SEMMMS A6 to Manchester Airport Relief Road

DF5 Junctions Options Report 1007/6.19/068

November 2012

STOCKPORT METROPOLITAN BOROUGH COUNCIL

MANCHESTER CITY COUNCIL

Cheshire East Council

SEMMMS
A6 to Manchester Airport
Relief Road

DF5 Junctions Options Report
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REFERENCES

TfGM UTC Junction Traffic Capacity Analysis Reports

Atkins Scenario Testing Report

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Road Safety Audits

1.0 EXECUTIVE SUMMARY

1.1 The South East Manchester Multi Modal Strategy (SEMMMS) A6 to Manchester Airport Relief Road is a proposed new road connecting the A6 at Hazel Grove to Manchester Airport via the existing A555. The relief road is approximately 10km of predominantly two-lane dual carriageway with interchanges proposed at various side roads along the length of the scheme.

1.2 The report describes the junctions that are proposed as part of the scheme prior to the Public Consultation programmed to commence in October 2012. Where a recommended single junction layout has not been determined a number of junction layouts have been proposed for the public to consider during the consultation.

1.3 In determining the junction option or options, Health and Safety during operation, environmental impacts, traffic capacity, land take requirements, land and construction costs, construction duration and disruption have been considered.

1.4 The junction capacity checks that have been carried out are based on Design Freeze 5 (DF5) or variations of. These were carried out by Transport for Greater Manchester Urban Traffic Control (TfGM UTC). Highway layouts were developed by beginning with simpler and potentially smaller sized junctions. They were tested and iterations were carried out gradually increasing the size of junctions including the introduction of grade-separation where appropriate. This was in the interest of determining the layout with potentially the least landtake, cost and impact on the environment.

1.5 TfGM Highways Forecasting and Analytical Services (HFAS) were also commissioned to test various scenarios for the inclusion and exclusion of certain junctions. Atkins were commissioned by the SEMMMS Project Team (SPT) and provided comment within a separate report to indicate the implications of such scenarios. The relevant chapters summarise the conclusions of the report.

1.6 For the purposes of SATURN Traffic Modelling and to inform the scheme Benefit Cost Ratio (BCR) for the Major Scheme Business Case a Design Freeze 6, also known as the ‘Core Option’ was composed, based on the results of the above.

1.7 An overall Scheme plan indicating the location of each junction is included in Appendix A.

1.8 An overall Scheme plan indicating Design Freeze 6 is included in Appendix B.

1.9 General Arrangement Drawings for Design Freeze 6 are included in Appendix C.

2.0 INTRODUCTION

2.1 The SEMMMS Relief Road links the A6 in Hazel Grove to Manchester International Airport. The area adjacent to Manchester Airport is currently being developed as 'Airport City' which has recently been awarded Enterprise Zone status.

2.2 The Project promotes economic development through the provision of efficient access and improved connectivity to, from and between Manchester Airport and the local, town and district centres and employment sites and the wider strategic road network. In doing so, it will reduce the productivity losses to business and provide an improved route for freight by limiting the conflict between local and strategic traffic.

2.3 The scheme is supported by a partnership of three Local Authorities namely:

i. Stockport Metropolitan Borough Council (SMBC) – Lead Authority
ii. Manchester City Council (MCC)
iii. Cheshire East Council (CEC)

These Local Authorities are responsible for the highway network (excluding motorways) within their boundaries. They are known generically as "The Overseeing Organisation".

2.4 The scheme comprises two sections of new dual two lane carriageways. The first section is approximately 5.1km in length, starting from a new realigned section of the A6 at Hazel Grove, and extending west to the existing A555 at Woodford Road, Bramhall. The second new section is approximately 3.2 km in length and is an extension of the existing A555 that currently terminates at Wilmslow Road. The scheme continues in a westerly direction crossing Styal Road and heading towards Manchester Airport along the line of Ringway Road West. The scheme utilises the entire length of the existing A555 Manchester Airport Eastern Link Road (MAELR) which is approximately 4.0km in length.

2.5 The Relief Road intercepts many of the arterial commuter routes through the conurbation for traffic accessing the City of Manchester and surrounding commercial centres. The scheme will be constructed on the fringe of Cheadle Hulme, Hazel Grove and Bramhall and also Wythenshawe, Gatley and Heald Green Local Centres providing an alternative route for commuters.

2.6 The scheme improves access from the south and east of the region to Manchester International Airport and the surrounding commercial areas, including the newly formed Enterprise Zone adjacent to the airport. Access to a number of regeneration areas is also improved by the scheme, including Stockport Town Centre, M60 Gateway and Wythenshawe.

2.7 The Relief Road provides a quality route for freight vehicles to access the trunk road network (i.e. M56), Manchester International Airport and the newly formed Enterprise Zone from the south and east of the region. This in turn reduces the impact of heavy goods, and other commercial vehicles, on the surrounding residential streets and neighbourhoods.

2.8 The Scheme consists of thirteen locations of potential new or improved highway junctions. These are a mixture of:

- At-grade and grade separated;
- Signalised controlled and priority junctions;
- Roundabout, T junction and cross road arrangements.

2.9 The route of the proposed road crosses four railway lines, one of which is the West Coast Mainline.

2.10 Provisions for pedestrians and cyclists have been included along the entire length of the scheme.

2.11 A range of complimentary and mitigation measures have been identified to improve the local road network to offset the potential impact of the new relief road.

2.12 Careful design consideration has been incorporated into the scheme to mitigate the effects of environmental intrusion. Mouchel environmental consultants have been commissioned to produce an Environmental Assessment Report and to provide advice and support on Environmental matters during the design process.

2.13 Draft Orders for the SEMMMS Scheme are to be published in summer 2013.

2.14 The Preferred Route announcement for the Scheme is expected in early 2013. The Preferred Route is a corridor, which restricts development along the proposed Scheme.

2.15 Several layout arrangements have been investigated at each junction location.

2.16 All design layouts have been developed using the Design Manual for Roads and Bridges (DMRB).

2.17 Road Safety Audit Stage 1 has been carried out by the SMBC Team and conclusions have been drawn in separate reports.

3.0 DESIGN CONCEPTS

Mainline Standards

3.1 The scheme comprises two sections of new two lane dual carriageway. The first section, starting from a new realigned section of the A6 at Hazel Grove, and extending west to the existing A555 at Woodford Road, Bramhall has a proposed design speed of 85kph (50mph speed limit).

3.2 The second new section of road is an extension of the existing A555, which currently terminates at Wilmslow Road, and continues west toward Manchester International Airport. The proposed design speed for the section of new carriageway from Wilmslow Road to Styal Road junction is 85kph (50mph speed limit) and from Styal Road the proposed carriageway is designed to 70kph design speed (40mph speed limit) to its merge with the existing junction at Ringway Road/Ringway Road West.

3.3 Both sections of the Relief Road have been designed as an Urban All-Purpose Road (DMRB, TD27, Fig 4-4a).

3.4 There are various speed limit changes proposed to existing side roads at the location of junctions and these are noted in the relevant chapters. Technical highway design document DMRB TD9, Table2, relates speed limits to design speeds

In general terms:
30mph speed limit relates to 60kph design speed
40mph speed limit relates to 70kph design speed
50mph speed limit relates to 85kph design speed
70mph speed limit relates to 120kph design speed

Junction Standards

3.5 The overall scheme philosophy is to provide at grade signal controlled junctions, with safe crossing facilities for Non-Motorised Users (NMUs). However, predicted traffic flows on the proposed mainline indicate that grade separation at particular junction locations will be required.

3.6 The junction layouts considered during the design process have been designed to the Design Manual for Roads and Bridges (DMRB) and associated Advice Notes, in particular

TD9 Highway Link Design.
TD22 Layout of Grade Separated Junctions.
TD27 Cross-Sections and Headrooms.
TD50 Geometric Layout of Signal Controlled Junctions and Roundabouts.
TD42 Geometric Design of Major/Minor Junctions.
TA90 Geometric Design of Pedestrian, Cycle and Equestrian Routes.

Alternative road layouts at certain junction locations have been considered and have been included in this report to substantiate the suitability of the proposed layout option or options prior to commencement of the public consultation.

Side Road Standards

3.7 The design standards adopted for the side road are based upon:

- DMRB.
- Consultations with the relevant Overseeing Organisation.

3.8 The design speeds adopted at each junction are based on the existing speed limits and/or in consultation with the relevant Overseeing Organisation. Where appropriate new design speeds have been proposed and will be promoted by the SEMMMS Project Team to the Overseeing Organisation.

3.9 Carriageway cross-sections, footpaths and verges for the side roads are based upon the existing site layout and/or in consultation with the relevant Overseeing Organisation.

Relaxations and Departures from Standard

3.10 The Relief Road mainline has been designed to conform to DMRB and a separate report has been written to record any Relaxations or Departures to Standard. The junctions have been designed in conjunction with DMRB where possible, with particular attention to forward visibility sight lines (SSD) on approach to junctions.

3.11 All junctions have been provided with full signal controlled crossing facilities for Non-Motorised Users (NMUs) where required, whether that be for pedestrian, cyclists or equestrians with the use of Puffin, Toucan or Pegasus crossing facilities, respectively.

Non Motorised Users (NMUs)

3.12 The design of facilities for non-motorised users has been carried out in accordance with the documents listed below, as follows:

- TD36 Subways for Pedestrians and Pedal Cyclists. Layout and Dimensions

The recommendations from the Advice Notes in the DMRB have been taken into account, specifically the documents listed below, as follows:

- TA68 The Assessment and Design of Pedestrian Crossing
- TA90 The Geometric Design of Pedestrian, Cycle and Equestrian Routes

3.13 Increased provision such as Toucan/Pegasus crossings have been incorporated into the design following consultation with Public Rights of Ways (PRoW) and cycling officers of all three authorities. Also the Vulnerable Road User Groups have been consulted on the suitability of routes and provision.

4. A6 / Relief Road

4.1. Existing Situation and Constraints

The A6 Buxton Road is a single lane carriageway which runs through High Lane, Disley, Hazel Grove, Stockport town centre and beyond.

Buxton Road is a single lane carriageway of 'A' road classification (A6).

- The existing design speed for Buxton Rd is 60kph west of its junction with Mill Lane and 70kph east of the same junction.

- The proposed realigned A6 design speed is 60kph west of Occupiers Lane, 70 kph east of Occupiers Lane junction with A6.

The land to the north of the A6 at this location is a mix of agricultural land and Golf Course land owned by Hazel Grove Golf Club. Also a covered reservoir, owned and maintained by United Utilities Plc is present. There are properties on both side of Buxton Road at this location and also smaller business units.

The Hazel Grove to Buxton rail line runs north west to south east adjacent to the A6. The Buxton and Edgeley Junction Branch is a non-electrified twin track railway supported on concrete sleepers and ballasted track on approximately 1.0m high embankment. The line provides a commuter route between Buxton and Manchester. Network Rail has advised that there is no intention currently to electrify the line and that this assumption can be considered for development of the SEMMMS Relief Road highway alignment

There are footways provided outside of residential properties only. There is currently a Toucan facility crossing A6 Buxton Road, north of Yew Tree Avenue. There are no other controlled crossings or online facilities for Non-Motorised User (NMUs) along this section of A6 Buxton Road.

The existing charted statutory undertaker equipment within the A6 which is required to be diverted is as follows:

- United Utilities water main
- United Utilities sewer main
- Electricity North West (ENW) LV and HV electric mains
- National Grid gas main
- British Telecom communication ducts

4.2. Alternative Junction Layouts

The A6 will be realigned to the north east of the existing A6 Buxton Road. Approximately half way along the realigned road a new signalised junction with the relief road would be constructed. An online junction layout is not feasible due to the proximity of the Hazel Grove to Buxton Railway Line in conjunction with the proposed Relief Road being aligned under the aforementioned railway.

A number of junction options were produced and their suitability was considered by a Technical Working Group made up of a variety of engineering and environmental specialists from the SEMMMS Project Team. A preferred layout was then submitted to the SEMMMS Project Board, consisting of high level officers from all partnering bodies, for final confirmation. Refer to Appendix A for a location plan.

Option 1 - All movement, at grade signalised roundabout
This was the preferred layout configuration when the SEMMMS scheme was from Junction 25 of the M60 Motorway to Manchester Airport. This large layout was required to accommodate the anticipated traffic flows.

Option 2 - Fully signalised T Junction
This layout requirement differs from option1 due to the different traffic capacity requirements, namely no traffic arm toward the M60 Motorway.

4.3. Traffic Data

Option 1 - All movement, at grade signalised roundabout

It was determined to not carry out junction capacity checks on this option unless option 2 was determined to provide insufficient capacity.

Option 2 - Fully signalised T Junction

Report Ref: **UTC_SEMMMS_A6_AMD_DF5**
Drawing Ref: **1007/3D-DF5/A6-MA/GA/500**

A report was commissioned with Transport for Greater Manchester Urban Traffic Control Unit (TfGM UTC) to consider the operational efficiency of the proposed junction in future years 2017 (Road Opening Year) and 2032 (Design Year) using LINSIG modelling computer software. The traffic flows used in the modelling have been taken from a DF5 SATURN model constructed by Highways and Forecasting Analytical services (HFAS).

The results of the modelling indicate that the junction will operate within capacity during both peak periods in future year 2017. However, the modelling indicates that the junction will operate above practical capacity (90% Degree of Saturation) during both peak periods in future year 2032.

In mitigation, TfGM UTC has suggested the construction of an additional straight ahead lane in each direction, on the realigned A6 Buxton Road, to improve capacity. However, TfGM also recognise the implementation of MOVA control would introduce significant delay benefits in the region of 15%, thus bringing the junction capacity to within acceptable limits for future year 2032.

The SEMMMS Design Team, with SEMMMS Board approval, has retained the modelled junction layout.

4.4. Summary and Recommendations

Option 1 - All movement, at grade signalised roundabout

This layout was the preferred option when the SEMMMS scheme ran directly from Junction 25 of the M60 through to this location. The junction sits on a larger land footprint, which in turn has an increased environmental impact over Option 2. It was discounted as Option 2 was determined to provide sufficient capacity, see Option 2 below.

Option 2 - Fully signalised T Junction

This junction will be constructed in a green field location to the north east of the existing A6 Buxton Road, and will be surrounded by extensive landscaping to minimise the visual effect to local residents. The junction does not support Non-Motorised User (NMU) facilities due to its off line location. Non-Motorised Users will continue to use the existing A6 Buxton Road and cross the line of the relief road by means of a new bridge structure.

This layout has been incorporated into the core scheme layout Design Freeze 6 (DF6) and is shown on the 1/2500 Scheme Engineering Drawings.

RECOMMENDATIONS

Option 2 is to be presented at Public Consultation.

5. A6 Buxton Road Tie in Junctions (West and East)

5.1. Existing Situation and Constraints

The A6 Buxton Road is a single lane carriageway which runs through High Lane, Disley, Hazel Grove, Stockport town centre and beyond. The proposed tie-in junctions are located close to Yew Tree Avenue, to the west, and Norbury Hollow Road to the east. The existing Toucan crossing facility will be removed and relocated as part of the new scheme proposals. Refer to Appendix A for a location plan.

The existing and proposed design speeds are noted within Chapter 4.

The existing charted statutory undertaker equipment within A6 Buxton Road, that are required to be diverted are indicated in Chapter 4.

5.2. Alternative Junction Layouts

Western Junction - Priority T junctions

The tie in point of the realigned A6 is to be constructed west of Yew Tree Avenue. Access to the realigned A6 from Yew Tree Avenue and Occupiers Lane will be via priority T junctions. Each priority junction will have protected right turn lanes with illuminated refuge islands. Between the priority junctions, a new Toucan crossing will be provided to replace the existing facility.

It is envisaged that bus services will continue to use the existing A6 Buxton Road without the requirement of further signalisation at this location. Their route would take them over the new bridge structure crossing the proposed relief road and continuing up the existing A6 via the new eastern junction

Eastern Junction – Signalised T junction

The proposed signalised junction will be located to the west of Wellington Road. Access to the existing A6 Buxton Road and Norbury Hollow Road will be provided via a T junction.

To enable efficient right turn manoeuvres for east bound A6 traffic, particularly for bus services, it was determined that signalisation of the junction should be tested for capacity. The results confirmed signalisation was required in addition to a dedicated right turn lane off the realigned A6 to facilitate traffic flows to Norbury Hollow Road.

There will be no provision for NMUs at this junction.

5.3. Traffic Data

Western Junction - Priority T junctions

Access to Yew Tree Avenue and Occupiers Lane would be for local residents and service vehicles. Local bus services would turn right, at the Yew Tree Avenue junction, and continue to use the existing eastbound A6 via the new bridge structure over the relief road. Junction capacity checks have not been carried out on this junction due to the relative low number of predicted traffic movements.

Eastern Junction – Signalised T junction

Report Ref: **SEMMMS_BuxtonRd_Modelling_Report_29-02-12**
Drawing Ref: **1007/3D-DF5/A6-MA/GA/500**

A report was commissioned with Transport for Greater Manchester Urban Traffic Control Unit (TfGM UTC) to consider the operational efficiency of the proposed junction in future years 2017 (Road Opening Year) and 2032 (Design Year) using LINSIG modelling computer software. The traffic flows used in the modelling have been taken from a DF5 SATURN model constructed by Highways and Forecasting Analytical services (HFAS).

The results of the modelling indicate that the junction will operate within capacity, during both peak periods, in future year 2017. However, the results of the modelling indicate that the junction will operate above practical capacity, during both peak periods, in future year 2032.

The implementation of MOVA control would confer significant delay benefits not considered by this fixed-time model (this can typically be up to a 15% reduction to total delay when compared to fixed-time plans).

5.4. Proposed Option or Options

The core scheme junction layout for the A6 Buxton Road is priority junction to the west and a signalised T junction at the east.

These layouts have been incorporated into the core scheme layout Design Freeze 6 (DF6) and are shown on the 1/2500 Scheme Engineering Drawings.

RECOMMENDATIONS

Western Junction
Priority Junction is to be presented at Public Consultation.

Eastern Junction
Signal Controlled Junction is to be presented at Public Consultation.

6. A523 Macclesfield Road

6.1. Existing Situation and Constraints on Alternative Junctions

Macclesfield Road is a single lane carriageway of 'A' road classification (A523).

- The existing design speed for Macclesfield Rd is 60kph north of the borough council border and 70kph south of the border.
- The proposed design speed is proposed to remain the same.
- The proposed relief road mainline design speed is 85kph.

Macclesfield Road connects Hazel Grove, to the north, with Poynton, to the south. North of the proposed junction location Macclesfield Road has a signal controlled cross road junction with Dean Lane and Mill Lane where there are controlled crossing facilities for NMUs. To the south of the proposed junction location, the A523 becomes London Road North. There are currently no crossing facilities for NMUs.

The proposed junction location is just north of the boundary between Cheshire East Council and Stockport Metropolitan Borough Council. Also just south of the junction location is Norbury Brook, which runs approximately parallel to the relief road mainline, with the flow running towards the west. Macclesfield Rd is carried over the Norbury Brook via a highway bridge.

There is currently a narrow footway (approximately 1.6m wide) on the eastern side of the carriageway on Macclesfield Rd. No existing footway provision is present on the west side. Norbury Hall, which is a locally listed structure, is located to the North West. The property is used as a business which includes farming. To the north east are residential properties. To the south east is Brookside Garden Centre which also contains a large at grade car park. To the south west there is a private property set back from Macclesfield Road. Vehicles access Norbury Hall and Brookside Garden Centre directly off Macclesfield Road. Refer to Appendix A for a location plan.

The existing charted statutory undertaker equipment within Macclesfield Road that is required to be diverted is as follows:

1. ENW LV and HV electricity mains
2. ENW Transmission EHV electricity mains
3. NG Gas mains
4. BT communication cable ducts
5. Virgin Media cable ducts

6.2. Alternative Junction Layouts

The junction proposals are located on the boundary of Stockport MBC and Cheshire East Council. The site is bounded by residential housing to the north, Brookside Garden Centre to the south and Norbury Brook, being the Borough boundary, running straight through the middle in an east west direction.
The designs were considered for suitability by a Technical Working Group made up of a variety of engineering and environmental specialists from the SEMMMS Project Team. A preferred layout was then submitted to the SEMMMS Project Board, consisting of high level officers from all partnering bodies, for final confirmation.

Option 1 – No Junction Provision

The relief road would pass under a road bridge carrying A523 Macclesfield Road. There would be no direct access from Macclesfield Road to the proposed relief road.

Option 2 - An at-grade all movements signal controlled cross road junction

Controlled crossing facilities for Non-Motorised Users (NMUs) will be provided.

Option 3 - A grade separated junction with restricted movements

This layout would consist of west facing slip roads only. Uncontrolled crossing facilities for Non-Motorised Users (NMUs) at the top of the slip roads will be provided.

Option 4 - An at-grade signalised satellite T junction

This junction layout would be located to the west of the A523 Macclesfield Road and would require a link road across adjacent fields to a signalised T junction with the relief road. An additional signal controlled T junction would be required with the A523 Macclesfield Road. Both T junctions will have appropriate crossing facilities for Non-Motorised Users. Access along Macclesfield Road would be maintained via a new bridge structure over the relief road.

Option 5 - Provision of a grade separated all movement junction

The relief road would pass under the A523 Macclesfield Road and be connected via slip roads. Uncontrolled crossing facilities for Non-Motorised Users (NMUs) at the top of the slip roads will be provided.

6.3. Traffic Data

Option 1 – No Junction Provision

No traffic analysis was carried out for this option. Refer to section 6.4 Option1 for further details.

Option 2 - An at-grade all movements signal controlled cross road junction

Relief Road/Macclesfield Road Junction (signalised cross road)
Report Ref: SEMMMS_MacclesfieldRd_29022012_etc_V2
Drawing Ref: 1007/3D/DF5/A6-MA/GA/501B

A report was commissioned with Transport for Greater Manchester Urban Traffic Control Unit (TfGM UTC) to consider the operational efficiency of the proposed junction in future years 2017 and 2032 using LINSIG modelling computer software. The traffic flows used in the modelling have been taken from a DF5 SATURN model constructed by Highways and Forecasting Analytical services (HFAS). The modelling also takes into accounts pedestrian/cyclist phases across all arms of the junction.

The results of the modelling indicate that the junction will operate within practical capacity during both peak periods in future years 2017 and 2032. It is current UTC practise to install MOVA to all new junctions and this is anticipated to improve capacity by up to 15%.

The SEMMMS Design Team have noted the Traffic Engineers comments regarding the extension of flare lanes to minimise queuing conflicts and have revised the junction layout accordingly.

Option 3 – A grade separated junction with west facing slip roads

No traffic analysis was carried out for this option. Refer to section 6.4 Option3 for further details.

Option 4 - An at-grade signalised satellite T junction

Relief Road/Macclesfield Road Offset Junction (signalised T junction)
Report Ref: SEMMMS_MacclesfieldRd_27.06.12_AMD
Drawing Ref: 1007/2D/DF5/A6-MA/GA/677

A report was commissioned with Transport for Greater Manchester Urban Traffic Control Unit (TfGM UTC) to consider the operational efficiency of the proposed junction in future years 2017 and 2032 using LINSIG modelling computer software. The traffic flows used in the modelling have been taken from a DF5 SATURN model constructed by Highways and Forecasting Analytical services (HFAS). The modelling also takes into accounts pedestrian/cyclist and equestrian phases across relevant arms of the junction.

The results of the modelling indicate that the junction will operate within practical capacity during both peak periods in future years 2017 and 2032. It is current UTC practise to install MOVA to all new junctions and this is anticipated to improve capacity further.

Option 5 – Provision of a grade separated all movement junction

No traffic analysis was carried out for this option. Refer to section 6.4 Option5 for further details.

6.4. Summary and Recommendations

Option 1 - No Junction Provision

No junction. This option was assessed and not supported by the Local Authorities on the grounds that existing traffic would continue to use Macclesfield Road, and therefore there would be no benefits to local residents.

Option 2 - An at-grade all movements signal controlled cross road junction

An at-grade all movements signal controlled junction. This junction will be constructed within a restrictive area bounded by residential and business properties. Construction time compared to the other options is reduced and therefore, disruption to adjacent properties during the construction phase would be minimised. In addition, controlled crossing facilities for Non-Motorised Users (NMUs) will be provided where required.

This layout has been incorporated into the core scheme layout Design Freeze 6 (DF6) and is shown on the 1/2500 Scheme Engineering Drawings.

Option 3 - A grade separated junction with west facing slip roads

A grade separated junction (west facing slip roads only). This option was assessed from a construction cost perspective, and was found to be expensive for this location. This option does not cater for all movements.

Option 4 - An at-grade signalised satellite T junction

An at-grade signalised satellite T junction to the west of the A523 Macclesfield Road. This option requires a link road across adjacent fields to link the relief road to A523 Macclesfield Road. An additional signalised T junction with A523 would be required. Both T junctions would have controlled crossing facilities for Non-Motorised Users (NMUs) where required. Access along Macclesfield Road would be maintained via a new bridge structure over the relief road.

Option 5 - Provision of a grade separated all movement junction

A grade separated junction (all movement). This option was assessed from a construction cost perspective, and was found to be expensive for this location.

RECOMMENDATIONS

Options 2 and 4 are to be presented at Public Consultation.

7. Woodford Road, Poynton

7.1. Existing Situation & Constraints

Woodford Road is a single lane carriageway and is unclassified.

- The existing design speed for Woodford Road is 70kph.
- The proposed design speed is to remain at 70kph.
- The proposed relief road mainline design is 85kph

The road travels between the south of Hazel Grove and the west of Poynton. At the junction location the road is within the Cheshire East Council boundary. There are various priority junctions off Woodford Road to residential cul-de-sacs, however, there are no major junctions in the vicinity of the relief road intersection. The area is surrounded by agricultural farm land with a small number of residential properties to the north and south of the location, the nearest being Hill Green Farm approximately 150m north east of the intersection point. Refer to Appendix A for a location plan.

7.1.1. There are no footways on either side of the carriageway although soft verges are present. There are no controlled crossing facilities for NMUs.

7.1.2. Approximately 500m west of the junction location is the Stockport to Stoke Line which is part of the West Coast Mainline route managed by Network Rail. Woodford Road is carried over the rail line via a rail bridge approximately 300m south west of the junction location.

The existing charted statutory undertaker equipment within Woodford Road, that is required to be diverted is as follows:

- United Utilities water main
- ENW LV and HV electric mains
- British Telecom communication ducts

7.2. Alternative Junction Layouts

The junction proposals are located within the green belt and surrounding pasture land. Woodford Road runs north to south across the line of the relief road.

The designs were considered for suitability by a Technical Working Group made up of a variety of engineering and environmental specialists from the SEMMMS Project Team. A preferred layout was then submitted to the SEMMMS Project Board, consisting of high level officers from all partnering bodies, for final confirmation.

Option1 – No junction provision

The relief road would be in a cutting with Woodford Road being carried over on a road bridge.

Option2 - At grade all movement right/left stagger junction

Full controlled crossing facilities for Non-Motorised Users (NMUs) will be provided.

Option3 - No junction provision

This would differ from Option1 with the relief road crossing the line of Woodford Road at ground level. Woodford Road would be stopped up with no though provision for motorised vehicles. Access between the severed parts of Woodford Road for NMUs would be via a bridging structure over the relief road.

7.3. Traffic Data

TFGM Highways Forecasting and Analytical Services (HFAS) were commissioned to test options 2 and 3 in terms of the effects on traffic in the local adjacent network as a differential to option 1. Atkins were commissioned by the SEMMMS Project Team (SPT) and provided comment within a separate report to indicate the implications of such scenarios.

Option 1 – No junction – Woodford Road over Relief Road

The DF6 scheme provides no junction at this location and the overall scheme traffic data suggests no adverse effects upon the network.

Option 2 - At-grade all movement right/left stagger junction

Overall the positive aspects that would reflect on the overall scheme benefit cost ratio and traffic forecasts are as follows:

- Reduced cost due to omission of bridge structure

The negative impacts are as follows:

- The addition of two new signal controlled junctions will add to delays for SEMMMS through traffic
- There is a cost implication when installing two additional set of traffic signals
- Creates additional access points which will increase traffic conflicts and hence accidents
- Additional traffic is attracted to the unsuitable Woodford Road

The report concludes that the option should be considered further.

Option 3 - No junction – Stop Up Woodford Road

Overall the positive aspects that would reflect on the scheme benefit costs ratio and traffic forecasts are as follows:

- Reduced scheme construction costs and maintenance liability due to omission of the structure.
- Limited wider traffic routing

The negative impacts are as follows:

- Severs a local road.
- Some traffic increases are forecasted on the A5102 Woodford Rd (Bramhall) and A523 Macclesfield Road

The report concludes that there is limited overall impact on the SEMMMS scheme.

7.4. Summary and Recommendations

Option1 - No junction – Woodford Road over Relief Road

No junction provision. The relief road would be in cutting with Woodford road being carried over on a road bridge.
This layout has been incorporated into the core scheme layout Design Freeze 6 (DF6) and is shown on the 1/2500 Scheme Engineering Drawings.

Option 2 - At-grade all movement right/left stagger junction

At grade all movement right/left stagger junction. In addition, controlled crossing facilities for Non-Motorised Users (NMUs) will be provided where required.

Option 3 - No junction – Stop Up Woodford Road

No junction provision. This would differ from option1 with the relief road crossing the line of Woodford Road at ground level and severing the existing traffic movement along Woodford Road. This options severs a local road.

RECOMMENDATIONS

Options 1 and 2 are to be presented at Public Consultation.

8. Bramhall Oil Terminal & A5149 Chester Road Link Junctions

8.1. Existing Situation

Chester Road is a single lane carriageway and is of 'A' road classification (A5149).

- The existing design speed for Chester Road is 60kph
- The proposed design speed is to remain at 60kph
- The proposed link road design speed is 60kph
- The proposed relief road mainline design is 85kph

The junction proposals are located within the green belt and surrounding pasture land. There are residential properties, adjacent to Bramhall Oil Terminal, on the northern boundary, with Chester Road forming the southern boundary. The relief road runs east to west across the site. Refer to Appendix A for a location plan.

8.1.1. The existing charted services that are present and require diverting, within the footways or carriageways of Chester Road, are present in the access road to the oil terminal or are present in existing fields are as follows:

- United Utilities water main
- ENW LV and HV electric mains
- National Grid gas mains
- National Pipelines Agency oil pipeline.

8.2. Alternative Junction Layouts

A number of alternative junction layouts were considered for suitability by a Technical Working Group made up of a variety of engineering and environmental specialists from the SEMMMS Project Team. A preferred layout was then submitted to the SEMMMS Project Board, consisting of high level officers from all partnering bodies, for final confirmation.

Option 1 - No junction

Traffic movements would be transferred to the junction provision at Woodford Road, Bramhall.

Option 2 - At grade signalised cross road junction

At grade signalised cross road junction with arm to Bramhall Oil Terminal demand only. There will be provision of an additional at grade T junction to the south linking Chester Road. Controlled crossing facilities for Non-Motorised Users (NMUs) will be provided (labelled as option 8A).

Option 3 - All movement grade separated junction

All movement grade separated junction was considered and discounted due to the location of the proposed junction, the close proximity of residential properties and the large footprint of the layout.

Option 4 - Restricted movement grade separated junction

A restricted movement grade separated junction was discounted on the same grounds as Option3 and well as the requirements of a requirement for all traffic movements.

Option 5 - At grade signalised roundabout

At grade signalised roundabout with arm off the roundabout linking back to Chester Road. Full controlled crossing facilities for Non-Motorised Users (NMUs) will be provides (labelled option 9 below).

8.3. Traffic Data

Option 1, 3 and 4

These options were considered not suitable layouts for this particular location and were therefore not tested for traffic capacity.

Option 2 – Signalised Elongated Rbt Junction and Chester Road T Junction

Relief Road/Oil Terminal Junction including adjacent Chester Road Junction (elongated signalised roundabout)
Report Ref: SEMMMS_OilTerminal_Modelling_Report_18-07-12
Drawing Ref: 1007/2D/DF5/A6-MA/GA/684A (option8A)

A report was commissioned with Transport for Greater Manchester Urban Traffic Control Unit (TfGM UTC) to consider the operational efficiency of the proposed junction in future years 2017 and 2032 using LINSIG modelling computer software. The traffic flows used in the modelling have been taken from a Modified DF5.1 SATURN model constructed by Highways and Forecasting Analytical services (HFAS). The modelling also takes into accounts pedestrian/cyclist phases across relevant arms of the junction.

The results of the modelling indicate that both junctions operate within practical capacity during both peak periods in future years 2017 and 2032. However, the traffic figures for year 2032 indicate significant levels of queuing which in turn would cause the roundabout to operate inefficiently. Although the implementation of adaptive signal control would provide additional benefits not considered by this fixed-time modelling.

The SEMMMS Design Team have noted the Traffic Engineers comments regarding changes to improve the junction and would revise the junction layout accordingly should this layout be taken forward as a preferred option.

Note

(i) DF5.1 SATURN model excludes the Woodford Development access on the Poynton Relief Road. The Oil Terminal access was not considered by this SATURN model after discussions with the Oil Terminal Operators to assess demand frequencies during the modelling time periods.

Option 5 – Signalised Cross Rd Junction and Chester Road T Junction

Relief Road/Oil Terminal Junction (including adjacent Chester Road Junction) (T junction)
Report Ref: SEMMMS_OilTerminal_Modelling_Report_31-07-12
Drawing Ref: 1007/2D/DF5/A6-MA/GA/685 (option9)

A report was commissioned with Transport for Greater Manchester Urban Traffic Control Unit (TfGM UTC) to consider the operational efficiency of the proposed junction in future years 2017 and 2032 using LINSIG modelling computer software. The traffic flows used in the modelling have been taken from a modified DF5.1 SATURN model constructed by Highways and Forecasting Analytical services (HFAS). The modelling also takes into accounts pedestrian/cyclist and equestrian phases across relevant arms of the junction.

The results of the modelling indicate that the junction of the Relief Road and the Poynton Relief Road would operate above practical capacity during both peak periods in future year 2032. However, the traffic figures indicate that the junction of the SEMMMS Relief Road and the Chester Road Link would operate within practical capacity for year 2032. Although not ideal, the implementation of adaptive signal control would provide additional benefits not considered by this fixed-time modelling.

8.4. Summary and Recommendations

Option 1 - No junction

No junction. The relief road requires this location and Woodford Rd junction to be considered together. This option is therefore considered unacceptable due to the Woodford Road junction unable to provide all movements. Refer to Chapter 9 for details of the Woodford Rd junction proposals.

Option 2 - At grade signalised cross road junction

At grade signalised T junction with fourth arm (demand only) to Bramhall Oil Terminal. Provision of an additional at grade T junction to the south linking Chester Road. In addition, controlled crossing facilities for Non-Motorised Users (NMUs including equestrians) will be provided where required.
This layout has been incorporated into the core scheme layout Design Freeze 6 (DF6) and is shown on the 1/2500 Scheme Engineering Drawings.

Option 3 - All movement grade separated junction

All movement grade separated junction. This layout was deemed unsuitable at this location and unnecessary due to option 2 providing adequate traffic capacity.

Option 4 - Restricted movement grade separated junction

Restricted movement grade separated junction. This layout was deemed unsuitable at this location with option 2 providing adequate traffic capacity.

Option 5 - At grade signalised roundabout

At grade signalised roundabout with an arm off the roundabout linking back to Chester Road and a signalised demand only arm to Bramhall Oil Terminal. There will also be a signalised T junction, to the south, providing a link back to Chester Road. Both junctions controlled will have crossing facilities for Non-Motorised Users (NMUs) where required.

RECOMMENDATIONS

Options 2 and 5 are to be presented at Public Consultation.

It should be noted that the junctions options proposed allow for the future development of Poynton Bypass. The junction layouts will cater for the anticipated traffic flows.

9. A5102 Woodford Road, Bramhall

9.1 Existing Situation & Constraints

Woodford Rd is currently a single lane carriageway of 'A' road classification (A5102).

- The existing design speed for Woodford Road is 60kph.
- The proposed design speed is to remain at 60kph.
- The existing A555 has a design speed of 120kph.
- The proposed relief road mainline design speed is 85kph to a point 500m along the existing A555 west of the proposed junction. The proposed design speed of A555 from this point to Wilmslow Road is 120kph.

At the junction location the existing road connects the south of Bramhall and the north of Woodford. Both areas are within the boundary of Stockport Metropolitan Borough Council. An at grade roundabout provides a connection to the existing A555 dual carriageway. The existing roundabout has an Inscribed Circle Diameter (ICD) of approximately 41m. Refer to Appendix A for a location plan.

There are standard width footways on both sides of Woodford Road. There are no NMU facilities adjacent to the existing A555 although there are uncontrolled crossing facilities present around the roundabout (tactile paving and dropped kerbs).

To the east and west of Woodford Road and to the north and south of the A555, at this location, there are residential properties which are accessed via Woodford Road and/or Jenny Lane. To the south there is farmland and a small number of industrial units. To the north west of the junction there is a recreation ground managed and owned by SMBC. To the east of the existing junction there is land and property owned by the Highways Agency in preparation for the previously funded trunk road scheme i.e. SEMMMS M60 to Manchester Airport. The relief road runs through Moorend Golf Course (9 hole) which is located behind the houses fronting the east side of Woodford Road.

The existing charted statutory undertaker equipment within Woodford Road that is required to be diverted is as follows:

- United Utilities water mains
- United Utilities waste water mains
- ENW LV and HV electricity mains
- NG Gas mains
- BT communication cable ducts

9.2 Alternative Junction Layouts

The designs were considered for suitability by a Technical Working Group made up of a variety of engineering and environmental specialists from the SEMMMS Project Team. A preferred layout was then submitted to the SEMMMS Project Board, consisting of high level officers from all partnering bodies, for final confirmation.

Option 1 – No junction provision

The A5102, Woodford Road would pass over the proposed relief road. The relief Road would pass through in a cutting and link directly into the existing A555. There would be no direct access onto the existing A555 or proposed relief road.

Option 2 – At grade signalised cross road junction

An at grade cross road junction would allow all traffic movements.

Option 3 – At grade roundabout

An at grade roundabout junction would allow all traffic movements.

Option 4 – Grade separated junction (all movements)

Grade separated junction would allow all traffic movements. The relief road would pass in cutting under A5102 Woodford Road. Two structures spanning the relief road would create a circulatory signalised junction layout to facilitate traffic movements.

Option 5 - Grade separated gyratory junction (restricted movements)
Grade separated junction (half diamond west facing slip roads). The relief road would pass in cutting under A5102 Woodford Road. Two structures spanning the relief road would create a circulatory signalised junction layout to facilitate traffic movements.

Option 6 - Grade separated T junction (restricted movements)
Grade separated junction (half diamond west facing slip roads). The relief road would pass in cutting under A5102 Woodford Road. A single structure spanning the relief road would carry the A5102. There would be a signalised T junction at the top of each slip road to facilitate traffic movements.

General Note:Junction configurations have been considered at this location in conjunction with junction layout proposals at Chester Road due to their close proximity and influence they would have on the surrounding area in respect of predicted traffic movements.

9.3Traffic Data

TFGM Highways Forecasting and Analytical Services (HFAS) were commissioned to test options 1 and 2 in terms of the effects on traffic in the local adjacent network. Atkins were commissioned by the SEMMMS Project Team (SPT) and provided comments within a separate report to indicate the implications of such scenarios.

Option 1 - No junction provision

Overall the positive aspects that would reflect on the overall scheme benefit cost ratio and traffic forecasts are as follows:

- Reduced number of junctions will reduce scheme construction costs.

The negative impacts are as follows:

- Significantly reduced traffic on the existing A555 sections of the relief road.
- New relief road is not accessible at this location.
- Increased traffic on local roads A5149 Woodford Road and B5095, with potential adverse environmental impacts.
- Significant re-routing along longer routes which would impact scheme economics and environment.

The report concludes that this option should be rejected.

Option 2 - At grade signalised cross road junction

Overall the positive aspects that would reflect on the overall scheme benefit cost ratio and traffic forecasts are as follows:

- All currently proposed movements are retained.
- Construction cost savings due to an at-grade solution, not requiring bridge structures.

The negative impacts are as follows:

- Analysis indicates that the junction at Woodford Road would be significantly over capacity.
- Significantly reduces traffic on the existing A555 and increases traffic on local roads.
- Some traffic currently using the A34 would be routed through Cheadle Hulme.
- Likely to have an adverse impact on scheme benefits and accidents.

The report concludes that further investigation is required. The SEMMMS Project Team was able to determine that an increased junction size would require further loss of residential property.

Option 3 - At grade roundabout

It was determined that traffic modelling of this option was not required due to similar land take requirements of option 2 and will require acquisition and demolition of private residential dwellings.

Option 4 - Grade separated junction (all movements)

It was determined that traffic modelling of this option was not required due to sufficient capacity provided by options 5 and 6 in conjunction with the junction options at the Oil Terminal / Chester Road link junction. This option would also require acquisition and demolition of private residential dwellings.

Option 5 - Grade separated gyratory junction (restricted movements)

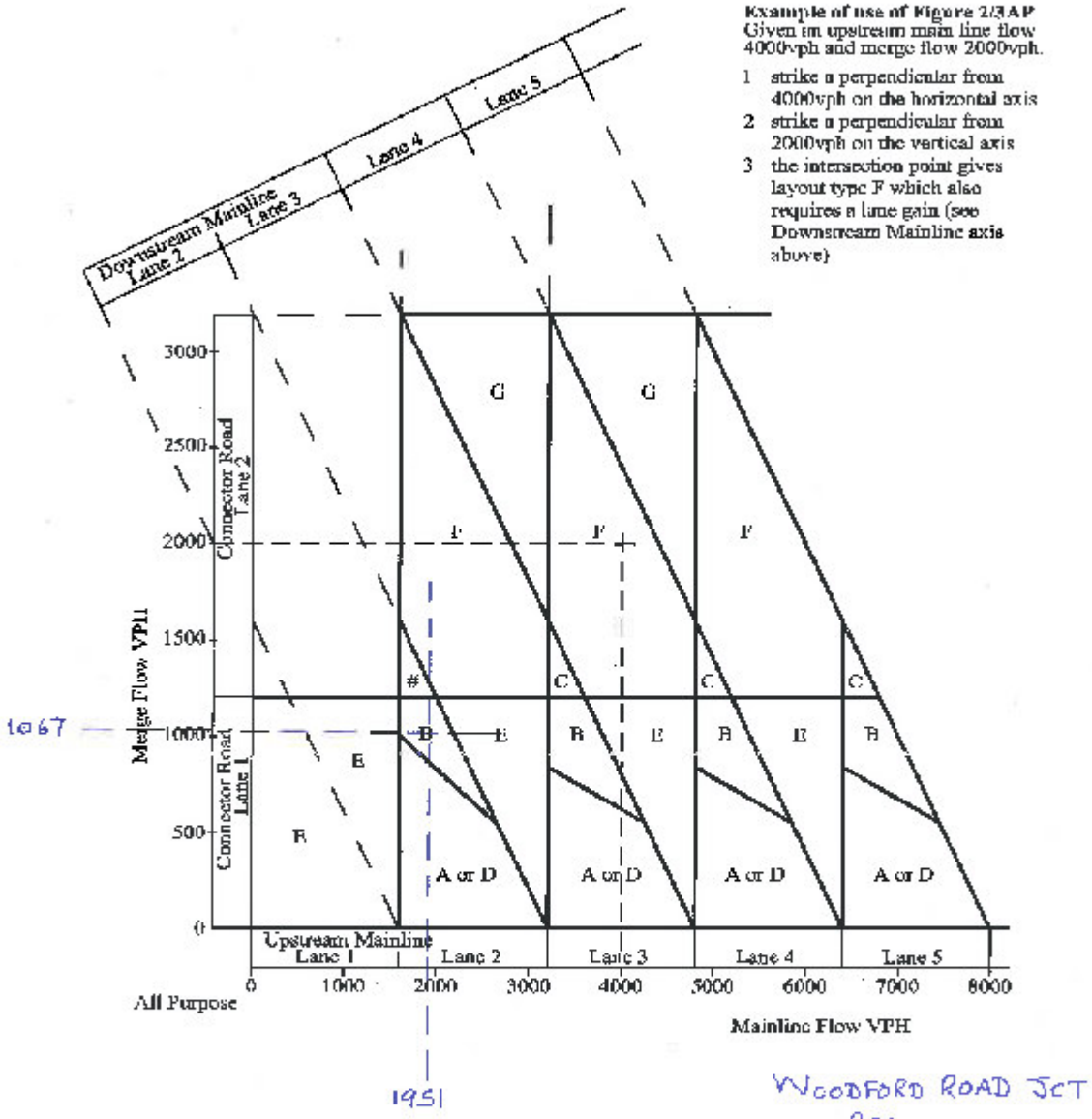
Woodford Road Junction, Bramhall (gyratory layout)
Report Ref: SEMMMS_WoodfordRd_Modelling_Report_DF5-2_19.04.12
Drawing Ref: 1007/2D/DF5/A6-MA/GA/652

A report was commissioned with Transport for Greater Manchester Urban Traffic Control Unit (TfGM UTC) to consider the operational efficiency of the proposed junction in future years 2017 and 2032 using LINSIG modelling computer software. The traffic flows used in the modelling have been taken from a modified DF5 SATURN model constructed by Highways and Forecasting Analytical services (HFAS). The modelling also takes into accounts pedestrian/cyclist and equestrian phases across relevant arms of the junction.

The results of the modelling indicate that the junction would operate within practical capacity during both peak periods in future years 2017 and 2032. The results assume that pedestrian movements are not demanded for every light signal cycle. This assumption has been considered reasonable given the location.

The 2032 design year merge and diverge diagrams from TD22/06 used in slip road designs are shown overleaf in Fig 9.1 and Fig 9.2 respectively. The merge/diverge layout types together with the cross section requirements are included in Table 9.1.

The cross section schedule is provided in Table 9.1 and list of departures are also indicated. The full schedule of departures is outlined in the A6 – MA Relief Road Departures from Standards Report.



Notes:

\# Area of uncertainty – In this area the choice will depend on the downstream provision. If there is a lane gain then use Layout E or F.

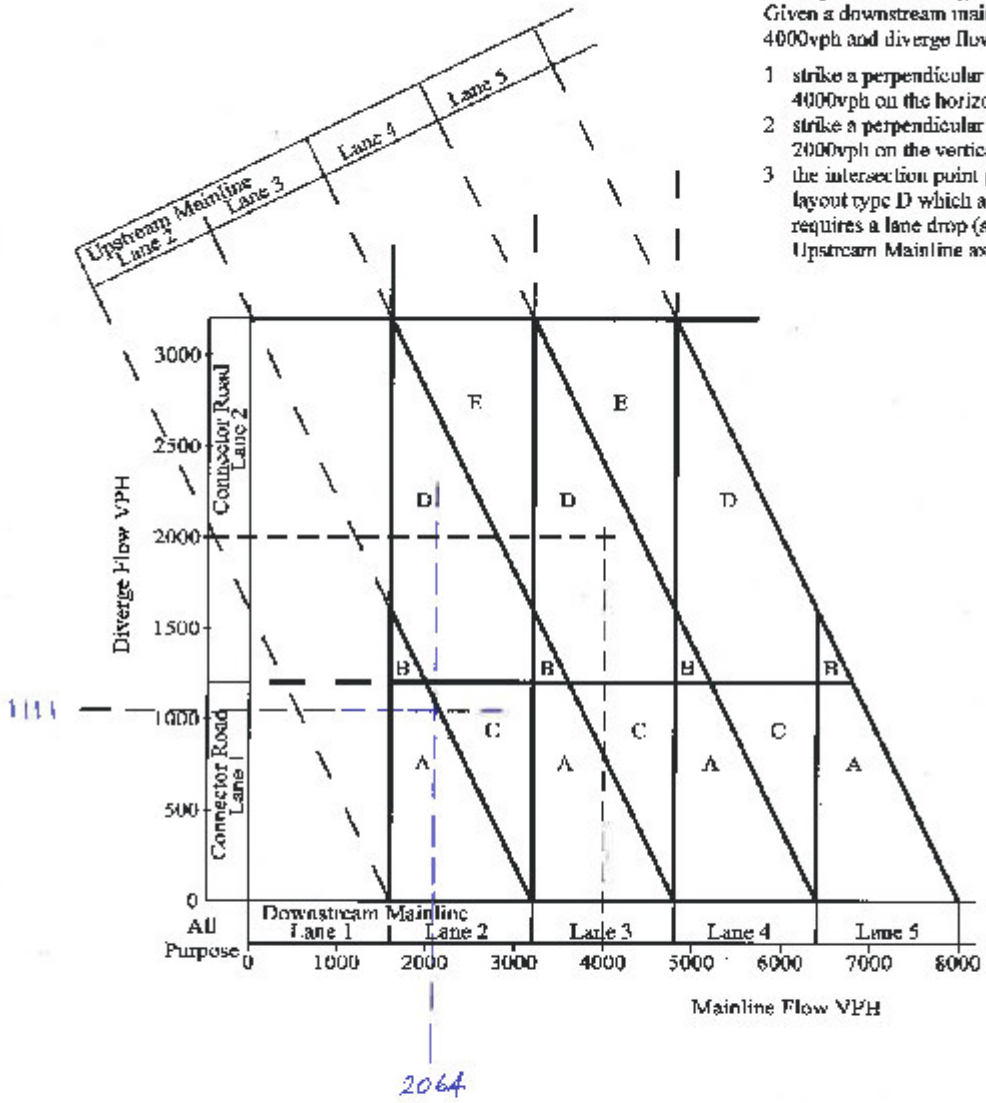
See paragraph 2.29 and the example above, for explanation of the usage of this diagram.

Figure 2/3 AP All-Purpose Road Merging Diagram

Fig 9.1 Woodford Road, Bramhall, Merge Diagram

Example of use of Figure 2/5AP
Given a downstream main line flow 4000vph and diverge flow 2000vph.

1 strike a perpendicular from 4000vph on the horizontal axis
2 strike a perpendicular from 2000vph on the vertical axis
3 the intersection point gives layout type D which also requires a lane drop (see Upstream Mainline axis above)



WOODFORD RD JCT
BRAMHALL
E/B DIVERGE

Notes:

See paragraph 2.43 and the example above, for explanation of the usage of this diagram.

Figure 2/5 AP All-Purpose Road Diverging Diagram

Fig 9.2 Woodford Road Diverge Diagram

WOODFORD ROAD JUNCTION, BRAMHALL

SLIP ROAD	DESIGN YEAR	CONNECTOR ROAD FLOW FOR YEAR 2032 / VPH		MAINLINE UPSTREAM FLOW FOR YEAR 2032 / VPH		MAINLINE DOWNSTREAM FLOW FOR YEAR 2032 / VPH		MAIN LINE CORRECTED FLOWS FOR HGVs		CONNECTOR ROAD CORRECTED FLOWS FOR HGVs		CONNECTOR ROAD CROSS-SECTION (TD 22/06 Table 3/1b)	REQUIRED MERGE / DIVERGE LAYOUT (see Appendix E)	CORE DESIGN DF6 PROPOSAL MERGE / DIVERGE LAYOUT	COMMENTS
		AM	PM	AM	PM	AM	PM	AM	PM	AM	PM				
WESTBOUND MERGE	2032	1067	602	1951	1284	3018	1887	3099	1918	1067	603	MG1D	B	A	To be reviewed post Public Consultation
EASTBOUND DIVERGE	2032	612	1111	2132	3175	1521	2064	1605	2095	618	1111	DG2F	A	A	

LOCATION		DESIGN SPEED (kph)	VERGE	H/ST H/SH	CWAY (m)	OFFSIDE H/ST	VERGE	TAPER	AUX LANE	GHOST	NOSE
WB MERGE	URBAN	70	2.0	3.3	3.7	0.7	2.0	130	-	-	75
EB DIVERGE	URBAN	70	2.0 (varies)	1.0	7.3	0.7	2.0	130	-	-	70

Departures from Standard

Eastbound Merge
DMRB TD22, Table 2/3 AP – Traffic figures indicated a requirement for a Type B (Parallel Merge).
Type A Direct Taper Merge layout has been adopted. A review of this decision will be undertaken post public consultation.

Eastbound Diverge
DMRB TD22, Table 2/5 AP – Conforms to standards.

Table 9.3 – Woodford Road, Bramhall Junction Table

Option 6 - Grade separated T junction (restricted movements)

Woodford Road Junction, Bramhall (double T layout)
Report Ref: SEMMMS_WoodfordRd_Modelling_Report_DF5-1_24.02.12
Drawing Ref: 1007/3D/DF5/A6-MA/GA/623

A report was commissioned with Transport for Greater Manchester Urban Traffic Control Unit (TfGM UTC) to consider the operational efficiency of the proposed junction in future years 2017 and 2032 using LINSIG modelling computer software. The traffic flows used in the modelling have been taken from a modified DF5 SATURN model constructed by Highways and Forecasting Analytical services (HFAS). The modelling also takes into accounts pedestrian/cyclist and equestrian phases across relevant arms of the junction.

The results of the modelling indicate that the junction would operate within practical capacity during both peak periods in future years 2017 and 2032. It is current UTC practise to install MOVA to all new junctions and this is anticipated to improve capacity further by up to 15%.

Fig 9.1, 9.2, 9.3 should be referred to for consideration of the junction table and merge/diverge diagrams in accordance with TD 22/06.

9.4 Summary and Recommendations

Option 1 - No junction provision

This option was discounted due to adverse traffic and environmental impacts.

Option 2 - At grade signalised cross road junction

This option was discounted due to traffic capacity modelling forecast and requirement for residential property acquisition.

Option 3 - At grade roundabout

This option was discounted due to traffic capacity modelling forecast and requirement for residential property acquisition.

Option 4 - Grade separated junction (all movements)

This option was discounted due to the location and land restrictions associated with this site location. Option 5 and 6 also provide sufficient traffic capacity without the excessive land requirements.

Option 5 - Grade separated gyratory junction (restricted movements)

Grade separated junction (half diamond west facing slip roads). This option offers an efficient junction configuration with its two bridge structures creating a circulatory configuration for local resident vehicular movements. The half diamond layout, when used in conjunction with a junction at Chester Road, facilitates traffic movements around the Woodford road area. In addition, controlled crossing facilities for Non-Motorised Users (NMUs) will be provided where required.
This layout has been incorporated into the core scheme layout Design Freeze 6 (DF6) and is shown on the 1/2500 Scheme Engineering Drawings.

Option 6 - Grade separated T junction (restricted movements)

Grade separated junction (half diamond west facing slip roads). There would be a signalised T junction at the top of each slip road to facilitate traffic movements linked by a single bridge structure spanning the relief road. The half diamond layout, when used in conjunction with a junction at Chester Road, facilitates traffic movements around the Woodford road area. In addition, controlled crossing facilities for Non-Motorised Users (NMUs) will be provided where required.

RECOMMENDATIONS

Options 5 and 6 to be presented at Public Consultation.

General Note: Junction layouts have been considered at this location in conjunction with junction layout proposals at Chester Road. Their close proximity creates an interaction in respect of predicted traffic movements.

10. A555 / A34

10.1 Existing Situation & Constraints

The A555 is a two lane dual carriageway running east/west and is approximately 4km long. The typical cross section comprises 2 standard width lanes and 700mm hard strips on the near side and offside. The central reserve is typically 4.5m wide and contains steel safety barrier and street lighting columns.

The A34 is 2 lane dual carriageway running north / south and is a major route in to and out of central Manchester. The typical cross section comprises 2 standard width lanes with 700mm wide hard strips on the nearside and offside. The central reserve varies at this location and contains steel safety barrier and street lighting columns.

- The existing design speed for A555 is 120kph.
- The proposed design speed is to remain at 120kph at this location.
- The existing A34 has a design speed of 60kph to the north of the existing roundabout.
- To the south of the roundabout the design speed of the A34 is 120kph.
- The proposed change in design speed is to occur south of the roundabout. 70kph north of borough boundary, 120kph south of boundary.
- The circulatory design speed is currently 120kph.
- The circulatory design speed is proposed to be 70kph.
- Slip roads are designed to 70kph. This is to remain.

The existing junction is grade separated with the free flow roundabout at the lower level and the mainline for the A555 crossing over on two highway bridges. The internal radius is approximately 32m. The western highway bridges currently spans two lanes of traffic and the eastern bridge spans three lanes. There is sufficient room under the western structure to facilitate an additional third lane. The A555 including the west facing slips cross Earl Road on a third highway bridge.

There are no NMU facilities adjacent to the existing A555. There is a segregated cycleway / footway on the A34 on both east and west sides. There are uncontrolled pedestrian crossing facilities at the bottom of both east facing slip roads.

To the north west of the junction there is a retail park with parking and industrial units present. To the south west there are further industrial units. To the south east and north east there is agricultural farmland. There is also residential housing further north east of the junction. Refer to Appendix A for a location plan.

The charted existing services that are present within the footways or carriageways of the A555 and A34 junction and are required to be diverted are as follows:

- British Telecom communication cables.

10.2 Alternative Junction Layouts

The changes to the existing junction layout were considered by a Technical Working Group made up of a variety of engineering and environmental specialists from the SEMMMS Project Team. The preferred layout was then submitted to the SEMMMS Project Board, consisting of high level officers from all partnering bodies, for final confirmation.

Option 1 – Existing grade separated junction

The grade separated junction has been retained. The existing roundabout at the bottom of the slip roads will be signalised along with the circulatory carriageway movements. Both of the diverge slip roads will be widened to increase traffic capacity, as will the north and south bound roundabout entry arms of the A34. The west bound merge slip road will change from a direct merge taper to a lane gain configuration, and the east bound diverge slip road will change from a direct diverge taper to a lane drop configuration. In addition, controlled crossing facilities for Non-Motorised Users (NMUs) will be provided on the northern side of the junction.

10.3 Traffic Data

Report Ref: **A34_SEMMMS_AMD_DF5**
Drawing Ref: **1007/3D/DF5/A6-MA/GA/506**

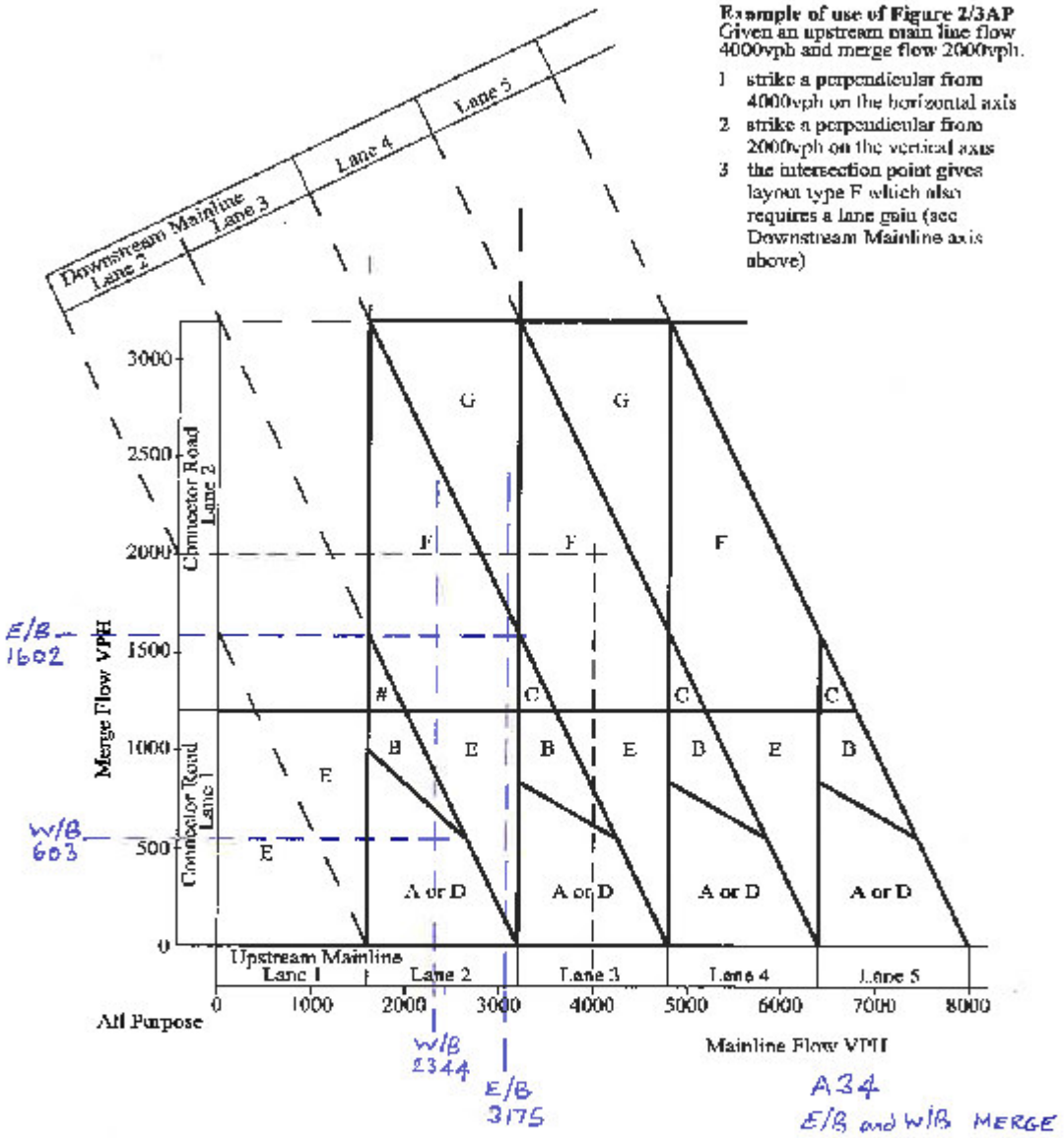
A report was commissioned with Transport for Greater Manchester Urban Traffic Control Unit (TfGM UTC) to consider the operational efficiency of the proposed junction in future years 2017 and 2032 using LINSIG modelling computer software. The traffic flows used in the modelling have been taken from a modified DF5 SATURN model constructed by Highways and Forecasting Analytical services (HFAS). The modelling also takes into accounts pedestrian/cyclist and equestrian phases across relevant arms of the junction.

The results of the modelling indicate that the junction would operate well above practical capacity during both peak periods in future years 2017 and 2032. Although it is current UTC practise to install MOVA to all new junctions it is extremely unlikely that this would mitigate the excessive oversaturation predicted to occur.

The high traffic saturation currently being experienced at this junction, and the close proximity of the Stanley Green Roundabout Junction, the SEMMMS Design Team has developed the scheme proposals to integrate the traffic analysis of both junctions.

Refer also to the Stanley Green junction traffic assessment for further details on this junction layout.

The 2032 design year eastbound and westbound merge and diverge diagrams from TD22/06 used in slip road designs are shown overleaf in Fig 10.1 and Fig 10.2 respectively. The merge/diverge layout types together with the cross section requirements/schedule are included in Table 10.3. The full schedule of departures are outlined in the A6 – MA Relief Road Departures from Standards Report.



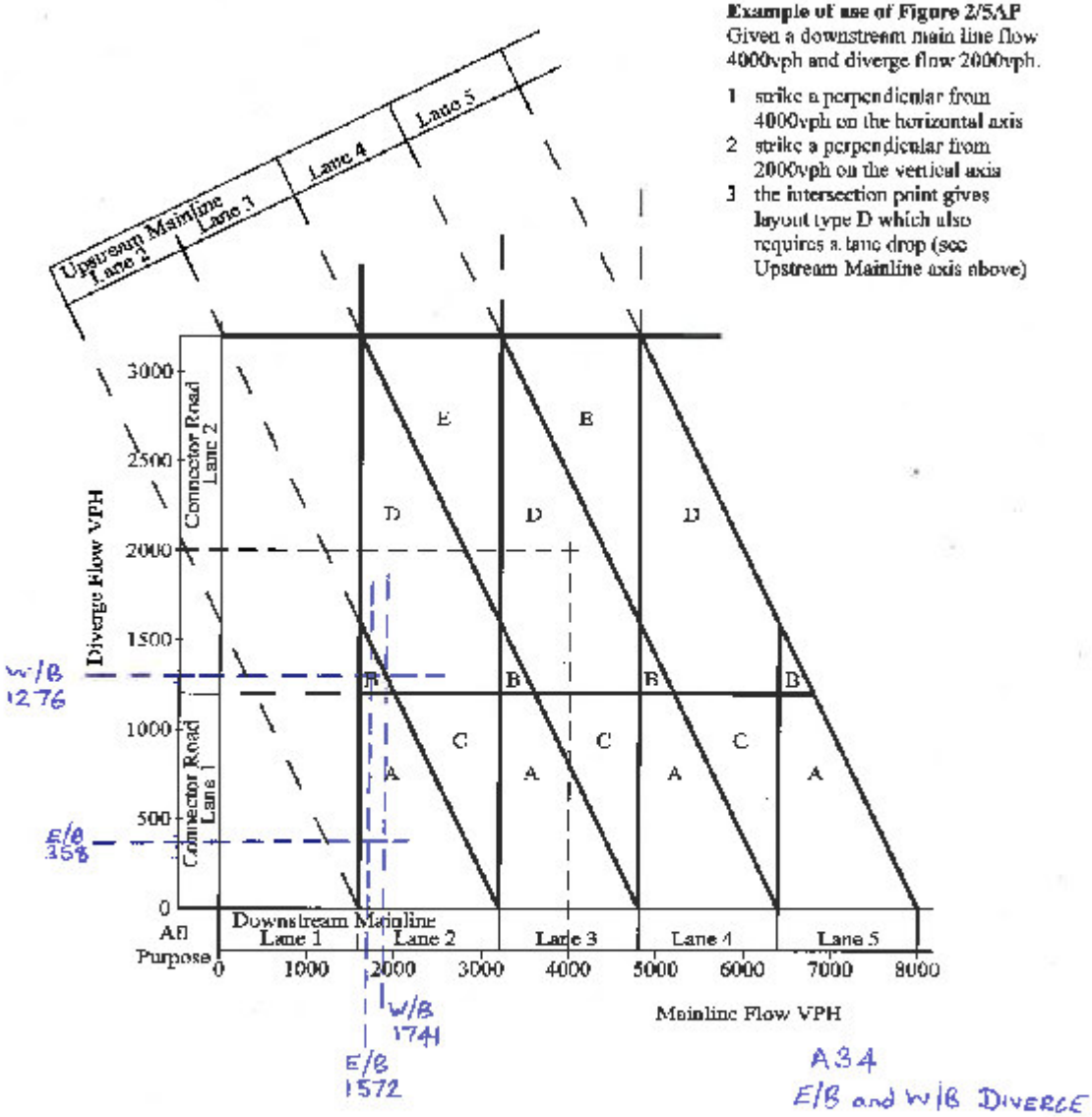
Notes:

\# Area of uncertainty – In this area the choice will depend on the downstream provision. If there is a lane gain then use Layout E or F.

See paragraph 2.29 and the example above, for explanation of the usage of this diagram.

Figure 2/3 AP All-Purpose Road Merging Diagram

Fig 10.1 A34 / A555 Eastbound and Westbound Merge Diagram



Notes:

See paragraph 2.43 and the example above, for explanation of the usage of this diagram.

Figure 2/5 AP All-Purpose Road Diverging Diagram

Fig 10.2 A34 / A555 Eastbound and Westbound Diverge Diagram

A34 JUNCTION

SLIP ROAD	DESIGN YEAR	CONNECTOR ROAD FLOW FOR YEAR 2032 / VPH		MAINLINE UPSTREAM FLOW FOR YEAR 2032 / VPH		MAINLINE DOWNSTREAM FLOW FOR YEAR 2032 / VPH		MAIN LINE CORRECTED FLOWS FOR HGVs		CONNECTOR ROAD CORRECTED FLOWS FOR HGVs		CONNECTOR ROAD CROSS-SECTION (TD 22/06 Table 3/1b)	REQUIRED MERGE / DIVERGE LAYOUT (see Appendix E)	CORE DESIGN DF6 PROPOSAL MERGE / DIVERGE LAYOUT	COMMENTS
		AM	PM	AM	PM	AM	PM	AM	PM	AM	PM				
EASTBOUND DIVERGE	2032	488	358	1586	1931	1097	1572	1144	1589	488	359	DG1D	A	C	Existing site constraints define core layout
EASTBOUND MERGE	2032	1034	1602	1097	1572	2132	3175	2223	3206	1077	1616	MG1D	E	A	To be reviewed post Public Consultation
WESTBOUND DIVERGE	2032	1276	1002	3018	1887	1741	884	1777	896	1320	1022	DG1D	B	A	To be reviewed post Public Consultation
WESTBOUND MERGE	2032	603	638	1741	884	2344	1523	2383	1536	605	639	MG1D	A	E	Existing site constraints define core layout

LOCATION		DESIGN SPEED (kph)	VERGE	H/ST H/SH	CWAY (m)	OFFSIDE H/ST	VERGE	TAPER	AUX LANE	GHOST	NOSE
EB DIVERGE	URBAN	70	0.0	0.7	5.1	0.5	2.0 – 3.0	LANE DROP	-	-	70
EB MERGE	URBAN	70	2.0	1.0	4.5	1.0	2.0	130	-	-	75
WB DIVERGE	URBAN	70	2.0	1.0	5.0	1.0	1.5	150	-	-	70
WB MERGE	URBAN	70	2.0	1.0	3.7	0 – 2.7	1.5	LANE GAIN	-	-	105

Note
Eastbound diverge verge (0m) has been replaced with a 2.5m wide pedestrian cycleway.

Table 10.3 A34 Junction Table

10.4 Summary and Recommendations

The junction is an existing grade separated junction. Additional lanes have been provided on slip road approaches to the lower level roundabout. The circulatory and approach arms to the roundabout will also be upgraded to a fully signalised specification.
These changes have been fully assessed using various traffic engineering techniques. In addition, controlled crossing facilities for NMUs will be provided on the northern and eastern side of the junction.
This layout has been incorporated into the core scheme layout Design Freeze 6 (DF6) and is shown on the 1/2500 Scheme Engineering Drawings.

RECOMMENDATIONS

This is the recommended option and will be presented at Public Consultation.

11. A34 / Stanley Road

11.1 Existing Situation & Constraints

The A34 is 2 lane dual carriageway running north / south and is a major route in to and out of central Manchester. The typical cross section comprises 2 standard width lanes plus 700mm wide hard strips on the nearside and offside. The central reserve varies at this location and contains steel safety barrier and street lighting columns.

Stanley Road is a single carriageway which runs east west. It connects Cheadle Hulme to the east and Heald Green to the west.

- The existing design speed for A34 is 50kph southern approach to the roundabout and 85kph northern of the roundabout.
- The proposed design speed is 70kph between Stanley Green Rbt and A555 roundabout (see Ch. 10 also).
- The proposed design speed on the northern approach to Stanley Green Rbt is 70kph.
- The existing Stanley Road has a design speed of 60kph
- The proposed Stanley Road is design speed of 60kph

The current arrangement is a priority roundabout. There are two circulatory lanes and traffic movements are controlled by spiral road markings currently. There are controlled crossing facilities across the A34 on the north and south approaches. There is a segregated cycle/footway on the east and west of the A34. Stanley Road contains a combination of standard width and non-standard width footways.

To the north west of the junction is an open landscaped area maintained by SMBC. To the south west of the junction is the Stanley Green retail and industrial estate. To the north east and south east of the junction are residential properties partly protected by an artificial earth bund with dense mature vegetation. Refer to Appendix A for a location plan.

There are currently no charted statutory undertakers equipment envisaged to be diverted.

11.2 Alternative Junction Layouts

The junction proposals are located predominately within the existing highway with minor additional landtake required. Residential properties restrict landtake to the east and west of the existing roundabout junction. The A34 dual two carriageway runs north to south through the junction.

The design options were considered for suitability by a Technical Working Group made up of a variety of engineering and environmental specialists from the SEMMMS Project Team. A preferred layout was then submitted to the SEMMMS Project Board, consisting of high level officers from all partnering bodies, for final confirmation.

Option 1 - **All movement at grade signalised roundabout**

The existing roundabout configuration has been changed to facilitate predicted traffic flow requirements. In addition, controlled crossing facilities for NMUs will be provided.

Option 2 - All movement at grade signalised crossroads junction

An all movement at grade signalised crossroads junction with controlled crossing facilities for Non-Motorised Users (NMUs) will be provided.

11.3 Traffic Data

Option 1 - All movement at grade signalised roundabout
Report Ref: A34_Stanley_Green_Roundabouts_Comparison_WLC1
Drawing Ref: 1007/3D/DF5/A6-MA/GA/622

A report was commissioned with Transport for Greater Manchester Urban Traffic Control Unit (TfGM UTC) and provides a comparison of the operation of the roundabouts of Stanley Road/A34 and A34/A555 with and without the SEMMMS development. The SEMMMS development includes proposals to signalise the two roundabouts. Without the SEMMMS development, the two junctions will remain as priority roundabouts. to consider the operational efficiency of the proposed junction in future year 2032 using LINSIG modelling computer software. The analysis centred on three scenarios:

i. 2009 existing flows.
ii. 2032 Do minimum, and
iii. 2032 Do something.

The traffic flows used in the modelling have been taken from a modified DF5 SATURN model constructed by Highways and Forecasting Analytical services (HFAS). The modelling also takes into accounts pedestrian/cyclist phases across relevant arms of the junction.

The traffic analysis has combined the predicted traffic flows of the Stanley Green junction and the A34/A555 junctions due to their close proximity.

The results of the modelling indicate that the existing A555/A34 junction and A34/Stanley Green roundabout are currently oversaturated with excessive queuing on several arms during both peak periods.

For the 2032 Do Minimum scenario these problems would be further compounded for both junctions due to the predicted increase in traffic flows.

For the 2032 Do Something scenario, the signalisation and alterations to the A34/A555 roundabout will result in significant improvements with all arms operating within capacity during both peak periods. This will result in reduced congestion, queuing and delays.

However, the signalisation of A34/Stanley Green Roundabout will not result in significant improvements. Only slight improvements will be observed in the morning peak in comparison to the 2032 Do Minimum scenario, while the signalisation will actually result in higher levels on congestion during the evening peak.

In conclusion, the modelling indicates that the signalisation of the A34/A555 will result in significant reductions in congestion and delay during both peak periods for future year 2032. However, the benefits of signalising A34/Stanley Green

roundabout are limited with predicted queues effecting the operation of the A34/A555 junction.

It is worth pointing out that without any signalisation to either existing roundabout, the traffic figures predict significantly worse traffic congestion through the junctions.

Option 2 - All movement at grade signalised crossroads junction
Report Ref: A34_StanleyGreen_Modelling/Report_15-05-12
Drawing Ref: 1007/2D/DF5/A6-MA/GA/653

A report was commissioned with Transport for Greater Manchester Urban Traffic Control Unit (TfGM UTC) to consider the operational efficiency of the proposed junction in future years 2017 and 2032 using LINSIG modelling computer software. The traffic flows used in the modelling have been taken from a modified DF5 SATURN model constructed by Highways and Forecasting Analytical services (HFAS). The modelling also takes into accounts pedestrian/cyclist phases across relevant arms of the junction.

This report follows on from the previous A34/Stanley Green Signalised Roundabout report.

The traffic analysis has combined the predicted traffic flows of the Stanley Green junction and the A34/A555 junctions due to their close proximity.

The results of traffic modelling indicate that the existing A555/A34 and A34/Stanley Green roundabouts are currently oversaturated with excessive queuing on several arms during both peak periods.

The signalisation and alterations to the A34/A555 roundabout will result in significant improvements with all arms operating within capacity during both 2032 peak periods. This will result in reduced congestion, queuing and delays.

However, the alterations to a signalised cross road arrangement at A34/Stanley Green indicate that the junction will operate well above practical capacity during both peak periods in both forecast years.

11.4 Summary and Recommendations

Option 1 - All movement at grade signalised roundabout

All movement at grade signalised roundabout. Existing roundabout configuration changed to facilitate predicted traffic flow requirements. In addition, controlled crossing facilities for NMUs will be provided.
This layout has been incorporated into the core scheme layout Design Freeze 6 (DF6) and is shown on the 1/2500 Scheme Engineering Drawings.

Option 2 - All movement at grade signalised crossroads junction

All movement at grade signalised crossroads junction. In addition, controlled crossing facilities for NMUs will be provided.

RECOMMENDATIONS

Both options to be presented at Public Consultation.

12. B5358 Wilmslow Road

12.1 Existing Situation & Constraints

Wilmslow Road is a single carriageway of 'B' road classification (B5358). The junction itself is within the CEC boundary. The SMBC boundary is approximately 200m north of the junction location.

- The existing design speed for Wilmslow Road is 60kph
- The proposed design speed is 60kph
- The proposed relief road mainline design is 85kph

There is an existing grade separation between the existing A555 which heads east, and the dumbbell junction arrangement on Wilmslow Road. Currently east facing slip roads connect with the A555. There is no mainline traffic heading west under the existing highway bridge. The existing highway bridge permits the mainline relief road to continue within its existing width without modification.

To the north west of the junction there are trading businesses including a private day nursery and retail shop. To the north east there is open space and a hotel. To the south east and south west there are residential properties. To the east there is a private car park adjacent to Wilmslow Road.

Clay Lane has direct vehicular access onto Wilmslow Road. This access is a requirement for any future junction configurations as agreed with the Highway Authority, CEC. Refer to Appendix A for a location plan.

The existing services that are present within the footways or carriageways of Wilmslow Road and are required to be diverted are as follows:

- United Utilities water mains
- ENW LV and HV electric mains

12.2 Alternative Junction Layouts

The existing layout of Wilmslow Road consists of a grade separated half diamond dumb bell junction. It incorporates east facing slip roads which form the termination of the existing A555. A bridge structure has already been constructed, in anticipation of the proposed scheme, and spans the route of the relief road.

The design layouts were considered for suitability by a Technical Working Group made up of a variety of engineering and environmental specialists from the SEMMMS Project Team. A preferred layout was then submitted to the SEMMMS Project Board, consisting of high level officers from all partnering bodies, for final confirmation.

Option 1 – Existing junction layout

The existing junction configuration will remain namely, dumb bell roundabouts with east facing only slip roads. Minor works to bottom of slip roads to create DMRB compliant merge and diverge layouts. Provision of a new pedestrian/cycleway link adjacent to the east bound merge slip road.

Option 2 – Grade separated junction (all movements)

Grade separated all movements junction. Will require work to the existing slip roads to create merge and diverge layout in accordance with DMRB. Additional west facing slip roads to be constructed with tie into the existing dumb bell roundabout arrangement. Direct vehicular access to Clay Lane will be maintained. In addition, non-controlled crossing facilities for Non-Motorised Users (NMUs) will be provided. Provision of a new pedestrian/cycleway link adjacent to the east bound merge slip road.

12.3 Traffic Data

Option 1 - Existing junction layout

TfGM Highways Forecasting and Analytical Services (HFAS) were commissioned to test options 1 in terms of the effects on traffic in the local adjacent network as a differential to option 2. Atkins were commissioned by the SEMMMS Project Team (SPT) and provided comment within a separate report to indicate the implications of such a scenario.

Overall the positive aspects that would reflect on the overall scheme benefit cost ratio and traffic forecasts are as follows:

- Reduced construction cost due to omission of the slip roads
- Reduced traffic on the B5358 through Heald Green and through Dean Row.

The negative impacts are as follows:

- The removal of turning movement at this junction results in traffic re-routing along longer routes and is likely to lead to economic disbenefits.
- Increased traffic on Finney Lane
- Increased traffic on unsuitable Stanneylands Road, Styal Road and A5102 Wilmslow Road.
- Will create ‘u’ turning traffic at the A34 junction and add to the weaving traffic on the new road between the A34 and B5358.
- Increased traffic through Stanley Green roundabout.

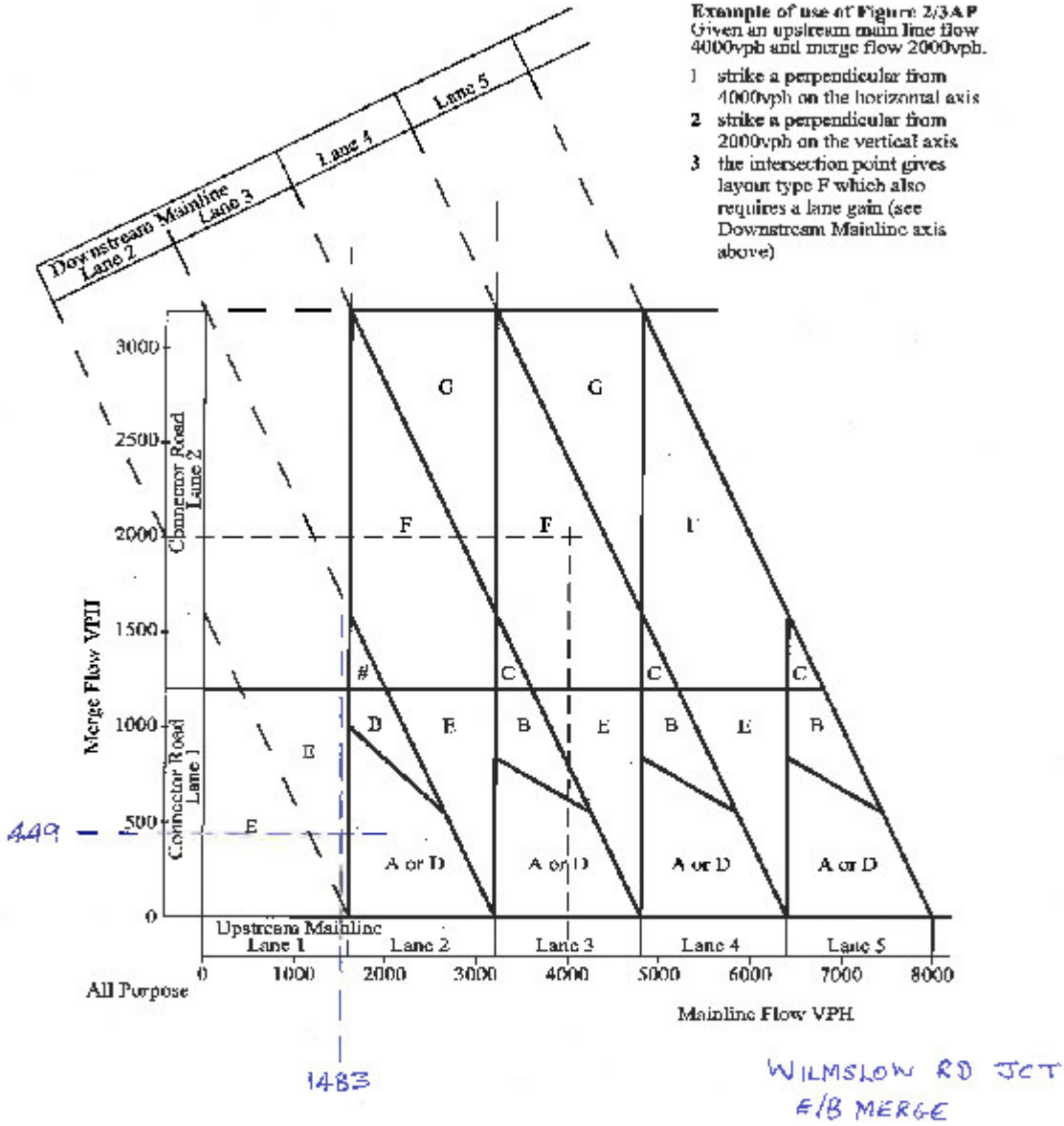
The report concludes that the option should be discounted.

Option 2 - Grade separated junction (all movements)
Report Ref: Wilmslow_Road_Roundabouts_Modelling_Report_WLC1
Drawing Ref: 1007/3D/DF5/A6-MA/GA/507 RevC

A report was commissioned with Transport for Greater Manchester Urban Traffic Control Unit (TfGM UTC) to consider the operational efficiency of the proposed junction in future years 2017 and 2032 using LINSIG modelling computer software. The traffic flows used in the modelling have been taken from a modified DF5 SATURN model constructed by Highways and Forecasting Analytical services (HFAS). The modelling also takes into accounts pedestrian/cyclist phases across relevant arms of the junction.

The results of the modelling indicate that the junction would operate within practical capacity during both peak periods in future years 2017 and 2032.

The 2032 design year eastbound and westbound merge and diverge diagrams from TD22/06 used in slip road designs are shown overleaf in Fig 12.1 to Fig 12.4 respectively. The merge/diverge layout types together with the cross section requirements are included in Table 12.5. The full schedule of departures is outlined in the A6 – MA Relief Road Departures from Standards Report.



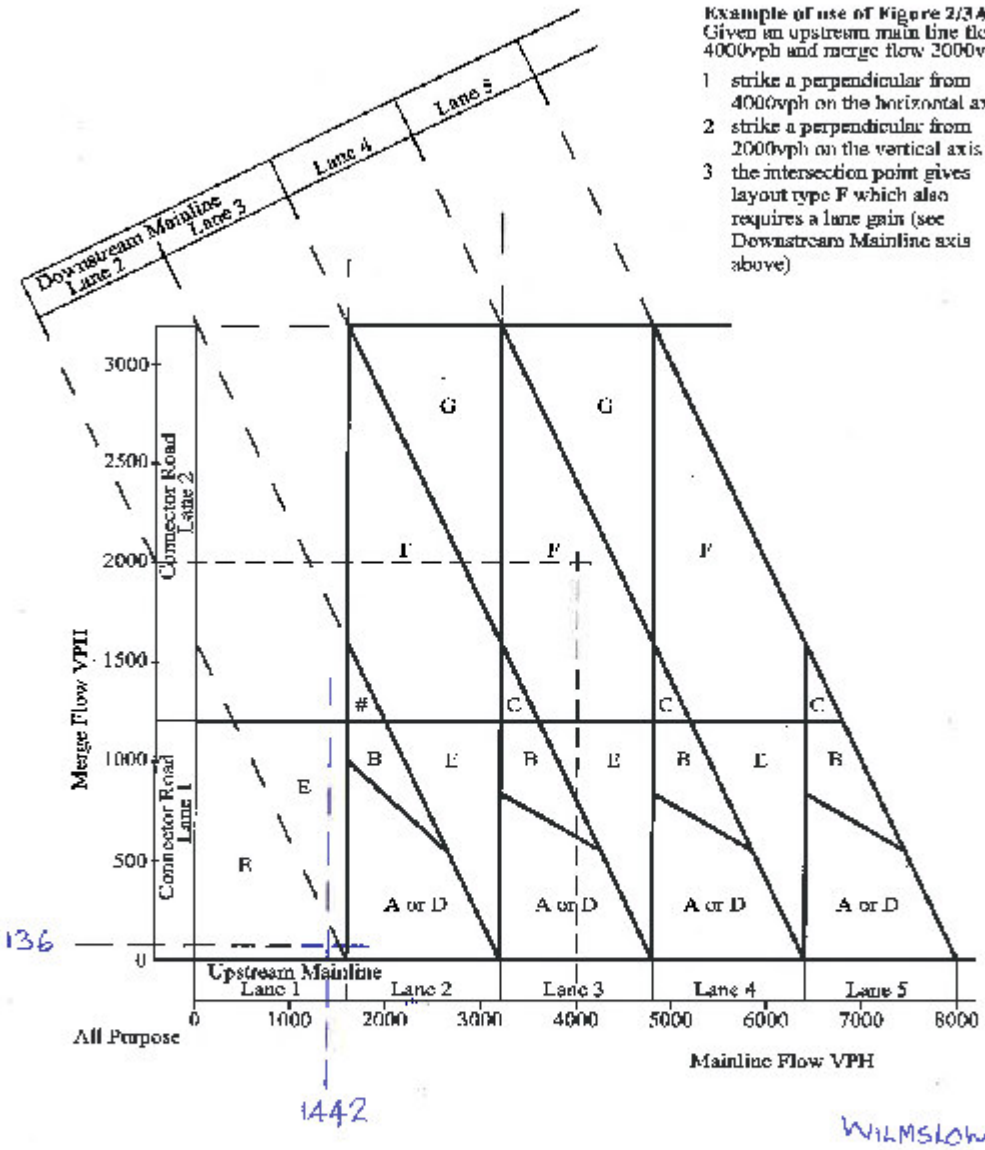
Notes:

\# Area of uncertainty In this area the choice will depend on the downstream provision. If there is a lane gain then use Layout E or F.

See paragraph 2.29 and the example above, for explanation of the usage of this diagram.

Figure 2/3 AP All-Purpose Road Merging Diagram

Fig 12.1 Wilmslow Road Junction eastbound merge diagram



Notes:

\# Area of uncertainty – In this area the choice will depend on the downstream provision. If there is a lane gain then use Layout E or F.

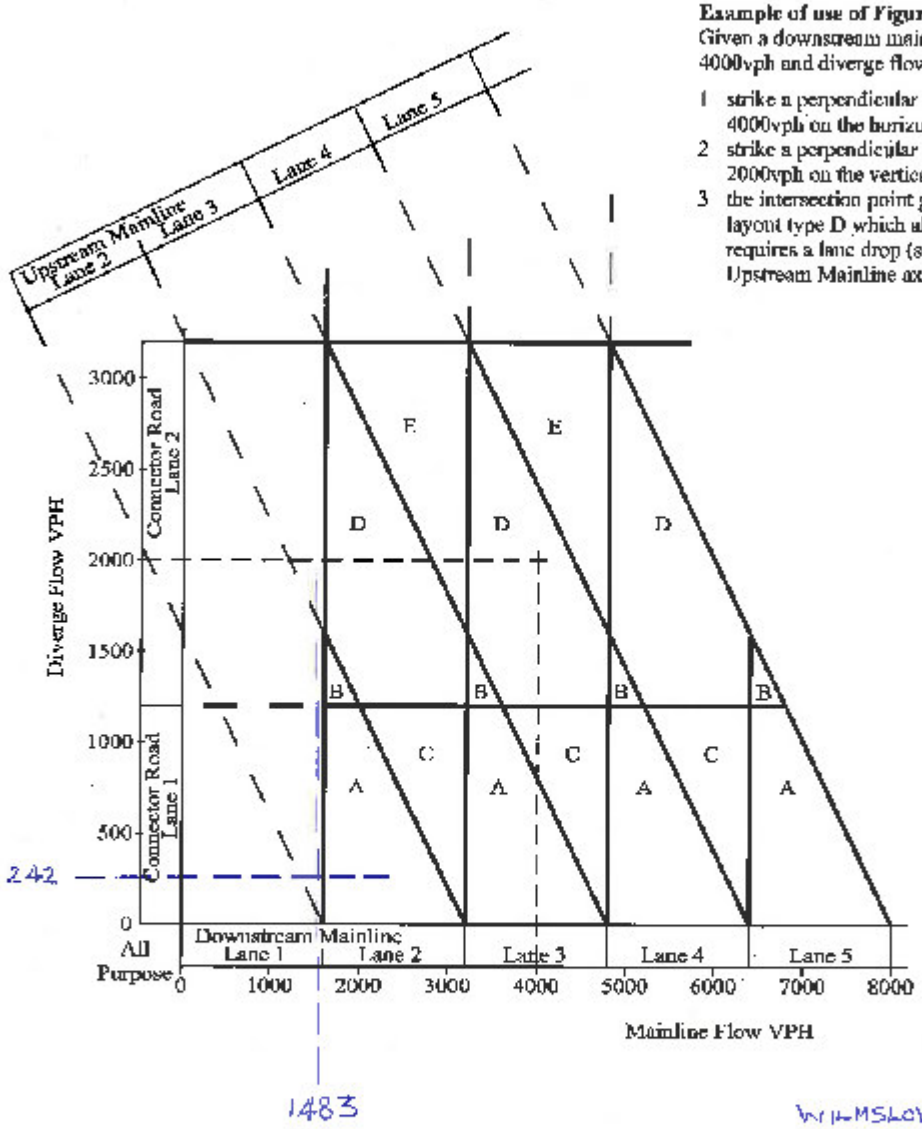
See paragraph 2.29 and the example above, for explanation of the usage of this diagram.

Figure 2/3 AP All-Purpose Road Merging Diagram

Fig 12.2 Wilmslow Road Junction westbound merge diagram

Example of use of Figure 2/5AP
Given a downstream main line flow 4000vph and diverge flow 2000vph.

1 strike a perpendicular from 4000vph on the horizontal axis
2 strike a perpendicular from 2000vph on the vertical axis
3 the intersection point gives layout type D which also requires a lane drop (see Upstream Mainline axis above)



Notes:

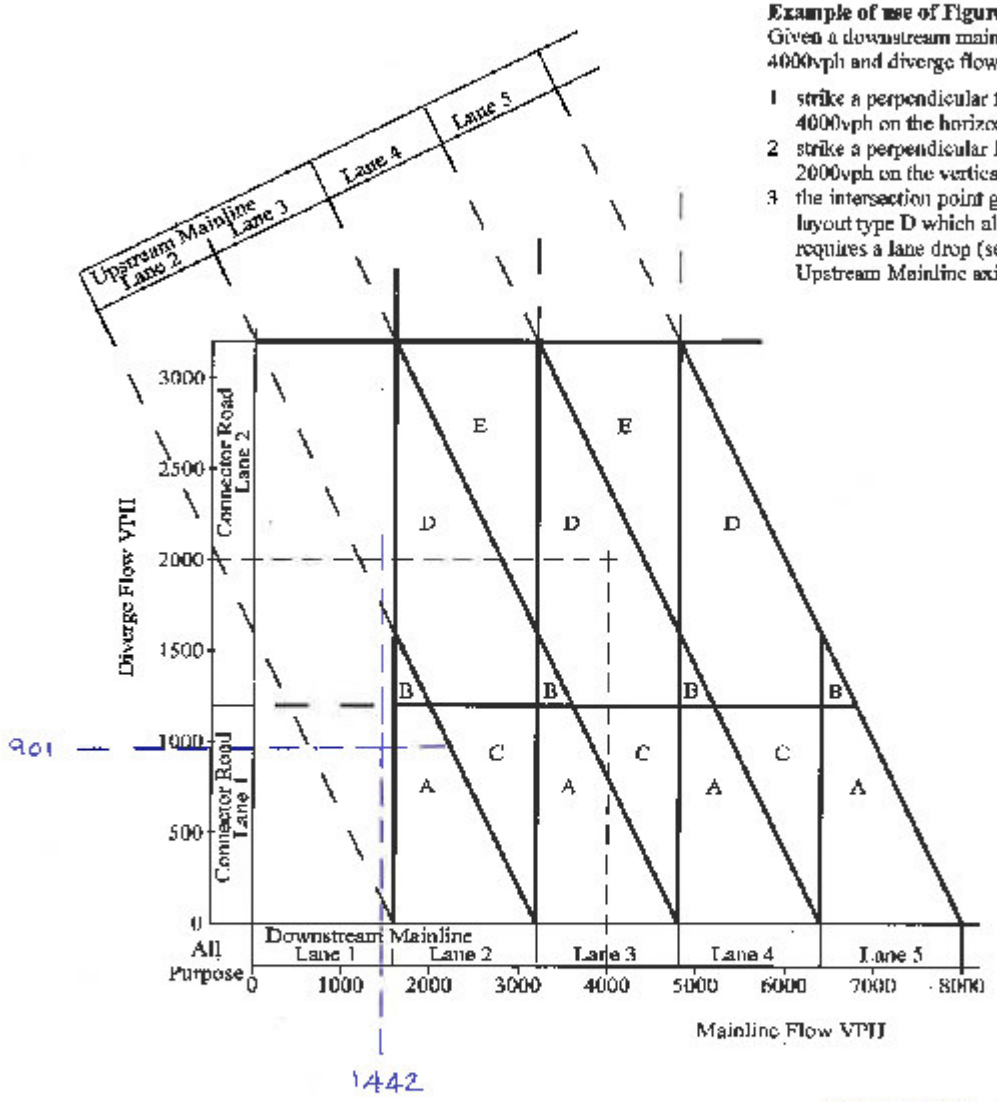
See paragraph 2.43 and the example above, for explanation of the usage of this diagram.

Figure 2/5 AP All-Purpose Road Diverging Diagram

Fig 12.3 Wilmslow Road Junction eastbound diverge diagram

Example of use of Figure 2/5AP
Given a downstream main line flow 4000vph and diverge flow 2000vph,

1 strike a perpendicular from 4000vph on the horizontal axis
2 strike a perpendicular from 2000vph on the vertical axis
3 the intersection point gives layout type D which also requires a lane drop (see Upstream Mainline axis above)



Notes:

See paragraph 2.43 and the example above, for explanation of the usage of this diagram.

Figure 2/5 AP All-Purpose Road Diverging Diagram

Fig 12.4 Wilmslow Road Junction westbound diverge diagram

WILMSLOW ROAD JUNCTION

SLIP ROAD	DESIGN YEAR	CONNECTOR ROAD FLOW FOR YEAR 2032 / VPH		MAINLINE UPSTREAM FLOW FOR YEAR 2032 / VPH		MAINLINE DOWNSTREAM FLOW FOR YEAR 2032 / VPH		MAIN LINE CORRECTED FLOWS FOR HGVs		CONNECTOR ROAD CORRECTED FLOWS FOR HGVs		CONNECTOR ROAD CROSS-SECTION (TD 22/06 Table 3/1b)	REQUIRED MERGE / DIVERGE LAYOUT (see Appendix E)	CORE DESIGN DF6 PROPOSAL MERGE / DIVERGE LAYOUT	COMMENTS
		AM	PM	AM	PM	AM	PM	AM	PM	AM	PM				
EASTBOUND DIVERGE	2032	338	242	1491	1724	1155	1483	1202	1500	349	242	DG1D	A	A	-
EASTBOUND MERGE	2032	433	449	1155	1483	1586	1931	1634	1949	433	449	MG1D	E	E	-
WESTBOUND DIVERGE	2032	901	501	2344	1523	1442	1014	1480	1027	901	501	DG2F	A	C	Existing site constraints define core layout
WESTBOUND MERGE	2032	136	391	1442	1014	1577	1405	1616	1419	136	391	MG1D	E	B	To be reviewed post Public Consultation

LOCATION		DESIGN SPEED (kph)	VERGE	H/ST H/SH	CWAY (m)	OFFSIDE H/ST	VERGE	TAPER	AUX LANE	GHOST	NOSE
EB DIVERGE	URBAN	70	2.0	3.3	3.7	0.3	2.0	75	-	-	40
EB MERGE	URBAN	70	2.0	0.7 – 5.0	3.7	0.7 – 5.0	2.0	LANE GAIN	-	-	85
WB DIVERGE	URBAN	70	2.0 (varies)	0.7	7.3	0.7	2.0 (varies)	LANE DROP	-	-	85
WB MERGE	URBAN	70	2.0	3.3	3.7	0.3	2.0	40	100	-	40

Table 12.5 Wilmslow Road Junction Table

12.4 Summary and Recommendations

Option 1 - Existing junction layout

The existing junction layout to remain. This option discounted based on traffic impacts to the local network and disbenefits created.

Option 2 - Grade separated junction (all movements)

Existing half diamond grade separated junction upgrade to an all movements grade separated junction. Minor works to existing east facing slips. In addition, controlled crossing facilities for Non-Motorised Users (NMUs) will be provided where required. Direct vehicular access/egress to Clay Lane is accommodated.
This layout has been incorporated into the core scheme layout Design Freeze 6 (DF6) and is shown on the 1/2500 Scheme Engineering Drawings.

RECOMMENDATIONS

Option 2 is to be presented at Public Consultation.

13. B5166 Styal Road

13.1 Existing Situation & Constraints

Styal Road is a single carriageway of 'B' road classification (B5166).

- The existing design speed for Styal Road is 70kph
- And the proposed design speed is 70kph
- The proposed relief road mainline design is 70kph.

The existing road is orientated north / south connecting Wythenshawe to the north and Styal to the south. The majority of the junction is located within the Manchester City Council (MCC) boundary. Should a large or more southerly option for the alignment and junction be utilised then the new junction would also be situated within the Cheshire East Council (CEC) boundary.

On the east and west side of Styal Road a shared cycle and footway is present. On the west side there is an access to private car parks that serve Manchester Airport. Further south are residential properties on the east and west side. To the east there is a large electricity substation with vehicular access from Styal Road. There is farmland on the west of Styal Road, north of the rail spur and also farmland between Styal Road and the Styal Rail line.

There are no junctions immediately to the south and to the north there is a signalised T junction with Ringway Road. Ringway Road acts as the main route to Manchester Airport from the east.

The Styal Rail line runs parallel to Styal Road at this location. There are northern and southern rail spurs to Manchester Airport. All the rail lines are in deep cutting circa 8m deep. Styal Road currently crosses over the airport spur lines via two rail bridges.

Refer to Appendix A for a location plan.

The existing services that are present within the footways or carriageways of Styal Road and are required to be diverted are as follows:

- United Utilities water mains
- ENW LV and HV mains cables
- ENW Transmissions EHV cables
- National Grid gas mains
- Virgin Media communications cable

13.2 Alternative Junction Layouts

The SEMMMS Project Team has considered three mainline routes from Wilmslow Road Junction towards Manchester Airport. All three routes cross Styal Golf Course and then split into:

- **Option 1** – route aligned directly adjacent to the Electricity Sub-Station.
- **Option 2** – route aligned to the south of the Electricity Sub-Station.
- **Option 3** – route aligned to the north of the Electricity Sub-Station.

Each route option creates its own different junction layout with Styal Road.

The design options were considered for suitability by a Technical Working Group made up of a variety of engineering and environmental specialists from the SEMMMS Project Team. A preferred layout was then submitted to the SEMMMS Project Board, consisting of high level officers from all partnering bodies, for final confirmation.

Option 1 Central Route

An all movement at grade signalised junction to be constructed over the Manchester Airport Spur railway line. This will require additional structures either side of the existing bridge and also to span the existing railway. In addition, controlled crossing facilities for Non-Motorised Users (NMUs) will be provided.

Option 2 Southern Route

Requires the construction of two at grade signalised T junctions. One signalised junction to be constructed on Hollin Lane close to its junction with Moss Lane. The second signalised junction to be constructed on Styal Road, in the vicinity of the entrance to the Electricity Sub-Station. The junctions would be linked by a dual two carriageway on the line of Styal Road utilising the existing bridge structures. In addition, controlled crossing facilities for Non-Motorised Users (NMUs) will be provided. This option will require the demolition of two residential properties on Hollin Lane.

Option 3 Northern Route

An all movement at grade signalised junction located to the north of the existing bridge structures on Styal Road in the vicinity of the entrance to the Electricity Sub-Station. In addition, controlled crossing facilities for Non-Motorised Users (NMUs) will be provided.

General Note:
Each route option requires one bridge structure to cross Styal Main railway Line, while Option 3 requires an additional bridge structure to span the northern rail spur to Manchester Airport.

13.3 Traffic Data

Option 1 - Central Route

Report Ref: **SEMMMS_Styal_DF5.1**
Drawing Ref: **1007/3D/DF5/A6-MA/GA/624**

A report was commissioned with Transport for Greater Manchester Urban Traffic Control Unit (TfGM UTC) to consider the operational efficiency of the proposed junction in future years 2017 and 2032 using LINSIG modelling computer software. The traffic flows used in the modelling have been taken from a modified DF5 SATURN model constructed by Highways and Forecasting Analytical services (HFAS). The modelling also takes into accounts pedestrian/cyclist phases across relevant arms of the junction.

The results of the modelling indicate that the junction would operate below practical capacity during both peak periods in future year 2017 and just over practical capacity during both peak periods in 2032. It is current UTC practise to install MOVA to all new junctions and this is anticipated to improve capacity further by up to 15%.

Option 2 – Southern Route

Report Ref: **SEMMMS_Styal_DF5.1Tjunction**
Drawing Ref: **1007/3D/DF5/A6-MA/GA/679**

A report was commissioned with Transport for Greater Manchester Urban Traffic Control Unit (TfGM UTC) to consider the operational efficiency of the proposed junction in future years 2017 and 2032 using LINSIG modelling computer software. The traffic flows used in the modelling have been taken from a modified DF5 SATURN model constructed by Highways and Forecasting Analytical services (HFAS). The modelling also takes into accounts pedestrian/cyclist phases across relevant arms of the junction.

The results of the capacity assessments indicate that both junctions will operate above capacity during both peak periods in design years 2017 and 2032, with the exception of the southern junction, which operates below capacity in the 2017 evening peak assessment. It is current UTC practise to install MOVA to all new junctions and this is anticipated to improve capacity further by up to 15%.

Option 3 – Northern Route

Report Ref: **Not Applicable**
Drawing Ref: **1007/3D/DF5/A6-MA/GA/414**

A separate traffic analysis report for this junction has not been commissioned. It has been assumed that the junction layout configuration will be that same as Styal Road Option 1 albeit in an adjacent location. It is also assumed that comments and predicted traffic flows would relate to this option in the same manner as Option 1.

13.4 Summary and Recommendations

Option1 – Central Route

An all movement at grade signalised junction to be constructed over the Manchester Airport Spur railway line on a new bridge structure. In addition, controlled crossing facilities for NMUs will be provided.
This layout has been incorporated into the core scheme layout Design Freeze 6 (DF6) and is shown on the 1/2500 Scheme Engineering Drawings.

Option2 – Southern Route

Requires the construction of two at grade signalised T junctions. One signalised junction to be constructed on Hollin Lane close to its junction with Moss Lane. The second signalised junction to be constructed on Styal Road, in the vicinity of the entrance to the Electricity Sub-Station. The junctions would be linked by a dual two carriageway on the line of Styal Road utilising the existing bridge structures. In addition, controlled crossing facilities for NMUs will be provided. This layout requires two residential properties to be demolished so will not be submitted for public consultation.

Option3 – Northern Route

An all movement at grade signalised junction located to the north of the existing bridge structures on Styal Road in the vicinity of the entrance to the Electricity Sub-Station. In addition, controlled crossing facilities for NMUs will be provided.

RECOMMENDATIONS

Options 1 and 3 are to be presented at Public Consultation.

14. Shadowmoss Road

14.1 Existing Situation & Constraints

Shadowmoss Road is single carriageway and unclassified. There is currently a priority junction with Ringway Road.

- The existing design speed for Shadowmoss Road is 60kph
- The proposed design speed is 60kph but may be subject to change dependent on the requirements of MCC.
- The existing design speed for Ringway Road between Shadowmoss Road and Styal Road is 70kph.
- The proposed design speed is 70kph but may be subject to change dependent on the requirements of MCC.
- The proposed relief road mainline design is 70kph.

14.2 Alternative Junction Layouts

Shadowmoss Road meets Ringway Road with an at grade priority T junction. Recent work to extend the Metrolink (TfGM) to Manchester Airport has resulted in a proposal to relocate this junction east of its present position. Refer to Appendix A for a location plan.

The design options were considered for suitability by a Technical Working Group made up of a variety of engineering and environmental specialists from the SEMMMS Project Team. A preferred layout was then submitted to the SEMMMS Project Board, consisting of high level officers from all partnering bodies, for final confirmation.

Option1 – Signalised T junction

Construct an at grade signalised junction with Shadowmoss Road and the relief road.

Option2 – No junction provision

No junction with Shadowmoss Road and the relief road. The relief road ties into the junction of Ringway Road/Ringway Road West and severs part of Ringway Road near its junction with Shadowmoss Road. The junction created as part of the Metrolink works to be removed and Shadowmoss Road to be directly linked into Ringway Road to maintain through service routes for the local community.

14.3 Traffic Data

No traffic analysis was carried out at this location.

14.4 Summary and Recommendations

Option1 - Signalised T junction

Construction of an at-grade priority junction with Shadowmoss Road and the relief road. This option was discounted following discussions with Manchester City Council (MCC) and will not be submitted for public consultation.

Option2 - No junction provision

No junction with Shadowmoss Road and the relief road. The relief road ties into the junction of Ringway Road/Ringway Road West and severs part of Ringway Road near its junction with Shadowmoss Road. The junction created as part of the Metrolink works is to be removed, and Shadowmoss Road to be directly linked into Ringway Road to maintain through service routes for the local community. This option scenario has been developed in conjunction with Manchester City Council. This layout has been incorporated into the core scheme layout Design Freeze 6 (DF6) and is shown on the 1/2500 Scheme Engineering Drawings.

RECOMMENDATIONS

Option 2 is to be presented at Public Consultation.

15. Ringway Road / Ringway Road West

15.1 Existing Situation & Constraints

Ringway Road West is single carriageway and unclassified. There is currently a priority junction with Ringway Road. As part of the Ringway Road Highway Improvement Works Scheme currently being constructed, the layouts and design speeds will change. For clarity of this report

- The existing design speed for Shadowmoss Road is 60kph
- The proposed design speed is 60kph
- The existing design speed for Ringway Road is 70kph.
- The proposed design speed is to remain but may be subject to change dependent on the requirements of MCC.
- The proposed relief road mainline design is 70kph.

15.2 Alternative Junction Layouts

The proposal is to signalise the existing priority junction. The junction works will be carried out as part of the Ringway Road Highway Improvement Works (RRHIW) in conjunction with the Metrolink extension works to Manchester Airport. The signalised junction will provide controlled crossing facilities for NMUs.

The detail design and further traffic modelling has been carried out by M-Pact Thales (MPT) on behalf of TfGM. The SEMMMS Design Team has liaised with MPT to ensure the relief road ties into the signalised junction with minimal impact.

The junction has been designed to provide the capacity to accommodate the predicted relief road traffic flows. Refer to Appendix A for a location plan.

15.3 Traffic Data

Refer to MPT traffic modelling reports.

15.4 Summary and Recommendations

Minimal works to the signal controlled T junction. The works will be carried out as part of the RRHIW in conjunction with the Metrolink extension works to Manchester Airport.

16. CONCLUSIONS

- This report has listed numerous design standards that have and will be used in the development and design of the SEMMMS Relief Road Scheme. The list is not exhaustive and other applicable standards will be referred to, as required.

- The junction matrix tables have shown that the design team has reviewed each junction location and recommended a design solution or solutions to the Project Board based upon proven design criteria for their approval.

- As principal designers, the SEMMMS Project Team at Stockport MBC and the commissioned specialist consultants have endeavoured to comply with design standards and agreed best practise throughout the development of the scheme.

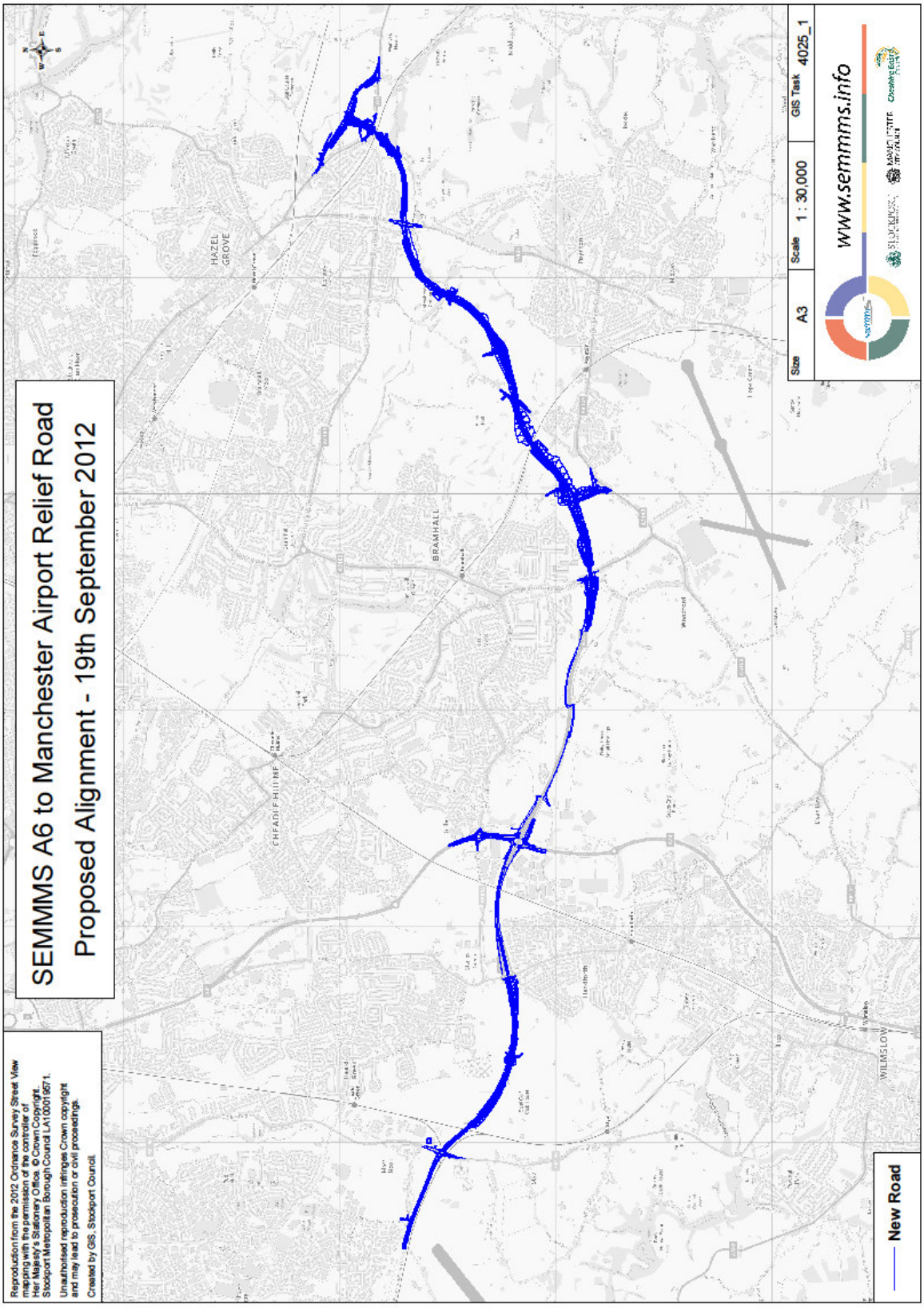
- The SEMMMS Project Team and its commissioned specialist consultants will continue to comply with statutory and legal obligations.

- Throughout the continued development of the design, agreement and consensus will be sought between all members of the project team. This will be achieved through forums such as the Technical Working Group Meetings and through the adoption of initiatives such as Design Rationales.

- This report informs of a '**core option'** for costing and SATURN traffic modelling purposes with the designation of '**Design Freeze 6'** (September 2012).

- Following Phase 1 of the Public Consultation this report is to be read with the findings of the public consultation, relating to junction options to produce a '**preferred scheme'**. The SEMMMS Project Team will then compose an updated design with the designation '**Design Freeze 7'.** This will be presented to the general public in Phase 2 of the Public Consultation. Following Phase 2 of the consultation and incorporation of any further amendments **'Design Freeze 8'** will be the basis of the Planning Application, Compulsory Purchase and Side Road Orders process.

APPENDIX A


SEMMMS A6 to Manchester Airport Relief Road
Proposed Alignment - 19th September 2012
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Size A3
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GIS Task 4025_1
www.semmms.info
New Road
HAZEL GROVE
BRAMHALL
WILMSLOW

APPENDIX B

Schedule of Design Freeze 6 General Arrangement Drawings:

1007/3D/DF6/A6-MA/GA/700	Design Freeze 6 - General Arrangement - Sheet 1 of 10
1007/3D/DF6/A6-MA/GA/701	Design Freeze 6 - General Arrangement - Sheet 2 of 10
1007/3D/DF6/A6-MA/GA/702	Design Freeze 6 - General Arrangement - Sheet 3 of 10
1007/3D/DF6/A6-MA/GA/703	Design Freeze 6 - General Arrangement - Sheet 4 of 10
1007/3D/DF6/A6-MA/GA/704	Design Freeze 6 - General Arrangement - Sheet 5 of 10
1007/3D/DF6/A6-MA/GA/705	Design Freeze 6 - General Arrangement - Sheet 6 of 10
1007/3D/DF6/A6-MA/GA/706	Design Freeze 6 - General Arrangement - Sheet 7 of 10
1007/3D/DF6/A6-MA/GA/707	Design Freeze 6 - General Arrangement - Sheet 8 of 10
1007/3D/DF6/A6-MA/GA/708	Design Freeze 6 - General Arrangement - Sheet 9 of 10
1007/3D/DF6/A6-MA/GA/709	Design Freeze 6 - General Arrangement - Sheet 10 of 10

APPENDIX C

Schedule of General Arrangement drawings used for traffic modelling purposes:

A6 Relief Road Option 2	1007/3D-DF5/A6-MA/GA/500
Buxton Road Tie in junction	1007/3D/DF5/A6-MA/GA/500.
Macclesfield Rd Option 2	1007/3D/DF5/A6-MA/GA/501B
Macclesfield Road Option 4	1007/2D/DF5/A6-MA/GA/677
Woodford Road, Poynton, Option 2	1007/3D/DF5/A6-MA/GA/613
Woodford Road, Poynton, Option 3	1007/3D/DF5/A6-MA/GA/612
Chester Rd link, Option 2	1007/2D/DF5/A6-MA/GA/684A (option8A)
Chester Rd link, Option 5	1007/2D/DF5/A6-MA/GA/685 (option9)
Woodford Road, Bramhall, option 5	1007/2D/DF5/A6-MA/GA/652
Woodford Road, Bramhall, option 6	1007/3D/DF5/A6-MA/GA/623
A555/A34 junction	1007/3D-DF5/A6-MA/GA/506
A34 Stanley Road Option 1	1007/3D-DF5/A6-MA/GA/622
A34 Stanley Road Option 2	1007/3D-DF5/A6-MA/GA/653
Wilmslow Road	1007/3D-DF5/A6-MA/GA/507C
Styal Road Option 1	1007/3D-DF5/A6-MA/GA/624
Styal Road Option 2	1007/3D-DF5/A6-MA/GA/679
Styal Road Option 3	1007/3D-DF4/A6-MA/GA/414