierley Hill; and
- Matter 4d - measures proposed by WMCA to mitigate any significant adverse impacts arising from the exercise of the powers in the proposed Order, and whether any such measures are appropriate and sufficient.
- Matter 5d - whether all the land and rights in land over which WMCA has applied for compulsory powers is necessary to implement the scheme.

3.1.3 In response to specific objections, summarised at section 12 of the WMCA Statement of Case, my evidence addresses those that have not been withdrawn as of 12 February 2019:

- Jewson Ltd, Saint Gobain and SGBD Property Holdings (OBJ/05)
- LCP Estates Limited* (OBJ/06)
- Jessops Europe Limited* (OBJ/07)
- Tata Steel UK Limited (OB/09)
- Intu and others* (OBJ/10)
- Waterstones Booksellers Limited (OBJ/11)
- National Grid Electricity Transmissions Plc* (OBJ/13)
- MFG – previously Malthurst Group/Jet (OBJ/15)
- McDonald’s Restaurants Limited and Astrad Limited and AR Sirkhat (OBJ/20)
- Argos Limited (OBJ/21)
- TJX (trading as TK Maxx) (OBJ/22)

4. INTRODUCTION

4.1.1 This proof of evidence is prepared on behalf of WMCA Authority. It is structured as follows:

- Section 5 describes existing conditions
    - Former South Staffordshire Railway
    - Highway Network
    - Cycle and Pedestrian Facilities
    - Structures
    - Drainage
- Section 6 describes works carried out by MMA:
    - Background – The 2005 Order
    - Role of MMA
    - Design Basis
    - Route Description
    - Background – The Midland Metro (Wednesbury to Brierley Hill and Miscellaneous Amendments) Order 2005 (the 2005 Order)
    - Role of MMA
    - Tramway
    - Structures
    - Tram Stops
    - Bus Facilities
    - Dudley Town Centre Planned Developments
    - Bus Interchange, Portersfield and Churchill Shopping Centre
    - Parking and Loading
    - Cycle Facilities
    - Pedestrian Facilities
    - Future Freight Passive Provision
    - Highway
    - Urban Realm and Landscaping
    - Traction Power
    - Street Lighting
    - Drainage
    - Tram Signalling, Communication and Electrical Equipment

- Section 7 considers Statutory Undertakers equipment and the proposed approach to protection or diversion
- Section 8 covers construction methods
- Section 9 outlines the operational features of WBHE
- Section 10 addresses the Statement of Matters
- Section 11 addresses objections
- Section 12 provides an overall summary and conclusion.

5. REVIEW OF EXISTING CONDITIONS

5.1 Former South Staffordshire Railway

5.1.1 The majority of WBHE will run along the disused railway alignment within the former South Staffordshire Railway corridor, as generally shown on route alignment drawings A1 through to I2 in the appendix to my proof [APP/P3.3].

5.1.2 Since the railway's closure in the early 1990's vegetation had been allowed to take root in the track ballast. MMA began to clear the former railway corridor, with Network Rail's agreement, during January 2017 in order to undertake topographical and investigative surveys to inform and progress designs. Invasive weed species are prevalent along the corridor embankments. MMA began herbicide treatment of invasive weeds, including Japanese Knotweed, during 2017 as advanced preparatory works to efficiently clear the route and is returning on a regular basis to continue this treatment.

5.1.3 Members of the public have obtained informal access to the former rail corridor through poorly maintained or none existent perimeter fencing and incidents of anti-social behaviour have been reported on numerous occasions, including thefts and damage of MMA equipment used during investigative works.

5.1.4 Existing railway bridge structures and retaining walls have fallen into various states of disrepair.

5.1.5 The only section of railway currently remaining in use, and which would operate alongside WBHE, is approximately 500 metres, of headshunt at Round Oak between Tata Steel's yard and Pedmore Road.

5.2 Highway Network

5.2.1 The majority of WBHE on street running will be in Dudley Town Centre, as generally shown on route alignment drawings A1 to I2 in the appendix to my proof [APP/P3.3].

5.2.2 **Dudley Town Centre**

5.2.3 Station Drive is a cul-de-sac approximately 60m in length. Double yellow lines run continuously on both carriageways throughout its length. Access onto and off Castle Hill and Trindle Road is controlled through a signalised traffic junction. The cul-de-sac provides gated vehicular access to the former railway corridor and pedestrian access to Dudley Zoo and Castle car parks.

5.2.4 Castle Hill is a wide dual lane bi-directional highway running between Castle Gate Island on Duncan Edwards Way and a signalised junction with The Broadway and Castle Street. Castle Hill has footways on both sides. Lanes are separated by a kerb upstand central reservation broken in places to allow traffic movements. Left hand movements from Castle Hill on to Castle Street at the signalised traffic junction are prohibited. One lane in both directions is dedicated for general vehicular traffic and the other lane in both directions is a dedicated bus lane broken in places to facilitate traffic movements. There is an existing signalised junction with Trindle Road and Station Drive. Right hand movements from Castle Hill on to Trindle Road are prohibited. There is a give way junction at Birmingham Street. Single bus stops and shelters are located on opposite sides of Castle Hill between Trindle Road and Birmingham Street, below Dudley Zoo and Castle's former main entrance. A traffic signal controlled pedestrian crossing is located opposite Dudley Zoo and Castle's former main entrance.

5.2.5 Travelling up Castle Hill existing vehicular accesses are provided across footways for; Station Hotel car park, commercial premises adjacent Station Hotel for front of shop parking, Assembly Hall of Jehovah's Witnesses car park and side gated access, commercial premises car park adjacent to Castle Hill Casino, Castle Hill Casino car park and Dudley Central Mosque gated access with the Mosque being located on the junction with Birmingham Street. Beyond Birmingham Street there is an existing gated access to a Georgian style office car park.

5.2.6 Travelling down Castle Hill existing vehicular accesses are provided across footways for; a Georgian property with gated access within the grounds of Dudley Zoo opposite the junction with Birmingham Street, dropped kerbs

providing controlled access to former Dudley Zoo and Castle main entrance through the use of a line of bollards, some of which are removable, gated access to new Dudley Zoo and Castle entrance, side access to former Dudley Hippodrome theatre.

5.2.7 Birmingham Street is a cul-de-sac providing access to Bourne Street at its give way junction with Bourne Street. Bourne Street is also a cul-de-sac being mainly residential with two commercial premises. Both streets have footways on both sides. Thirteen on street parking spaces perpendicular to the highway are located along Birmingham Street opposite the Mosque.

5.2.8 Travelling towards the junction with Bourne Street existing vehicular accesses are provided across footways for; Dudley Central Mosque's gated car park and commercial premises adjacent to the Mosque for front of shop parking. Immediately beyond the Bourne Street junction access is provided to Dudley Bus Station car park and a secondary gated access to the Georgian style office car park referred to in 5.2.5 above. Birmingham Street beyond the two car park accesses also provides bus only single lane access into Dudley Bus Station, all other traffic is prohibited.

5.2.9 King Street is a wide dual lane bi-directional highway running between its 4 way pedestrian and traffic signalised junction with Trindle Road/Fisher Street and Hall Street and its 3 way pedestrian and traffic signalised junction with Flood Street and the entrance to Churchill Shopping Centre staff car park and loading bays, after which King Street continues for some considerable distance being a through road for Dudley Town. King Street has footways on both sides.

5.2.10 Travelling along King Street towards Flood Street there are no vehicular accesses across footways. King Street has existing parallel parking for approximately 3 vehicles located adjacent to the existing footbridge which links the Churchill Shopping Centre with the opposite large, open air public car park.

5.2.11 Travelling along King Street from its junction with Flood Street, towards the Bus Station, vehicular access to the Churchill Shopping Centre staff car

park and loading bays is located at the pedestrian and traffic signalised junction. A set of traffic lights controls vehicles leaving the Churchill Shopping Centre. There is no pedestrian control over this crossing. Immediately after this junction a bus, taxi and cycle only filter lane peels off providing direct access towards the Bus Station immediately adjacent to Churchill Shopping Centre. General vehicular traffic is directed either onwards to Trindle Road or through a right hand turn movement at the 4 way junction on to Hall Street. General vehicular traffic is prohibited from turning left at the 4 way junction towards the bus station.

5.2.12 Flood Street is a bi-directional highway which runs between its traffic signal controlled junction with King Street and Flood Street Island on Duncan Edwards Way. Flood Street has footways on both sides. Flood Street has 3 give way junctions with Oakeywell Street, The Minories and New Mill Street. Oakeywell Street is a cul-de-sac providing access to two adjacent open air car parks and 2 separate furniture store car parks. The Minories is a short section of road which provides an additional link between Flood Street and New Mill Street. The Minories provides access to Falcon House and its dedicated car park and a separate public car park sandwiched between Flood Street, The Minories and New Mill Street. Additional access to this public car park can be gained off New Mill Street. Access along The Minories off New Mill Street is one way only towards Falcon House. Access along the Minories off Flood Street towards Falcon House is bi-directional.

5.2.13 Travelling along Flood Street from the King Street signal controlled junction towards the Flood Street Island a single vehicular access across the existing footway is provided to Flood Street open air car park. The car park has a height restriction barrier. Immediately before this car park access there is a single bus stop pole with highway parking prohibited between the hours of 07:30 and 18:30, Monday to Saturday, through the use of a single yellow line. After the junction with Oakeywell Street, Flood Street has an uncontrolled pedestrian crossing before joining Duncan Edwards Way at the Flood Street Island.

5.2.14 Travelling along Flood Street from the Flood Street Island, Flood Street first meets its junction with New Mill Street and then a short distance after this meets its junction with The Minories. Between these two give way junctions there is on street parking for 3 demarcated vehicles. After the Minories junction there is further on street parking for approximately 5 vehicles.

5.2.15 Nearer to the King Street signal controlled junction there is one extended dropped kerb vehicular access across the existing footway which serves a car sales/service forecourt and 3 commercial premises located immediately at the back of the footway. Left turns from Flood Street onto King Street are prohibited.

5.2.16 **Brierley Hill**

5.2.17 Bi-directional access to Tata and Norish premises is from a dead end access road off The Gateway. No footways are present on either side of this access road.

5.2.18 Waterfront Way is a long bi-directional feeder road linking Dudley Road, The Waterfront Business Park and West car parks, The Gateway with Pedmore Road, The Waterfront and East car parks, and Level Street. Waterfront Way has an inner footway but no outer footway. The tram will cross Waterfront Way in two locations as shown on route alignment drawing A2 [APP/P3.3].

5.2.19 Level Street roundabout is a complex four arm roundabout which forms a junction with Waterfront Way, Level Street (east and west) and The Embankment. Uncontrolled pedestrian crossings can be found on Waterfront Way, Level Street (East) and The Embankment. All four arms have footways on both sides. There is no pedestrian crossing on the Level Street (West) arm.

5.2.20 Venture Way is a road which runs parallel to Brierley Hill High Street. Venture Way has footways on both sides. The tram will cross Venture Way approximately perpendicular to the road near to an existing traffic signalised pedestrian crossing.

5.2.21 **Sandwell**

5.2.22 In Sandwell an existing signalised pedestrian crossing is located at New Road over bridge, Great Bridge. Traffic controls marshal single vehicular passing over the railway corridor at Horseley Road and Lower Church Lane over bridges near to Dudley Port. At Park Lane East over bridge the highway has also been narrowed to one lane and traffic is controlled by priority signs.

5.2.23 Coneygree Road and Sedgley Road East under bridges carry the railway corridor over bi-directional highways.

5.3 Cycle and Pedestrian Facilities

5.3.1 Local authority designated cycle routes affected by the tramway comprise:

- Off road towpath route running alongside Tame Valley Canal crossing WBHE in 2 locations, both under the tramway in Sandwell.
- National Cycle Network route along Birmingham Canal running adjacent to Dudley Port, over the tram and an off road towpath on a further section of Birmingham Canal near to Coneygree running under tram in Sandwell.
- National Cycle Network along Castle Hill in Dudley.
- National Cycle Network under Parkhead Viaduct in Dudley.
- National Cycle Network running along Dudley Canal, top of Embankment in Brierley Hill.

5.3.2 Pedestrian crossing facilities are primarily included within the method of control at traffic signal controlled junctions identified in 5.2.3 through to 5.2.23 above.

5.4 Structures

5.4.1 A total of 30 existing bridge structures are affected by WBHE, these are summarised in the appendix to my proof and located on route alignment drawings A1 through to I2 [APP/P3.3]:

5.4.2 Approximately 3000m of existing retaining walls of varying lengths and heights, retain and support the corridor and infrastructure along WBHE.

The forms of construction vary from gabion baskets, reinforced earth, dry stone walling, brickwork, sheet piles and concrete.

5.5 Drainage

5.5.1 The South Staffordshire Railway Corridor trackside drainage has not been maintained. Sections of the ballasted track is water logged and the location of outfalls are as yet unknown.

5.5.2 Highway and hard standing surface water drainage is generally collected through storm and combined sewer water drainage collection systems.

6. SUMMARY OF WORK BEING CARRIED OUT

6.1 Background - The Midland Metro (Wednesbury to Brierley Hill and Miscellaneous Amendments) Order 2005.

6.1.1 A public inquiry for the 2005 Order was held between 23 March and 16 April 2004. The Inspector recommended in his report to the Secretary of State for Transport "…that the Order be made and that deemed planning permission be granted subject to conditions." [WBHE/B8].

6.1.2 On 20 December 2004, the Secretary of State for Transport issued a decision letter [WBHE/B6], confirming the Inspectors recommendation, approving the 2005 Order to convey powers on Centro to construct, operate and maintain an extension to the existing Midland Metro Line 1, running between Wolverhampton and Birmingham City Centre's. The 2005 Order [WBHE/B3] came into force on 22 March 2005. The 2005 Order also provided for deemed planning permission and compulsory purchase powers, both of which had expiry time limits of 5 years following the date on which the 2005 Order came into force.

6.1.3 Centro (WMCA's predecessor organisation) implemented the deemed planning permission in the discharge of relevant planning conditions and undertaking of material operations at Dudley Town Centre and Dudley Port Railway Station. Dudley Council was satisfied that all necessary conditions had been met and that a material operation relevant to the development had been carried out [WBHE/B10 and WBHE/B11].

6.1.4 WMCA therefore has statutory authority to construct, operate and maintain WBHE and in addition has implemented the accompanying deemed planning permission, which is extant.

6.1.5 Compulsory purchase powers, granted with the 2005 Order, expired on 22 March 2010.

6.1.6 Following central Government's confirmed £207million contribution for the WBHE through the WMCA Second Devolution deal [WBHE/D2 and

WBHE/B15] it has become necessary to seek a refreshing of the compulsory purchase powers for the purposes of the 2005 Order and an application for the proposed Order was submitted to the Secretary of State for Transport on 12 December 2017 [WBHE/A1] which has resulted in this Public Inquiry.

6.2 Role of MMA

6.2.1 As stated in Peter Adams' proof [APP/1.1] MMA is taking forward the design and construction of WBHE as part of its 10-year commission.

6.2.2 MMA, is developing the design and producing outline designs, including undertaking necessary site clearance to progress topographical surveys together with a package of ground and structural investigations that is being coordinated to inform these designs.

6.2.3 Outline designs have included; track alignment, track drainage, urban realm and landscaping, tram stop designs including access studies, bridge designs, retaining wall designs, highway and highway drainage designs, utility diversions and protections, earthworks and foundation engineering. Designs have been developed in consultation with Dudley and Sandwell Local Authorities in their roles as planning and highway authorities, with Network Rail, various utility companies and other developers and stakeholders along the route.

6.2.4 Condition 2 of the deemed planning permission [WBHE/B7] concerning Horizontal Alignment of Tramway and in particular where tram rails fall within the green hatched area, within the limits of deviation, has been discharged with both Dudley and Sandwell planning authorities [WBHE/F22 and WBHE/F23] based on the alignment design available at that time.

6.2.5 As with any major civil engineering scheme, MMA's outline designs for WBHE will be peer assessed to develop optimum solutions, before further development into detailed design and approved for construction. This process commenced in November 2018, and is anticipated to be completed

by the end of March 2019. Any additional physical investigations necessary to further these solutions will be undertaken during this period as required.

6.2.6 Therefore from April 2019, MMA expect to progress the detailed design of WBHE including all final approvals, discharge of planning conditions, construction strategies, communication strategies, traffic management plans and Code of Construction Practice Part 2. Detailed designs are expected to take 18 months to complete. MMA will prioritise designs with WMCA to enable an advanced start on some critical path and long duration construction activity works, as set out in the high level deliverables and milestone schedule included in the appendix to my proof [APP/P3.3]

6.3 Design Basis

6.3.1 The track alignment and associated infrastructure for WBHE has been developed in accordance with; current Midland Metro system design parameters and technical requirements, Network Rail standards, UK Tram's Tramway Principles and Guidance and best practice from other tramways. The geometric design parameters utilised in the development of the track alignment for WBHE have been established to provide passenger ride quality, promote vehicle stability and reduce vehicle and infrastructure maintenance requirements commensurate with the existing Midland Metro Network.

6.3.2 The Railways and Other Guided Transport Systems (Safety) Regulations 2006 (ROGS) provides the regulatory regime for rail safety including tramways. ROGS place a specific duty on transport operators to carry out risk assessments and put in place measures they have identified as necessary to make sure the transport system is run safely. Pre-safety meetings have been and continue to be held with the Midland Metro operator to identify and assess risks, and to develop design and operating solutions as avoidance and mitigation measures.

6.3.3 The design basis for highway works is based on the Manual of Contract Documents for Highway Works, Volume 1 - Specification for Highway Works.

6.4 Route Description

6.4.1 The WBHE will connect with the existing Line 1 between Wolverhampton and Birmingham at Wednesbury, adjacent to the existing tram depot. From Wednesbury the extension will run along the disused South Staffordshire railway line traversing and linking Great Bridge, Dudley Port railway station and Tipton before leaving the former rail corridor to climb Castle Hill on street linking with Dudley Town Centre and bus station. From Dudley bus station the route will continue to climb along King Street before entering Flood Street and leaving the town centre along a segregated strip of land alongside Duncan Edwards Way heading towards Cinder Bank. At Cinder Bank the extension will join the disused Oxford Worcester Wolverhampton railway line travelling as far as the Waterfront area before leaving the railway line to integrate with The Waterfront and Merry Hill Shopping Centre and then on to the terminus in Brierley Hill.

6.4.2 The total length of the extension is 11Km of which approximately 7Km will run along disused railway lines. The route will traverse through the administrative areas of Sandwell and Dudley Metropolitan Borough Councils. 35 bridge structures will be repaired, demolished, rebuilt or created [APP/P3.3]. Up to 17 new tram stops will be constructed. Numerous developments are actively being planned in Dudley Town Centre in coordination with WBHE. Dudley Town Centre is planning for a renaissance with WBHE acting as the catalyst as outlined further in the proofs of evidence of Peter Adams, David Carter and Paul Ellingham [APP/P1.1, APP/P2.1 and APP/P5.1]. The extension will also penetrate a new Business and Innovation Enterprise Zone known as DY5 in the Waterfront and Merry Hill areas.

6.4.3 Trams will typically run along two tracks along the length of the route. The extension is being designed so as not to preclude future conversion to a shared tram and train, should a separate business case and funding be established. Network Rail has no current proposals to bring this forward.

6.5 Tramway

6.5.1 Former Railway Corridor

6.5.2 On former railway sections of the route, significant vegetation had taken root in the track ballast, making the route impassable on foot. The majority of this has now been cleared by MMA as part of preparatory works, necessary to access the corridor to undertake investigations and surveys to inform outline designs.

6.5.3 MMA has undertaken ballast sampling as part of investigative works and are reviewing results to optimise the tramway ballast design and construction details. Given that the top layers of ballast are now contaminated with organic matter, as a minimum, it is expected that the existing top ballast will need to be removed and either recycled or disposed of. Similarly ballast from other areas of the route which have become water logged or have become contaminated with detritus material from unofficial tipping will need to be removed and recycled or disposed of. The exact extent of ballast removal and recycling will be determined in detailed design stages.

6.5.4 Network Rail has recently begun to salvage remaining redundant rails along the corridor. Concrete and timber sleepers have been discarded and left on the ballast.

6.5.5 The typical high level sequence of tramway design and construction being planned along existing ballasted sections is expected to be:

- Route cleared of utility services by utility undertakers as advanced works.
- Remove any residual railway rails and sleepers.
- Remove, recycle and if not possible dispose of ballast.
- Install trackside drainage to existing or new outfalls.
- Replace ballast, including using recycled material, and install concrete sleepers.

- Fix and weld rails to concrete sleepers.
- Install ducting/troughing for lineside services, power and communication cabling.
- Tamp and line rails to finished design alignment.
- Install overhead line poles and equipment from rails.

6.5.6 **Highway and Segregated Sections**

6.5.7 MMA's standard trackform on highway and segregated sections generally involves using encapsulated rails to reduce stray current, noise and vibration, the encapsulation material is normally an elastomer or other resilient material.

6.5.8 The typical high level sequence of tramway design and construction being planned on street or segregated sections is expected to be:

- Route cleared of utility services by utility undertakers as advanced works.
- Install traffic management and safety fencing/hoardings to safely segregate pedestrians and road users from work sites.
- Excavate for tramway construction, drainage and ducting for lineside services, power and communication cabling.
- Construct track foundations using stone, bound stone or concrete.
- Construct in-situ or install prefabricated track slab ready to receive rails.
- Install and fix prefabricated and encapsulated rails to correct line and level.
- Pour concrete around rails.
- Construct final road surface.

- Remove any existing unwanted street furniture and install new including road signs and junction controls.
- Install overhead line poles and equipment.

6.5.8 Trams progress along the highway and through highway signal controlled junctions in the same manner as other road vehicles. Trams will be provided with an agreed level of priority with Dudley Council, provided via a ground loop detection and an on-board transponder system.

6.6 Structures

6.6.8 As discussed at 5.4.1, 30 existing bridge structures are affected by WBHE, an additional 5 completely new structures are also required to enable the tramway to traverse between Wednesbury and Brierley Hill, these are summarised in the appendix to my proof and located on route alignment drawings A1 through to I2 [APP/P3.3]:

6.6.9 Approximately 4000m of retaining walls of various lengths and heights are proposed to replace existing or is required to be constructed to support the tramway along its route over narrow sections.

6.6.10 All structures will be developed further by MMA as part of detail design, together with all associated approvals, including discharging conditions 2, 3, 4, 7, 8 and 9, 12 of the deemed planning condition [WBHE/B7], as required, with Sandwell and Dudley Council's.

6.7 Tram Stops

6.7.1 WBHE will benefit from up to seventeen new tram stops at:

1. Golds Hill
2. Great Bridge
3. Horseley Road
4. Dudley Port
5. Sedgley Road East
6. Birmingham New Road

7. Tipton Road
8. Station Drive
9. Dudley Town Centre
10. Flood Street
11. New Road
12. Cinder Bank
13. Pedmore Road
14. Canal Street
15. Waterfront
16. Merry Hill
17. Brierley Hill Terminus

6.7.2 The proposed locations of these tram stops are shown on the route alignment drawings A1 through to I2 [APP/P3.3].

6.7.3 The final positions of tram stops in Dudley Town Centre (Tipton Road to Flood Street) are part of ongoing consultations with stakeholders and Dudley Council to coordinate with and complement planned developments to be delivered by others.

6.7.4 Design criteria for tram stops requires platforms to be located on straight or near straight sections of track so that the gap between the tram door and the platform is very small. This is consistent with existing Midland Metro network requirements.

6.7.5 WBHE tram stops will be designed to complement those on the existing Metro network and will include either canopies or shelters with seating, passenger information, help points, lighting and CCTV. Cycle racks will be provided at stops where reasonably practicable.

6.7.6 Tram stops will be up to 35m in length. Side platforms will be a minimum of 3.0m deep and centre platforms, if used, a minimum of 4.5m deep. Tram stop platforms will be 300mm higher than the tram rail, this to provide near

level boarding access. The paved surface of platforms in on-street sections will be integrated with the adjacent footway to provide a single continuous surface. Ramps at the interface between platform and footway may be necessary to compensate for any differences in level but such ramps will be formed in the footway surface, without there being an obvious change of gradient.

6.7.7 High quality materials and finishes will be employed to provide integration with the surrounding areas. The detailed design of the tram stops is a reserved matter under the deemed planning permission [WBHE/B7] at conditions 3 and 4. MMA will discharge these conditions with Dudley and Sandwell Councils as part of detailed design.

6.8 Bus Facilities

6.8.1 Two existing bus shelters along Castle Hill will be relocated towards the rear of footway if required to facilitate spatial integration of the tramway which will run past them.

6.8.2 A single existing bus stop pole in Flood Street will be relocated immediately opposite its current location along a realigned section of Flood Street to be constructed as part of tramway works.

6.8.3 All existing public transport facilities in close proximity to WBHE tram stops will be signed and way marked to integrate public transport modes.

6.9 Dudley Town Centre Planned Developments

6.9.1 Dudley Metropolitan Borough Council's (DMBC's) Chief Executive Officer, in her letter of support, describes the town as being "on the verge of a renaissance" [WBHE/F1]. The level of projects planned to happen in the town at or around the same time and adjacent to the WBHE are unprecedented, as outlined further in the evidence of Peter Adams, David Carter and Paul Ellingham[APP/P1.1, APP/P2.1 and APP/P5.1], and amongst others include:

- Very Light Rail National Innovation Centre – new training college and test facility.

- Black Country Living Museum – new entrance and visitor attractions.
- Dudley College Research and Development facility.
- Portersfield - mixed use residential and commercial development.
- Dudley Bus Interchange – rebuild of existing bus station.
- Churchill Shopping Centre – external façade improvements.
- Dudley Leisure Centre – new leisure centre.

6.9.2 **Dudley Coordination Board**

6.9.3 To manage the coordination of multiple planned works in Dudley, DMBC has organised a Coordination Board which meets six weekly to manage proposed and planned works in the town centre. DMBC, private developers, WMCA and MMA attend this meeting. Through this forum DMBC has agreed to employ a dedicated Project Coordinator, to take a helicopter view, to control and manage all town centre projects so the effects of construction are reduced so far as is reasonably practicable on the day to day activities of those visiting or working in Dudley.

6.9.4 An evolving high level programme detailing all key developments being coordinated through the Dudley Coordination Board is attached in the appendix to my proof [APP/P3.3]. By way of example, there is a desire to bring forward WBHE works in Flood Street so as to clear the area for the adjacent planned leisure centre development and in advance of significant highway works to be undertaken to create the space and access for the Portersfield development. This is reflected in MMA's latest high deliverables and milestone schedule attached in the appendix to my proof [APP/P3.3].

6.9.5 DMBC are fully committed to WBHE and support the scheme as demonstrated in their letter dated 13 February 2019, as attached in the appendix to my proof [APP/P3.3].

6.10 Bus Interchange, Portersfield and Churchill Shopping Centre

6.10.1 The existing Dudley Bus Station is to be redeveloped by WMCA as part of the Dudley Interchange scheme. This is a separate project to WBHE. The tramway alignment will sever the existing bus station turning circle. This is consistent with the 2005 Order. However, in 2004 retaining walls were planned as part of WBHE through the bus station and the bus station was planned to be redeveloped on the remainder of the land unaffected by WBHE including new land acquired or to be acquired by Centro the predecessor organisation to WMCA.

6.10.2 The Portersfield development is located immediately opposite and to the rear of the existing bus station and involves; the demolition of a multi-storey vacant eye sore building, significant earthworks and regrading and new town centre road layouts. This has provided an opportunity to rethink connectivity proposals between the respective developments and the intention now is an earthworks regrade of the whole area removing the need for the retaining walls proposed as part of the 2005 Order design in order to create flat pedestrian access between the new Bus Interchange, WBHE's Dudley Town Centre tram stop and Portersfield's development.

6.10.3 As part of new road layout plans in the area, not part of WBHE scheme, Dudley Interchange will benefit from a new rear entrance by the extension of St Joseph's Street which will feed directly onto Duncan Edwards Way and new roads to run adjacent to Duncan Edwards Ways enabling Trindle Road to be closed, in part, to provide land for the Portersfield development.

6.10.4 Dudley Council, WMCA, Portersfield's developers and MMA have worked closely to integrate and coordinate ground and road levels. Finished levels for the St Joseph's Street rear entrance, the intersection of WBHE with Dudley Interchange, and levels along WBHE through the Dudley Town Centre tram stop and up to King Street near to Churchill Shopping Centre have been agreed between with the parties.

6.10.5 Churchill Shopping Centre (owned by LCP Estates Limited) is planning to improve its external facade and provide a new entrance close to the Dudley

Interchange and tram stop more closely and seamlessly linking with the Portersfield development

6.10.6 The Portersfield development, Churchill Shopping Centre and Dudley Interchange project, like WBHE, are in outline development stages.

6.11 Parking & Loading

6.11.1 Thirteen existing on street parking spaces, perpendicular to the highway, are located along Birmingham Street, Dudley. It is currently proposed that these spaces will be removed to make space for the tramway. MMA is consulting with DMBC on its wider regeneration plans for the town centre and DMBC has advised MMA of its intention to compensate for this loss of on street parking provision in the immediate local area. The MMA outline design in this area is consistent with the design at the time of the 2005 Order which also planned to remove these spaces.

6.11.2 An existing former bus stop lay by area is located outside Churchill Shopping Centre, Dudley. The bus stop pole has been removed but road markings and lozenge paving remain. The lay by falls within plot 174 which is required temporarily for construction of WBHE. Regeneration plans for Dudley town centre anticipate that the former facility and the greater part of plot 174 will become a pedestrianised area. The MMA outline design is consistent with the design at the time of the 2005 Order in this area.

6.11.3 Existing parallel on street parking for approximately three vehicles can be found along King Street, Dudley adjacent to the existing footbridge which links the Churchill Shopping Centre with the opposite large, open air, public car park accessed off Flood Street. These spaces are one hour short duration. The adjacent large, open air, car park is operated by DMBC and it is currently free to park for up to two hours here. The 2005 Order provided for kerb lines to be realigned in this area removing the parallel parking provision in order to form a new junction with Flood Street. The MMA outline design is consistent with the design at the time of the 2005 Order in this area.

6.11.4 Existing parallel on street parking for approximately 8 vehicles can be found on Flood Street, Dudley on the approach lane to King Street. These spaces are not currently intended to be replaced by the scheme.

6.11.5 The required realignment of Flood Street, Dudley, to provide adjacent segregated tramway running will necessitate a new access and egress point for the large open air public car park off Flood Street opposite the existing location. The existing car park will be rationalised as required to accommodate the tramway. The MMA outline design is consistent with the design at the time of the 2005 Order in this area.

6.11.6 Where WBHE traverses the rear of the Waterfront complex, Brierley Hill, through the existing car park, car parking spaces will need to be rationalised to accommodate the tramway. Some spaces will inevitably be lost. The MMA outline design is consistent with the design at the time of the 2005 Order in this area. Where WBHE terminates at Brierley Hill, adjacent to Cottage Street, the existing car park will need to be rationalised to accommodate the tramway. DMBC are the Owners of this car park which primarily serves an adjacent building that will be demolished to accommodate the tramway terminus. The MMA outline design is consistent with the design at the time of the 2005 Order in this area.

6.12 Cycle Facilities

6.12.1 Pedal cycles will generally have unrestricted access to streets in which the Metro is not segregated from the highway. There will be signs on the approaches to the tram that will warn of the presence of trams and their tracks as are found along the existing Midland Metro network.

6.12.2 Where reasonably practicable, cycle racks will be provided at tram stops and this will be part of MMA's detailed planning discussions and submissions with DMBC and Sandwell Metropolitan Borough Council (SMBC) as required by conditions 3 and 4 of the deemed planning permission..

6.12.3 Local authority designated cycles routes were noted in section 5.3 of this proof and whilst some parts of these routes may need to be temporarily

diverted during construction works for the safety of users they will otherwise be unaffected by the tramway during future operation.

6.13 Pedestrian Facilities

6.13.1 Existing pedestrian facilities will be rationalised and new signalised pedestrians crossings will be provided where traffic conditions require them.

6.13.2 It is anticipated new pedestrian signalised crossings will be provided in the following locations:

- Station Drive
- Waterfront Way x2
- Level Street

6.13.3 Although Metro is a line of sight driven system and access is generally not restricted along its route pedestrians will be discouraged from walking along the railway corridor sections of WBHE. Pedestrians will also be discouraged from walking along parts of the route adjacent to Duncan Edwards Way where the trams will be segregated from traffic, in keeping with the current “pedestrian free” environment of this stretch of highway land. Pedestrians will also be discouraged from walking along the corridor alongside the embankment over Dudley Canal towards Brierley Hill. The intention to discourage pedestrian movements in these areas is consistent with the design at the time of the 2005 Order in this area.

6.14 Future Freight Passive Provision

6.14.1 Freight trains are fundamentally controlled by signals and the driver’s ability to view and react to signals. In contrast Midland Metro trams generally operate on a driver’s line of sight meaning the driver reacts to what they see up ahead, similar to a highway vehicle. Trams also have much shorter breaking distances than freight trains when travelling at speed.

6.14.2 Passive provision for future conversion of the tramway to a shared tram and heavy freight corridor is being considered by MMA as part of design development.

6.14.3 Former railway corridor sections of the route are now being designed for 2 tracks with passive provision for future conversion to allow joint tram and train running along the corridor. Originally 3 tracks were planned. This is a change from the design at the time of the 2005 Order.

6.15 Highway

6.15.1 The detailed design of WBHE will include highway alterations including highway realignment where required and reinstatement / repaving of highway footpaths and dedicated cycle paths. WBHE will also include for modifications to highway signalling, the final designs of which will be agreed with SMBC and DMBC, by MMA, in discharging condition 9 of the deemed planning conditions [WBHE/B7].

6.15.2 The horizontal and vertical alignment of the carriageway and associated footways is being developed to facilitate the safe on-street operation of WBHE as well as the needs of all other road users including heavy goods vehicles, private vehicles, passenger service vehicles, cyclists and pedestrians. Consultation has been undertaken with both SMBC and DMBC as the local highway authorities for any additional requirements and will continue as WBHE is taken forward.

6.15.3 The construction and operation of WBHE will require the introduction of and modification to some highway junctions along the route. The ability to undertake these modifications is included within the Order. All modifications will require the approval of either SMBC or DMBC in accordance with condition 9 of the deemed planning permission [WBHE/B7], and will incorporate pedestrian and cycle facilities as appropriate. Himanshu Budhiraja deals with post construction highway impacts for all highway junctions in Dudley in his proof of evidence [APP/P4.1].

6.15.4 The installation of infrastructure enabling the operation of WBHE, such as overhead line poles, will require the reconstruction of the immediate carriageway and footway and other areas local to the scheme resulting from associated accommodation and utility diversion works. In the case of

external appearances, choice of materials and landscaping, MMA has begun consultations with SMBC and DMBC to discharge conditions 3 ,4 and 5 of the deemed planning conditions [WBHE/B7] and this consultation will continue as WBHE is taken forward.

6.16 Urban Realm and Landscaping

6.16.1 WBHE benefits from a deemed planning consent [WBHE/B7]. Urban Realm and Landscaping conditions are contained within the deemed planning consent at:

- Condition 3 – Design and External Appearance
- Condition 4 – Materials
- Condition 5 – Landscaping

6.16.2 MMA is actively consulting with SMBC and DMBC and will discharge these conditions, and others, as part of detailed design.

6.16.3 WBHE also benefits from a SMBC and DMBC approved Street Design Guide [WBHE/F17, WBHE/F18 and WBHE/F19]. This document establishes the extent of hard and soft landscaping at tram stops and within the tramway corridor. This document is being used by MMA in its discussions with SMBC and DMBC as an important reference document to start to progress aesthetic design solutions.

6.16.4 The general approach to urban realm is the creation of a high quality public realm creating visual continuity and promoting a distinct identity for the tram. This will typically involve the replacement of existing surface materials, the removal and replacement of street furniture and sensitive integration of the tram infrastructure. This is outlined further in the approved Street Design Guide [WBHE/F17].

6.17 Traction Power

6.17.1 Vehicles on the Metro network are powered by 750V dc overhead electric lines and for WBHE this is proposed to be fed by current drawn from up to five substations. These five substations are proposed at Horseley Heath,

Tipton Road, Thornleigh Trading Estate, Pedmore Road tram stop and Level Street, Merry Hill and will be linked to the power supply on Line 1. This is consistent with the design at the time of the 2005 Order.

6.17.2 The method of supporting the overhead line, where required, will generally be by poles, the majority of which will be located along and to the side of the tram tracks. Where possible, building fixings will be used to reduce street clutter. This is consistent with the design at the time of the 2005 Order.

6.17.3 WMCA has commenced a programme of retrofitting the West Midlands Metro existing tram fleet with batteries so they have the capability to run catenary free, the first in the UK. Tram batteries will be charged as they travel along overhead line sections and at certain tram stops where charging points would need to be provided. WMCA intend to procure future trams with similar battery capability so they may also run wire free. WBHE could benefit from this innovative approach along the route, particularly on railway corridor sections of the route, if for example, vertical clearances through existing over bridge structures become the key factor for costly rebuild or retain decisions. It is however unlikely that catenary free running will be practical on steep sections of WBHE given current battery limitations. Power simulation models confirming the substation and power requirements are being progressed and potential for and the extent of wire free running will be developed further in later design stages. This is a change from the design at the time of the 2005 Order, borne out of advancements in technology and could have potential aesthetic, time and cost benefits for the scheme.

6.18 Street Lighting

6.18.1 The most appropriate class of lighting for the various sections of route will be determined by MMA in consultation with, and for the approval of, SMBC and DMBC as required by deemed planning conditions 3, 4 and 9 [WBHE/B7].

6.19 Drainage

6.19.1 A new drainage system will be installed throughout the railway corridor. Existing outfalls will be reinstated or where these do not exist or cannot be found new connections will be made to public sewers.

6.19.2 Existing highway and hard standing surface water drainage systems will be used for off rail corridor sections. If necessary new connections will be made.

6.20 Tram Signalling, Communication and Electrical Equipment

6.20.1 WBHE will include for the design and construction of tram signalling, communication and electrical equipment as well as the installation of parallel feeders (cables and ducting that will run parallel to the route) necessary for the safe operation of the tram.

6.20.2 It is envisaged that most of the enabling equipment will be hidden underground in a network of ducts being visible only at discrete lineside cabinets, periodically along the former railway corridor and in highway land.

7. STATUTORY UNDERTAKERS EQUIPMENT

7.1.1 As noted at paragraph 6.5.8 of my proof, the sequence of tramway construction on the public highway will generally commence with the diversion of utility services. To facilitate this, utility companies were initially contacted to request information about the location of their apparatus and to determine the nature and extent of any diversions they considered to be necessary as a result of the construction and operation of the WBHE. Responses received from the utility companies were used to plot composite utilities plans against the route of the WBHE, thereby determining the locations of any potential clashes between such apparatus and the tramway. Further enquiries were made requesting outline details of any diversions or protections required by the utility company concerned together with budget costs for those works. These details are being, and will continue to be, refined.

7.1.2 The undertaking of utility diversion and protection works in advance of the tramway works, where reasonably practicable to do so, has both a time and cost benefit for the project. It significantly de-risks the construction of the tramway since the act of undertaking the diversions or protections gives greater certainty of ground conditions and provides a “clear site”. WMCA will co-ordinate the utility companies’ programmes, in consultation with MMA, and in conjunction with DMBC and SMBC pursuant to their statutory roles as local highway authorities.

8. CONSTRUCTION

8.1 Introduction

8.1.1 As stated at section 6.2 and in the Proof of Peter Adams [APP/1.1] MMA was formed to design and construct a programme of Midland Metro enhancements including WBHE.

8.1.2 MMA is in the process of preparing construction plans and schedules. The following issues are amongst those being considered:

a. Former railway corridor sections of the route will now be designed and constructed for 2 tracks with passive provision for future conversion to allow joint tram and train running along the corridor. Originally 3 tracks were planned.

b. Bridge refurbishments and constructions, mainly along the former railway corridor, have been reassessed given a) above, and in light of further ground and structural investigations undertaken by MMA. In the current scheme there is opportunity to retain and modify existing structures as additional corridor width is no longer required.

c. Locations of three tram stops in Dudley Town Centre are being reviewed with DMBC and stakeholders against Dudley Town Centre planned developments.

d. Dudley Town Centre. Numerous new developments are planned to happen at or around the same time as WBHE, including the Bus Station Interchange and Portersfield. DMBC will coordinate all developments including WBHE in Dudley Town Centre. This may impact the phasing and timing of WBHE design and construction activities, necessary to suit the final coordination plan for Dudley Town Centre. A high level programme drafted by the Dudley Coordination Board for key Town Centre developments is attached in the appendix to my proof [APP/P3.3].

e. Former earth and retaining wall embankments planned at Canal Street and adjacent to The Embankment, Brierley Hill, have been

reassessed in light of further ground and structural investigations undertaken by MMA and viaduct solutions are now planned.

f. The planned introduction and procurement of innovative battery operated trams may make it possible for certain sections of the route to be wire free.

8.2 Code of Construction Practice

8.2.1 The deemed planning conditions, that were granted with the 2005 Order, [WBHE/B7] at condition 7 state “Development shall not begin until Part 1 of the Code of Construction Practice has been submitted to and approved in writing by the local planning authority. Before any stage of the works begins, Part 2 of the Code of Construction Practice with respect to that stage shall be submitted to and approved in writing by the local planning authority. The development shall be carried out in accordance with Part 1 of the Code of Construction Practice, together with the relevant provisions of Part 2 of that Code.”

8.2.2 Centro, predecessor organisation to WMCA, obtained the approval of SMBC and DMBC of Part 1 of the Code of Construction Practice (CoCP) [WBHE/C1] following the granting of the 2005 Order [WBHE/F28 and WBHE/F27].

8.2.3 The CoCP Part 1 [WBHE/C1] sets down a series of measures to reduce the potential impacts of construction of WBHE on the environment. It defines minimum standards of construction practice acceptable to WMCA, SMBC and DMBC, required of a Concessionaire who is now the MMA , and contemporaneously deals with:

- Roads, footways and cycleways
- Protection of the water environment
- Noise and hours of working
- Vibration

- Dust and air pollution
- Disposal of waste and contaminated material
- Urban ecology
- Archaeology
- Site boundaries/hoardings
- Site activities
- Safety
- Lighting
- Protection of existing installations
- Liaison with the local authorities (including emergency services) and public

8.2.4 MMA has begun consultations with SMBC and DMBC as required by the CoCP Part 1 [WBHE/C1] and will agree and obtain SMBC and DMBC written approval of CoCP Part 2 for planned works in any section before work commences. Approval of CoCP Part 2 will ensure MMA's construction plans that could affect the environment, amenity and safety of local residents, businesses and the general public and the surroundings in the vicinity of the proposed works and associated worksites have been appropriately considered and mitigation provided for.

8.2.5 The CoCP Part 2 does not address MMA's responsibility for the safety and welfare of those visiting site and working on site which are regulated through other statutory controls.

8.3 Utilities Diversion

8.3.1 As stated at Section 7 of this proof diversion and protection of utility company equipment will generally take place in advance of the main construction works where reasonably practicable to do so.

8.3.2 Utility diversion and protection work is required to provide suitable safe access to apparatus for maintenance on completion of the tram infrastructure and to maintain apparatus at a depth such that apparatus is not at risk from highway loads.

8.4 Construction Areas

8.4.1 MMA will construct the main infrastructure works within a series of fenced off sections along the route as will be set out in the relevant CoCP Part 2 and as agreed and approved by the relevant local authority in advance, in accordance with the approved CoCP Part 1 [WBHE/C1, approvals WBHE/F27 and WBHE/F28] and in particular section 10.

8.4.2 The phasing and timing of all infrastructure works is currently being assessed and reviewed by MMA as part of developing design solutions. A high level deliverables and milestone schedule is attached in the appendix to my proof [APP/P3.3].

8.5 Site Compounds

8.5.1 MMA intends to use worksites as proposed in the 2005 Order and now included in the proposed Order. Changes in land use since the making of the 2005 Order means that some worksites are no longer available.

8.5.2 Worksites available and subject to this Order are shown on MMA route alignment drawings A1 through to I2 [APP/P3.3] using the same numbering system referenced in the 2005 Order, all as listed below:

- Worksite 2 – Plots 36, 40, 41 and 43. Temporary land adjacent Gold's Hill tram stop. MMA access to corridor and compound.
- Worksite 3 – Plot 60. Temporary land adjacent Eagle Lane. MMA compound.
- Worksite 4 – Plot 96. Permanent land adjacent Horsley Road, intended for car park. MMA compound.
- Worksite 5 – WMCA owned land and existing car park adjacent Dudley Port. MMA access to corridor and compound.

- Worksite 6 – Plot 129. Temporary land adjacent Sedgley Road East. MMA access to corridor and compound.
- Worksite 7 – Plot 149. Temporary land, part of Dudley Z00 and Castle car park. MMA compound.
- Worksite 8 – Plot 197. Temporary land adjacent Flood Street. MMA access to corridor and compound.
- Worksite 9 – Plots 203, 205 and 206. Permanent land adjacent New Road, intended for car park. MMA Compound.
- Worksite 11 – Various plots at Parkhead Viaduct. MMA access to corridor and works necessary to undertake Parkhead improvements only. Not to be used by MMA as compound.
- Worksite 13 – Plot 313. Temporary land adjacent Canal Street. MMA access to corridor and compound.
- Worksite 13 – Plot 322, 323 and 324. Permanent land adjacent the Gateway. MMA access to corridor and compound.
- Worksite 14 – Plot 352. Permanent land adjacent Brierley Hill tram stop. MMA access to corridor and compound.

8.5.3 Additional construction offices and compounds may be established elsewhere along the route away from the corridor subject to acquiring agreement with the necessary land owner and obtaining any necessary local authority permissions.

8.6 Traffic Management

8.6.1 MMA will develop traffic management proposals for the approval of SMBC and DMBC in their capacity as highway authorities, as required by the CoCP Part 1, section 2 [WBHE/C1].

8.7 Sequence of Operations

8.7.1 WBHE will be delivered as a programme of works with multiple sites being open at any one time. MMA will develop and confirm a detailed schedule

as part of detailed design considerations and consultations with others who could impact the build, for example multiple development sites in Dudley Town Centre.

8.7.2 Assuming design is complete and approved for construction, the typical sequence of construction operations will be:

- Plan labour, resource and materials.
- Order and commence advanced utility diversions and protections. Utility diversion and protections are discussed in more detail at Section 7 of this proof.
- Apply for and obtain necessary approvals eg NRSWA Notices, Highway diversion routes and CoCP Part 2.
- Site establishment – construct secure compounds, establish offices and welfare and secure sites with suitable hoardings and fences as detailed in approved CoCP Part 2.
- Site clearance – clear working areas of vegetation, detritus material, street furniture etc.
- Commence excavations and recycling/replacement of ballast in former railway corridor.
- Commence installation of new drainage.
- Bridge, retaining walls and viaduct construction, including any necessary highway diversions.
- Construct tram tracks. Typical tramway design and construction methods are discussed in more detail at section 6.5 of this proof for both Railway Corridor and Highway sections.
- Install overhead poles, street furniture and street lighting including signage and waymarking.
- Install power and telecoms.

- Fit out tram stops. Install shelters, help points, lighting, pedestrian access facilities and CCTV.
- Trial running, driver training and testing. Ensure system (including trams) works as it should and obtain safety authorisations and approvals from Office of Rail and Road pursuant to Railway and Other Guided Systems Regulations.
- Site demobilisations. Clear site compounds and reinstate areas.
- Open WBHE to passenger service

8.7.3 The total duration for all construction works is estimated to be up to 4 years with an opening to passenger service in December 2023. A high level schedule is attached as part of my appendix proof [WBHE/P3.3].

8.8 Former Railway Corridor Construction Impacts

8.8.1 Given the almost remote nature and location of the railway corridor it is not envisaged that construction works will significantly affect businesses and residents situated along and lying just off the railway corridor.

8.8.2 Highway bridge rebuilds and repairs may require highway closures and/or local diversions. In accordance with Section 15 of CoCP Part 1, MMA's WBHE dedicated Engagement Team will consult with all businesses, residents and general public likely to be affected in advance of the works and will put in place mitigation measures to reduce potential impacts, so far as is reasonably practicable. Consultation by MMA's WBHE Engagement Team has already begun and is noted in the Consultation Report [WBHE/A5]. For businesses this could be re-phasing or timing of the works, advanced advertising that businesses remain open in local press or websites or could be more physical street signage interventions confirming the same. For local residents WBHE's dedicated Engagement Team will consult with local residents in advance of planned works to mitigate the potential impact of the works on them. This could be by understanding residents working hours and exploring the possibility reducing noisy works during certain times, so far as is reasonably practicable. Additionally no

works will be commenced without the approval of CoCP Part 2 from SMBC or DMBC as appropriate.

8.8.3 Highway sections of the route, particularly in Dudley Town Centre, will be more challenging to plan than railway corridor sections. Section 8.9 of this Proof discusses Highway section planning further.

8.9 Highway Construction Impacts

8.9.1 Construction works on highway sections of the route in Dudley Town Centre will be programmed in discrete self-contained sections. This will be necessary to maintain access to frontages, businesses, places of worship, car parks, general public and emergency service vehicles, so far as is reasonably practicable. Himanshu Budhiraja deals with post construction highway impacts for all highway junctions in Dudley in his proof of evidence [APP/P4.1].

8.9.2 The approach to tramway construction In Dudley Town Centre will be to limit work sections to no more than 100m in length with appropriate spacing between consecutive work sections to ensure the town continues to function whilst the works are constructed. This is in line with the approach taken on other Metro extensions and tramway construction elsewhere in the UK. Limiting sections to no more than 100m in length generally ensures emergency service access to those properties immediately fronting the work section. Each section is then typically completed, before moving on to break new ground. MMA will consult with DMBC, emergency services and frontagers in advance of the works. No works will be commenced without the approval of CoCP Part 2 from DMBC.

8.9.3 As noted above MMA already has a dedicated WBHE Engagement Team who will continue to facilitate the construction of the WBHE by identifying key stakeholder groups and/or individuals, identifying the key messages applicable to each and proactively engaging with them using timely, consistent and relevant methods of communication in order to establish and maintain goodwill and mutual understanding throughout the whole project life-cycle.

8.9.4 MMA will employ dedicated traffic marshals for each section of the planned highway works. They will be responsible for ensuring traffic management is maintained and that access to frontagers is also maintained at all times. They will also provide a point of customer contact and engagement during the work feeding into WBHE's dedicated Engagement and Construction Teams on specific customer requests.

8.9.5 Whilst the design is still developing the following explanations are offered as possible construction methodologies for each affected street in Dudley, the final plans will be confirmed following detailed design and agreed with DMBC as part of CoCP Part 2 approvals.

8.9.6 I anticipate that the works along Station Drive, the existing condition of which is described in section 5.2.3 of this proof, will be constructed under a temporary road closure. This is not a thoroughfare road so traffic flows will not be affected. There are no accesses to premises off Station Drive. Pedestrians will be directed safely around the works along existing footways. On completion only trams are currently planned to be permitted along Station Drive.

8.9.7 The tramway alignment along Castle Hill, the existing condition of which is described in section 5.2.4 of this proof, is likely be constructed in phases. Phase 1 could be to restrict traffic to the outer lane in one direction whilst utility diversions and kerb lines are realigned along the inner lane creating increased road space to one side of Castle Hill. During this period, the other dual lane would operate normally. Phase 2 would then be to swop sides and carry out the same operations in the opposite direction. Phase 3 would then be removal of the central reservation, subject to confirmation of safe passing clearances. This would then allow contra flows to be established around future phased works whilst maintaining traffic flows. Phase 4 would be to arrange a 2 lane contraflow of traffic on say the uphill side of Castle Hill enabling the downhill side to become the work site. The downhill side could then be excavated for ducting and drainage. Phase 5 would be to swop sides and carry out the same operations in the opposite direction. Phase 6 would then, subject to confirmation of safe passing clearances, be

to divert traffic onto single outside lanes running in both directions enabling construction of the track slab and new central reservation. If safe passing clearances are not achievable this last phase will need to be carried out under a temporary road closure. The length of phases will depend on the location of existing accesses off Castle Hill. Where necessary temporary alternative accesses will be provided during the works. Existing owners and occupiers of premises fronting King Street will be consulted in advance and during the works by WBHE's Engagement Team. Pedestrians will be diverted safely around the works along existing footways throughout all phases. On completion the tramway will be segregated from general traffic along the centre of Castle Hill. Traffic will run on single lanes either side of the tramway.

8.9.8 Construction works at the wide Castle Hill/Trindle Road/Station Drive junction could be carried out as a discrete section of works and could be constructed in halves to maintain traffic flows around the works under temporary traffic lights and temporary traffic management arrangements.

8.9.9 Prior to carrying out any works on Birmingham Street, the existing condition of which is described at section 5.2.7, a new junction between Bourne Street and Trindle Road will be constructed as well as a new turning head on Bourne Street as authorised by the 2005 Order. This will allow for traffic to flow continuously in a one way direction from Castle Hill along Birmingham Street towards Bourne Street during tramway construction works on Birmingham Street.

8.9.10 Works affecting Birmingham Street would be carried out as a discrete section of works. Existing owners and occupiers of premises fronting Birmingham Street will be consulted in advance and during the works by WBHE's Engagement Team. Pedestrians will be safely directed around the works, to the footway on the Mosque side of Birmingham Street during the works.

8.9.11 Construction works at the Birmingham Street/Castle Hill junction would be carried out as a discrete section of works. Given that the tramway route alignment is generally alongside Birmingham Street, through the existing

parallel parking spaces, sufficient road space should be available to provide one way access along Birmingham Street at all times off Castle Hill. A contra flow arrangement around the works on the downhill side of Castle Hill could be provided to enable the works. Existing owners and occupiers of premises fronting King Street will be consulted in advance and during the works by WBHE's Engagement Team. Pedestrians will be diverted safely around the works along existing footways throughout all phases.

8.9.12 I expect that the single bus only lane to the bus station would need to be temporarily closed, I would expect this to be scheduled with the Bus Interchange redevelopment works, and temporary access to existing car parks could be made over the adjacent wide footway suitably protected with pedestrians safely directed to the opposite wide footway until final arrangements are constructed. On completion the tramway will be segregated from general traffic which will run one way along Birmingham Street towards Bourne Street. Only trams will be permitted to access the Bus Interchange from the rear of Birmingham Street. Bourne Street will be opened to bi-directional traffic from its new junction with Trindle Road as far as the new turning head.

8.9.13 MMA currently estimates, including and allowing for utility diversion works, the duration for all construction works in Station Drive, Castle Hill, Birmingham Street and Bourne Street will be around 14 months.

8.9.14 King Street, the existing condition of which is described at section 5.2.9, is a wide road. The proposed tramway alignment lends itself to maintain traffic flows through a contraflow arrangement around the works, although this may require some central reservations to be removed in advance. Works along King Street will be phased and managed as discrete packages of works. Existing owners and occupiers of premises fronting King Street will be consulted in advance and during the works by WBHE's Engagement Team. Pedestrians will be diverted safely around the works along existing footways throughout all phases.

8.9.15 Construction works at the wide King Street/Fisher Street/Trindle Road/Hall Street would be carried out as a discrete section of works and could be

constructed in halves to maintain traffic flows around the works under temporary traffic and pedestrian lights and traffic management arrangements. Pedestrians will be diverted safely around the works along existing footways throughout all phases.

8.9.16 Construction works at the King Street/Flood Street/Churchill Shopping Centre staff car park and loading bays junction would also be carried out as a discrete section of works and could be constructed in halves to maintain traffic flows to provide continuous access to the Churchill Shopping staff car park and loading bays. This work could be phased to benefit from additional road space offered by both the new Flood Street realignment junction and existing Flood Street junction which will become dedicated to tramway running, this additional space could enable traffic to be moved around the works sufficiently to maintain access to Churchill Shopping Centre staff car park and loading bays. LCP, owners of the Churchill Shopping Centre, will be engaged and consulted over junction construction proposals in advance and during the works by WBHE's engagement team. Pedestrians will be diverted safely around the works along existing footways throughout all phases. On completion the tramway will be segregated from general traffic along King Street. Single lane bi-directional traffic will run alongside the tramway.

8.9.17 MMA currently estimates, including and allowing for utility diversion works, the duration for all construction works in King Street will be around 15 months.

8.9.18 Works at Flood Street, the existing condition of which is described at section 5.2.12, will be carried out as a discrete package of works.

8.9.19 There is a strong local political desire to commence works along Flood Street this calendar year to clear the area for a proposed new leisure centre in this area for which a planning application has been made. This has been discussed with DMBC and WMCA and at Dudley Coordination Board and is shown on MMA's high level deliverables and milestones schedule attached in the appendix to my proof [APP/P3.3].

8.9.20 The new Flood Street road alignment could be established and utilities could then be diverted into the area of the new footway being on land which is currently part of the existing Flood Street Car Park, clearing the existing Flood Street footway to give a clear site. Following this the new Flood Street would be constructed. As part of the new Flood Street layout, The Minories junction will be relocated to be opposite the Oakeywell Street junction and the New Mill Street junction with Flood Street will be closed. The new Minories highway layout will be a bi-directional highway and will link with both Constitution Hill and New Mill Street. The new leisure centre, not part of WBHE, is proposed to be located adjacent Constitution Hill. The phasing of the works would be planned to ensure access to car parks and premises is maintained at all times in this area. Existing owners and occupiers of premises fronting Flood Street will be consulted in advance and during the works by WBHE's Engagement Team. Pedestrians will be diverted safely around the works along existing footways throughout all phases.

8.9.21 Following completion of the new Flood Street traffic flows could be diverted on to the new Flood Street allowing relatively unfettered access to the old Flood Street to construct the tramway. The existing Flood Street Car Park would be rationalised on completion. Existing premises fronting Flood Street will be consulted in advance and during the works by WBHE's Engagement Team. Pedestrians will be diverted safely around the works along existing footways throughout all phases.

8.9.22 MMA currently estimates that, including and allowing for utility diversion works, the total duration for constructing the new Flood Street and the new tramway within the old Flood Street will be around 14 months.

8.9.23 The road crossing to Tata Steel/Norish access road will be constructed under a temporary road closure following construction of a new temporary access to these properties through plot 326 which will maintain traffic flows and access through out.

8.9.24 Road crossings at Waterfront Way and Venture Way could be constructed in two halves with traffic flows maintained around the works under

temporary traffic lights. Pedestrians will be diverted safely around the works along existing footways throughout all phases.

8.9.25 MMA currently estimates that, including and allowing for utility diversion works, the duration for a single road crossing will be around 2 months.

8.9.26 Level Street Crossing and The Embankment is discussed in more detail at 8.12 of this proof.

8.9.27 Whilst there will inevitably be some disruption during construction of highway works, the intention of MMA will be to maintain all existing accesses and to reduce disruption to local residents and businesses, so far as is reasonably practicable.

8.10 Site Construction Considerations

8.10.1 As well as the consultation that was undertaken as part of the TWAO process (see Consultation Report [APP/A5]) MMA through its dedicated Engagement Team has already begun communicating and engaging with residents, businesses and stakeholders near to the corridor and with commuters who use the existing highway network and who may be affected by WBHE construction operations. As construction ramps up MMA's customer engagement will be aligned in tandem with this using all appropriate media including face to face contact to consult with those affected in advance. This will enable MMA to consider comments to optimise construction methods to the mutual benefit of those making comment and MMA wherever reasonably practicable to do so. As well as generally accepted good construction practice MMA's approach to communication and engagement is also a requirement of Section 15 of the CoCP Part 1 [WBHE/C1].

8.10.2 Considerations in respect of noise sensitive receptors, protection of the water environment, hours of work, dust, general site housekeeping, archaeology and general safety including unexploded ordnance arising from construction operations are all dealt with by the approved CoCP Part 1 [WBHE/C1]. MMA will develop, consult and gain approval from SMBC and DMBC in respect of a CoCP Part 2 where appropriate.

8.10.3 Subject to detail design a floating trackform might be required to be designed and constructed in specified locations requiring attenuation of vibration from the tramway. The system would incorporate a concrete track slab with grooved rails fixed on tied twin-block sleepers embedded in concrete. The track slab will be placed on an elastomeric floating slab mat of specified stiffness and supported within a concrete trough element. This will be considered as part of detailed design development and in discharging conditions 10 (Airborne Noise) and 11 (Ground-Borne Noise) of the deemed planning conditions [WBHE/B7].

8.11 Land Requirements

8.11.1 Land requirements for WBHE are based on the design and engineering details available at the time of the submission of the Proposed Order [WBHE/A2], and are described in the Proposed Order Schedules and Book of Reference [WBHE/A8] as well as being shown on the land plans [WBHE/A7] submitted with the application for the Proposed Order.

8.11.2 Only land that is considered necessary for the construction, operation and maintenance of WBHE has been included in the draft Order [WBHE/B2]. The amount of third party land required has been considered and reduced from that required for the 2005 Order. The land take will continue to be reviewed and, where reasonably practicable, reduced during the process of detailed design.

8.12 Level Street and The Embankment

8.12.1 Due to the complexities of the Level Street junction, the MMA has undertaken dialogue with Intu and DMBC to progress the design and plans for the construction of the WBHE in the vicinity of this junction. A developing Indicative Construction Plan is attached in the appendix to my proof [APP/P3.3]. Himanshu Budhiraja's proof of evidence deals with post construction operational highway impacts at Level Street roundabout and more generally Merry Hill in his proof of evidence [APP/P4.1].

8.12.2 As the design of the scheme and construction strategy is still emerging as explained above, it is currently proposed that initial access will be required

for construction off either The Embankment or Level Street to construct a new abutment for the new underbridge MMA1 Dudley Canal South. The abutment on the opposite side of MMA1 Dudley Canal South will be constructed with access gained from Venture Way. Once the bridge abutment has been constructed on the Merry Hill side of Dudley Canal, MMA will proceed to work out and away from the underbridge towards Level Street. Given the existing topography of the embankment either substantial earthworks and retaining walls or a viaduct will be required to support the tramway. A general arrangement drawing for Level Street to Brierley Hill is attached in the appendix to my proof [APP/P3.3].

8.12.3 MMA, in its outline design has proposed a viaduct solution instead of the retaining wall and mass fill solution discussed at the 2004 Public Inquiry. A 2005 concept design for the retaining wall can be viewed on page 120 of the approved Street Design Guide [WBHE/F17]. The reason for this change is borne out of concerns over poor underlying ground conditions confirmed by MMA ground investigations in this area. In my opinion the proposed change will provide construction opportunities to benefit from offsite modular construction methods, de-risking and reducing construction durations on site for these works and also reducing impacts for occupiers of the Merry Hill Shopping Centre.

8.12.4 Given the close proximity of the tramway alignment to the Embankment road in this area partial road closures will be required to site mobile plant, lifting equipment and to receive and off load materials for lifting onto the working area. This is necessary for the safety of the general public and MMA work force. This is consistent with the 2005 Order. Intu, the owners of Merry Hill Shopping Centre, will be consulted by MMA on the timing and phasing of these works. MMA will discharge deemed planning condition 7 [WBHE/B7] by agreeing a Code of Construction Practice Part 2 with DMBC in advance of this stage of the works. These consultations and approvals will form part of the future detailed design and planning stages for the scheme.

8.12.5 The Level Street Indicative Construction Plan [APP/P3.3] demonstrates MMA's intention to maintain vehicular access at all times during the highway works, thereby allowing continuous use of this route by lessees at the shopping centre throughout construction subject to such temporary interference as cannot be reasonably avoided but which would be scheduled to take place at such times as would reduce the impacts upon existing users.

8.12.6 MMA currently estimates that, including and allowing for utility diversion works, Shopping Centre embargos and bridge abutment and viaduct construction, the continuous duration for all construction works at Level Street and the Embankment will be around 30 months.

8.12.7 There is no current intention to change the layout or functionality of The Embankment road following the works. The junction with Level Street will become a permanent signalised traffic crossing, necessary to manage the safe interaction between tram and road vehicle.

9. OPERATIONS

9.1.1 WBHE's proposed tram frequency will be a peak six-minute service along the route, with alternate trams heading to Birmingham and Wolverhampton

9.1.2 The operational hours of WBHE are assumed to be similar to those of Midland Metro Line 1:

Monday to Friday inclusive from 05:15 to 00:30

Saturday from 05:15 to 01:00

Sundays and Bank Holidays from 07:45 to 00.00.

Terminus and turn back arrangements are proposed at Brierley Hill.

9.1.3 Bus interchange along WBHE will be facilitated through the location of tram stops, existing bus stops, pedestrian facilities and signage. As stated earlier in my proof, the new Dudley Interchange will be constructed in Dudley Town Centre adjacent to WBHE's tram stop.

9.1.4 Train interchange along WBHE will be facilitated at Dudley Port with access to the West Coast Main Line.

9.1.5 Maximum tram speeds will be :

- 70 km/h on off-street (former railway) running sections.
- 48 km/h (30 mph) on segregated / integrated on-street running sections.

9.1.6 In certain areas, speeds will be lower due to:

- Visibility constraints,
- Tramway alignment ; curves and steep gradients,
- Degree of segregation from cars, buses and pedestrians,
- Pedestrian zones (Dudley Town Centre, Merry Hill and Brierley Hill),
- Crossing junctions (road traffic and tramway pointwork),
- Arriving at and leaving tram stops,
- Dwell times at tram stops (to allow for passenger exchange).

10. STATEMENT OF MATTERS

10.1 Matter 4a

10.1.1 Impacts on access to and within the area, including the effects on local roads, access to businesses and car parks, and access by emergency vehicles has generally been discussed in my Proof of Evidence and in particular at sections 8.8, 8.9, 8.10 and 8.12.

10.1.2 It is not envisaged that works will sever accesses to businesses and car parks. Works will be planned and executed in such a manner to maintain traffic flows, so far as reasonably practicable. Works will be planned and executed in consultation with the emergency services so construction works do not impact on emergency response times in the event of an incident. Access to frontagers will be maintained at all times. A dedicated MMA Engagement Team has already begun to communicate with land owners, residents, businesses and occupiers along the route to take into account their particular needs, so far as is reasonably practicable. WMCA's dedicated Utility Team has begun consultations with all statutory undertakers along the route.

10.1.3 In accordance with condition 7 of the deemed planning conditions [WBHE/B7] MMA is required to obtain the written approval of Dudley and Sandwell Council's for its Code of Construction Practice Part 2 before commencing any works. The importance of this approval to reduce the impact of construction on the environment is discussed at Section 8.2 of my Proof of Evidence.

10.2 Matter 4c

10.2.1 Impacts on members of the general public, including users of the Churchill Shopping Centre, Dudley and Merry Hill Shopping Centre, Brierley Hill has generally been discussed in my Proof of Evidence and in particular at sections 6.8 to 6.13 and 8.8, 8.9, 8.10 and 8.12.

10.2.2 The Churchill and Merry Hill Shopping Centres will continue to function throughout the tramway construction works. Accesses to shopping centres

and car parks will be maintained and pedestrians will be safely diverted around the works where necessary.

10.2.3 In accordance with condition 7 of the deemed planning conditions [WBHE/B7] MMA is required obtain the written approval of Dudley and Sandwell Council's for its Code of Construction Practice Part 2 before commencing any works. The importance of this approval to reduce the impact of construction on the environment is discussed at Section 8.2 of my Proof of Evidence.

10.3 Matter 4d

10.3.1 Measures proposed to mitigate any significant adverse impacts arising from the exercise of powers in the proposed Order, and whether any such measures are appropriate or sufficient will be dealt with by discharging the deemed planning conditions [WBHE/B7], in particular the CoCP Part 2 discussed at Section 8.2 of this Proof of Evidence.

10.3.2 Section 8.10 of this Proof of Evidence discusses site construction considerations.

10.3.3 No significant adverse impacts arising from the exercise of powers in the proposed Order are expected.

10.3.4 In my opinion the deemed planning conditions [WBHE/B7] are both appropriate and sufficient.

10.4 Matter 5d

10.4.1 All the land and rights over land applied for in the Order is reasonably necessary to implement the scheme. This is discussed further at section 8.11 of my Proof of Evidence.

11. RESPONSE TO OBJECTORS

11.1 Introduction

11.1.1 This section addresses civil engineering aspects in response to objections and builds on the responses already provided by Peter Adams in his Proof of Evidence [APP/1.1].

11.2 Jewson Ltd Saint Gobain and SGBD Property Holdings Ltd (OBJ/05)

11.2.1 This objection relates to plots 303 and 307. The objector believes they have additional interests in plots 308, 309, 310 and 311 but have not been able to confirm these interests to WMCA.

11.2.2 Plot 303 lies towards the bottom of an existing batter adjacent to the proposed Canal Street tram stop. Plot 303 is permanently required to enable construction and maintenance of new retaining walls to support both the tram stop and to create the running area for the tramway in an elevated area adjacent to the existing heavy freight head shunt. The works will be suitably fenced as required by planning conditions and Section 10 of the Code of Construction Practice Part 1 [WBHE/C1].

11.2.3 Plot 307 was temporarily required to provide access to plot 303 during construction works. However, following discussion with the objector and further construction methodology refinement WMCA is no longer seeking powers over plot 307. All construction access and egress will be along the existing rail corridor and plot 303.

11.2.4 WMCA has offered assurances through a deed of unilateral undertaking [WBHE/F7] with a view to securing the withdrawal of the objection.

11.3 LCP Estates Limited (OBJ/06)

11.3.1 The objection relates to plots 174, 175, 179, 180, 182, 183 and 184, which are located within Dudley town centre adjacent to the objector's Churchill Shopping Centre, which as stated earlier is one of the

developments within Dudley Town Centre. The objector has submitted a Statement of Case, in the form of the original objection letter [OBJ/06/SOC].

11.3.2 The objector is a supporter of WBHE. The objection has been raised to gain clarity as to the nature and effects of the proposed tramway.

11.3.3 Please also refer to sections 6.9, 6.10 and 8.9 of this Proof of Evidence regarding planned developments in Dudley Town Centre. MMA will consult with the objector, through its dedicated engagement team, on the timing and phasing of all plots on an individual basis and more generally as part of Dudley Town Centre Coordination Board which the objector also attends. MMA will also gain approval for CoCP Part 2 from DMBC as discussed in section 8.2 of this Proof of Evidence in advance of commencing any works.

11.3.4 Plots 174 and 175 are located over and along Fisher Street, a road that runs between the existing Dudley Bus Station and the objector's shopping centre. The bus station is planned to be redeveloped at the same time as WBHE is constructed and the objector is planning to reconfigure a new shopping entrance opposite the new Dudley interchange. Plots 174 and 175 are required temporarily to enable construction works of the tramway during redevelopment works.

11.3.5 Plots 179 and 180 are located over and along King Street along which the tramway will run and are required for the construction, operation and maintenance of the authorised works.

11.3.6 Plot 182 is a parcel of land between the existing pedestrian footbridge over King Street and an entrance into the objector's shopping centre. Plot 182 is required to allow temporary closure of the footbridge whilst construction works take place underneath in the interests of pedestrian safety as well as temporarily providing construction access to install safety features to prevent access to new overhead lines which will pass underneath the footbridge.

11.3.7 Plot 183 is a ramped pedestrian access leading to one of the objector's existing shopping centre entrances, located off King Street. Plot 183 is required for the construction, operation and maintenance of the authorised works being immediately adjacent to the route. Construction works in this area will involve utility diversions, installation of overhead line poles and changes in footpath levels, all of which will be refined in later detail design stages.

11.3.8 Plot 184 is the objector's single vehicular access way into the shopping centre's service area and car parking facility, located off King Street. Plot 184 is required for the construction, operation and maintenance of the authorised works being immediately adjacent to the route. Construction works in this area will involve utility diversions, installation of overhead line poles and changes in highway levels, all of which will be refined in later detail design stages. MMA will provide continuous access through plot 184 wherever reasonably practicable to do so and this will be in accordance with an agreement negotiated with, and to be executed by, the objector.

11.4 Jessops Europe Limited (OBJ/07)

11.4.1 This objection relates to plots 336 and 337. The objector occupies a unit within the Merry Hill shopping centre and has rights of access in common with others over these plots.

11.4.2 A statement of case has been submitted by the objector [OBJ/07/SOC] in which the following grounds are identified:

- Ground 1 – Risk of uncompensated business interruption during works.
- Ground 2 – Costs of making good of damage caused to private roads.
- Ground 3 – Insufficient attempts to reach a private treaty agreement.

11.4.3 This evidence will deal with the construction aspects covering Grounds 1 and 2 above.

11.4.4 Please refer to sections 8.2 and 8.12 of this Proof of Evidence regarding CoCP approval and construction method in this area.

11.4.5 Construction access to plot 336 will be from either Level Street, a publicly adopted road, or from The Embankment along the proposed new structure. As the Embankment is a private estate road, accessed from Level Street and plot 337, this will require rights to be taken over plot 337 for both construction and maintenance access. No works will be carried out within plot 337. No works will take place in Merry Hill Shopping Centre car parks adjacent either plot 336 or 337.

11.4.6 A CoCP Part 2, which will include construction strategy and communication plan, will be agreed with and approved by DMBC following consultation with Intu the owners of Merry Hill Shopping Centre, in accordance with condition 7 of the deemed planning conditions [WBHE/B7]. Design of temporary traffic management and advanced communication of any necessary diversions will be a key part of the consultation as will timing and phasing of the works to avoid busy shopping periods. The choice of structure design to support the tramway will also be key to reduce construction timescales and construction vehicle deliveries. Whilst there will inevitably be some disruption MMA will seek to reduce this as far as is reasonably practicable.

11.4.7 A pre-condition survey of plots 336 and 337 will be undertaken by MMA and agreed with Intu, owners of the estate, before any works commence in this area and any defects or damages arising from the construction works will be made good by MMA on completion.

11.4.8 WMCA has offered assurances through an agreement negotiated with, and to be executed by, the objector.

11.5 Tata Steel UK Limited (OBJ/09)

11.5.1 This objection relates to plot 320. The objector is a lessee and occupier of the plot.

11.5.2 The objector has raised 6 grounds for objection:

1. Construction affects to vehicular storage yard.

2. May restrict or prohibit rail deliveries.

3. Difference in ground levels may require retaining walls.

4. Objector operations could be disrupted during construction.

5. Boundary fencing to north of site could be compromised during construction.

6. Vibration during construction could impinge objector's overhead crane.

11.5.3 This evidence will deal with the construction aspects of all the above points.

11.5.4 The objector's facility is accessed by an existing dedicated road located off The Gateway. The tramway will cross this access road on completion. It will be necessary to ensure access to the Objector's facility is maintained at all times to reduce disruption and inconvenience both during construction and following completion of the tramway. During construction a temporary access suitable for the types of vehicles accessing the Objector's facility will be constructed by MMA off Waterfront Way through plot 326. Permanent traffic management, ie traffic signals, will be designed and constructed to control and manage the future safe interaction between tram and road vehicles along the dedicated access road.

11.5.5 The existing headshunt, subject to approval with Network Rail, will be altered or amended as part of the construction works, but the existing operational railway feeding the Objector's facility will not be affected by construction works. Through consultation with the Objector, MMA will

ensure works to the headshunt do not interfere with the Objector's planned operations. This is a requirement set out in Section 15 of the Code of Construction Practice Part 1 [WBHE/C1].

11.5.6 Part of the Objector's property extends into Plot 320 and projects above adjacent existing ground levels. The tramway will be designed to avoid running over this projection, instead the tramway will run near to and to one side of it. It is likely the tramway will be constructed on a viaduct at this point although this will be confirmed during detailed design.

11.5.7 Existing fencing to the objector's premises will be maintained at all times during construction works by MMA. This is a requirement set out in Section 10 of the Code of Construction Practice Part 1 [WBHE/C1].

11.5.8 Vibration monitoring will be employed, if necessary, to monitor construction activities so they do not affect the operation of the Objector's crane. Whilst it is inevitable that some vibration will be caused during construction works the extent of vibration will be mitigated by construction designs and machinery employed. MMA will consult with the Objector with a view to ensuring that its operations are not impeded as a consequence of construction works. This is a requirement set out in Section 5 of the Code of Construction Practice Part 1 [WBHE/C1].

11.5.9 The objector will be consulted throughout the works. A CoCP Part 2 will be approved by DMBC prior to commencing any works as required by the Code of Construction Practice Part 1 [WBHE/C1].

11.5.10 WMCA has offered assurances through a deed of unilateral undertaking [WBHE/F9] with a view to securing the withdrawal of the objector.

11.6 Intu and others (OBJ/10)

11.6.1 This objection relates to Merry Hill Shopping Centre and the adjacent Waterfront Business Park. Intu owns both Merry Hill Shopping Centre and Waterfront Business Park and does not object in principle to the scheme.

11.6.2 A wide-ranging objection was lodged and an accompanying statement of case [OBJ/10/SOC] has since updated this. Issues requiring a civil engineering design and construction response are summarised below:

1) Extent of land required. Statement of Case line 3.1.

2) Insufficient scheme design. Statement of Case line 5.1.

3) Disruption during construction phase (traffic). Statement of Case line 7.6.

4) Insufficient design for Dudley Canal tram stop access. Statement of Case, section 9.

11.6.3 Sections 8.2 and 8.12 of this Proof of Evidence deal with CoCP approval and construction methodology in this area.

11.6.4 Construction access to plot 336 will be from either Level Street, a publicly adopted road, or from The Embankment along the proposed new structure. As the Embankment is a private estate road, accessed from Level Street and plot 337, this will require rights to be taken over plot 337 for both construction and maintenance access. No works will be carried out within plot 337. No works will take place in Merry Hill Shopping Centre car parks adjacent either plot 336 or 337.

11.6.5 A CoCP Part 2, which will include construction strategy and communication plan, will be approved by DMBC following consultation with Intu the owners of Merry Hill Shopping Centre, in accordance with condition 7 of the deemed planning conditions [WBHE/B7], in advance of any works in this area. Design of temporary traffic management and advanced communication of any necessary diversions will be a key part of the consultation as will timing and phasing of the works to avoid busy

shopping periods. The choice of structure design to support the tramway will also be key to reduce construction timescales and construction vehicle deliveries. Whilst there will inevitably be some disruption MMA will seek to reduce this as far as is reasonably practicable, for example by designing for pre-fabricated concrete sections to reduce construction times

11.6.6 The design will be progressed and developed to discharge all deemed planning conditions [WBHE/B7] including; Condition 3 Design and External Appearance, Condition 4 Materials and Condition 5 Landscaping.

11.6.7 MMA has completed outline designs for the tram stop located adjacent to Dudley Canal, temporarily named "Merry Hill"**,** and is consulting with DMBC in respect of accessibility for this tram stop and others in the Borough. Similar to the 2005 scheme MMA propose to construct a lift shaft and stair well in part of plot 336, on land sandwiched between The Embankment and Central Way. The lift shaft and stair well will give access to the tram stop via a pedestrian walkway over The Embankment. The location of the lift shaft and stair well has been proposed to utilise the existing pedestrian crossing and footways on Central Way linking with one of the main shopping centre entrances. The lift shaft and stair well can be visualised in the approved Street Design Guide [WBHE/F17] at page 116 and 117 and on MMA general arrangement drawing A1 "Brierley Hill to Level Street" [APP/P3.3]

11.7 Waterstones Booksellers Limited (OBJ/11), MFG – previously Malthurst Group/Jet (OBJ/15), McDonalds Restaurants Limited and Astrad Limited and AR Sirkhat (OBJ/20), Argos Limited (OBJ/21) and TJX (trading as TK Maxx) (OBJ/22)

11.7.1 All objectors have retail units within the Merry Hill shopping centre or in the case of MFG are located on the Waterfront. All objectors have rights of access over plots 336 and 337.

11.7.2 This evidence will deal with the construction aspects concerning plots 336 and 337.

11.7.3 Please refer to sections 8.2 and 8.12 of this Proof of Evidence regarding CoCP approval and construction method in this area.

11.7.4 Construction access to plot 336 will be from either Level Street, a publicly adopted road, or from The Embankment along the proposed new structure. As the Embankment is a private estate road, accessed from Level Street and plot 337, this will require rights to be taken over plot 337 for both construction and maintenance access. No works will be carried out within plot 337. No works will take place in Merry Hill Shopping Centre car parks adjacent either plot 336 or 337.

11.7.5 A CoCP Part 2, which will include construction strategy and communication plan, will be approved by DMBC following consultation with Intu the owners of Merry Hill Shopping Centre, in accordance with condition 7 of the deemed planning conditions [WBHE/B7], in advance of any works in this area. Design of temporary traffic management and advanced communication of any necessary diversions will be a key part of the consultation as will timing and phasing of the works to avoid busy shopping periods. The choice of structure design to support the tramway will also be key to reduce construction timescales and construction vehicle deliveries. Whilst there will inevitably be some disruption MMA will seek to reduce this as far as is reasonably practicable.

11.7.6 WMCA have offered assurances to all objectors through deeds of unilateral undertaking [WBHE/F10, WBHE/F11, WBHE/F12, WBHE/F13 and WBHE/F14] with a view to securing the withdrawal of all objections.

11.8 National Grid Electricity Transmissions Plc (OBJ/13)

11.8.1 This holding objection relates to the objector's electricity transmission assets between Black Country New Road and the existing Metro Depot

in Sandwell. The objection is made whilst WMCA and the objector seek to reach agreement for the protection of NGET's assets.

11.8.2 The objector has prepared a Statement of Case and has identified the following assets, which are in close proximity to WBHE:

- Ocker substations
- 275kV overhead line – towers and access
- 400kV overhead line – towers and access

11.8.3 The objector has interests in land to be used temporarily in plots 22, 23, 24, 25 and 27 and land to be acquired permanently in plots 20, 21, 26, 32, 35 and 39.

11.8.4 MMA will undertake works in accordance with the Health and Safety Executive's Guidance Note GS6 "Avoiding danger from overhead power lines".

11.8.5 Temporary land is intended to be used to access the bottom of steep batters in this area to enable construction of retaining walls and boundary fencing trackside to support and secure the tramway. MMA are hopeful this will be reduced through the process of detail design but cannot confirm this at this stage.

11.8.6 MMA has undertaken topographical surveys and aerial drone surveys to accurately locate the objector's assets. This information is being used to develop track alignments to give horizontal and vertical design minimum safe clearance assurance, verified against the objector's own on site measurements which have been shared with MMA.

11.8.7 During detailed design consideration will be given to the positioning of Metro overhead line equipment (poles, catenary and wires) so as to provide the maximum practical clearance between the objector's assets and Metro assets. Consideration will also be given in the design to the safe future planned maintenance of Metro assets and the objector's assets which will be in close proximity to each other and the points of

contact to be made in respective operational organisations to facilitate this safely.

11.8.8 During construction works signage will be erected to warn site personnel in advance of entering zones influenced by live overhead transmission lines and a maximum jib height for any crane, excavator or lifting equipment will be established and physically controlled in the vehicle, where available, and by erecting barriers, goalposts and overhead bunting.

11.8.9 MMA is not aware of the objector's future routine planned maintenance of their assets during construction. This is likely to be communicated during detailed design consultations and any such need will be coordinated with the WBHE construction schedule.

12. SUMMARY AND CONCLUSION

12.1 Route Description

12.1.1 The WBHE will connect with the existing Line 1 between Wolverhampton and Birmingham at Wednesbury, adjacent to the existing tram depot. From Wednesbury the extension will run along the disused South Staffordshire railway line traversing and linking Great Bridge, Dudley Port railway station and Tipton before leaving the former rail corridor to climb Castle Hill on street linking with Dudley Town Centre and bus station. From Dudley bus station the route will continue to climb along King Street before entering Flood Street and leaving the town centre along a segregated strip of land alongside Duncan Edwards Way heading towards Cinder Bank. At Cinder Bank the extension will join the disused Oxford Worcester Wolverhampton railway line travelling as far as the Waterfront area before leaving the railway line to integrate with The Waterfront and Merry Hill Shopping Centre and then on to the terminus in Brierley Hill.

12.1.2 The total length of the extension is 11Km of which approximately 7Km will run along disused railway lines. The route will traverse through SMBC and DMBC Borough's. 35 bridge structures will be repaired, demolished, rebuilt or created. Up to 17 new tram stops will be constructed. In addition numerous developments are actively being planned in coordination with the metro extension in Dudley town centre which is planning for a renaissance with metro acting as the catalyst. The extension will also penetrate a new Business and Innovation Enterprise Zone known as DY5 in the Waterfront and Merry Hill areas.

12.2 Design and Construction

12.2.1 MMA was formed to design and construct a programme of Midland Metro enhancements including WBHE

12.2.2 The track alignment and associated infrastructure for WBHE has been developed in accordance with; current Midland Metro system design parameters and technical requirements, Network Rail standards, UK Tram's Tramway Principles and Guidance and best practice from other tramways.

12.2.3 Trams will typically run along two tracks along the length of the route. The extension is being designed so as not to preclude future conversion to a shared tram and train, should a separate business case and funding be established. Network Rail has no current proposals to bring this forward.

12.2.4 The scheme is at outline design stage progressing towards detailed design. MMA is in the process of preparing construction plans and schedules. The following issues are amongst those being considered:

a. Former railway corridor sections of the route will now be designed and constructed for 2 tracks with passive provision for future conversion to allow joint tram and train running along the corridor. Originally 3 tracks were planned.

b. Bridge refurbishments and constructions, mainly along the former railway corridor, have been reassessed given a) above, and in light of further ground and structural investigations undertaken by MMA. In the current scheme there is opportunity to retain and modify existing structures as additional corridor width is no longer required.

c. Locations of three tram stops in Dudley Town Centre are being reviewed with DMBC and stakeholders against Dudley Town Centre planned developments.

d. Dudley Town Centre. Numerous new developments are planned to happen at or around the same time as WBHE, including the Bus Station Interchange and Portersfield. DMBC will coordinate all developments including WBHE in Dudley Town Centre. This may impact the phasing and timing of WBHE design and construction activities, necessary to suit the final coordination plan for Dudley Town Centre.

e. Former earth and retaining wall embankments planned at Canal Street and adjacent to The Embankment, Brierley Hill, have been reassessed in light of further ground and structural investigations undertaken by MMA and viaduct solutions are now planned.

f. The planned introduction and procurement of innovative battery operated trams may make it possible for certain sections of the route to be wire free.

12.2.5 The deemed planning conditions, that were granted with the 2005 Order, [WBHE/B7] at condition 7 state "Development shall not begin until Part 1 of the Code of Construction Practice has been submitted to and approved in writing by the local planning authority. Before any stage of the works begins, Part 2 of the Code of Construction Practice with respect to that stage shall be submitted to and approved in writing by the local planning authority. The development shall be carried out in accordance with Part 1 of the Code of Construction Practice, together with the relevant provisions of Part 2 of that Code."

12.2.6 Centro, predecessor organisation to WMCA, obtained the approval of SMBC and DMBC of Part 1 of the Code of Construction Practice (CoCP) [WBHE/C1, approvals WBHE/F27 and WBHE/F28] following the granting of the 2005 Order.

12.2.7 The CoCP Part 1 [WBHE/C1] sets down a series of measures to reduce the potential impacts of construction of WBHE on the environment. It defines minimum standards of construction practice acceptable to WMCA, SMBC and DMBC, required of a Concessionaire who is now the MMA.

12.2.8 MMA has begun consultations with SMBC and DMBC as required by the CoCP Part 1 [WBHE/C1] and will agree and obtain SMBC and DMBC written approval of CoCP Part 2 for planned works in any section before work commences. Approval of CoCP Part 2 will ensure MMA's construction plans that could affect the environment, amenity and safety of local residents, businesses and the general public and the surroundings in the vicinity of the proposed works and associated worksites have been appropriately considered and mitigation provided for.

12.2.9 It is not envisaged that works will sever accesses to businesses and car parks. Works will be planned and executed in such a manner to maintain traffic flows, so far as reasonably practicable. Works will be planned and

executed in consultation with the emergency services so construction works do not impact on emergency response times in the event of an incident. Access to frontagers will be maintained at all times. A dedicated MMA Engagement Team has already begun to communicate with land owners, residents, businesses and occupiers along the route to take into account their particular needs, so far as is reasonably practicable.

12.2.10 The Churchill and Merry Hill Shopping Centres will continue to function throughout the tramway construction works. Accesses to shopping centres and car parks will be maintained and pedestrians will be safely diverted around the works where necessary.

12.2.11 No significant adverse impacts arising from the exercise of powers in the proposed Order are expected.

12.3 Statutory Undertakers Equipment

12.3.1 All Statutory Undertakers have been contacted by WMCA, in consultation with MMA, to ascertain the extent and cost of utility works.

12.3.2 WBHE will undertake the majority of utility diversion and protection works in advance of WBHE infrastructure works, where reasonably practicable to do so. This has both a time and cost benefit for the project and significantly de-risks the scope since the act of undertaking the diversions or protections gives greater certainty of ground conditions and provides a ‘clear site’. WMCA will co-ordinate and manage the utility companies programmes, in consultation with MMA, and in conjunction with DMBC and SMBC pursuant to their statutory roles as highway authorities.

12.4 Operations

12.4.1 WBHE’s tram frequency will be a peak six-minute service along the route, with alternate trams heading to Birmingham and Wolverhampton

12.4.2 Maximum tram speeds will be :

- 70 km/h on off-street (former railway) running sections.
- 48 km/h (30 mph) on segregated / integrated on-street running sections.

12.5 Secretary of State Matters

12.5.1 My Proof of Evidence has addressed matters 4a, 4c, 4d and 5d raised in the Statement of Matters.

12.6 Response to Objectors

12.6.1 In response to specific objections my civil engineering evidence addresses:

- Jewson Ltd, Saint Gobain and SGBD Property Holdings (OBJ/05)
- LCP Estates Limited* (OBJ/06)
- Jessops Europe Limited* (OBJ/07)
- Tata Steel UK Limited (OB/09)
- Intu and others* (OBJ/10)
- Waterstones Booksellers Limited (OBJ/11)
- National Grid Electricity Transmissions Plc* (OBJ/13)
- MFG – previously Malthurst Group/Jet (OBJ/15)
- McDonald's Restaurants Limited and Astrad Limited and AR Sirkhat (OBJ/20)
- Argos Limited (OBJ/21)
- TJX (trading as TK Maxx) (OBJ/22)

12.7 Conclusions

12.7.1 Only land that is considered necessary for the construction, operation and maintenance of WBHE has been included in the draft Order [WBHE/B2]. The amount of third party land required has been reviewed and reduced from that required for the 2005 Order. The land take will continue to be reviewed and, where reasonably practicable, reduced during the process of detailed design.

12.7.2 The project is progressing to be delivered and I urge the Inspector to recommend the powers applied for by WMCA.

13. STATEMENT OF TRUTH

13.1.1 The evidence I shall give is true, given in good faith and represents my professional opinion. I have carried out my assessment in accordance with the Code of Professional Conduct of the Institution of Civil Engineers.

Ian Collins

13 February 2019.