

Scottish Trunk Road Infrastructure Evaluation (STRIPE), M74 Completion Scheme, 5 Years After Opening Project Evaluation

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1 The M74 Completion Scheme

1.1 Background

The M74 Completion Scheme provides a new connection across the southern flank of Glasgow linking the M74 in the east with the M8 in the west. The 8km section of motorway links the M74 motorway from its Fullarton Road Junction, near Carmyle, to the M8 motorway west of the Kingston Bridge.

Construction work on the scheme began in May 2008, with the completed road opening to traffic on the evening of Tuesday 28 June 2011. The road has been built to motorway standards and includes three lanes and a hard shoulder in each direction. The scheme included construction of 14 bridges, one two-way junction where the M74 meets the M8, and three four-way junctions.

The alignment of scheme is illustrated in Figure 1.

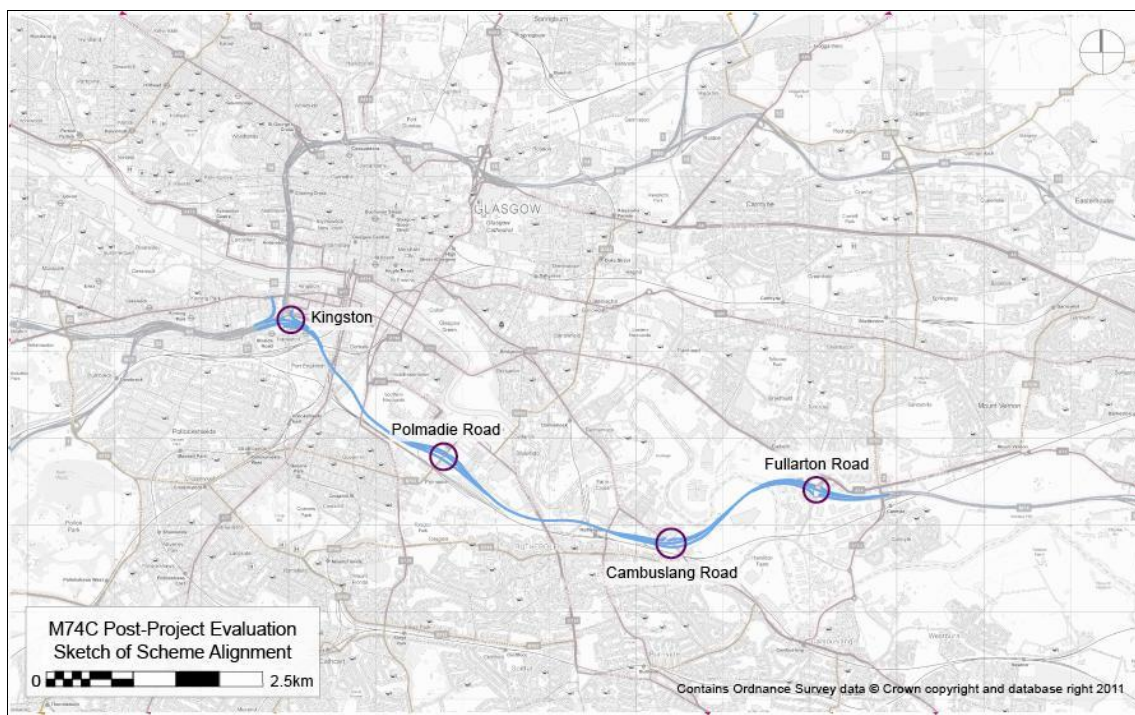


Figure 1 : Alignment of M74 Completion Scheme

1.2 Scheme Objectives

During its development, the project partners (Transport Scotland, Glasgow City Council, South Lanarkshire Council, and Renfrew Council) defined a series of planning and transportation objectives.

The planning objectives set the context for the new road in terms of completing a strategic transport link, improving access to Glasgow Airport and other key strategic commercial and industrial sites, assisting the development of prime sites in high unemployment areas, and opening the way for regeneration of derelict land across the south and east of Glasgow, and in Rutherglen and Cambuslang.

The transport objectives set the context for the predicted benefits of the scheme in that the scheme was forecast to:

- Provide relief to the M8 northern flank between Charing Cross and Baillieston by reducing the two-way flow by around 20,000 vehicles per day, and provide relief to the local road network through the transferral of traffic from the local road network to the new road.
- Improve journey time by around 5 to 10min for local journeys, and by up to 15min for strategic journeys using the new route and avoiding the congested M8 northern flank.
- Improve access along and adjacent to the scheme corridor to currently derelict areas.
- Improve safety and reduce traffic accidents by transferring traffic off local roads to the new motorway.

1.3 Project Evaluation

Through its Scottish Transport Appraisal Guidance (STAG) process, Transport Scotland carries out an evaluation for any project for which Scottish Government funding is provided.

The Scottish Trunk Road Infrastructure Project Evaluation (STRIPE) guidance provides the framework for the evaluation process in assessing a scheme's performance in terms of its planning and transport objectives, as well as the wider STAG criteria such as integration, accessibility and social inclusion, environment, safety, economy, and relevant policies at the time.

The process is conducted at one, three, and/or five year intervals following completion of a scheme and includes:

- An initial evaluation one year after opening (1YA) to provide an early indication (as far as is practicable) that the project is operating as planned and is on-track to achieve its objectives.
- A more detailed evaluation three and/or five years after opening (3YA/5YA). This second evaluation considers a project's impacts and whether it has achieved its objectives. It also reviews the actual impacts against forecasts and determines the causes of any variances.

1.4 One Year After Opening

A detailed evaluation of the M74 Completion Scheme was carried out to capture the impacts one year after opening to traffic. The evaluation established that the scheme was on track to achieving its objectives in terms of attracting trips from the local road network onto the new road, helping reduce the number of accidents and reduce journey times.

1.5 Five Years After Opening

In 2016, the M74 Completion Scheme was the subject of a further evaluation process, carried out to capture impacts five years after opening. The evaluation was carried out jointly by Transport Scotland, Glasgow City Council, SYSTRA Limited (formerly SIAS Limited) in its role as Traffic and Transportation Advisor & Auditor to Transport Scotland, CH2M as Landscape Advisors, and EKOS as Economic Advisors.

2 Operational Indicators

2.1 Data Collection

The operational evaluation of the M74 Completion Scheme relied heavily upon the availability of long-term traffic flow data collated from various permanent automatic traffic counter (ATC) sites managed by a number of organisations, including:

- Transport Scotland's Scottish Road Traffic Database (SRTDb)
- Partner local authorities, namely Glasgow City Council, South Lanarkshire Council, and Renfrewshire Council
- Connect Roads, who operate the A726 Glasgow Southern Orbital.

The organisations provided information from around 1,100 ATC sites within the area of interest across Greater Glasgow/west central Scotland. The majority of the counter sites were configured to provide classified count data, i.e. the traffic flows broken down into the different vehicle classifications.

To analyse the huge volume of data, SYSTRA developed a bespoke data repository in Microsoft Access which, by the end of the evaluation process, held data in around 19,000 files, containing over 52 million records.

2.2 Comparison of Traffic Flows on Strategic Road Network

For the purposes of the evaluation, traffic count data was summarised for the following periods:

- Before Opening (1YB): June 2010 to May 2011
- After Opening (5YA): July 2015 to June 2016

Data for Tuesdays, Wednesdays, and Thursdays were taken to represent an average weekday during these periods. By analysing this data and removing any spurious months, e.g. months where the average weekday flow was not within 10% of the median flow for the full 12 months data set, it was possible to obtain as robust as possible before and after opening annual average weekday flows.

While checks and filtering processes were carried out to remove any obviously spurious data (e.g. complete days where no flows were recorded), the checks were not always able to pick out more subtle changes, such as those associated with the temporary traffic management around roadworks.

For example, traffic movements in and around eastern Glasgow have latterly been influenced by the temporary traffic management around the M8/M73/M74 Improvement works. Consequently, there were numerous locations across the road network which were likely to be affected to some degree by roadworks, diversions, etc. and a strong degree of care was needed when attributing the likely reasons for changes in the traffic flows.

Analysis of the traffic data suggested that the opening of the M74 Completion Scheme has resulted in a number of significant changes in traffic flows and traffic flow patterns across the strategic road network:

- Along the northern flank of the M8, between J8 Baillieston and J17/18 Charing Cross, there are reductions in flows in both directions:
 - ▶ The westbound flow reductions range from around 2,000 – 2,500 vehicles per day (J13 Provan to J14 Blochairn, J14 Blochairn to J15 Townhead, J17/J18 Charing Cross to J19 Anderston) to 11,500 vehicles per day (J12 Riddrie/Steps to J13 Provan).
 - ▶ The eastbound flow reductions range from between 2,600 vehicles per day (J16 Dobbies Loan to J15 Townhead) and 11,000 vehicles per day (J13 Provan to J12 Riddrie/Steps).
- The total flows on the M73 northbound reducing by around 2,500 vehicles per day between J1 Maryville and J2 Baillieston, and increases in flows of around 5,500 vehicles per day in both directions along the M73 between J2 Baillieston and J2a Gartcosh.

- Increases in flows on the M8 secondary carriageway between J21 Seaward Street and J22 Plantation (west of the connection with the scheme) of around 20,000 vehicles per day eastbound and 34,000 vehicles westbound. These are accompanied by a decrease of around 6,000 vehicles per day westbound and around 1,000 vehicles per day eastbound along the adjacent M8 main carriageway as traffic switches to the new route.
- Flows increasing along the M8 to the west of the M77; westbound flows increase by around 5,000 vehicles per day (J26 Hillington to J27 Arkleston) and 19,000 vehicles per day (J22 Plantation to J23 Dumbreck). Eastbound the flows increase by around 6,000 vehicles per day (J27 Arkleston to J26 Hillington) to around 20,000 vehicles per day (J23 Dumbreck to J22 Plantation).
- Large flows, of between 38,000 and 43,500 vehicles per day northbound and between 38,000 and 47,000 vehicles per day southbound, along the new M74 Completion Scheme.

The pattern of changes across the majority of strategic motorway network during the morning, inter-peak and evening peak intervals was largely similar. The main exceptions to this were westbound along the M8 between J14 Blochairn and J15 Townhead in the morning peak where a slight increase in flows was observed (compared to decreases in the overall 24hr flow).

2.3 Comparison of Traffic Flows on Local Road Network

In addition to the data derived from traffic counter sites on the strategic road network, data was also analysed for a number of counter sites located across the local road network.

The comparisons indicated that in the majority of locations there were traffic flow reductions following the opening of the M74 Completion Scheme, including on Cook Street, Cumberland Street, Cathcart Road, Main Street (Rutherglen), and Stewartfield Way (East Kilbride).

In contrast, the comparisons also suggested that the traffic flow has increased slightly on some links, including Calder Street East, Allison Street, Barrhead Road, and Glasgow Road. On closer inspection, these local increases were shown to reflect local re-routing of traffic to/from connections with the new M74 Completion Scheme.

2.4 Observed v Predicted/Forecast Traffic Flows

As part of the evaluation process, a comparison was carried out between the observed and forecast traffic flows. The forecast traffic flows were based on outputs from the Central Scotland Transport Model Version 3A (CSTM3A) which was employed during the development of the scheme in providing (then) future year forecast traffic flows.

The comparison suggested that across the entire study area, along both the strategic and local road networks, the observed flows were lower than the forecast flows. While there were a small number of locations where the observed flows were higher than the forecast flows, these were very much the exception.

There is considerable scope for differences between the original assumptions and the reality of what ultimately occurred over the past decade due to the number of variables involved; including, for example, the recession and the escalation in fuel costs.

Consequently, the comparisons acknowledged the limitations placed around the original growth forecasts and modelling tools available at the time, and consequently the predictions made around the likely economic benefits accruing from the scheme.

2.5 Journey Times

In order to determine the impact the M74 Completion Scheme has had on journey times, four journey time routes were defined at the outset of the evaluation process:

- Route 1: Hamilton to Glasgow Airport via M73 & M8
- Route 2: Hillington to Newhouse
- Route 3: Newton Mearns to Glasgow City Centre
- Route 4: Hamilton to Glasgow Airport via M74 Completion & M8 (on completion only)

In planning the 5YA journey time surveys, it quickly became apparent that journey times across the eastern and northern flanks of Glasgow would be influenced heavily by the temporary traffic management around road works associated with the M8/M73/M74 Improvement Scheme.

Much of the M8, M73, and M74 corridors currently operate under temporary speed restrictions, enforced through the use of average speed cameras. Consequently, average speeds across the eastern and northern flanks of Glasgow will be lower than they would have been one year before the opening of the M74 Completion Scheme.

Transport Scotland plan to revisit the journey time surveys once the network is clear of restrictions.

2.6 Average Speeds

In addition to the traffic flow comparisons, vehicle average speeds were collected at a number of locations across the strategic road network. Again, it should be noted that there is some element of caution in interpreting the outputs given the impacts of the temporary road works around the M8/M73/M74 Improvement Scheme.

The analysis indicated that average speeds along the existing M8 motorway network have increased slightly between J10 Easterhouse and J17 Dumbarton Road. East of J10 Easterhouse, average speeds were slightly lower reflecting the impact of the temporary traffic management around the M8/M73/M74 improvement works. The remainder of the M8 motorway network remains largely unchanged until west of the M77 where decreases in speeds were recorded.

Elsewhere across the strategic motorway network (M77, M73 and M80), vehicle average speeds during the morning peak period have generally reduced compared with the pre-opening speeds. This could be attributed to the opening of the M80 scheme and trips using the M73 to access the M74 Completion Scheme, which would fit well with the traffic flow increases recorded along these sections of the network.

2.7 Stakeholder Consultation

As part of a review of the operation of the M74 Completion Scheme, SYSTRA consulted with a range of stakeholders who currently oversee, provide, maintain or operate along the M74 Completion Scheme.

South Lanarkshire Council (SLC) believed the M74 Completion Scheme has had a positive impact for journey times on the local and strategic road networks and that the M74 Completion Scheme has overall been successful.

Scotland TranServ is the operating company responsible for the management and maintenance of the trunk road network in south-west Scotland, and believed the M74 Completion Scheme has had positive impact on traffic conditions both locally and strategically and that the M8 northern flank has benefited from the implementation of the scheme.

The Road Haulage Association (RHA) is the trade association for road transport and freight logistics operators, and believed that journey times across both the local and strategic road networks have reduced since the introduction of the scheme and that it has helped improve road safety. The RHA consider the M74 Completion Scheme to be a success and have welcomed the improvements.

2.8 Summary

In summary, the traffic data suggests that the M74 Completion Scheme is largely meeting its operational objectives, in terms of reducing the flow of traffic on the M8 northern flank and attracting trips from the local road network. A review of the potential savings in journey time will be carried out as future conditions allow.

Consultation with stakeholders has suggested that the scheme is fulfilling its transport objectives in terms of attracting traffic away from the northern flank of the M8 and of taking traffic off (some) local roads.

3 Environment

3.1 Scope of Evaluation

As part of the project evaluation, Transport Scotland separately commissioned consultants CH2M to review the implementation of the scheme's environmental mitigation measures, which included:

- A desk study review of the project objectives and M74 Completion Environmental Statement December 2003
- A site visit on 9 – 11 May 2016
- Preparation of a report detailing the observations from the site visit and comments on the condition of the environmental mitigation

3.2 Findings

The review considered that the mitigation measures implemented as part of the M74 Completion Scheme have been successful.

The evaluation established that the landscape work undertaken as part of the project has been implemented in accordance with the plans and helps tie the scheme into the surrounding townscape and soften some of the more adverse effects of the project.

4 Safety

4.1 Scope of Evaluation

The evaluation included a review of accident savings derived from Police STATS19 reports was obtained from the Scottish Government Transport Statistics branch.

4.2 Analysis

Considering specifically strategic trips across Glasgow, a review was conducted of personal injury accidents occurring for motorway journeys between M74 J4 Maryville (the junction between M74 and M73) and the M8 J22 Plantation.

Table 1 summarises the number and severity of accidents occurring on the two alternative routes for 1YB and 5YA the opening of the M74 Completion Scheme.

Table 1 : Before & After Opening Accident Comparisons (M73 & M8 vs. M74C)

Accident Severity	One Year Before (via M73 & M8)	Five Year After (via M74C)	Change in Accidents
Fatal	0	1	+1
Serious	6	2	-4
Slight	107	98	-9
Total	113	101	-12

The data indicates that there was an overall reduction of twelve accidents for trips between the M74 J4 Maryville and the M8 J22 Plantation, however, it can also be seen that one fatal accident occurred during the five year period after opening period. The fatal accident occurred on the M8 at J15 Townhead. The cause of the accident was recorded as "Dangerous action in carriageway (e.g. playing), pedestrian impaired by alcohol, pedestrian failed to judge vehicles path or speed."

As one of the transport objectives of the new M74 Completion Scheme was to relieve congestion on the M8 northern flank (the section between the junction with the M8/M73 and the M8/M74 at the Kingston Bridge), a further comparison was carried out of accidents occurring on this section only.

A summary of the accidents occurring along the M8 northern flank in the 1YB and 5YA periods are presented in Table 2.

Table 2 : Before & After Opening Accident Comparisons (M8 Northern Flank)

Accident Severity	One Year Before (Northern Flank)	Five Year After (Northern Flank)	Change in Accidents
Fatal	0	1	1
Serious	3	1	-2
Slight	84	66	-18
Total	87	68	-19

The data indicates that there has been a reduction in the number of accidents occurring on this section of the network. Again, the data includes the fatal accident that occurred on the M8 at J15 Townhead.

It should be noted that it is not possible to attribute the reduction in accidents on the trunk road network solely to the opening of the M74 Completion Scheme, only that the scheme is a contributor to the reduction in accidents occurring.

4.3 Stakeholder Consultation

In addition to the accident analysis, SYSTRA consulted with Police Scotland and South Lanarkshire Council (SLC) on the operational and safety aspects of the M74 Completion Scheme.

Police Scotland felt that the opening of the M74 Completion Scheme has had a positive impact on traffic conditions across Glasgow providing a particular benefit to the M8 northern flank and local road network.

South Lanarkshire Council (SLC) was not aware of any specific safety issues arising as a result of the new M74C scheme. In general, SLC considered the scheme had brought improvements which have been felt locally as well as on other routes such as the M8 northern flank.

4.4 Findings

In summary, the evidence suggests that the new M74 Completion Scheme is achieving its safety objectives in terms of improving safety and (helping to) reduce traffic accidents on both the local and trunk road networks.

Discussions with key stakeholders supports this finding in that operators identified a range of safety benefits arising from the scheme.

5 Economy

5.1 Scope of Evaluation

As part of the project evaluation, Glasgow City Council commissioned consultants EKOS to consider the wider economic benefits and economic and location impacts which could be attributed to the opening of the M74 Completion scheme.

Their review considered the period 2001 (when the M74 Completion Scheme was approved by Scottish Ministers) up to 2016 (five years post completion). The focus of the evaluation was to assess the wider economic effects that have been supported through completion of the scheme, and measure progress towards delivering against the objectives that were identified in the Outline Business Case (2000). In particular, the evaluation assessed the impact of the scheme on incentivising and catalysing new capital development activity within a number of key strategic sites across the West of Scotland.

5.2 Stakeholder Engagement

Over the course of the evaluation EKOS engaged with over 80 stakeholders from over 40 organisations including public, private, and third party sectors. These included Scottish Government, Transport Scotland, Glasgow, Renfrewshire, South Lanarkshire Local Authorities (economic development, planning, transport), Scottish Enterprise, Clyde Gateway, Glasgow Airport, Chambers of Commerce, Federation of Small Businesses, Housing Associations, Scottish Property Federation, Strathclyde Passenger Transport, employability agencies, and private sector developers and investors.

5.3 Findings

The EKOS study concluded that since 2001, the M74 Completion has been a key factor in:

- Attracting and incentivising almost £3.1 billion of new capital development activity within the West of Scotland – this has supported 13,000 net construction jobs and £671m in GVA
- This investment has delivered nearly one million sqm of new commercial floorspace and 10,000 new residential units
- The new capital development activity has helped accommodate 11,000 net jobs which will generate an additional £540m GVA every year within the West of Scotland economy

In addition, the study also identified a number of operational benefits, which included:

- 87% of businesses felt that the M74 Completion has had some impact on making the local area more attractive for businesses to operate from
- 42% of businesses reported a benefit to improving productivity, and 26% reported it helped them to access a larger labour pool or retain employees

6 INTEGRATION

6.1 Scope of Evaluation

As part of the evaluation process, SYSTRA conducted a review of strategic planning policy at the time. The review considered both national, regional and local planning and transportation policies, and included reference to:

- *NPPG 17 Transport and Planning, Scottish Government (1999)*
- *Travel Choices for Scotland – Strategic Roads Review, The Scottish Executive (1999)*
- *Working Together for Scotland – A Programme for Government, Scottish Government (2001)*
- *Scotland's Transport: Delivering Improvements, Scottish Government (2002)*
- *Building Better Transport, Scottish Government (2003)*
- *A Partnership for a Better Scotland, Scottish Government (2003)*
- *Central Scotland Transport Corridor Studies, Scottish Government (2003)*
- *Glasgow and Clyde Valley Joint Structure Plan, Clydeplan (2002)*
- *Keep Glasgow Moving – Local Transport Strategy, Glasgow City Council (2007 – 2009)*
- *Glasgow City Plan 2, Glasgow City Council (2009)*
- *South Lanarkshire Council Local Transport Strategy, South Lanarkshire Council (2006 – 2009)*
- *South Lanarkshire Local Plan – Volume 1, South Lanarkshire Council (2009)*

6.2 Findings

The review established that the local planning documents of the time clearly set the context for the objectives taken forward for the M74 Completion Scheme, in terms of:

- Providing a strategic transport link across the south of Glasgow
- Improving access to Glasgow Airport and other key strategic commercial and industrial sites

With connections to wider south Glasgow, the scheme was considered as having contributed towards:

- Assisting the development of prime sites in high unemployment areas throughout West Central Scotland
- Opening the way for regeneration of derelict land across the south and east of Glasgow and in Rutherglen and Cambuslang
- Providing opportunities around East End Regeneration and facilitating transport around the 2014 Commonwealth Games

6.3 Summary

The outcomes from the evaluation confirmed that the M74 Completion Scheme is achieving its wider planning objectives (of the time) in terms of connectivity and opening up opportunities on the south side of Glasgow.

7 Accessibility & Social Inclusion

7.1 Scope of Evaluation

As part of the evaluation process, SYSTRA consulted a range of stakeholders who have interests in a range of issues around accessibility and social inclusion including public transport, walking, and cycling.

7.2 Stakeholder Engagement

SYSTRA contacted Strathclyde Partnership for Transport (SPT) – the largest of Scotland’s seven regional transport partnerships. SPT consider the scheme has helped transfer traffic from the local road network and benefitted journey times on both the local and strategic road networks.

SYSTRA also contacted a number of accessibility groups and community councils, including:

- Go Bike! The Strathclyde Cycle Campaign
- Skelmorlie Community Council
- Achenshuggle Community Council
- Simshill Community Council
- Cathcart Community Council
- Castlemilk & Dennistoun Community Council
- Cambuslang Community Council
- Merchant City Community Council

The majority of Community Councils felt the scheme had had a positive impact on access to jobs and services within the local communities adjacent to the scheme, and felt that the scheme had had a positive impact on access to development areas.

7.3 Summary

In summary, discussions with stakeholders suggest that the M74 Completion Scheme is meeting its accessibility objectives by allowing public transport operators to make some minor efficiency savings and timetable changes to services and is enabling Glasgow City Council to bring forward major investment in walking and cycling facilities.

Feedback from community councils suggests that the majority felt that the new route has had a positive impact on local development opportunities, increased accessibility and has resulted in improvements in safety.

8 Cost to Government

8.1 Scope of Evaluation

As part of the project evaluation, a comparison was carried out between the forecast scheme costs used during the assessment and the predicted net project outturn costs (at 5YA). The comparison provides an indication of the accuracy of the original scheme cost estimates.

8.2 Comparison of Costs

The (then) Scottish Executive made provision for the M74 Completion Scheme for final outturn costs of between £375m and £500m in 2008 (in 2002 prices and values). Consequently, the economic benefits based on this range of outturn costs were presented in the PLI Final Forecasting and Economics report which was prepared by (then) SIAS (14 March 2003, SIAS Ref. 57687).

The net project outturn cost in September 2016 (5YA) was provided by Transport Scotland MTRIPS Directorate as being £681.7M. To provide a direct comparison with the forecast costs, the figure must be rebased to the same Base Year, in this case 2002. Using a September 2016 Retail Price Index (RPI) of 264.9, the equivalent 2002 cost is around £367.5M.

8.3 Summary

A comparison of the scheme costs indicates that the net out-turn costs five years after opening were lower than the forecast estimates at pre-contract award.

9 Summary & Findings

9.1 Summary

Working collaboratively since 2000, Transport Scotland, Glasgow City Council, SYSTRA, CH2M and EKOS have examined impacts associated with the M74 Completion Scheme, which opened to traffic on June 2011.

The evaluation has compared various metrics in the 12 months before opening with the 5 years after opening against the context of the scheme's objectives which were:

- Providing relief to the M8 Northern Flank between Charing Cross and Baillieston
- Providing relief to the local road network through the transfer of traffic from the local road network to the new road
- Improving journey times for local and strategic journeys
- Improving safety and reduced traffic accidents by transferring traffic off local roads to the new motorway

9.2 Findings

The changes captured in the project evaluation indicate that the M74 Completion Scheme is performing as intended and that it is meeting its key objectives in terms of:

- Providing relief to the M8 northern flank with reductions in the two-way flow of around 5,000 vehicles per day recorded between J13 Provan and J17/J18 Charing Cross, and around 22,000 between J8 Baillieston and J13 Provan
- Providing relief to the local road network through the transferral of traffic from the local road network to the new road
- Improving safety and reducing traffic accidents by transferring traffic off local roads to the new motorway

Transport Scotland plan to revisit the potential savings in journey times once the road network is clear of temporary traffic restrictions.

Acknowledgements

SYSTRA would like to acknowledge the help and input of the following organisations in delivering the project evaluation: correct titles required

- i. Transport Scotland, SRTDb
- ii. Glasgow City Council, Land and Environmental Services, Traffcom
- iii. South Lanarkshire Council, Traffic and Transportation, Community and Enterprise Resources
- iv. Connect Roads, Clearview Intelligence Ltd.
- v. Scottish Government Transport Statistics Branch

In addition, SYSTRA would like to acknowledge the input and support from the various consultees and stakeholders along the way.