

Midland Metro

6.3 Traffic and Transport

6.3.1 Introduction

This section of the ES addresses the impact of the operation of the Wednesbury to Brierley Hill scheme on the local road network and the users of the network (ie private car, bus, cyclists and pedestrians). Impacts associated with the construction of the scheme are described in *Section 7.3*.

6.3.2 Assessment Methodology

Overview

The overall objective of this assessment is to provide estimates of the positive and negative impacts of changes in traffic brought about by the operation of the scheme. The assessment also examines the proposed permanent traffic management measures.

In carrying out this assessment data contained in the Transport Assessment (TA) undertaken by Faber Maunsell ⁽¹²⁾, the Urban Context Analysis ⁽¹³⁾ and the Transport Impact report ⁽¹⁴⁾ has been utilised.

The assessment criteria used to identify significant impacts arising from changes in traffic are set out in *Box 6.1*.

Box 6.1 Traffic and Transport Assessment Criteria

<p><i>Traffic Conditions</i></p> <p>Assessment of impacts of the extension, when operational, on specific junctions is assessed in terms of junction capacity likely to be experienced both with and without the extension. The TA identifies these potential impacts which are summarised in this ES.</p> <p>Pedestrian and Cyclist Conflicts</p> <p>For the purposes of this assessment, it has been assumed that changes in traffic flow as a result of Midland Metro of less than 30% are unlikely to have significant impacts on pedestrian and cyclist movements. This criterion is based on extensive studies examining the relationship between traffic flow and conflicts between motor vehicles and pedestrians and cyclists in a variety of road conditions ⁽¹⁵⁾.</p> <p><i>Traffic-related Air Quality and Noise</i></p> <p>The assessment of traffic-related environmental impacts is based on Institute of Environmental Assessment (IEA) guidance ⁽¹⁶⁾. The guidance asserts that only relatively large changes in traffic are likely to result in environmental impacts. The guidelines state that where receptors exist, environmental effects are unlikely to occur unless generated traffic increases baseline flows on highway links by more than 30%.</p>

6.3.3 Baseline Traffic Flows

The surveys undertaken by Dudley MBC and on behalf of Centro indicate that Dudley and Brierley Hill study areas are both congested networks.

The opening of the Dudley Southern Bypass in 1999 has significantly reduced the volume of traffic and consequently eased the levels of congestion in Dudley town centre. Dudley MBC has introduced a number of public transport priority schemes through Dudley town centre since the opening of the bypass. These have effectively discouraged through traffic from using these routes, as is demonstrated by the traffic counts.

It is clear from the traffic study that other junctions within the study area have capacity problems, as follows:

- Castle Hill link is currently at or very close to capacity within the peak periods. Currently extensive queues exist back from the Trindle Road/Castle Hill junctions in both directions. Safety concerns have been expressed about traffic queuing back from this junction onto Castlegate Roundabout.
- Castlegate roundabout itself is close to capacity.

Traffic congestion is an existing major problem within the Brierley Hill area, particularly in the PM peak period. In this period there is the greatest amount of commuter traffic and also a significant amount of retail related traffic accessing Merry Hill.

Two major through routes exist within the area:

- the A461 Stourbridge to Dudley Road;
- the A4036 which links the Lye/Cradley Heath areas to the Dudley area.

Two large developments exist within the study area. The Waterfront is a major office development and the Merry Hill Centre is a major retail area. Both of these sites are major traffic attractors/generators.

6.3.4 Traffic Model

Overview

In order to assess the impact of the scheme when operational a traffic model was used to assess highway capacity. The level of modal shift was not incorporated into the assessment because the expected reduction in the number of private car journeys is minimal due to the scheme being an extension. Details of the model are set out in the TA (17).

A number of scenarios were modelled both with and without Midland Metro for the years 2006 and 2021.

Traffic Growth

There are two main effects that produce traffic growth within any given area. These are:

- a background increase in the demand to travel due to population growth and increased levels of car ownership; and
- increases in demand to travel due to new development.

Both Brierley Hill and Dudley town centre areas have considerable development aspirations contained within them. All individual developments would have to cater for the impact of their own development traffic. Currently, however, there are no specific committed development proposals.

It was therefore agreed through consultation with Dudley MBC not to include any specific development proposals within the study area.

Future Year Highway Network Development

Dudley Town Centre. In consultation with Dudley MBC, there are no planned, non-development related alterations to the network within the model area. The base network is therefore assumed to be as that in the validated base year.

Brierley Hill. It is recognised that the Brierley Hill area will continue to develop over the forthcoming years.

It has been agreed between Dudley MBC and Centro to incorporate the proposals listed in Box 6.2.

Box 6.1 Road Network Proposals Incorporated in the Traffic Model for Brierley Hill

1. Brierley Hill High Street Parallel Route comprising:
 - A new 10m wide link road between Mill Street and Level Street;
 - A new 7.3m wide link road between Level Street and Waterfront West.
2. Upgrade of the existing Waterfront West comprising:
 - A new link road between the A4036 (Pedmore Road) and Waterfront Way.
3. The Brockmoor improvement comprising:
 - Signalisation of the John Street (B4180) Bank Street (B4179) Junction;
 - Closure of the High Street (B4180) at its junction with Pensett Road (B4179);
 - Signalisation of the junction of Hichman Road and Pensnett Road (B4179).
4. Signalisation of the junction of Level Street and Pedmore Road.
5. Conversion of the junction of Central Way/Level Street to a standard roundabout format.
6. Opening of a new bus only link from Merry Hill to Merry Hill Bus Station.
7. Capacity enhancements of the junction of The Boulevard/The Embankment.

It is anticipated that these schemes will either come forward as part of development

proposals or as part of the Local Transport Plan proposals submitted by Dudley MBC.

Road Infrastructure Alterations to Accommodate Metro in Dudley Town Centre

In addition to the scheme alignment, a number of road infrastructure alterations are required and were incorporated into the traffic model. These are as follows:

- Bourne Street will become two-way from the junction with Birmingham New Street to a site adjacent to 19 Bourne Street, and a turning head provided. The stopped section on Bourne Street will be removed.
- Birmingham Street (Northern Section) to become open to Midland Metro only.
- A realignment of Flood Street parallel to the alignment.
- A merger of Fisher Street and New Mill Street to a single route.

The scheme will be integrated into the junction with Castle Hill and Trindle Road. This junction is currently signalised. This will allow Midland Metro to cross the eastbound carriageway.

Road Infrastructure Alterations to Accommodate Metro in Brierley Hill

There is only one major alteration to the highway network within the Brierley Hill area. This is the closure of The Embankment to traffic, northbound,

between Level Street and the car park access road roundabout.

Midland Metro Specifications

Midland Metro will run approximately every six minutes. At junctions requiring signal controls the signals will be vehicle activated and will seek to give Midland Metro absolute priority.

6.3.5 Long Term Impacts on Traffic

Introduction

The introduction of new street running infrastructure to the city centre and the resulting impact on road traffic flows can have a number of effects, namely:

- changes in traffic conditions;
- changes in traffic-related noise and air quality;
- changes in conditions for pedestrians and cyclists; and
- changes in conditions for public transport users at interchanges with the new infrastructure in question.

Receptors which are potentially sensitive to these types of impact comprise road users (drivers, pedestrians, cyclists and public transport users) and people adjacent to the road network including residents of properties, occupants of commercial or industrial premises and users of facilities.

Traffic Conditions

The local road network is considered to be congested. The traffic model has identified the main locations where a significant increase in the level of congestion is likely:

- the junction of Castle Hill/Trindle Road as a result of a reduction in capacity from the road space taken by Midland Metro;
- the location of the new crossing of Tipton Road; and
- the junction of Castle Hill with Birmingham Street.

The TA concludes that the Trindle Road junction operates within capacity after the introduction of Midland Metro. With regard to the impacts of a new crossing of Tipton Road, the TA concludes that queues and delays will occur when a northbound tram in the evening peak period crosses the road. However, these queues will quickly disperse. The traffic modeling has shown that the average queues and delays predicted at the Castle Hill/Birmingham Street junction do not cause significant delay to the network.

Further details of these congestion points are shown in the TA.

A Park and Ride site ⁽¹¹⁸⁾ will be located at a number of tram stops, as described in *Section 2.6.5*. Each Park and Ride site will provide a maximum of approximately 80 car parking spaces. The maximum hourly demand would be in the order of 40 to 50 vehicle movements per hour. It is not expected that this level of traffic generation will be sufficient for any implications to traffic conditions. This has been agreed with the Local Highways Authority.

Traffic-related Environmental Impacts and Pedestrian and Cyclist Conditions

A number of locations have been identified where the traffic flow will increase in the AM peak period. Pedmore Road will receive increases at different locations along its length, ranging from 9.8% to 18.9%. Merry Hill is expected to receive an increase of approximately 6%. Mill Street is expected to receive an increase of 13.4% and Level Street, to the west of the junction with Waterfront Way is expected to receive an increase of 8.2%. Trindle Road will have an increase in the AM peak and in the PM peak of 7.2% and 9.9% respectively related to the re-routing of buses along Trindle Road. These increases are unlikely to cause significant impacts on the level of local noise and air quality and on pedestrians and cyclists.

The combination of Midland Metro and the Park and Ride sites will alter traffic flows. However, the magnitude of change is not considered significant in terms of impacts on pedestrians and cyclists and on traffic-related environmental impacts. Changes in traffic flow occurring as a result of Midland Metro do not exceed the 30% criteria used to assess impacts on cyclists and pedestrians, air quality and noise. Therefore, no significant impacts are expected in respect of these criteria.

However, it should be noted that cyclists might suffer from a reduction in amenity due to more congestion at localised points.

Public transport users are expected to benefit from the introduction of Midland Metro. The scheme will diversify the modal choice to travellers and will provide a high quality, direct and rapid transport system.

6.3.6 Mitigation Measures

Recommendations for Junction Alterations in Dudley Town Centre

In order to mitigate against potential impacts on traffic conditions a number of changes to road and public transport infrastructure have been recommended. Road infrastructure alterations required for Midland Metro are presented below in *Box 6.3*.

Box 6.3 Road Infrastructure Alterations in Dudley Town Centre

Flood Street with the Realigned New Mill Street: Currently there are two links on to Flood Street on the western side. It is proposed to rationalise the existing two entries on the western side of Flood Street into a single entry.

It is considered that signalising Flood Street and the realigned route to produce an all red phase when a Metro vehicle crosses the realigned route is the safest way to accommodate the existing alignment into Flood Street. It does unnecessarily delay traffic going straight on at Flood Street. However, the all red phase will be short and only be called on average once every 3.5 minutes. As a result, the extra delay is unlikely to be significant.

Signalisation of Castlegate Roundabout: It is understood that Dudley MBC is considering proposals to signalise Castlegate Roundabout. The following comments apply to the concept of this signalisation.

Signalisation should increase capacity, together with an increase in control over the traffic. This should benefit the introduction of Midland Metro in the Castle Hill area for two reasons:

- The increase in capacity and traffic control at the junction should reduce the likelihood of queues developing over the route of the Metro along Castle Hill.
- The increase in capacity at Castle Gale roundabout should reduce the likelihood of through traffic using the Trindle Road route. This will benefit the implementation of the Metro route through the Dudley town centre section of the route.

Alterations to public transport required for Midland Metro are presented below in *Box 6.4*.

Box 6.4 Public Transport Alterations

Hall Street with Trindle Road: The introduction of the Midland Metro into the Dudley study area will result in the closure of the existing Bus Only link on Birmingham Street between Castle Hill and Dudley Bus Station to all vehicles with the exception of the Midland Metro. The closure of this link, therefore, necessitates the re-routeing of all buses that currently use this link.

In consultation with Centro, it was agreed that for the purpose of this study, all buses currently using this link would be diverted along Trindle Road. This means that access to the Bus Station will be via the junction of Hall Street-Trindle Road-Birmingham Street.

A right turn prohibition currently exists for traffic to turn from Trindle Road into Birmingham Street. It is possible to easily accommodate a Bus Only right turn facility into the junction arrangement. The majority of traffic at this junction is accessing or egressing Hall Street. There is very little traffic using this as a through route. The right turn for buses can therefore be incorporated into the existing arrangement using the outside lane as a straight on and right turn for buses. The additional delay for buses at this point should be minimal and the right turns should be easily accommodated within the integration at the junction.

Closure of Birmingham Street to Buses: As part of the opening of the Midland Metro route through Dudley Town Centre, it is proposed to close access to Dudley Bus Station from Castle Hill via Birmingham Street.

There are a significant number of buses that access the bus station from Castle Hill via Birmingham Street. However, they only enter the bus station from the east (from Birmingham Road/Tipton Road direction). All registered bus services from the west (The Broadway/Priory Road direction) enter the bus station via Priory Road/New Street/Castle Street and Fisher Street.

It is therefore proposed to introduce an alternative access for buses from Tipton Road/Birmingham Road direction. The proposed route would be via Trindle Road with a new right turn without the revised traffic signal arrangement at the Trindle Road/Hall Street junction. This route is not significantly longer than the existing route and should provide adequate access to the bus station. There are also modifications required to the bus station to assist its continued operation as a result of the scheme. These works are included in the TW Order application for the Wednesbury to Brierley Hill scheme, and provisional arrangements for a modified bus station are being prepared by David Lock Associates as part of a separate study. A separate bid for funding is also being made in the LTP to carry out the proposed modifications.

Junction Alterations in Brierley Hill

The analysis of the proposals for the introduction of Midland Metro into the study area demonstrates that it has minimal impact on traffic conditions within the area. However, there are some locations where impacts are likely to occur. To minimise these impacts various junction alterations have been proposed, and are outlined in *Box 6.5*.

Box 6.5 Junction Alterations in Brierley Hill

Waterfront Way: At two locations along Waterfront Way there are junctions with the Midland Metro. Installation of simple signalised crossings of the Metro are proposed. Vehicle detection of the Metro would activate signals, stopping traffic both directions along Waterfront Way.

Waterfront Way/Level Street: The existing layout of the junction takes the form of a roundabout. Two factors affect the traffic flow in and around the roundabout.

- Opening of the A4036/Waterfront Way link road. This reduces the volume of traffic using this roundabout.
- Closure of The Embankment northbound. This further reduces the traffic using this roundabout.

The Embankment: As part of the opening of Midland Metro it is proposed that The Embankment is closed one-way (northbound) between the junction with Central Way and Level Street. The closure is the major factor in the re-routing of traffic within the study area. Traffic surveys indicate that this is a significant traffic route used by some 9 000 vehicles per day. This traffic would, therefore, be displaced onto other routes within the area. The main alternative routes are.

- The A461 – Main Dudley to Stourbridge Road, which is heavily congested.
- The M4036 – Main Dudley to Cradley Heath/Lye Route. Improvements along this route, recent and planned, significantly enhance the capacity of this route.
- Central Way – This serves predominantly as a car park access route at the moment.

The overall impact of the measures outlined in Box 6.5 is a significant net reduction in

traffic. The combination of the reduction in traffic and the existing layout allows the junction to be signalised using vehicle actuated traffic signals. Therefore, when a Midland Metro vehicle is detected, the traffic signals on all approaches to the roundabout will turn red, allowing Midland Metro to pass across the roundabout unhindered. This type of layout is an innovative design and would require both type approval and safety audit. It does, however, provide the best design in coping with the traffic demand and its interaction with Midland Metro.

Pedestrian Facilities

There are a number of tram stop locations that currently have a poor standard of pedestrian environment. Additionally, some transport locations have insufficient pedestrian crossings (sometimes over busy roads) and links to provide access to the new tram stops and to provide access between different transport modes (for example between bus and tram or taxi and tram). In order to overcome these limitations a series of measures have been proposed as part of the scheme. These comprise a number of new pedestrian crossings and links at suitable locations, using different materials to define the pedestrian areas (such as brick/block paving), lighting and improving existing footpaths by broadening them to improve sight lines and sense of security.

6.3.7 Summary of Residual Impacts

The Wednesbury to Brierley Hill scheme, including the Park and Ride sites, is not expected to generate significant levels of traffic. In addition, no impacts on pedestrians and cyclists, or on traffic-related noise and air quality are expected to result from the alterations in traffic flow.

However, the traffic model identified a number of locations where there may be increases in congestion. These locations have been identified above and are assessed further in a separate TA.