

# EAST CLEVELAND GATEWAY - A SCHEME REVIEW

Redcar & Cleveland Borough Council / Middlesbrough  
Council

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REDCAR AND CLEVELAND COUNCIL / MIDDLESBROUGH COUNCIL  
EAST CLEVELAND GATEWAY - A SCHEME REVIEW  
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# 1 INTRODUCTION



# 1. Introduction

## 1.1. Project History

In 2001 FaberMaunsell, on behalf of Middlesbrough Council (MC), Redcar and Cleveland Borough Council (RCBC) and the Tees Valley Joint Strategy Unit (TVJSU), prepared a major scheme Annex E submission for the East Middlesbrough Corridor Improvement Scheme. The key component of this scheme comprised a new radial link road from Swan's Corner roundabout to Middlesbrough town centre. The bid was submitted to the then Department of Transport, Local Government and the Regions (DTLR) in July 2001.

In December 2001 it was announced that the bid had not been successful due to a lack of support from both local authorities and pending an ongoing study into the viability of rapid transit within the same corridor. The outcome of this rapid transit study is to be confirmed with Middlesbrough Council.

In 2003 FaberMaunsell were again commissioned by Middlesbrough Council to undertake an updated engineering review of the proposed East Middlesbrough Link Road (EMLR), including examining the potential for links to ongoing and future regeneration initiatives. Based on this review and feedback from key stakeholders - most notably National Trust, Network Rail and Highways Agency – and advice from the Government Office North East (GONE), the decision was taken by Middlesbrough Council *not* to re-present the full corridor link road scheme from Swan's Corner roundabout Longlands Road to the Department for Transport (DfT) in July 2003.

In 2005 FaberMaunsell were joint-commissioned by Redcar & Cleveland Borough Council and Middlesbrough Council to review the evidence base and appraise engineering options for a shortened link road connecting Swan's Corner roundabout to the A174(T) Parkway trunk road only. In accordance with the aspirations of the forthcoming Local Transport Plans for the respective authorities, the objective of this link road is to improve the linkages to the wider Tees Valley strategic network, reduce congestion on current key corridors and increase regeneration opportunities within East Cleveland.

## 1.2. Report Structure

Following this introduction there are 5 further chapters:

- **Chapter 2** reviews the existing network operation;
- **Chapter 3** provides an engineering review of the proposed new link including reference to preliminary scheme design drawings;
- **Chapter 4** summarises option testing using the Tees Valley Joint Strategy Unit's TRIPS model;
- **Chapter 5** summarises consultation with key stakeholders; and

- **Chapter 6** provides a summary of the preceding chapters, a recommendation and suggests a way forward.

This report also contains a number of supporting appendices.

## 2 EXISTING NETWORK OPERATION



## 2. Existing Network Operation

### 2.1. Overview

A range of traffic data was reviewed in order to determine operational issues with the existing highway network. Key findings from this assessment are summarised below, with Figures A1 to A6 contained in **Appendix A** providing supporting information.

### 2.2. Link Flow Data

**Figure A1**, Appendix A summarises link flow information provided by Middlesbrough Council at a number of key sites along the A172, A171 and A1043 corridors.

TA 79/99 in Volume 5 of the Design Manual for Roads & Bridges (DMRB) reports on the theoretical capacity of urban roads and states a one-way link flow capacity of 1,300 vehicles per hour (vph) for a 7.3m two-way single carriageway and 1,530 vph for a 9.0m two-way single carriageway. These one-way link capacity flows represent the busiest flow 60% figure. The most recent available data for 2004 indicates that link flows in the study network are *within* theoretical capacity at *all sites* under review.

Other key findings from the link flow analysis includes:

- Highest northbound directional flows were recorded during the AM peak period at Site 11 on A172 Marton Road (north of the junction with Ladgate Lane) with 1,084 vph, and at Site 4 on A171 Cargo Fleet Lane (north of the junction with Homerton Road) with 1,059 vph;
- Highest southbound directional flows were recorded during the PM peak period at Site 11 on A172 Marton Road with 1,088 vph.
- Highest percentage HGV flows were recorded on A172 Dixons Bank southbound during the AM peak period.

It is recognised that there are a number of discrepancies in the traffic flow data, but this is not considered to affect the analysis summarised above. The reason for the discrepancy is likely to be attributable to mainline traffic count surveys being undertaken at different times of the year and to missing side road flow data. This is exemplified when reviewing the traffic flow data at Site 9 and Site 11 on A172 Marton Road.

### 2.3. Journey Time Data

Empirical journey time data was collected by FaberMaunsell during February 2005 for strategic end-to-end through journeys to/from Swan's Corner roundabout to/from A19(T) junction with (j/w) A66(T). Two alternative strategic routes were considered, namely:

- Route 1: A171 - A66(T) and vice-versa during the PM peak period; and
- Route 2: A172 - A174(T) - A19(T) and vice-versa during the PM peak period.

Journey time runs were undertaken for the morning peak period, inter-peak period and evening peak period with both the average and maximum journey time recorded. Because of the length of the routes and the level of congestion / delay, the surveys can only be considered as offering 'snapshot' results as it was not possible to undertake a statistically significant number of full journey time runs during the respective peak periods.

**Figure A2**, Appendix A summarises the results of the empirical journey time surveys. Key findings include:

- The quickest end-to-end recorded journey time route was via Route 2 (A172 - A174(T) - A19(T)), despite the delays experienced on the A174(T) westbound approach to the junction with the A19(T) during the morning and evening peak periods. The total average journey time for Route 2 was approximately 15 minutes northbound during the AM peak period and approximately 15.5 minutes southbound during the PM peak period; and
- The longest journey time end-to-end recorded journey time route was via Route 1 (A171 - A66(T) - A19(T)), with the most significant delay recorded northbound during the AM peak period on the A171 Cargo Fleet Lane route section between the junction with High Street roundabout to the south to the junction with Longlands Road to the north. Significant delays were also recorded westbound on the A66(T) westbound during the PM peak period. The total average journey time for Route 1 was approximately 21 minutes northbound during the AM peak period and approximately 20 minutes southbound during the PM peak period.

### 2.4. Speed Survey Data

**Figure A3**, Appendix A summarises 85<sup>th</sup> percentile and average speeds of traffic on A171 Ormesby Bank, A172 Dixons Bank, A1043 Nunthorpe Bypass and A171 Cargo Fleet Lane based on available speed survey data provided by Middlesbrough Council.

It is evident from Figure A3 that lowest traffic speeds were recorded northbound on the A172 Dixons Bank during the AM peak period, with an average speed of 15.8mph.

The remaining recorded speeds are in line with speed limits for this local area highway network.

### 2.5. Personal Injury Accident Data

Based on available data and as shown on **Figure A4**, Appendix A, recorded personal injury accident rates on key links - A171 Cargo Fleet Lane, A172 Marton Road and Guisborough Road - are all **above** the default accident rate for roads of this type (link and junction combined) of 0.822 per million vehicle kilometres as set out in Table 4/1 of the COBA Manual.

## 2.6. Severance Issues

The A171 Ormesby Bank / Cargo Fleet Lane corridor is characterised by a range of land uses including housing, schools and local shops / amenities as shown on **Figure A5**, Appendix A. The high volumes of traffic on this link (up to 1,500 vehicles per hour (2 way) during the AM peak period) results in some community severance, with the high traffic flows affecting ease of movement.

Similar community severance issues apply to the A172 Dixons Bank which is also characterised by a range of land uses and high volumes of traffic throughout the day, with up to 1,830 vehicles per hour (2 way) during the PM peak period.

## 2.7. Existing Network Operational Problems

Based on site observations and a review of available data, existing network operational problems are summarised in **Figure A6**, Appendix A and listed below:

- Delays on the A172, in particular on Dixons Bank both northbound and southbound during peak flow periods (including mid-day peak period);
- Delays on the A171 Cargo Fleet Lane corridor, northbound during the AM peak period and southbound during the PM peak period;
- Delays on the approaches to Swan's Corner Roundabout during peak periods;
- Delays on the A174(T) westbound approach to the junction with the A19(T) during the morning and evening peak periods.

### 3 ENGINEERING REVIEW



## 3. Engineering Review

### 3.1. Preliminary Scheme Design Drawings

Preliminary scheme design option drawings P001–P004, **Appendix B** were developed in order to determine if a junction arrangement with the A174(T) could be accommodated within the available land space. Two alternative arrangements for this junction were considered, namely a compact grade separated junction arrangement (see P001 and P003) and a conventional junction arrangement (see P002 and P004). The advantages and disadvantages associated with the different junction arrangements are listed on the respective drawings.

Following a meeting with representatives from Redcar & Cleveland Borough Council and Middlesbrough Council of 21 March 2005, a compact grade separation junction with the A174(T) was agreed to be the 'best fit' arrangement in terms of minimising land take, with the alignment of the new link road and the positioning of the junction to be located as close as possible to the Middlesbrough - Whitby rail line in order to minimise the impact on National Trust land, in particular Ormesby Grange to the north of the A174(T). Preliminary Design drawing P001 Rev A reflects the junction arrangement and alignment which was then subject to a detailed review against design standards through discussions with the Highways Agency.

### 3.2. Site Constraints

Recognised site constraints of both scheme options from an engineering 'buildability' perspective include:

- Significant level differences from Swan's Corner roundabout to the A174(T);
- Railway over-bridge provides an obstacle to providing new west facing slip roads;
- In order to maintain access to/from James Cook University Hospital, it is important to retain the east facing slips at the A172 junction with A174(T). This means that the west facing slips associated with the new link road junction with the A174(T) would contravene design standards in terms of desired weaving distances between junctions; and
- Poor forward visibility for traffic merging onto the A174(T) from a new westbound on-slip due to the east-west alignment of the A174(T).

The full range of identified site constraints are summarised on **Figure C1**, Appendix C.

## 4 OPTION TESTING



## 4. Option Testing

### 4.1. Overview

The Tees Valley Joint Strategy Unit are in possession of a region wide strategic TRIPS traffic model. This model has been validated / calibrated in the local area under review in this study. The TVJSU were commissioned to undertake an option test which included the proposed link road connecting Swan's Corner roundabout to a new junction with the A174(T).

This chapter describes the impacts of constructing the proposed link in relation to the following key modelling outputs:

- The effects to volumes of traffic using the new link road and on existing radial corridors; and
- The effect on strategic end-to-end 'through' journey times for vehicles travelling from the Swan's Corner Roundabout to the junction of the A19(T) / A66(T) and vice-versa.

Assessments were carried out for a **2010 assessment year**, both with and without a new link road. A total of 12 model runs were produced, including AM peak, off-peak and PM peak hour runs in the northbound and southbound directions, with and without the new link road.

### 4.2. Volumes of Traffic

The TRIPS model indicates that changes can be expected in volumes of traffic on the local area network, as summarised in **Table 4.1**.

In terms of the A171 link road extension (hereafter referred to as East Cleveland Gateway (ECG)), peak hour flows on the ECG are predicted by the traffic model to be as follows:

- 1,746 vehicles per hour two-way in the AM peak;
- 1,531 vehicles per hour two-way in the off-peak;
- 2,184 vehicles per hour two-way in the PM peak; and
- Highest one-way flow of 1,358 vehicles per hour is expected in the southbound direction during the PM peak.

The above peak hour flows equate to a two-way Annual Average Daily Traffic Flow (AADT) of approximately 20,000 vehicles. This compares to an existing (2003) recorded AADT on the A174(T) east of the A171 junction of 30,500 vehicles.

It is evident from Table 4.1 that the traffic using the proposed new link road is primarily made up of traffic diverting from the A1043 Nunthorpe Bypass / A172 Dixons Bank route. A full "select link" interrogation of the TRIPS model in terms of where the traffic on the new link road has come from could be undertaken should more detailed analysis be required;

Specific traffic flow outputs from the TRIPS model include:

- Two Way traffic volumes on the A1043 Nunthorpe Bypass decreases significantly by -707, -373 and -585 vehicles per hour during the AM, off-peak and PM peak periods respectively, which is equivalent to a percentage decrease of -58%, -44% and -56%. A172 Dixons Bank also experiences similar drops in the volumes of two-way traffic as would be expected, with falls of -957 (-54%), -688 (-38%) and -800 (-44%) vehicles per hour for the AM, off-peak and PM peak periods respectively.
- Traffic volumes increase on the A174(T). Two sections of the A174 have been considered. The section of the A174(T) between the junctions with the proposed ECG link road and Hemlington Lane interchange experiences significant increases in traffic volumes of +537 (21%), +664 (29%) and +812 (26%) for the AM, off-peak and PM peaks respectively if the proposed link is constructed. The section of the A174(T) between Hemlington Lane interchange and the A19(T) can also expect some slight increases in traffic volumes, however these will not be as significant. An additional +226 (+6%), +195 (+4%) and +441 (+8%) vehicles per hour (two-way) can be expected for the AM, off-peak and PM peaks respectively. The TRIPS modelling outputs therefore appear to be suggesting that Hemlington Lane is a major sink for A174(T) traffic. This may require further investigation / more detailed modelling analysis.
- The TRIPS model outputs suggest that changes in traffic flows on the key radial corridors of A172 Marton Road and A171 Cargo Fleet Lane north of the A174(T) Parkway would be minimal. This is likely to be due to trips which currently use alternative routes to avoid the existing congestion on these key radial routes are expected to transfer back on to Cargo Fleet Lane and Marton Road with the relief offered by the construction of the ECG link road (induced traffic effect). Two-way traffic flows along A172 Marton Road are expected to increase slightly by 84 (4%), 177 (10%) and 19 (1%) vehicles per hour in the AM, off-peak and PM peaks respectively. Two-way flows along the A171 Cargo Fleet Lane Road are expected to decrease slightly by 1 (0%), -115 (-7%) and -140 (-8%) vehicles per hour in the AM, off-peaks and PM peak periods respectively.

Table 4.1 – TRIPS Modelling Outputs

Link	AM 2-way Flow (vph)		Off Peak 2-way Flow		PM 2-way Flow (vph)	
	With ECG	Without	With ECG	Without	With ECG	Without
New Link Road (ECG)	1,746	N/a	1,531	N/a	2,184	N/a
A1043 Nunthorpe Bypass	508	1,215	475	848	468	468
A172 Dixons Bank	813	1,770	1,101	1,789	1,032	1,832
A172 Marton Road	2,201	2,117	2,010	1,833	1,753	1,734
A171 Ormesby Bank	882	904	956	990	1,117	1,017
A171 Cargo Fleet Lane	1,310	1,309	1,477	1,592	1,625	1,765
A174(T) – East of Hemlington i/c	3,088	2,551	2,922	2,258	3,934	3,122
A174(T) – West of Hemlington i/c	4,190	3,964	5,340	5,145	5,982	5,541

Source of TRIPS Output Data: TVJSU, 2005.

- Traffic volumes on the A19(T) between the junctions with the A174(T) and A19(T) are expected to increase slightly, by 92 (1%), 158 (2%), and 372 (4%) vehicles per hour (two-way) in each of the AM, off-peak and PM periods respectively.

#### 4.3. Journey Times

Two journey time scenarios were considered as part of the traffic modelling exercise, namely “Do-nothing” where it is assumed the ECG link road is not built and the “Do-something scenario where it is assumed that the ECG is constructed. Both scenarios are based on an assessment year of 2010 whereby base traffic flows are growthed using TEMPRO to 2010. Key findings from the journey time analysis are summarised below.

##### 4.3.1. “Do-Nothing” Scenario – 2010 Growthed Base Traffic: No Link Road

Four journey time routes were considered for 2010 where a new link road is not constructed, namely:

- Route 1 - Nunthorpe Bypass, Dixons Bank, Stainton Way, Hemlington Lane, A174(T), A19(T);
- Route 2 - Ormesby Bank – Orchard Way – Sunnyfield – Cargo Fleet Lane – A66 North Ormesby Bypass – A66 Middlesbrough Bypass – A66(T);
- Route 3 - Nunthorpe Bypass – Dixons Bank – A174(T) – A19(T) – A66(T); and
- Route 4 - Nunthorpe Bypass – Dixons Bank – Stokesly Road – Marton Road – Marton Road Bypass – A66 Middlesbrough Bypass – A66(T)

The TRIPS model output suggests that without constructing the proposed ECG Link Road, the quickest end-to-end through route from Swan’s Corner Roundabout to the A19(T) junction with (j/w) A66(T) is via the Nunthorpe Bypass – Dixons Bank – A174(T) – A19(T) route. This finding reflects empirical journey time surveys undertaken by FaberMaunsell in February 2005 which also identified the A174(T)-A19(T) route to be the quickest, despite the delays on A172 Dixons Bank and on the A174(T) westbound

approach to the j/w A19(T) during the morning peak period.

Out of the four routes summarised above, the quickest end-to-end journey time ranges between 10.8 and 11.8 minutes depending on the time period. In the northbound direction, the quickest end-to-end journey time without a new link is 11.2, 10.9, and 10.8 minutes for the AM, off-peak and PM peaks respectively. In the southbound direction, the quickest end-to-end journey times are expected to be 11.11, 11.07 and 11.84 minutes for the AM, off-peak and PM peaks respectively. As stated above, without a new link road constructed, the quickest existing route is along the A174 and the A19 (Route 3) in all time periods except for the AM northbound direction, where Route 1 is the quickest.

##### 4.3.2. “Do-Something” Scenario – 2010 growthed base traffic: ECG Link Road Constructed

If a new ECG link road were to be constructed, the quickest end-to-end through route from Swan’s Corner Roundabout in the south to the A19(T) j/w A66(T) to the north has been identified as:

- Route 5 - A171 ECG – A174(T) – A19(T) – A66(T).

TRIPS modelling outputs suggest that constructing the new ECG link road results in a **significant decrease** in vehicle end-to-end journey times from Swan’s Corner roundabout to A19(T) j/w A66(T). Total journey times expected along Route 5 vary from 8.5 minutes to 9.5 minutes depending on the direction and peak period. In the northbound direction end-to-end journey times are expected to be 8.5, 8.3 and 8.4 minutes for the AM, off-peak and PM peak periods respectively. In the southbound direction end-to-end journey times are expected to be 8.5, 8.5 and 9.5 minutes for the AM, off-peak and PM peak periods respectively.

The difference in strategic journey times with and without the ECG link road varies between 2.3 and 2.75 minutes depending on the time period assessed. This equates to an average decrease in journey time of approximately 23%.

#### 4.4. Summary

Key findings from this TRIPS modelling assessment of the proposed new link road when compared to the base model are:

- An estimated 2-way Annual Average Daily Traffic (AADT) flow of 20,000 using the new link road in the assessment year of 2010. This compares to an existing (2003) recorded AADT on the A174(T) east of the A171 junction of 30,500;
- The new link road takes a significant volume of traffic off the parallel roads of A171 Ormesby Bank and A172 Dixons Bank, although this effect is relatively localised.
- Vehicle flows on the A171 Cargo Fleet Lane and A172 Marton Road corridors north of the A174(T) are not significantly affected by the construction of the new ECG link road. Any trips that transfer onto the new link road are replaced by trips which currently use alternative routes (such as Flatts Lane) to avoid the existing congestion on these key radial routes (induced traffic effect). The provision of priority measures for other modes (buses, cyclists and pedestrians) offers a mechanism for suppressing inappropriate through traffic on these strategic corridors should any spare capacity be released;
- Strategic journey times for individual vehicles from Swan's Corner to/from the A19(T)/A66(T) are reduced as a result of the implementation of a new link. Journey times are reduced by approximately 23% on average for the periods for which surveys were undertaken (approximately 2.5 minutes journey time saving by direction).
- Longer distance traffic is attracted to the new link road from East Cleveland and North Yorkshire, thereby reducing traffic across Yearby Bank and along the A174(T)/A66(T), but increasing use of the A171.

In summary, and as would be expected, this option testing suggests that a new link road would offer some local benefits south of A174(T) by relieving some traffic off the A171 Ormesby Bank and A172 Dixons Bank, but does little to relieve congestion on the main A171 Cargo Fleet Lane and A172 Marton Road corridors to the north of the A174(T).

## 5 CONSULTATION WITH KEY STAKEHOLDERS



### 5.1. Overview

Discussions were held with 3 key stakeholders regarding the proposed scheme, namely:

- National Trust - landowners;
- Highways Agency - proposed new link road would connect into the strategic network via the A174(T); and
- Network Rail – Middlesbrough-Whitby line railway overbridge affected by the proposed new junction arrangement with the A174(T).

Formal written feedback on the proposed scheme from each of the above is provided as **Appendix D** and summarised below.

Although not required at this feasibility stage, it is recognised that a range of additional consultation with other statutory consultees including the Environment Agency, Countryside Agency, English Nature and English Heritage would be required for a full Annex E style submission to the Department for Transport.

Consultation would also be required with the Freight Transport association to ensure that business freight traffic use the new link road in order to connect into the wider strategic trunk road network.

### 5.2. National Trust

Did **not** support the proposed scheme for several reasons including the detrimental impact on Ormesby Grange (which is within a Conservation Area). There is a major land ownership issue in that the alignment of the proposed link road and junction arrangement with the A174(T) would pass through **inalienable land** which is not subject to normal Compulsory Purchase powers. Whilst in very rare cases The National Trust has allowed inalienable land to be released for schemes that are of overriding public interest, this scheme is not considered by The Trust to fall into this category.

### 5.3. Highways Agency

Representatives from Redcar & Cleveland Borough Council and FaberMaunsell met with a representative from the Highways Agency on 3 May 2005 to discuss the proposed scheme. Discussions at this meeting and subsequent written correspondence confirmed that the Highway Agency were **not** in support of the proposed scheme for the following principal reasons:

- General policy against creating new junctions on high standard routes [such as the A174(T)] except in exceptional circumstances;
- A presumption against displacing local traffic onto the trunk road network to resolve local road problems which this scheme may do;
- Concerns that the proposed junction would create junction hopping between the new junction and the A172 junction for traffic avoiding the "Marton Crawl" on Dixons

Bank. This is highly undesirable on the trunk road network;

- The proximity of the proposed junction to the A174(T)/A172 junction raises concerns about safe weaving distances between the slip roads. It would appear that meeting the required design standards may be difficult to achieve, even with the addition of an auxiliary third lane between the junctions;
- The Highways Agency Design Manual for Roads and Bridges standard TD 40/92 advises that compact grade-separated junctions (GSJ) are appropriate with mainline average annual daily traffic (AADT) flows of 12,500 to 30,000. The current mainline flows (recorded maximum of 30,500 AADT) are at the top end of the acceptable flows for a compact GSJ. At a future design year 15 years beyond opening the AADT will be well in excess of 30,000; TD 40/92 requires that the side road flows are below 10% of the mainline flows. Based on traffic modelling by JSU, side road flows are estimated to be in excess of 20,000 AADT in 2010. It would therefore be inappropriate to use compact grade separation at this location to accommodate design year flows; and
- Modelling outputs from the TVJSU suggest that the new link road will only relieve the A172 Dixons Bank to the south of the A174(T). The routes to the north of the A174(T) will remain congested, limiting the effectiveness of the new route in reducing congestion.

### 5.4. Network Rail

Although correspondence did not definitively state opposition to the scheme, it is important to recognise that it is "not Network Rail's current policy to agree to the disruption required for underbridge works" which would be required in this instance in order to accommodate new west facing slips roads associated with a compact grade separated junction arrangement.

## 6 SUMMARY & RECOMMENDATIONS



### 6.1. Overview

This report reviews existing network operation, appraises engineering options and summarises consultation feedback from key stakeholders regarding a proposed new link road connecting Swan's Corner roundabout to the A174(T), referred to as the East Cleveland Gateway (ECG). The objectives of this link road are to improve the linkages to the wider Tees Valley strategic network, reduce congestion on current key corridors and increase regeneration opportunities within East Cleveland.

This chapter summarises the findings from the preceding chapters, provides a recommendation and suggests a way forward.

### 6.2. Existing Network Operation

A range of traffic data was reviewed to determine operational issues with the existing highway network. Key findings from this assessment are:

#### *Network Delays*

- Delays on the A172, in particular on Dixons Bank both northbound and southbound during peak flow periods (including mid-day peak period);
- Delays on the A171 Cargo Fleet Lane corridor, northbound during the AM peak period and southbound during the PM peak period;
- Delays on the approaches to Swan's Corner Roundabout during peak periods;
- Delays on the A174(T) westbound approach to the junction with the A19(T) during the morning and evening peak periods.

#### *Personal Injury Accidents*

- Based on available data, recorded personal injury accident rates on key links - A171 Cargo Fleet Lane, A172 Marton Road and Guisborough Road - are above the national average accident rates for this type of road.

#### *Severance Issues*

- Severance issues on A171 Ormesby Bank / Cargo Fleet Lane and A172 Dixons Bank. Both links are characterised by a range of land uses including housing, schools and local shops / amenities. The high volumes of traffic on these links (up to 1,850 vehicles per hour (2 way) during the peak period) result in some community severance.

### 6.3. Engineering Review

#### *Scheme Options*

Preliminary scheme design option drawings P001–P004, Appendix X were developed in order to determine if a junction arrangement with the A174(T) could be accommodated within the available land space. Two alternative arrangements for this junction were considered, namely a compact grade separated junction arrangement (see P001 and P003) and a conventional junction arrangement (see P002

and P004). The advantages and disadvantages associated with the different junction arrangements are listed on the respective drawings.

Following a meeting with representatives from Redcar & Cleveland Borough Council and Middlesbrough Council of 21 March 2005, a compact grade separation junction with the A174(T) was agreed to be the 'best fit' arrangement in terms of minimising land take, with the alignment of the new link road and the positioning of the junction to be located as close as possible to the Middlesbrough - Whitby rail line in order to minimise the impact on National Trust land, in particular Ormesby Grange to the north of the A174(T). Preliminary Design drawing P001 Rev A reflects the junction arrangement and alignment which was then subject to a detailed review against design standards through discussions with the Highways Agency.

#### *Site Constraints*

Recognised site constraints of both scheme options from an engineering 'buildability' perspective include:

- Significant level differences from Swan's Corner roundabout to the A174(T);
- Railway over-bridge provides an obstacle to providing new west facing slip roads;
- In order to maintain access to/from James Cook University Hospital, it is important to retain the east facing slips at the A172 junction with A174(T). This means that the west facing slips associated with the new link road junction with the A174(T) would contravene design standards in terms of desired weaving distances between junctions; and
- Poor forward visibility for traffic merging onto the A174(T) from a new westbound on-slip due to the east-west alignment of the A174(T).

### 6.4. Option Testing

The Tees Valley Joint Strategy Unit (TVJSU) are in possession of a region wide strategic TRIPS traffic model. This model has been validated / calibrated in the local area under review in this study. The TVJSU were commissioned to undertake an option test which included the proposed link road connecting Swan's Corner roundabout to a new junction with the A174(T). Key findings from this TRIPS modelling assessment of the proposed new link road when compared to the base model are:

- An estimated 2-way Annual Average Daily Traffic (AADT) flow of 20,000 using the new link road in the assessment year of 2010. This compares to an existing (2003) recorded AADT on the A174(T) east of the A171 junction of 30,500;
- The new link road takes a significant volume of traffic off the A1043 Nunthorpe Bypass and A172 Dixons Bank, although this effect is relatively localised. A full "select link"

analysis and detailed interrogation of the TRIPS model in terms of where the traffic on the new link road has come from could be undertaken should more detailed analysis be required;

- Vehicle flows on the A171 Cargo Fleet Lane and A172 Marton Road corridors north of the A174(T) are not significantly affected by the construction of the new ECG link road. Any trips that transfer onto the new link road are replaced by trips which currently use alternative routes (such as Flatts Lane) to avoid the existing congestion on these key radial routes (induced traffic effect). The provision of priority measures for other modes (buses, cyclists and pedestrians) offers a mechanism for suppressing inappropriate through traffic on these strategic corridors should any spare capacity be released;
- Strategic journey times for individual vehicles from Swan's Corner to/from the A19(T)/A66(T) are reduced as a result of the implementation of a new link. Journey times are reduced by approximately 23% on average for the periods for which surveys were undertaken (approximately 2.5 minutes journey time saving by direction).
- Longer distance traffic is attracted to the new link road from East Cleveland and North Yorkshire, thereby reducing traffic across Yearby Bank and along the A174(T)/A66(T), but increasing use of the A171.

In summary, and as would be expected, this option testing suggests that a new link road would offer some local benefits south of A174(T) by relieving some traffic off the A171 Ormesby Bank and A172 Dixons Bank, but does little to relieve congestion on the main A171 Cargo Fleet Lane and A172 Marton Road corridors to the north of the A174(T).

### 6.5. Consultation Feedback

Preliminary scheme design drawings were discussed with 3 key stakeholders in May 2005, feedback from which is summarised below.

#### *Highways Agency*

Did **not** support the proposed ECG scheme for several reasons including concerns regarding the weaving distances between the slip roads of neighbouring junctions and also the volumes of side road flows using the proposed compact grade separated junction scheme option.

#### *National Trust*

Did **not** support the proposed ECG scheme for several reasons including the detrimental impact on Ormesby Grange (which is within a Conservation Area). There is a major land ownership issue in that the alignment of the proposed link road and junction arrangement with the A174(T) would pass through **inalienable land** which is not subject to normal Compulsory Purchase powers. Whilst in very rare cases The National Trust has allowed inalienable land to be released for schemes that are of overriding public interest, this scheme is

not considered by The Trust to fall into this category.

#### *Network Rail*

Although correspondence did not definitively state opposition to the scheme, it is important to recognise that it is "not Network Rail's current policy to agree to the disruption required for underbridge works" which would be required in this instance in order to accommodate new west facing slips roads associated with a compact grade separated junction arrangement.

### 6.6. Recommendation

Based on analysis of available data, an engineering review, option testing by TVJSU, and feedback from key stakeholders, it is recommended that a proposed new link connecting Swan's Corner roundabout to the A174(T) with an associated junction arrangement at the A174(T) is **not progressed** for the following principal reasons:

- Whilst the indicative traffic modelling undertaken by the TVJSU suggests that, as would be expected, there would be some benefits / reduced traffic flows on the A172 Dixons Bank and A171 Ormesby Bank to the south of the A174(T), to the north of the A174(T) these benefits are not evident with this section of the network remaining congested, thereby limiting the effectiveness of the new route in reducing overall network congestion.
- Site constraints are such that it will be very difficult from an engineering "buildability" perspective to construct a new junction arrangement with the A174(T) without contravening design standards and incurring significant construction costs.
- Crucially, none of the key stakeholders are in support of the proposed scheme.

Given the results of this study, it is considered unlikely that major scheme funding for the proposed East Cleveland Gateway scheme would be forthcoming from the Department for Transport through the Local Transport Plan process.

### 6.7. Way Forward

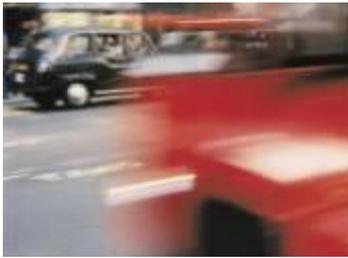
In terms of a way forward, it is recommended that the following actions are progressed:

- Undertake a local feasibility study regarding scheme options to improve the efficiency of the Swan's Corner roundabout. This is likely to require local widening;
- Undertake a full strategic signing review, in particular to/from the A19(T), the A174(T) and at Swan's Corner roundabout;
- Liaise with the Highways Agency regarding proposed improvements to the A174(T) / A19(T) junction;
- Identify and implement a prioritised programme of on-line improvement measures, in particular for buses, pedestrians and cyclists along the A171 Ormesby Bank / Cargo Fleet Lane;
- Investigate Intelligent Transport Solutions including UTMC to relieve congestion on the A171 and A172 corridors, in particular on the A172 Dixons Bank corridor;

- Embrace the key findings of Tees Valley Bus Network Review Study, including increasing and improving the quality of bus services along the key radial corridors of A171 and A172; and
- Undertake a feasibility study for a Park & Ride site located in the vicinity of Nunthorpe including the possibility of bus and rail connections to / from central Middlesbrough.

As an alternative to the ECG link road scheme and depending on the outcome of the feasibility study, a bus and rail based Park & Ride site in the vicinity of Nunthorpe may offer the greatest potential for removing some traffic off the currently congested A171 and A172 radial corridors.

## Appendix A – Existing Network Operation: Figures



## Appendix B – Preliminary Scheme Design Drawings



### Appendix C – Site Constraints Figure



## Appendix D – Key Stakeholder Correspondence

