

M60 Route Management Strategy

A663 Chadderton Area Local
Committee Meeting - Handbook

March 2004

Report no: 0039-NH50721-NHR-01-F

Highways Agency



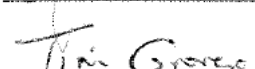
M60 Route Management Strategy

A663 Chadderton Area Local Committee Meeting - Handbook

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Date:

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Contents

1	The Meeting	1
1.1	Venue and Date	1
1.2	Meeting Objectives	1
1.3	Meeting Agenda	1
1.4	Meeting Process.....	2
2	The Route	3
2.1	Route Description	3
2.2	Route Data	3
3	Policy Objectives	7
3.1	What are they?	7
3.2	Where do they come from?	7
3.3	A663 Policy Objectives.....	7
4	Route Functions	10
4.1	What are they?	10
4.2	How have they been derived?	10
4.3	A663 Route Functions.....	10
5	Problems and Issues	13
5.1	What are they?	13
5.2	How have they been derived?	13
5.3	A663 Problems and Issues	13
6	Route Outcomes	19
6.1	What are they?	19
6.2	How have they been derived?	19
6.3	A663 Route Outcomes	19
	Appendices	22

1 The Meeting

1.1 Venue and Date

Venue: Radclyffe Lower School
Broadway
Chadderton
Oldham
OL9 9QZ
Tel: 0161 624 2594

Date: 22nd March 2004 at 7pm

1.2 Meeting Objectives

Following the Initial Stakeholder Meeting held at the Norton Grange Hotel the Highways Agency are happy to accept the invitation to meet with the Local Area Committee to discuss the M60 Route Management Strategy. Following the initial meeting further progress has been made in preparing the Strategy for the M60.

The objective of this meeting will be to discuss the Initial Route Management Strategy and how it affects the A663 specifically. This meeting will;

- Inform stakeholders of the purpose extent and details of the RMS study
- Inform them of the current performance of the route
- Engage stakeholders in the development of the route strategy in line with Government policy and Highways Agency key objectives
- Involve stakeholders in establishing route functions and objectives
- Establish the views of stakeholders on the problems along the route
- Consider potential desired outcomes for the RMS and how these may be developed

1.3 Meeting Agenda

6:00pm – Exhibition of plans and existing data regarding A663 will be available for viewing

7:00pm – Welcome and Introductions

7:10pm – Background/Route Data

7:20pm – Policy Objectives/Route Function

7:30pm – Discussion

8:00pm – Route Problems and Issues/Route Outcome

8:10pm – Discussion

9:00pm – Summary of Meeting/What Happens Next

9:05pm – Close

1.4 Meeting Process

The meeting will involve;

Highways Agency – Route Operator

Hyder Consulting – RMS Consultants

The Participants/Stakeholders

The meeting participants provide valuable information to determine the solution to the problems. As such we would encourage that;

- Everybody contributes fully
- Political and seniority barriers are ignored
- The focus of the discussion is maintained without diversion
- Switch off all mobile phones and pagers during the meeting
- Give others the chance to speak without interruption

During the meeting it is intended to discuss the key input elements that are used to prepare a Route Management Strategy. These are Policy Objectives, Route Functions, Problems and Issues and Route Outcomes. This document explains what these elements are and how they have been derived for this route. By the end of the meeting we will be able to develop a strategy for the route that will aim to meet the users and local communities needs.

2 The Route

2.1 Route Description

The scope for the study to prepare the M60 Route Management Strategy incorporates the trunk road section of the A663, also known as Broadway. The route commences from the junction with Moston Lane, Manchester City Council's boundary, and extends northwards over the M60 at Junction 21, through a series of at grade signal controlled junctions, to terminate at the northern end at a grade separated junction with the A627/A627(M).

The route is generally a four lane single carriageway (2.9 km/1.8 miles) but there are short sections of dual carriageway north of the junction with the M60 (0.8 km/0.5 miles) (Junction 21) and to the south of the junction with the A627(M) (0.8 km/0.5 miles).

2.2 Route Data

Traffic Data Analysis

Figure 1 shows the AADT (average annual daily traffic) flows and percent of HGV's forecast for the A663/A627(M) RMS study area from the start year of 2004 and the RMS end year of 2014. The AADT flows reflect NRTF (National Road Traffic Forecast) 1997 central growth. The highest AADT flows are on those links approaching the M60/M62 Junction 18, this is due to the junction providing a strategic function for national and international traffic.

Figure 2 shows the CRF (congestion reference flow) on the A663/A627(M) RMS study area for 2004 and 2014. The CRF figures reflect NRTF 1997 central growth. The threshold level is set at 0.90, this is a level at which action is recommended to ensure that sufficient reserve capacity is maintained. There are certain links already over capacity these are, the M62 Junctions 18-20, the M66 on approach to the M60 Junction 18 and the M60 between Junction 21 and 22. The links along the M60 within the A663/A627(M) study area (M60 Junctions 17-22) will have reached or be very close to the threshold level by the year 2014.

Safety Analysis

Figure 3 shows accident rates per 100 million vehicles per km along the links of the A663, A627(M) and the M62 between Junctions 18 and 20. The accident rates cover a five year period from 1998 to 2002 and the chart provides two intervention levels. This is due to the M62 and A627(M) being motorway routes and the A663 being classed as an urban trunk road. The intervention level are figures provided by the Highways Agency that determines the level at which accidents are a problem along that link. The A663 between the B6189 and Moston Lane and most of the motorway links

are already above the intervention levels provided by the Highways Agency.

Figure 4 shows the accident severity ratios for the links and junctions within the A663/A627(M) study area. This is a ratio of total accidents against those recorded as fatal or serious, the intervention level set by the Highways Agency is 0.13 that the junction where the A627(M) meets the Slattocks Link Road and the link between this junction to the A663 are both above this intervention level. The blank sections in the chart indicate that the accidents recorded on these links or junctions do not have a severity of fatal or serious.

Environment

From our research we have determined that the whole of the A663 is within an Air Quality Management Area (See Figure 1). This means that the route has been identified as having predicted emissions exceeding those prescribed within the National Air Quality Standards set by the Government.

In addition we have identified four sites of archaeological interest adjacent to the route (See Figure 1). These are;

- Remains of a Roman or Medieval Bloomery with slag heaps
- Boundary Park
- Chadderton Cemetery
- Handley Page Aircraft Factory

We have also identified three Part B Processes sites nearby (See Figure 1). These are ongoing industrial operations on a small scale that have the potential to release emissions to air that could damage the environment. They are regulated by the Local Authority under Part I of the Environmental Protection Act : 1990. These operations involve concrete batching and coating processes.

We also believe that there are as many as three conservation areas, one historic park and garden, two Sites of Biological Interest (SBI) and one Site of Special Scientific Interest (SSSI) in the vicinity of the route.



Figure 1 – An Extract from the Environmental Constraints Plan

Public Transport Services

Buses

There are eight bus stops in each direction on the A663.

The services that use this route are identified below;

- Bus services with a Monday to Saturday daytime frequency of at least one bus an hour are – 24, 151, 159, 181, 182, 406 and 419,
- Other services – 20, 149 and 150.

These services travel along some part of the A663.

Urban Bus Challenge funding has provided a new bus service linking homes in the SRB6 area with the A62 Quality Bus Corridor (QBC), Hollinwood and Moston Rail Stations, and Greengate and Broadgate employment areas, where Oldham's Travel Co-ordinator is promoting travel plan development. The A664 is also a Quality bus corridor between Smedley and Middleton. Furthermore the section of the A664 between Middleton and Rochdale is a bus corridor that is currently being improved.

GMLTP

Trains

There are nine train stations within three miles radius of the A663, all of which are connected to Manchester's central train stations. These are Dean Lane, Failsworth, Hollinswood, Oldham Werneth, Oldham Mumps, Derker, Shaw and Crompton, Moston and Mills Hill

Cycle lanes/footway provisions

There are cycle lanes along the A663, however they are not constant throughout the length of the route. Footways are present throughout the length of the route, on both sides of the carriageway.

3 Policy Objectives

3.1 What are they?

Policy Objectives are wider planning, economic and transport objectives that are pertinent to the route. Objectives that are relevant to the route have been identified and listed under the Government's five objectives for transport,

- Environment
- Safety
- Economy
- Accessibility, and
- Integration.

Objectives that are similar have been grouped together with the aim of rationalising the objectives into a manageable number.

3.2 Where do they come from?

Sources for National Objectives include:

- Government Policies and Objectives
- Planning Policy Guidance
- Highways Agency Aims, Plans & Initiatives; and
- Other Authorities National Plans, Policies and Initiatives

Regional and Local Objectives have been derived from:

- Regional Planning Guidance (including Regional Transport Strategies)
- Development Plans (Structure Plans, Local Plans and UDP's)
- Local Transport Plans
- Multi-Modal Studies/Road Based Studies, and
- Mineral and Waste Plans

3.3 A663 Policy Objectives

The Policy Objectives for the M60 Route Management Strategy (which incorporates the A663/A627 (M) corridor) were presented in the Initial RMS document issued in advance of the recent Seminar. These Objectives are

identified below and those that are thought to have a particular relevance to the A663 are highlighted;

Safety

S1: Road infrastructure should be managed to improve safety

S2: Seek to reduce the numbers of road accidents and their severity

S3: Aim to improve safety for areas where there is an interface between transport types (e.g. road-rail; road-foot)

Environment

ENV1 – Seek to ensure the maintenance, preservation and enhancement of the biodiversity resource of the area.

ENV 2 – Ensure that transport infrastructure does not adversely affect European or Nationally Protected Sites.

ENV 3 – Seek to protect and enhance existing landscape and townscape quality in the area

ENV 4 – Seek to reduce the effects of the road network on air and noise pollution

ENV 5 – Respect and minimise impacts upon sites, buildings and/or landscapes of historic interest

ENV 6 – Ensure that the visual impact of transport infrastructure is minimised.

ENV 7 – Seek to use sustainable business initiatives in the development and maintenance of road infrastructure

ENV 8 – Minimise the impact of the road network on ground and surface water resources.

Accessibility

A 1: Ensure that the management of road infrastructure maintains or improves access to community facilities and amenities.

A 2: Maintain and improve public footways and highway crossing points to allow use by able and disabled persons

A 3: Encourage and support the use of alternative forms of transport such as cycling, walking, public transport

A 4: Maintain and improve links with the wider highway and transportation network

Integration

Int 1: Seek to improve links between different modes of transport and aim to reduce the reliance on the private car

Int 2: Facilitate policy integration and partnerships between government departments and other authorities and organisations – integrating land use/development control and transport policies/plans.

Economy

Econ1: New developments for business and industry should foster links with all forms of transport and not adversely affect existing traffic flow and safety.

Econ 2: Improve the existing road infrastructure and increase journey time reliability to maintain and promote economic investment

4 Route Functions

4.1 What are they?

Route Functions describe the purpose the route serves currently and those it is intended to serve in the future. The Functions are based on the nature of journeys that occur on the route, and the relationship between the route and other parts of the national and local transport infrastructure and regional land use development.

Where possible, Policy Objectives will translate into Route Functions and consideration of the Functions will direct the study towards the problems and issues that it will be seeking to resolve.

4.2 How have they been derived?

Route Functions have been derived following discussions at internal Stakeholder events and the A663/A627 (M) Initial Stakeholder Meeting held at the Norton Grange Hotel on 30th November 2003.

The Highways Agency's view of the existing and future function of the route would include the general functions that a trunk road would be expected to perform. These include,

- Providing safe transportation of people and goods,
- Providing reliable journey times,
- To respect the environment,
- To inform travellers,
- To provide an effective route,
- To support the principles of sustainable development,
- To be part of an integrated transport system.

The current function could be 'to provide a good road transport route for long distance and local traffic, allowing long distance traffic to have easy access to and from the communities and destinations along the route.'

4.3 A663 Route Functions

The Route Functions for the A663 and the adjacent routes are identified below. It will be important to consider the functions of the A627 (M), the M60 Junction 21 to Junction 18 and the M62 Junction 18 to Junction 20 given that are inter-related and that any changes to the function of the A663 could have an impact on the other adjacent routes.

The Route Functions for the A663 can be categorised as having National, Regional and Local characteristics.

The current National functions could be described as follows;

- Forms part of the National Core Trunk Road Network
- Provides a link from Oldham to the National Motorway Network

The current Regional Function could be described as follows;

- Provides a link between Oldham and Manchester
- Provides a link between Oldham and Rochdale
- Is a Strategic Access Route

The current Local Function could be described as follows;

- Provides access to local businesses, schools and other community facilities along the route
- Provides access to residential properties along the route
- Provides local access across the route from Middleton to Oldham and vice versa
- Provides safe facilities for pedestrians and cyclists
- Provides access to Public Transport Services

These functions are illustrated overleaf;

Key to Route Functions Schedule

<u>International</u>	
<u>National</u>	
<u>Regional</u>	
<u>Local</u>	

M62/M60 Junction 18 to M60 Junction 21	M62 Junction 18 to M62 Junction 19	M62 Junction 19 to M62 Junction 20	A627(M) from junction with A664 (north of M62 Junction 20) to junction with A663	A663 from A627(M) junction to junction with Moston Lane (south of M60 Junction 21)
Section 1	Section 10	Section 11	Section 12	Section 13
M60/M62 Junction 18 forms part of the Trans European Network (TENS)	Forms part of the Trans European Network (TENS)	Forms part of the Trans European Network (TENS)	Forms part of the National Core Network	Forms part of the National Core Network
It forms part of the National Motorway Network	It forms part of the National Motorway Network	It forms part of the National Motorway Network	Provides a link from Oldham and Rochdale to the National Motorway Network	Provides a link from Oldham and Rochdale to the National Motorway Network
It provides access from the M60 to the M62 Trans Pennine Motorway (of international importance)	It provides access from the M62 Trans Pennine Motorway to the M60 and the M66	It provides access from the M62 Trans Pennine Motorway to the M60 and the A627(M)	Provides a link between Oldham and Rochdale	Provides a link between Oldham and Manchester
It forms part of the circular route around Manchester for freight	Is a major East/West freight route for the North of England	Is a major East/West freight route for the North of England	Is a Strategic Access Route	Provides a link between Oldham and Rochdale
Provides access to the regional towns of Bury, Oldham & Rochdale	Is a major commuter route to and from Manchester	Is a major commuter route to and from Manchester		Is a Strategic Access Route
It forms part of the circular route around Manchester for local traffic	Provides access to the regional town of Bury	Provides access to the regional towns of Rochdale and Oldham		Provides access to local businesses, schools and other community facilities along the Route
It forms part of the circular route around Manchester for commuters	Provides access to Heywood and Middleton	Provides access to Heywood and Middleton		Provides access to residential properties along the route
It forms part of the circular route around Manchester for leisure travellers				Provides safe facilities for pedestrians and cyclists
				Provides access to Public Transport Services
				Provides a local access across the route from Middleton to Oldham and vice versa

5 Problems and Issues

5.1 What are they?

Route Problems and Issues are matters of concern to the Highways Agency, stakeholders and the public and are likely to occur where there is a reduction in route performance. Route Problems and Issues prevent the route Policy Objectives from being met and/or hinder the performance of the Route Function.

An understanding of the Problem and Issues will demonstrate how the route is performing against its function, how it compares with other routes and illustrate why it might not be performing as desired. By stating the Problems and Issues during the preparation of the Route Management Strategy it will be possible to measure the effectiveness of the measures implemented through the strategy over time.

5.2 How have they been derived?

The Initial Route Problems have been derived by consultations with the key stakeholders as identified previously. They are perceived problems identified by stakeholders during these consultation events. The problems identified have been categorised against the Government's five objectives for Transport of Safety, Economy, Environment, Integration and Accessibility.

The key stakeholders included the Highways Agency and its Maintaining Agent, Local Authorities and the Police who all have a detailed knowledge of the route and its problems.

5.3 A663 Problems and Issues

Problems and issues derived from stakeholder consultations are identified below. They are split into two sections where general route wide problems are identified against the Government's five objectives for Transport and where more specific problems generally relating to individual junctions are identified.

5.3.1 Environment

Specific Key Objective:

- To minimise the impact of the trunk road network on both the natural and built environment.

Air quality, traffic noise and vibration are all issues along this route.
Landscaping Issues – Poor condition and quality around and along Broadway.
<i>See also specific problems below.</i>

5.3.2 Safety

Specific Key Objective:

- To improve safety for all road users and contribute to the Government's current safety strategy targets.

Existing carriageway in poor condition.
Existing drainage in poor condition.
Complex lane marking arrangements.
Safety problems due to high vehicle speeds etc – especially at end of A627 (M).
History of Personal Injury Accidents (PIA).
Right turning vehicles block outside lane whilst waiting to turn - safety/congestion impact with this.
Sept 2000 Stage 3 Road Safety Audit for M60 works recommendations outstanding.
Broadway – wagons, turning traffic, pedestrians, schools, shops, some cycling provision on route - no consistency.
Major crossing movements – both vehicles and pedestrians – to local road, with many Accessibility/Integration issues.
<i>See also specific problems below.</i>

5.3.3 Economy

Specific Key Objectives:

- To take action to reduce congestion and increase the reliability of journey times.
- To give priority to the maintenance of trunk roads and bridges with the broad objectives of minimising whole life costs.

Yellow boxes cause queuing inefficiency.
Maintenance problems for signals – being addressed by study on cost/benefits.
Right turning vehicles block outside lane whilst waiting to turn - safety/congestion

impact with this.
Queuing at Costco.
No room for right turn pockets at junctions.
Housing developments may be refused on congestion grounds.
Middleton Road junction acts as a choke to traffic flow.
Complex lane marking arrangements.
Queuing problems at peak hours.
Queuing related to yellow boxes, right turn on opposite side of road.
Development issues – need a steer on serviceability levels to assess development proposals.
<i>See also specific problems below.</i>

5.3.4 Accessibility (see also specific problems below)

Specific Key Objective:

- To implement traffic management, network control and other measures aimed at making best use of existing infrastructure and facilitating integration with other transport modes, and improve facilities for non-motorised users.

Bus stops are generally in the nearside lane, which causes conflict other traffic.
Access to schools adjacent to the route is difficult.
Access to community facilities along the route is difficult.
Signing to Rochdale via A663 should not be on M60 signs. Trans-Pennine traffic should stay on the Motorway.
No suitable cyclist facilities along the route.
Access to and from residential properties on the route is difficult.
Lots of accidents – poor road, lots of congestion and access problems for non-motorised users.
Major crossing movements – both vehicles and pedestrians – to local road, with many Accessibility/Integration issues.
Most junctions have poor pedestrian provision.
Broadway – wagons, turning traffic, pedestrians, schools, shops, some cycling provision on route - no consistency.
A669 junction – Pedestrians have a long time to wait.
South Chadderton School is to increase in numbers, use and ages – to include more community service
<i>See also specific problems below.</i>

5.3.5 Integration

Specific Key Objective:

- To work with others to ensure passengers and freight operators can switch efficiently and smoothly between different modes of transport, and to broaden the choices available.

INCLUDED IN 'ACCESSIBILITY'

5.3.6 Site Specific Problems

Hollinwood Avenue Junction

- Poor pedestrian and cyclist facilities, high accident rate, vehicles running red lights.
- Most dangerous junction of all – pedestrian refuges needed in middle of road.

Mough Lane/Butterworth Lane

- Poor visibility due to pedestrian guard railing. Pelican crossing currently to north of junction yet most pedestrians cross to the south.
- Road users have lack of visibility and space. Vulnerable road users include many elderly people and children from nearby schools.
- Lane width is an issue.
- Most accidents are turning accidents.
- U-turns at Mough Lane – right turn is mainly for bus route. Traffic to join M60 Anticlockwise has to use Semple Way.
- G-turn facility is not being used.
- This is a community bus route
- Lining and signing issues in advance of M60 junction (s/b).
- This is a Safety Camera partnership area.

M60 Junction/Semple Way & Broadgate

- Pinch point where Semple Way narrows to one lane. Possible problem with visibility of signals, large number of rear-end collisions. Significant number of cyclist accidents.
- Traffic wishing to join M60 clockwise has to use Semple Way/Long Lane – this has safety issues
- The Semple Way route also cause of other problems, e.g. Hollinwood Avenue
- Long Lane – right turn safety problem (also community bus route is incorporated at this junction)
- Semple Way is congested throughout the day
- Sunday congestion due to Retail Park

- Most congestion at Hollinwood Avenue to Semple Way – all day bust – Costco complaints

Foxdenton Lane/Eaves Lane Junction

- Not to current design standards. HGV's cannot easily turn into Eaves Lane. Worst accident location on the A663.
- Speed of traffic may be an issue on southbound approach to this junction.

Thatch Leach Junction

- Right turn manoeuvres into and out of Thatch Leach are tight and perceived to be difficult.
- Cars are parked on Thatch Leach at end of school day.
- Pedestrian crossing is not on desire lines.

Milton Drive/Fold Green Junction

- Perceived concern for vehicles turning out of the side street, all accidents are rear end collisions.
- There are rear end collisions on Broadway near Milton Drive.

Middleton Road to Foxdenton Lane/Eaves Lane

- The link has a straight alignment causing vehicles to increase speed. 10 to 20% of vehicles are perceived to exceed speed limit in this section.
- 56% of accidents on this link involve pedestrians.
- Access to/from Derwent Drive causes problems especially during 'school run' leading to a number of rear end shunt type accidents.
- Speeding is an issue on this long link – there is a perceived speeding issue between Middleton Road and Foxdenton Lane
- Potential housing development at Old Coal Yard could affect usage at local junction.
- Lack of pedestrian facilities
- Rat running and backing up of traffic
- School crossing patrols not available on Broadway due to resourcing/recruiting difficulties

Middleton Road Junction

- Cycleway layout at junction has cause for concern, street furniture in footway/cycleway

Middleton Road to A627 (M)

- Congestion from Middleton Road northbound to A627 (M) from 3 pm – long peak hour

Park View/Eustace Street Junctions

- 5 accidents at junction - 40% pedestrian, 60% rear end collisions

- Eustace Street now no-entry from Broadway

Firwood Manor School

- Cars parked alongside the A663 on the footway and on Park View at end of school day.
- Subway is a problem (security of user)

6 Route Outcomes

6.1 What are they?

Route Outcomes set out what the Highways Agency will seek to obtain from the route over the 10-year period of the RMS. They should,

- contribute to Policy Objectives,
- improve the performance of Route Functions,
- support the Land Use & Development Control Statement, and
- address Route Problems and Issues.

Route Outcomes will not normally be specific but will instead identify a 'goal' to be achieved. The Outcome will not specify how this 'goal' is to be achieved but Summary Outcome Sheets may include a list of potential actions that could be taken in this respect.

6.2 How have they been derived?

Route Outcomes have been derived from our initial understanding of the route, its Functions, Policy Objectives, Land Use and Problems. The development of the initial Route Outcomes identifies the relationship between Policy Objectives, Route Function and specific Problems.

The Initial Route Outcomes for this RMS have been developed using Route Outcome Development Sheets that clearly identify the Policy Objectives for the Route, the relevant Route Functions and the Problems along the route.

6.3 A663 Route Outcomes

Initial Route Outcomes have been developed for the Initial Route Management Strategy. They have been put forward in order to stimulate discussion. Additional Route Outcomes may well come out of the discussions at the meeting. These outcomes are identified below with those thought to be of particular relevance to the A663 highlighted.

Environment

Improved signing along the route to improve driver awareness and to discourage inappropriate use of certain routes (such as M67 to Sheffield and A663 to Rochdale)

Reduced noise impact of the route where noise is identified as a problem by, for example, quieter surfacing and noise barriers as appropriate

Improved air quality near the route by, for example, improved emissions, reduced congestion and appropriate planting

Minimised impact of surface water and pollutants on watercourses, groundwater and flooding by managing the drainage system effectively

Manage the route in a sustainable manner, by conserving existing resource, minimising waste and encouraging recycling where possible

Improved landscape along the route in certain locations where this has been identified as a benefit

Safety

Reduced number of accidents along the route

Reduced number of accidents involving children (particularly at junctions and on the A663)

Reduced accident rate along the route

Reduced severity of accidents where they occur by, for example, reducing spray from traffic in wet weather, improved skid resistance, or improved junction layouts

Emergency access route and refuges where there is no hard shoulder

Improved/clearer lane markings and signing

Improved barriers of over bridges

Improved drainage

Economy

Reduced congestion and delays for M62 through traffic

Reduced congestion at junctions on the M60 to allow traffic to leave the route more effectively and safely

Developments discouraged near the route which would result in a detrimental impact on traffic flows and safety on the M60

Sustainable Development encouraged near the route in regeneration areas

Reduced effects of incidents on traffic flow

Improved real time information to encourage more efficient use of the network and improved journey time reliability

Minimised disruption and cost effects of maintenance and roadworks

Accessibility

Implemented use of variable message signs to encourage efficient use of lanes and make best use of the network

Improved accessibility for pedestrian, cyclist and other vulnerable road users across junctions

Improved accessibility for pedestrian, cyclist and other vulnerable road users along the A663

Improved accessibility for pedestrian, cyclist and other vulnerable road users to public transport facilities along the A663

Improved accessibility to public transport where facilities are provided by appropriate signing

Improved accessibility to hospitals and other community facilities by appropriate signing

Integration

Use of alternative modes of transport encouraged by signing car parking sites for transfer onto alternative modes of transport from the route

Working in partnership to encourage the establishment of inter-modal terminals and alternative travel opportunities at appropriate locations

Appendix A – Traffic Data Analysis

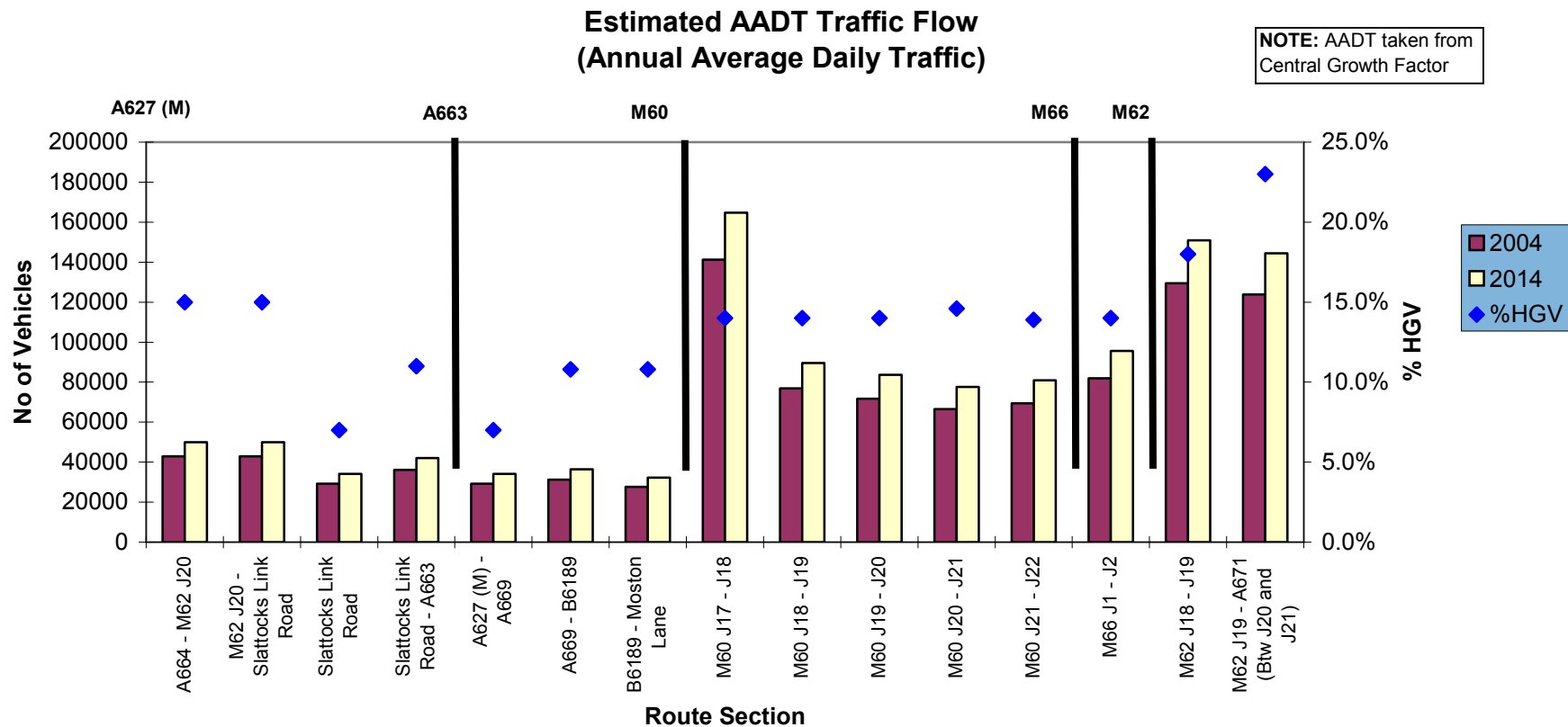


Figure 1 -Estimated AADT Traffic Flow (Annual Average Daily Traffic)

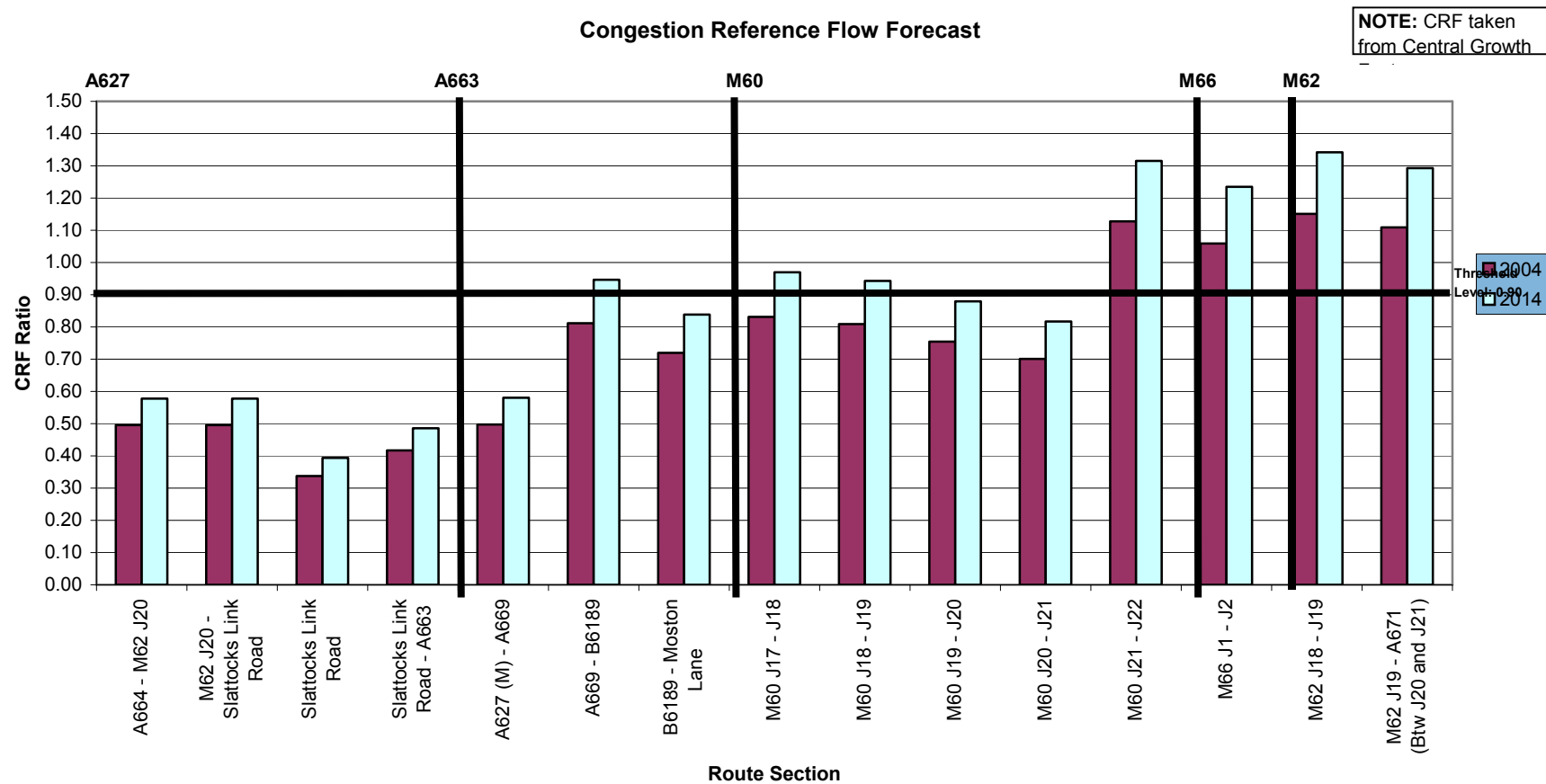


Figure 2 - Congestion Reference Flow Forecast

Appendix B – Safety Analysis

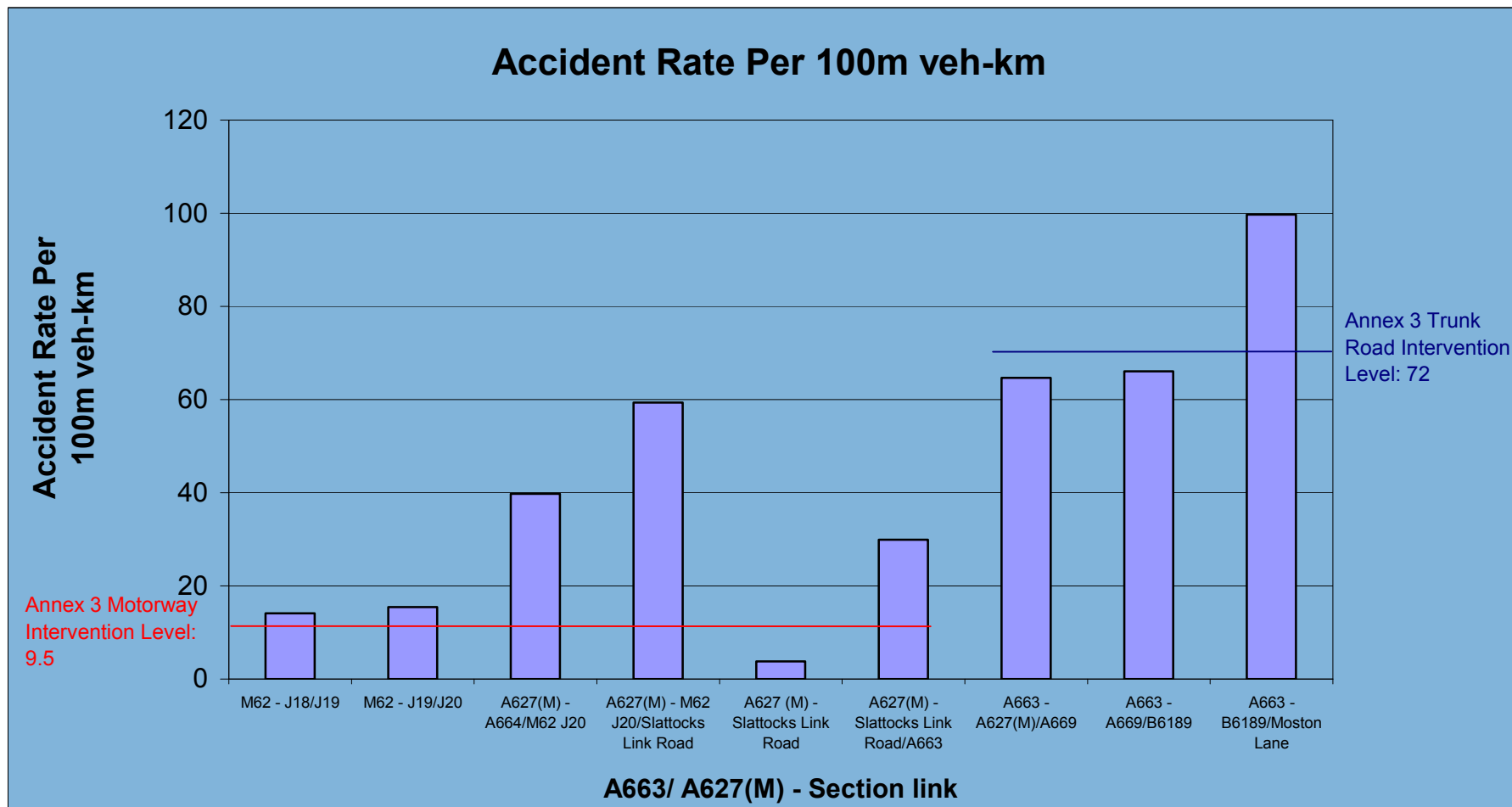


Figure 3 - Accident Rate Per 100m veh-km

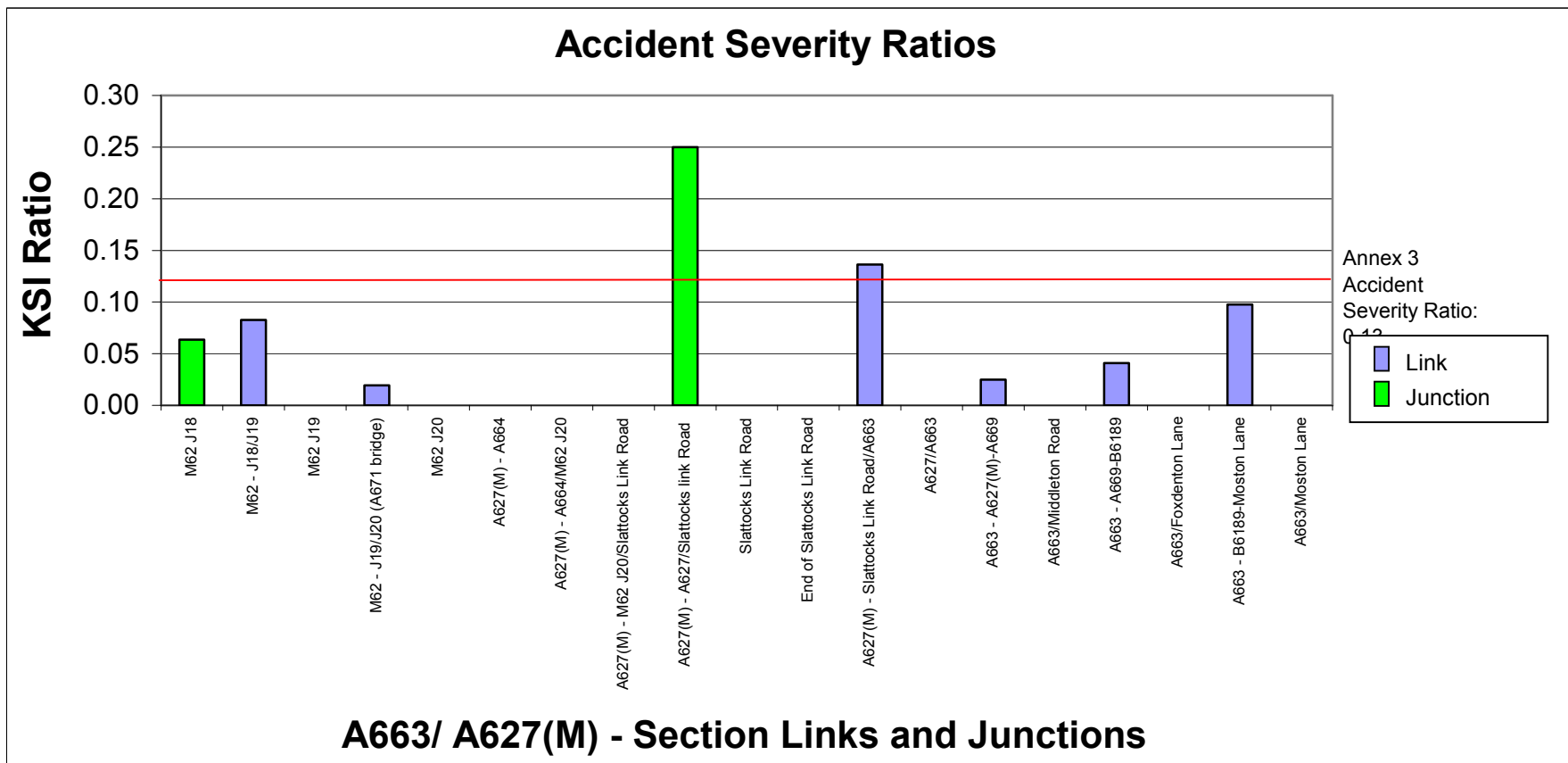


Figure 4 - Accident Severity Ratios