Ipswich Waterfront Transport Study

Final Report

Suffolk County Council & Ipswich Borough Council

January 2007

Ipswich Waterfront Transport Study

Final Report

Project No: 113731
November 2006

Newcombe House
45 Notting Hill Gate,
London, W11 3PB
Telephone: 020 7309 7000
Fax: 020 7309 0906
Email : London@cbuchanan.co.uk

Prepared by:	Approved by:
Annemarie de Boom	Atholl Noon

Status: Final Issue no: 1 Date: 23 January 2007

i:\11373x_ipswich waterfront transport study\study\reports\final report\final report 2\ipswich waterfront transport study 100107.doc

Contents

		Page
SUMMARY		I
1.	**INTRODUCTION**	**10**
1.1	Background	10
1.2	The study area	11
1.3	Report structure	12
2.	**THE WIDER CONTEXT**	**13**
2.1	Introduction	13
2.2	Major Public Transport Scheme Bid	13
2.3	Development on the Waterfront	14
2.4	Pedestrian connectivity	16
2.5	Cycling and bus accessibility	19
2.6	Air quality	19
2.7	Traffic	20
2.8	New road infrastructure options	22
2.9	Traffic reduction potential	23
3.	**A VISION FOR IPSWICH**	**25**
3.1	Introduction	25
3.2	The town and the Waterfront	25
3.3	Breaking the barrier	27
3.4	Moving around in Ipswich	29
4.	**THE STAR LANE GYRATORY**	**30**
4.1	Introduction	30
4.2	The pedestrian environment	30
5.	**ASSESSMENT OF TRAFFIC OPTIONS**	**33**
5.1	Introduction	33
5.2	General Options	33
5.3	Traffic management options	34
5.4	Option 1: Traffic calming	35
5.5	Option 2: Realignment	37
5.6	Option 3: Two-times two-way	39
5.7	Option 4: Single carriageway gyratory	42
5.8	Option 5: Star Lane two-way	44
6.	**STAKEHOLDER CONSULTATION**	**47**
6.1	Stakeholder appraisal consultation	47
6.2	Stakeholder Workshop	47
7.	**CONCLUSIONS**	**49**
7.1	General	49
7.2	Appraisal of options	49
7.3	Recommendations	53

Tables

		Page
Table 2.1:	Approved and Pending Planning Schemes	15
Table 7.1:	Summary of traffic implications of options	50
Table 7.2:	Summary Appraisal of options	52

Figures

		Page
Figure 1.1:	Areas and links	11
Figure 1.2:	Town quarters and road connections	11
Figure 2.1:	Location of new development	14
Figure 2.2:	North-South pedestrian links	17
Figure 2.3:	East-West pedestrian links	18
Figure 2.4:	Air Quality Management Area	19
Figure 2.5:	Traffic Flows – AM and PM Peaks (pcu/hr)	21
Figure 2.6:	Local origins of gyratory traffic	22
Figure 2.7:	Major Road Scheme Options	24
Figure 3.1:	Concept 1 – town in a ring road	26
Figure 3.2:	Concept 2 – town on the Waterfront	27
Figure 3.3:	Through-traffic removed	28
Figure 4.1:	Classification of pedestrian environment	31
Figure 4.2:	Cross-section of College Street	32
Figure 4.3:	Cross-section of Salthouse Street	32
Figure 5.1:	Option 1 – Traffic Calming	36
Figure 5.2:	Option 2 – Realignment of Star Lane	38
Figure 5.3:	Option 3 –Two-way Star Lane and College Street	40
Figure 5.4:	Option 3 – Two way Star Lane and College Street showing temporary road closure	41
Figure 5.5:	Option 4 – one-lane Star Lane and College Street	43
Figure 5.6:	Option 5 two-way Star Lane	46
Figure 7.1:	Key Street existing	53

Figure 7.2: Key Street proposed layout 54
Figure 7.3: Section showing proposed streetscape improvements 54

Summary

Introduction

The purpose of this study is to evaluate alternative options for improving access east to west around Ipswich town centre and between the town centre and the Waterfront area, particularly for buses, cyclists and pedestrians.

Ipswich town centre

Ipswich, the County town of Suffolk has an attractive and vital town centre. It benefits from a wealth of historic buildings and a dense network of attractive streets and lanes. Its retail offer includes several department stores, representations of all the major multiples as well as a variety of independent shops and boutiques.

Ipswich is a major focus of future growth, with a projected increase of 15,400 dwellings over the period 2001-2021 - some 4,000 of these are proposed on the Waterfront to the immediate south of the town centre. To the east and west of the town centre, new / proposed development includes the "Education Quarter" with University Campus Suffolk and Suffolk New College, and Ipswich Village, a "Civic Quarter" including Suffolk County Council and Ipswich Borough Council offices.

Ipswich has a system of roads, including the Star Lane gyratory, that collectively form a "ring road" around the town centre. Although the ring road allows for a relatively traffic calmed, pedestrian-friendly environment within the town centre, it forms a barrier between the areas surrounding it.

The 'core' of the town centre, e.g. the Buttermarket, is about 650 metres from the Waterfront, or a walk of about 8 minutes. However at present there is relatively little movement between the two areas, probably due to the relatively low level of development of the Waterfront area so far, and the lack of linkages between the areas.

Figure S 1: Star Lane gyratory in context

Traffic conditions

Star Lane and College Street, as part of the town centre ring road are busy local traffic routes – use of these roads is probably 'encouraged' by the fact that most of the town centre parking in Ipswich is to the west of the Novotel roundabout and this parking is relatively cheap and plentiful.

In the peak hours some 1,600 vehicles per hour use the one-way eastbound Star Lane, while between 1,800 and 2,100 vehicles use the one-way westbound College Street. These are significant volumes, twice as high as the vehicles using the other part of the ring road at Crown Street. This traffic-dominated environment causes severe air quality problems, with the consequence that the area was proclaimed an 'Air Quality Management Area' in 2006. The poor air quality is clearly of concern given the 4,000 new households expected here in the next few years.

Another issue is that all of the available data indicates that the traffic using the Star Lane gyratory is primarily shorter distance, local traffic, the vast majority of which has both origins and destinations within a 2 mile radius of the city centre. This is perhaps not surprising given existing congested conditions – longer-distance travellers will seek to avoid the area. There is clearly significant potential for many of these trips to be made by other modes, in particular walking, cycling and buses. This assumption regarding the extent of 'local' traffic movements is supported by census travel analysis by Suffolk County Council.

Given that further traffic growth is predicted for Ipswich, and that significant development is planned at the Waterfront, future traffic conditions are expected to worsen in the vicinity of the Star Lane gyratory. Traffic volume increases on Star Lane and College Street themselves are predicted to be relatively low, given that they are at practical capacity already, but congestion is expected to increase and other parts of the network will experience increased volumes. Given the lack of capacity, it seems likely that traffic from new developments in the Waterfront will 'displace' other trips on the local network, but overall volumes will remain broadly the same.

Pedestrian accessibility

There are 6 pedestrian routes linking the town centre and the Waterfront, but there are few views of the Waterfront along these due to the curving nature of the roads and their orientation. An area of low density, vacant and under-utilised sites to the north and south of Star Lane also forms a barrier between the town centre and the Waterfront and affects all of the routes with the exception of Fore Street and St. Peters Street and St. Nicholas Street.

There are 3 main east-west routes linking the University and residential areas to the southeast of the town centre with Cardinal Park and the railway station to the west, with the best of these currently being the Quayside. The other routes via Star Lane and College Street are generally poor, with a car-dominated environment and a lack of active frontages. The Novotel roundabout to the west also lacks adequate pedestrian crossing facilities, and forms a major barrier to easy east/west pedestrian movement.

In conclusion, the Star Lane gyratory presents a significant barrier to pedestrians, both in terms of north-south, and east-west movements. The poor quality of the north-south routes between the town centre and the Waterfront are however only partly due to the lack of crossing facilities and high volume of traffic on the Star Lane gyratory. Other issues, such as the street pattern of the town, lack of views and poor quality development in the "transition zone" also play a significant part.

Cycling and bus access

In terms of cycling, the Quayside is part of a national cycle route, and Rope Walk is an important link from the proposed Education Quarter to the city centre. A number of bus services serving the eastern part of Ipswich use Fore Street and Grimwade Street, but other

than a school bus, there are currently no bus services using Star Lane or College Street along their length.

General Options

There would appear to be three broad 'sets' of options to improve conditions on the Star Lane Gyratory:

Demand management – reduce the amount of traffic on the road by e.g. road pricing and/or reductions in city centre parking. Road pricing is clearly outside the remit of this study, but it offers real possibilities to reduce demand by requiring drivers to pay more to use sensitive streets such as those in the air quality management area. Based on experience elsewhere, reductions of 10-30% of traffic and significant increases in the use of other modes are possible using road pricing. While not part of this study, we commend it as a potentially highly effective longer-term policy tool for use in this area. A parking strategy for Ipswich is also outside this study remit, but the existence of plentiful and relatively cheap parking in central Ipswich works against other policies seeking traffic reduction and improved air quality, and we believe that a reduction in commuter parking has an important part to play in future reductions in city centre traffic and congestion.

Provide additional capacity to relieve the corridor. One potential solution to the high traffic volumes running through the city centre on the Star Lane gyratory would be to construct a new route 'bypassing' the area. In this connection a ''Wet Dock Crossing', linking Duke Street to Wherstead Road, has been considered in the past. This new set of bridges would need to be subject to periodic closure due to the needs of river traffic, and current estimates indicate that it would cost some £60 million to build. Tests indicate that this bridge would relieve town centre traffic, although volumes on Star Lane and College Street would still remain high, and as traffic demand grows, these benefits would start to erode. This bridge remains a long-term possible solution, but given the current lack of funding for such a major scheme, this report has not considered this option further.

An 'East Bank Link Road' has also been proposed in the past – this road would link Duke Street with a new junction on the A14, offering easy access to the A14 from the eastern bank of the river. Tests indicate that this road does not significantly reduce existing volumes on the Star Lane Gyratory, and this has not been considered further in this study as a solution to this area's problems.

An eastern extension to Star Lane through the proposed Education Quarter to Duke Street has also been proposed – options to link this road through to Duke Street include consideration of closure of Back Hamlet, and restrictions on the use of Fore Street. Tests indicate a significant reduction of traffic on College Street, but an increase on Star Lane with these options, and scheme costs are expected to be in the region of £40 million. Given these costs, these 'supply' options have not been considered further in this study

Traffic management to make the corridor more pedestrian and cyclist friendly. The current approach in the SCC major scheme bid is to introduce more pedestrian crossings on the gyratory – this could be extended to widen pavements where possible and to improve access across the Novotel roundabout. Other options could include restricting access to one or other of the roads, or to changing the way they operate – **these options have been the main focus of this study.**

Traffic management options considered

As noted above, the options considered for this study were primarily those that could be achieved in the short to medium term, and did not include longer term options such as new bridges and/or road pricing or parking restraint.

The options considered and their key implications are set out in the table - all of the options envisage new pedestrian crossings across Star Lane and College Street.

Table S 1: Options considered

Option (and cost)	Option Description	Urban Design Impact	Traffic Impact	Comments
1. Traffic calming (£2m)	New pedestrian crossings and reduces carriageway width throughout the area to 6.0m.	Footway width can be increased on gyratory, but some areas still sub-standard.	No significant impact expected on existing traffic conditions. On some bends HGV's may need to use both lanes.	Improves mainly north/south linkages, but no reduction in traffic or improvement in air quality.
2. Realignment (£3.9m + land, statutory undertaker and demolition costs)	Replaces existing 2-lane, one-way section of Star Lane between Foundation Street and Fore Street with a two-way section of road (on land that is currently vacant or in industrial use), with 4 lanes.	Better pedestrian environment on 'new' stretch of road, only one main traffic route to cross for a small section, enables Key Street traffic reductions, better development potential.	Given that the new road would have 4 lanes for traffic , the capacity of the gyratory as a whole is not likely to be significantly affected.	Advantages likely to be relatively small - would require significant land assembly and is regarded as only achievable in the longer-term.
3. College Street and Star Lane two-way (£3.5m+)	Star Lane and College Street two-way.	Introduces a ' traffic-calming' effect, and creates a less 'traffic–orientated' road layout.	Capacity issues expected at Novotel roundabout junction	Allows periodic (e.g. summer holidays, weekend) closure of College Street/Key Street for events etc. Both roads still traffic-dominated
4. Single-lane gyratory (£2.1m)	Star Lane and College Street as existing but one-lane rather than two.	Footways can be widened throughout, easier crossings, lower traffic volumes.	Traffic reduction of some 20% required. Ability to provide cycle/bus lanes or footway improvements with reallocated roadspace.	High potential for better pedestrian conditions – significant impact on traffic, but lower compared to Option 5.
5. Star Lane 2-way (£4.5m)	Retaining Fore Street /Salthouse Street/Key Street/College Street for local access only and diverting all traffic to Star Lane which will become a two-way street.	Significant streetscape improvements potential, reduction in traffic volumes and more traffic calmed environment.	Traffic reduction of some 20-30% is required. Significant traffic reduction on College Street. Some additional land is likely to be required for right-turning movements from Star Lane.	High potential for improving linkages, but highest impact on traffic.

Star Lane in the future

In order to decide what level of change to the Star Lane gyratory is necessary and desirable, it is important to set the Star Lane issue in the context of the future of Ipswich town centre. In particular we need to consider two things:

- What is the future relationship between the town and the Waterfront?
- How will people move around Ipswich in the future?

In respect of the first question, the Waterfront is changing rapidly, and the rapid increase in the number of people and activities here is likely to result in an increased demand for walking trips between it and the town centre. These trips will be by Waterfront residents and employees, town centre users and residents, and tourists and visitors to Ipswich who want to experience the combined attractions of the town centre and Waterfront. It is in the long-term interests of Ipswich to encourage these trips by making them as attractive, safe and comfortable as possible, to reduce car use, encourage expenditure on local goods and services and strengthen the visitor appeal of the town by offering the combined attractions of a mixed-use Waterfront and historic town centre.

In respect of the second question, the clear emphasis in both the County and City's policy documents and proposals are to maintain a level of car access while encouraging the use of more sustainable modes such as walking, cycling and the bus. Given the current and predicted congestion in this particular area, increases in car travel cannot be accommodated.

In considering the future relation between the town and the Waterfront, we considered two alternative scenarios:

Ipswich – town in a ring road

If the links between the town centre and the Waterfront are not substantially improved, they will remain two separate 'quarters' and linked trips between the two are likely to be few in number. Without these linked trips, it is questionable if the facilities of the Waterfront alone will be enough to attract a sufficient number of visitors to the Waterfront throughout the day to sustain the proposed shops, restaurants, cafes, etc. Without these visitors from "outside", the Waterfront development is likely to become a type of "dormitory town". This will have a negative impact of the quality of the Waterfront, both for the Waterfront residents as well as Ipswich town as a whole. The Waterfront will remain separated from the town centre by a traffic-dominated area of poor air quality and congestion.

Ipswich – town on the Waterfront

If the barrier between the town and the Waterfront can be substantially reduced, Ipswich could become "a town on the Waterfront", with people moving freely between the attractions and facilities of each. This will increase the footfall on the Waterfront and help sustain the restaurants, cultural venues and other businesses proposed here. It will also encourage development in the area between the city centre proper and the Waterfront. Having an attractive and vital Waterfront, as well as a historic town centre, will increase Ipswich's appeal to residents, employees and visitors, bringing economic and social benefits to all.

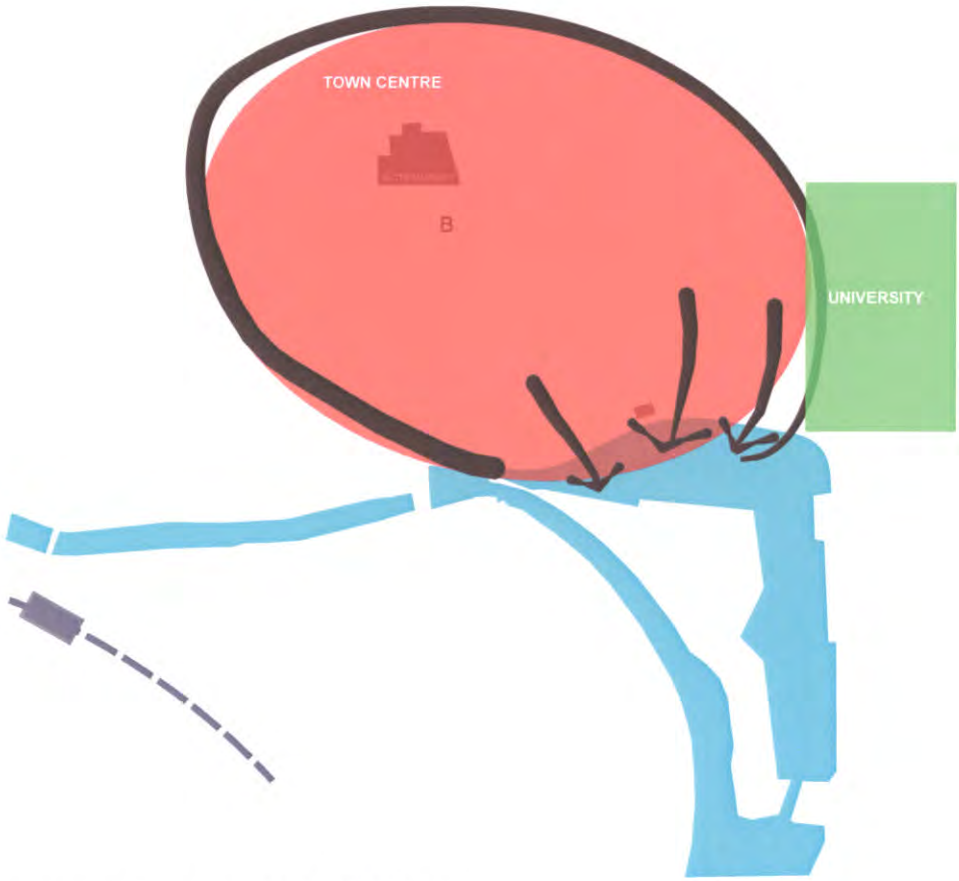

Figure S 2: Town on the Waterfront

Consultation

Two separate consultations were carried out for this study.

In the first, a selection of some 12 key local stakeholders were interviewed to discuss the importance of various appraisal factors, and to obtain their views on the relative local importance or weighting of these. There was a variety of views expressed, but a simple average of the scores shows safety objectives coming out on top, with environment, accessibility and the economy all achieving similar scores. Planning objectives achieved a significantly lower average score than the other four criteria. The key conclusion to be drawn was that the 'economic' objectives were not regarded as having priority over other objectives relating to safety, the environment and accessibility in the local context.

A breakfast stakeholder workshop was also held, at which the 'visions' and options were outlined and comment invited. A summary of the discussions at this seminar were:

- Vision: The three groups were divided on whether or not the Waterfront should or could be integrated with the town centre. However, the majority of groups agreed that the success of the area is dependent on good transport linkages for all modes of traffic, but particularly for 'green' modes. There was concern over reducing capacity for motorists as it could mean a decrease in accessibility.
- Problems: Only one group suggested that Star Lane was the only problem to achieving their vision. However, all groups noted that the existing traffic problem was related to the lack of east/west traffic routes, and in particular, one group noted that most of the car parking was located on the west side of Ipswich, further encouraging trips across town. Many of the problems noted such as volume of traffic and air pollution were noted as problems impeding the identified vision. These

were problems that affected the whole town and therefore the solution should come from a package of measures.

- Options: The general consensus was that something should be done in the short term until larger schemes such as a possible new road bridge or bypass around Ipswich could be developed. It was felt to be important that the existing road capacity should not be significantly affected by any shorter-term measures. Therefore, the most appropriate option would be traffic calming or management that did not significantly reduce capacity.

Recommendations

It seems clear to the consultant team that the long-term retention of the 'status quo' of the Star Lane gyratory will not promote the future development of Ipswich, and that a move to a 'town on the Waterfront' must be the way forward in the future. It is also our view that the current traffic volumes using the Star Lane gyratory are inappropriate for the existing air quality in the area and the proposed developments and for the long-term future of an Ipswich that has a town centre integrated with its Waterfront.

Our recommendation is that in the short to medium-term aim (1-5 years) of the Councils should be to move towards a single lane Star Lane and College Street, maintaining the existing one-way nature of these roads. This will enable pavements to be widened where necessary to improve east/west links, and easy crossings of a single traffic lane in a north/south direction. Figures S 3, S 4 and S 5 indicate the scheme proposals.

Figure S 3: Recommended scheme – 1-lane gyratory concept – Key Street

Initial tests indicate that this arrangement is likely to result in a capacity reduction of some 20% on the corridor, which will reduce volumes, improve air quality and help the integration of the Waterfront and the city centre. It seems clear from consultation undertaken that there

is a firm desire to improve the links between the city centre and the Waterfront, but there are also concerns about the possible traffic impacts such a scheme could cause.

We are however confident that (1) a significant proportion of the traffic using the gyratory is 'local' (starting and finishing within 2-3 miles of the city centre) and there is therefore great potential to transfer many of these trips to other modes such as walking, cycling and buses and (2) that in our experience of many similar such 'capacity reduction' schemes, that the ultimate effect is far lower than projected using traffic models, as traffic transfers to other modes and reroutes. We also recommend that the scheme be introduced over a few years in a co-ordinated fashion, facilitating slower changes in travel behaviour. We are confident therefore that the impacts predicted by the traffic models are unlikely to be achieved in practice, and that our recommended option is achievable if managed effectively and phased in over time. While new developments are planned on the Waterfront, their location will make use of more sustainable modes more likely.

An action plan for implementation

We recommend that the introduction of a 1-lane Star Lane and College Street could be accomplished in stages, all of which need to complement each other. It will be important to encourage and support a change in travel behaviour while ensuring that the public are aware of the reasons and benefits behind the changes. Not least, attention will need to be paid to the use of the Waterfront itself, to ensure that people want to use it and its facilities.

- Firstly, it will be important to encourage use of other modes by current car users on Star Lane. Over time information should be provided to these car users about (1) the current conditions in Star Lane, and in particular the AQMA issues (2) the alternatives available to them for travel and (3) the development and events taking place in the area and the Council's vision for an Ipswich on the Waterfront. This could be reinforced by particular measures such as trial free bus passes for some households or employees, car sharing initiatives for employees using this route from the east and other promotions. The councils and the university as major local employers also have a major part to play in this process.
- Hand in hand with these initiatives should be improvements to cycling, walking and bus facilities on the corridor – a particular challenge will be to try and ensure good connections between east Ipswich and the main employment areas to the west of the town centre .
- The councils should also start to encourage better linkages between the centre and Waterfront, and more use of the facilities of the Waterfront – this could take the form of events and promotions to get people to use the Waterfront and appreciate the benefits of the integration of the area with the city centre.
- Developers should be encouraged to develop the ' transition' area between the city centre and the Waterfront, particularly on key pedestrian routes, and to ensure their developments ' face' the roads on the gyratory, making them more ' human scale' and supporting the traffic reduction measures.

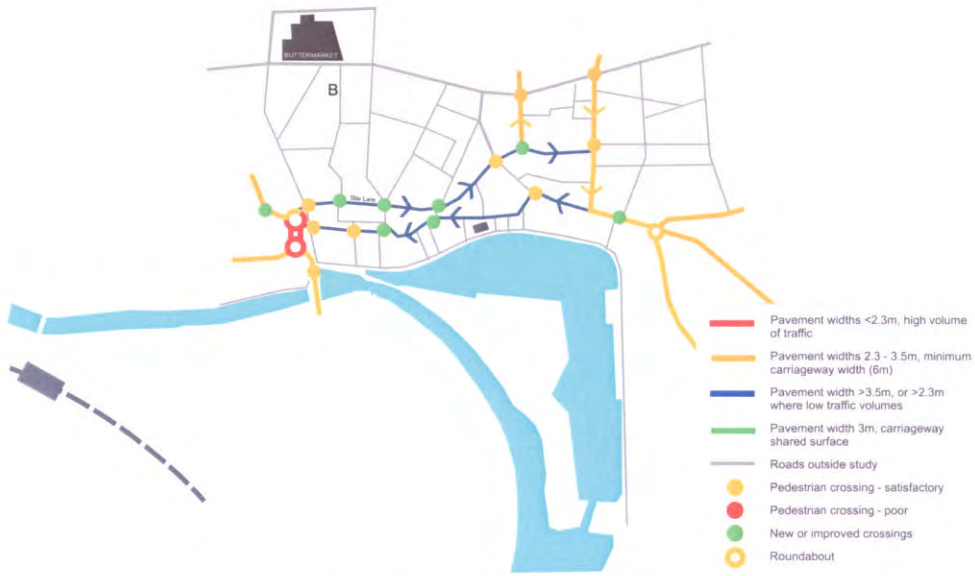

Figure S 4: Recommended scheme – 1- lane gyratory

- New car parking for commuters should be discouraged within the 'core 'city centre, and the scope for some parking on the eastern edge of the gyratory could be considered – in this respect the University or adjacent sites may be a possible 'park and walk' (or park and free bus ride) location.

Finally, the traffic management measures should be introduced incrementally, and timed to minimise impact, implemented wherever possible at times of least traffic, such as the school holidays. This could be accompanied by some queue relocation measures on the edges of the gyratory and improved directional signing. We believe that implemented over a few years the impact of reduction in any one year will not be significant, and offer opportunities for modal shift and changes in travel behaviour that are 'stepping stones' to a final scheme that can change the nature of the Star Lane gyratory, and link the Waterfront with the rest of Central Ipswich.

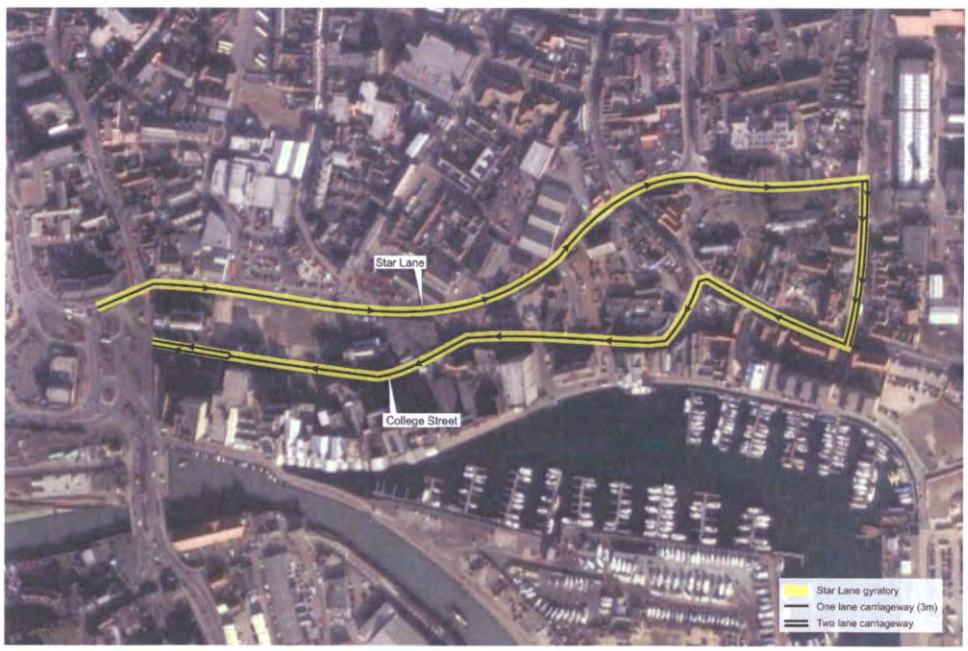

Figure S 5: Recommended scheme - proposals

1. Introduction

1.1 Background

1.1.1 Ipswich's Waterfront is undergoing a dramatic transformation. In recent years derelict wharfs and industrial buildings have been replaced by high density residential developments, including a range of cafes and restaurants. This transformation is set to continue with a greater mix of land uses, including a university, a theatre, studios, cafes, bars, restaurants and retail units, as well as some 4,000 additional dwellings planned for in the near future.

1.1.2 The Waterfront lies approximately 650 metres (or some 8 minutes walk) to the south of the town centre, but is separated from it by an area of low density, mixed use, (but predominantly industrial) land, which can be described as a "transition zone", as well as a number of busy roads collectively known as the Star Lane gyratory. The combined effect of these barriers makes the distance between the Waterfront and the town centre feel significantly greater than it actually is.

1.1.3 To the east and west of the town centre there is a proposed "Education Quarter" with University Campus Suffolk (UCS) and Suffold New College, and Ipswich Village, a "civic quarter" including Suffolk County Council and Ipswich Borough Council offices – see Figure 1.1.

1.1.4 In May 2006 Suffolk County Council and Ipswich Borough Council jointly commissioned this study to evaluate alternative road scheme options to address the severance caused by the Star Lane gyratory and improve access between the Waterfront and the town centre, university and other key destinations in the area.

1.1.5 The options considered should be appraised in terms of how they:

- Improve connectivity in town centre
- Support development of Waterfront
- Support development of Education quarter
- Improve quality of the urban environment
- Improve urban form and structure
- Encourage a shift from car use
- Improve air quality in AQMS
- Relieve congestion in and around town centre.

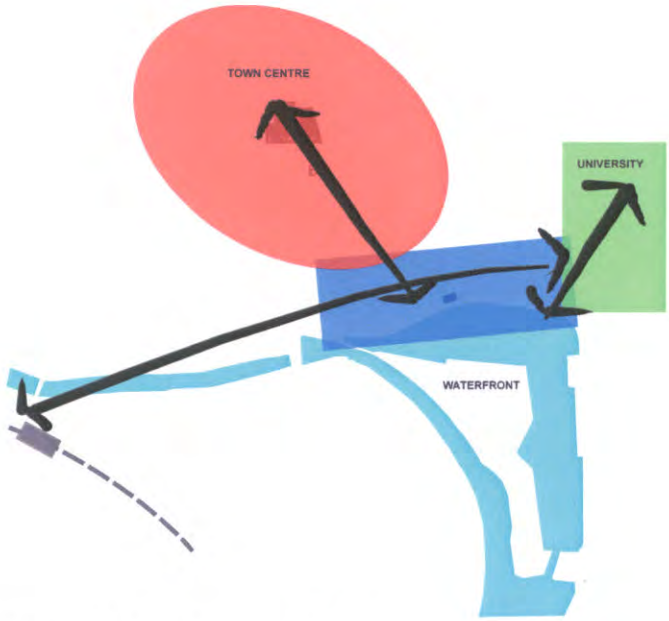

Figure 1.1: Areas and links

1.2 The study area

The study area is focused on the Star Lane gyratory from the Novotel roundabout in the west to the emerging Education Quarter and Duke Street roundabout in the east – see Figure 1.2. However in assessing some of the impacts of the transport schemes we have also tried to consider the wider pedestrian and road network, including Ipswich town centre, the railway station, Crown Street, Valley Road and the A14.

Figure 1.2: Town quarters and road connections

1.3 Report structure

1.3.1 Following this introduction this report is structured as follows:

- Chapter 2 reviews the wider context of the study area, including planning and development, transport and urban design issues.
- Chapter 3 looks at movement and accessibility issues of the Waterfront in the context of a long term vision for Ipswich town centre.
- Chapter 4 describes the Star Lane gyratory in further detail, including its role in the road network and the pedestrian environment.
- Chapter 5 explores the alternative road schemes in terms of their effect on improving the pedestrian environment as well as their impact on traffic capacity and the wider network.
- Chapter 6 summarises the results of consultation with stakeholders and councillors of Ipswich Borough Council and Suffolk County Council.
- Finally, chapter 7 sets out our recommendations.

1.3.2 A separately bound appendix document contains a pedestrian route analysis, a summary literature review, notes on consultation and a note on traffic impacts predicted for the preferred option.

2. The wider context

2.1 Introduction

2.1.1 Ipswich, the County town of Suffolk has an attractive and vital town centre. It benefits from a wealth of historic buildings and a dense network of attractive streets and lanes. Its retail offer includes several department stores, representations of all the major multiples as well as a variety of independent shops and boutiques.

2.1.2 Ipswich has a system of roads that collectively form a "ring road" around the town centre. Although the ring road allows for a relatively traffic calmed, pedestrian-friendly environment within the town centre, it forms a barrier to the areas surrounding it.

2.1.3 Ipswich is a major focus of growth, with a projected increase of 15,400 dwellings over the period 2001-2021. Some 4,000 of these are proposed on the Waterfront to the immediate south of the town centre. To the east and west of the town centre, new / proposed development includes the "Education Quarter" with University College Suffolk, and Ipswich Village, a "Civic Quarter" including Suffolk County Council and Ipswich Borough Council offices – see Figure 1.1.

2.1.4 Because of these emerging high density quarters outside the ring road, there is pressure for pedestrian links to be strengthened across it, and to reduce traffic volumes on the road itself.

2.1.5 The Star Lane gyratory forms the southern section of the ring road. The focus of this Waterfront Transport Study is to improve the connectivity of the Waterfront, the area where most of the new development is taking place and that currently suffers the worst pedestrian connections.

2.2 Major Public Transport Scheme Bid

2.2.1 In 2005 Suffolk County Council submitted to the DfT a £16 m bid for a major public transport improvement scheme in Ipswich. This included three packages of measures:

- Improvements to public transport infrastructure (including the two bus stations and introduction of additional shuttle bus services)
- Enhancement of the Urban Traffic Management and Control (UTMC) system, variable message signs to car parks and a real time passenger information system for bus services
- Improvements to walking and cycling facilities.

2.2.2 The analysis for the bid indicated that the city centre traffic could be reduced by 8% as a result of the measures.

2.2.3 The bid recognised that "even with improved pedestrian crossings as envisaged in the scheme, the Star Lane Gyratory remains a very unattractive environment for pedestrians and cyclists in a key location". This recognition, and a recommendation for further study of this issue, was one of the starting points for the present study.

2.3 Development on the Waterfront

2.3.1 A number of high density residential schemes have been developed on the Waterfront in recent years. This includes amongst others the Bellway development (69 units)and Neptune Marina (113 units) in the east of the study area.

2.3.2 Currently, the focus of building activity is on the section of the Waterfront between the Novotel roundabout to the west and Old Custom House to the east. Figure 2.1 shows the location of new developments (shown in dark grey). A list of schemes that have recently been given planning permission or are being considered are shown in Table 2.1.

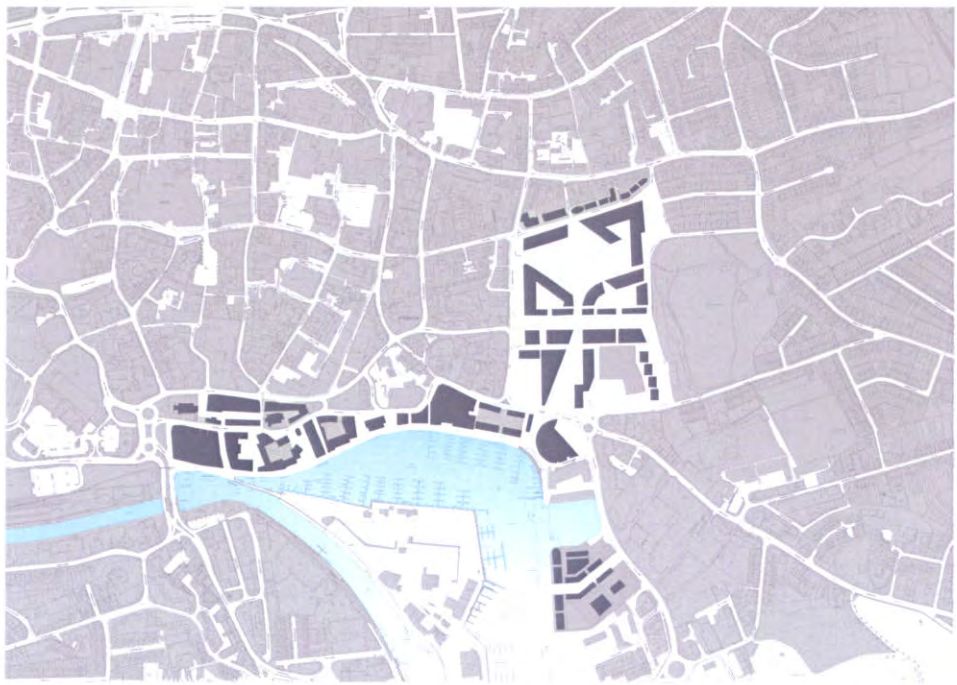

Figure 2.1: Location of new development

Table 2.1: Approved and Pending Planning Schemes

Address	Proposal	Status
College Street		
Cranfield Flour Mill College Street Ipswich	Demolition of former mill buildings to facilitate redevelopment (includes retention of part of frontage to College Street and buildings fronting Albion Wharf)	Approved / Conditions
Redevelopment Sites (Former Cranfields) College Street Ipswich	Redevelopment of former Cranfield Mill site and associated garage and lorry parking areas for mixed use development in multi-storey blocks (up to 23 storeys), comprising: 384 residential units; live/work units; 3,840 sq m commercial use (A1/A2/A3/B1 and D2); dance studio/space with accommodation (2460 sq m); 81 bedroom hotel; car parking; vehicular accesses; open spaces and associated works.	Approved / Conditions
Burton Son And Sanders (North Side) College Street Ipswich	Erection of multi-storey blocks comprising of 3 hotels (405 bedrooms), 28 residential apartments, 2064 sq m of retail/restaurant uses 2,896 sq m offices and 3 basement floors of parking spaces (442 spaces).	Pending decision
Burton Son And Sanders South College Street Ipswich	Erection of 6 storey building containing 10 residential units and ground floor commercial unit (A1/A2/A3/A4) and alterations to vehicular access and associated works.	Approved / Conditions
Star Lane		
Former Anglian Water Authority Waterworks Street Ipswich	Erection of two 4 and 5 storey building to provide 36 residential units with associated outbuildings, 24 car parking spaces, local area for play and landscaping.	Approved / Conditions
Portia Ltd, 52 - 54 And Land Adjacent Grimwade Street Ipswich	Residential development including new vehicular access	Pending decision
Key Street		
Pauls Malt Ltd Key Street Ipswich	Demolition of former maltings buildings to facilitate redevelopment. Proposal includes part retention of quayside maltings	Approved / Conditions
Pauls Malt Ltd Key Street Ipswich	Mixed use development in multi-storey blocks (up to 14 floors), - 290 residential units and 3000 sq m of non-residential floor space, car parking,	Pending Decision
6 The Old Bull Inn Workshop 35 Key Street Ipswich	Change of use from Office/Storage to Mail Order distribution warehouse with ancillary retail sales.	Approved / Conditions
Turret Lane		
1 Turret Lane Ipswich	Residential development (13 houses and 6 flats) with Class B1 (3575 sq m) Office Unit in two five storey blocks with associated car parking and external works.	Approved / Conditions
11 Turret Lane Ipswich	Change of use of ground floor office unit (currently under construction) to cafe use (class A3)	Approved / Conditions
Tudor Works 26 Turret Lane Ipswich	Continued additional use of warehouse as depot for vehicle glass replacement service, with fitting bay	Approved / Conditions
Suffolk College		
Suffolk College Rope Walk Ipswich	Demolition of existing office and education buildings, erection of 4-storey further education college buildings and 2-storey sports hall with associated car parking and landscaping, and new vehicular/ pedestrian access points.	Pending decision
Fore Street		
Orwell Service Station Fore Street Ipswich	Erection of 4 storey building comprising of 34 units of affordable accommodation, ancillary works and new vehicular access	Approved / Conditions

2.3.3 Bringing new residents and a range of commercial and leisure uses on the ground floors, these new developments will transform the streetscape on College Street / Key Street. By introducing variety and interest on street level, these roads may become attractive pedestrian streets. However, the narrow pavements and noise, air quality and safety issues associated with the existing high volumes of traffic will compromise the future of the street as a pedestrian thoroughfare and may jeopardise the viability of the proposed businesses.

2.4 Pedestrian connectivity

2.4.1 There are several north-south routes linking Ipswich town centre with the Waterfront. These are illustrated in Figure 2.2. We have undertaken a detailed assessment of these routes which has been included in Appendix A. The main findings may be summarised as follows:

- There are 6 routes linking the town centre and the Waterfront
- The 'core' town centre, e.g. The Buttermarket is about 650 metres from the Waterfront. This is a walk of some 8 minutes.
- The heart of the Waterfront is located to the southeast of the town centre. However, Ipswich's street pattern has a predominantly northeast/south-westerly orientation, making the Waterfront quite hard to 'find' - Fore Street is an exception.
- Ipswich's streets are generally curved, and there are no long distance views of the Waterfront, adding further to the poor legibility of the routes.
- An area of low density, vacant and under-utilised sites (i.e. bus depot, surface car parking, single storey industrial buildings) to the north and south of Star Lane forms a barrier between the town centre and the Waterfront and affects all the routes with the exception of Fore Street and St Peters Street/St Nicholas Street.
- The high traffic flows and associated noise, air pollution and safety issues on Star Lane and College Street create a significant barrier between the town centre and the Waterfront.
- There are only a few formal crossing points on Star Lane and College Street / Key Street / Salthouse Street, and these do not in all cases complement the north-south pedestrian routes.

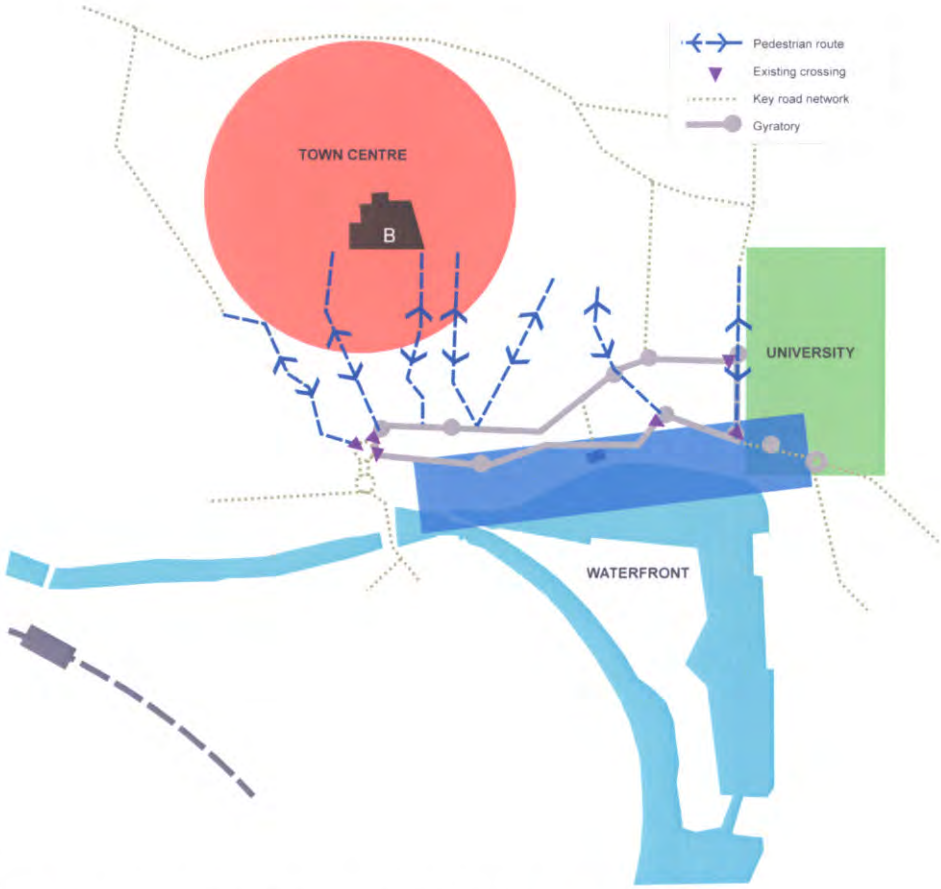

Figure 2.2: North-South pedestrian links

2.4.2 East-west routes linking the University and residential areas to the southeast of the town centre with Cardinal Park and the railway station to the west of the study area include those listed below. These are illustrated in Figure 2.3.

- The Quayside – a sunny route with views of the harbour and lined with a number of cafes and restaurants. Low traffic flows but cluttered in places with quayside car parking.
- Fore Street / Salthouse Street / Key Street / College Street – the westbound section of the Star Lane gyratory. Car-dominated environment with sections of extremely narrow pavements (<1 metre). Visual interest provided by historic buildings and ongoing building construction work. Future development will include commercial uses at ground floor level.
- Fore Street – an attractive route for northwest - southeast movement, i.e. linking the eastern section of the Waterfront with the town centre.
- Star Lane – eastbound section of the gyratory. Car dominated environment. More pedestrian space than the Fore Street / Salthouse Street / Key Street / College Street route, with pavements generally >2.3 metres, but the lack of active frontages or visual interest make it a very poor route for pedestrians.

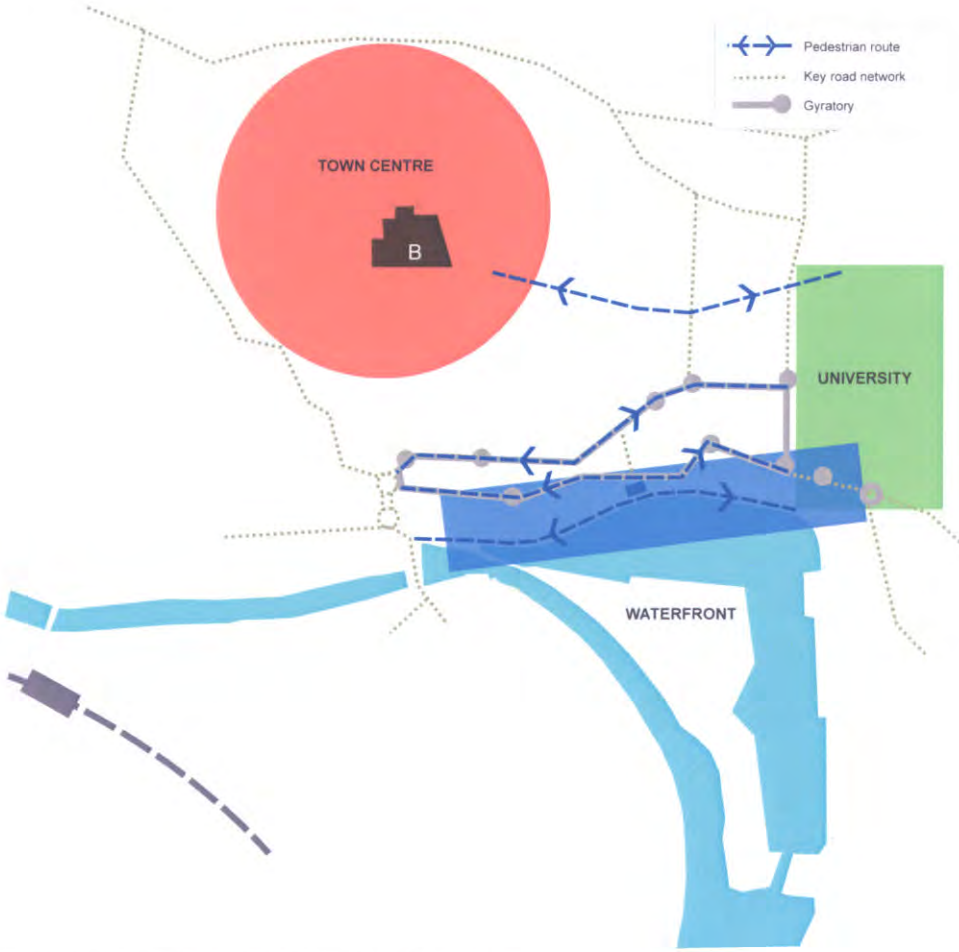

Figure 2.3: East-West pedestrian links

2.4.3 The Novotel roundabout to the west lacks adequate pedestrian crossing facilities and forms a major barrier to pedestrian movement. A zebra crossing at the Grimwade Street / Fore Street junction, as well as pedestrian phases on the Grimwade Street / Star Lane junction provide reasonable pedestrian access to the east.

2.4.4 In conclusion, the Star Lane gyratory presents a significant barrier to pedestrians, both in terms of north-south and east-west movements. The poor quality of the north-south routes between the town centre and the Waterfront are only partly due to the lack of crossing facilities and high volume of traffic on the Star Lane gyratory. Other issues, such as the street pattern of the town, lack of views and poor quality development in the "transition zone" also play a significant part.

2.4.5 In terms of east-west movements, the high volumes of traffic, associated noise and pollution, limited pavement width and poor crossing facilities do have a major impact on the quality of the east-west pedestrian links. It could be argued that the quayside forms an attractive and acceptable pedestrian route that may accommodate all east-west movements. However, we consider it important that College Street / Key Street / Salthouse Street / Fore Street and Star Lane should also provide alternative pedestrian routes because of:

- Proposed commercial development frontages on College Street and Key Street;

- The limited number of east-west pedestrian routes between the Waterfront and Rope Walk / Orwell Place / Tacket Street over 400 metres to the north. The lack of a fine-grained pedestrian network has a detrimental effect on walking as an attractive mode of transport.

2.5 Cycling and bus accessibility

2.5.1 In terms of cycling, the Quayside is part of a national cycle route, and Rope Walk is an important link from the proposed Education Quarter to the city centre. A number of bus services serving the eastern part of Ipswich use Fore Street and Grimwade Street, but other than a school bus, there are currently no bus services using Star Lane or College Street along their length.

2.6 Air quality

2.6.1 The land in or around the junction of Grimwade Street with St. Helens Street, the Star Lane gyratory system including Fore Street, Salthouse Street, Key Street, College Street, Bridge Street, Foundation Street and Slade Street was designated as an Air Quality Management Area (AQMA) by Ipswich Borough Council in March 2006 – see figure 2.4. Within these areas the Council is required to prepare an action plan to make improvements. The air quality problems here and the declaration of an AQMA have created strong justification for a reduction of traffic and congestion in this area in the near future.

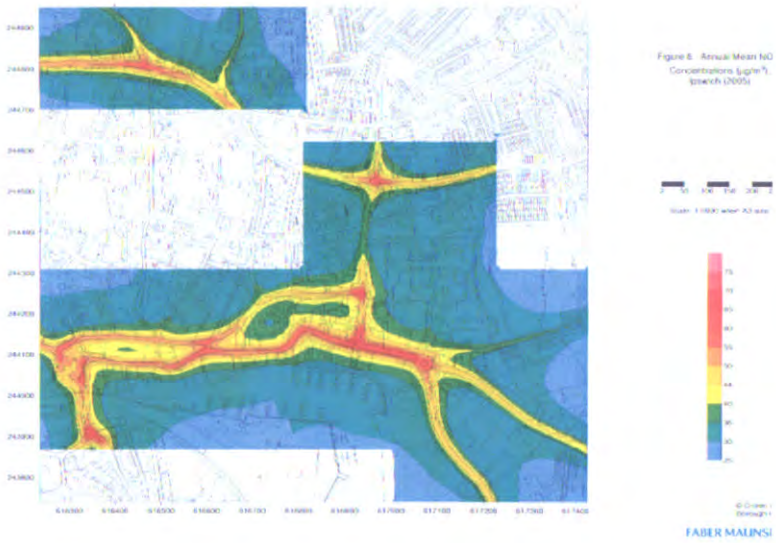

Figure 2.4: Air Quality Management Area

2.7 Traffic

2.7.1 In terms of traffic characteristics, Figure 2.5 shows the main features of existing traffic patterns in the area, based primarily on counts undertaken in 2004. A summary is:

- Star Lane (one-way eastbound) carries between 1,550 and 1,650 vehicles in peak hours (morning and evening) between the Novotel roundabout and Waterworks Street. At Waterworks Street approximately 600 vehicles proceed northbound, while the remaining 1,000 proceed eastwards to the junction of Grimwade Street and on to the Duke Street roundabout. They are joined at Grimwade street by 1,000 vehicles heading south on Grimwade Street. These flows are relatively consistent between the morning and evening peak periods. In the evening peak hour there is typically a slow-moving queue from the Novotel junction along Star Lane to the Duke Street roundabout.
- The Fore Street approach to Key Street/College Street carries between 1200 and 1400 vehicles in the peak hours – a further 5-600 vehicles join 'Key Street'/College Street at Grimwade Street, which means that along College Street volumes are typically 2,100 vehicles in the morning peak hour and about 1,700 in the evening peak hour.

2.7.2 We have reviewed information available on future traffic levels in Ipswich as predicted by the County Council's SATURN model. This indicates no significant increase in volumes on the Star Lane gyratory in the future, mainly due to the fact that the system is close to practical capacity already. Any traffic from new development at the Waterfront is likely to displace other traffic using the gyratory for the same reason.

2.7.3 In the light of the above, and the fact that the declaration of the AQMA requires a reduction in traffic in the area, this study has concentrated on analysing the impact of traffic management changes on existing traffic volumes.

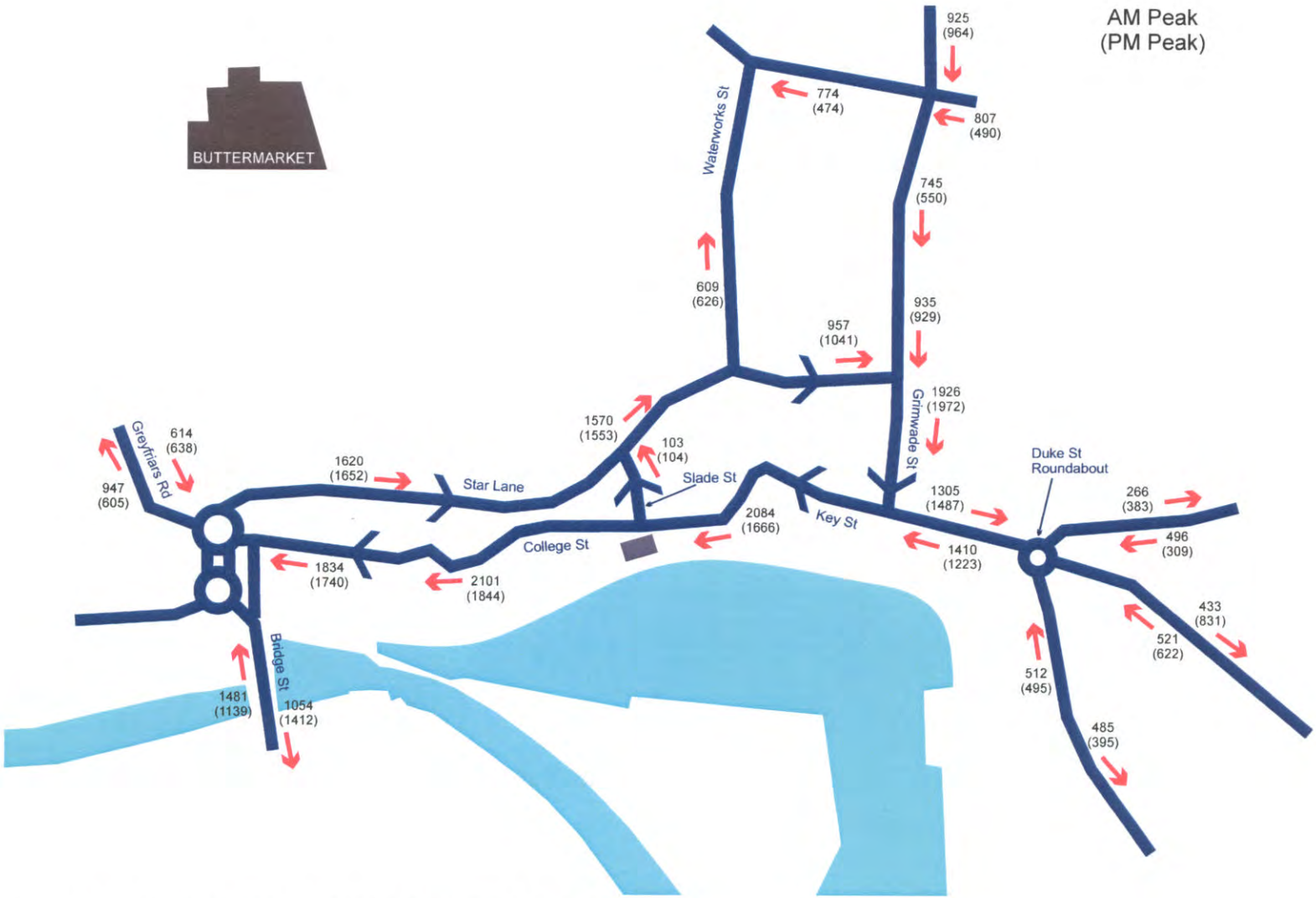

Figure 2.5: Traffic Flows – AM and PM Peaks (pcu/hr)

2.7.4 While survey data is relatively old, all available evidence from the traffic model and knowledge of local travel patterns is that the vast majority of the traffic using the Star Lane gyratory is 'local' in the sense that it probably has an origin and destination in an area of Ipswich within some 3 miles of the city centre. This is perhaps not surprising given existing congested conditions – longer-distance travellers will seek to avoid the area. This fact is reinforced by census information analysed by SCC for the draft Ipswich Transport Strategy, which shows that there is clearly significant potential for many of these trips to be made by other modes, in particular walking, cycling and buses.

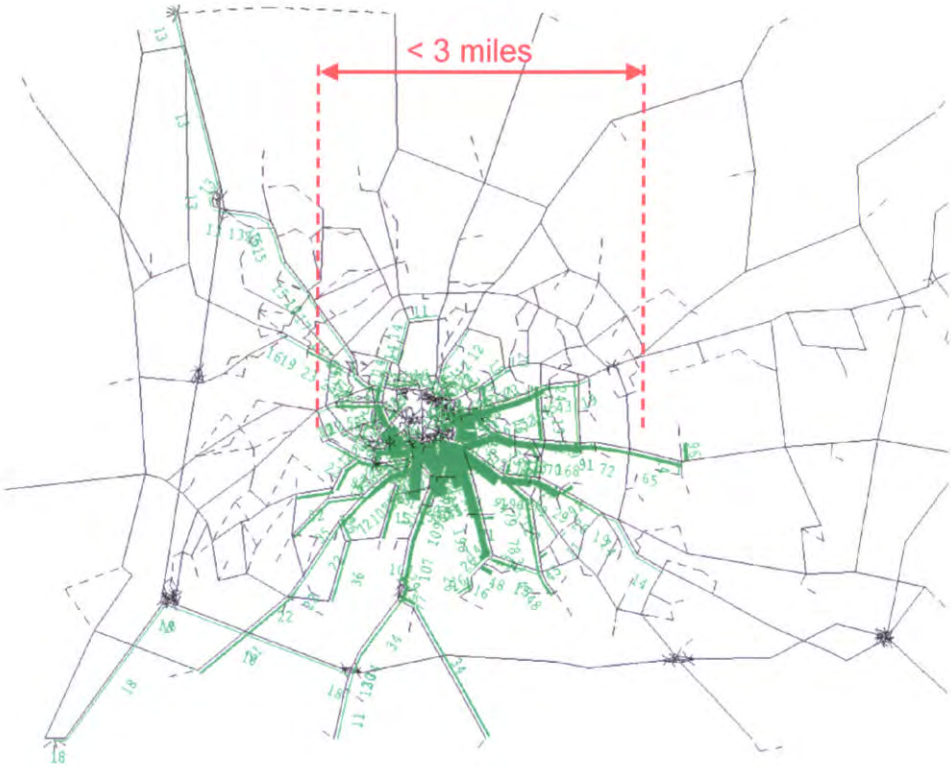

Figure 2.6: Local origins of gyratory traffic

2.7.5 The proportion of heavy goods vehicles (HGV's) is estimated from counts to be less that 2% (32 per hour) on Star Lane, with a far lower proportion in the evening peak hour, and up to 2.5% (53 per hour) on College Street, again with a far lower proportion in the evening peak hour.

2.8 New road infrastructure options

2.8.1 A number of alternative road options have been the subject to previous tests. A summary of the, main proposals affecting the study are and the implications are as follows (see Figure 2.7):

- A **''Wet Dock crossing'**, linking Duke Street to Wherstead Road, has been considered. This new set of bridges would need to be subject to periodic closure due to the needs of river traffic, and current estimates indicate that it would cost some £60 million. Tests indicate that this bridge would reduce traffic on Star Lane in the peak hours by some 250 vehicles per hour (or some 15%) and reduce College Street traffic by some 150-200 vehicles per hour, or up to 10%. However, as demand grows, and without any restraint in the gyratory area, it is likely that these benefits would start to be eroded.

- An **East Bank Link Road,** connecting the Duke Street area with a new junction on the A14 has also been considered. The tests indicate that this improvement will reduce traffic flows on the Star Lane gyratory by less than 5%, and consequently this option has not been considered further.
- A **Suffolk College Link Road** aims at providing a link across Suffolk College between the Fore Hamlet roundabout and Grimwade Street (cost estimate £34.7m at 2004 prices). A variation included a Suffolk College Eastern Access Road between the Waterfront and St. Helen's Street (total combined cost estimated at £43m at 2004 prices). Tests indicate an increase of traffic on Star Lane (200-700 vehicles per hour in the peaks) but a decrease on College Street (500-600 vehicles per hour) with these options, assuming restrictions on traffic using Fore Street, with this being re-routed via the new College link road.

2.8.2 Given the high costs and medium to longer term nature of these schemes, these 'supply' options have not been considered further in this study

2.9 Traffic reduction potential

2.9.1 Most traffic analysis starts from the premise of a 'fixed trip' matrix i.e. one in which the amount of trips using car as a mode before and after the various schemes is assumed to remain the same. In reality, improvements to public transport, walking and cycling over the coming years are likely to decrease the car trips entering the city centre in particular. In the modelling of the Major Scheme bid, this reduction was estimated to be some 8% in the central part of Ipswich by consultants working for the County Council.

2.9.2 We agree with the scale of these estimates, but believe that the reduction could be greater on the Star Lane gyratory corridor itself if specific marketing and promotional measures are targeted, for example through contact with households or employees living in East Ipswich.

2.9.3 In addition to this transfer of trips due to improvement in these modes, it is highly likely that further decreases in car use in central Ipswich will result if schemes are introduced that reduce car capacity - this means that car journeys will take longer, and alternative modes, particularly for shorter trips, will become more attractive. Based on experience elsewhere, we expect that such a mode share change could be between a further 5 and 10%, particularly if there is marketing of alternatives.

2.9.4 In summary, we can expect that with improvements in public transport, walking and cycling and reductions in traffic capacity if various Star Lane options are introduced, that there will be a reduction of between 8 and 18% in car volumes in central Ipswich, which will significantly reduce the impact of the measures on the existing traffic volumes.

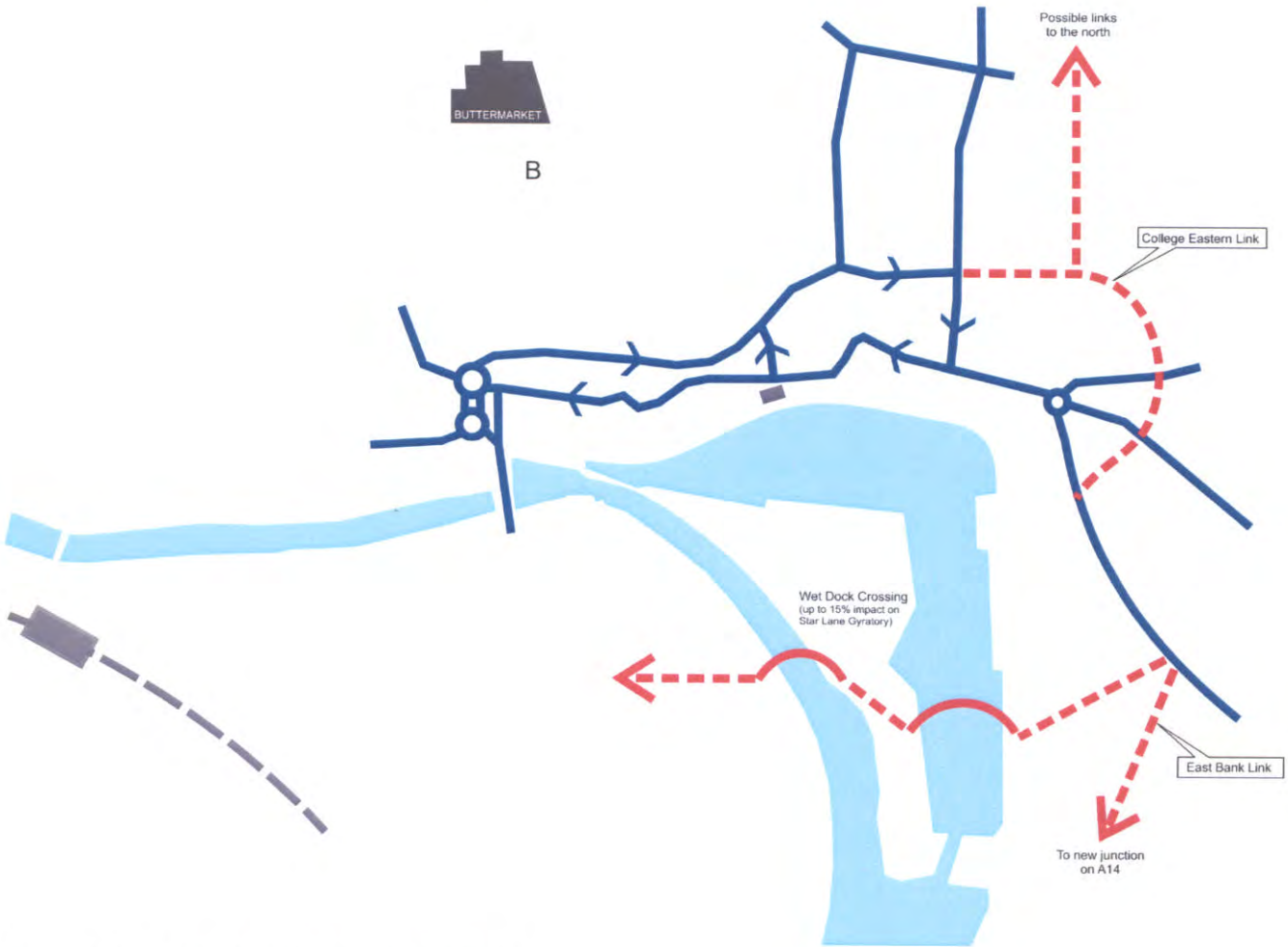

Figure 2.7: Major Road Scheme Options

3. A vision for Ipswich

3.1 Introduction

3.1.1 The overall objective of the Ipswich Waterfront Study is to reduce the severance between the Waterfront and the wider town centre. In order to decide what level of change to the Star Lane gyratory is necessary and desirable, it is important to set the Star Lane issue in the context of the future of Ipswich town centre. In particular we need to consider two things:

- What will the relationship between the town and the Waterfront be?
- How will people move around Ipswich in the future?

3.2 The town and the Waterfront

3.2.1 The Waterfront is changing rapidly. Contrary to what was believed some 10 years ago, the poor quality environment of the Star Lane gyratory does not appear at present to inhibit sites coming forward for redevelopment in quick succession. So with the redevelopment of the Waterfront a commercial success, why is it still important to address the area's poor links with Ipswich town centre?

3.2.2 Apart from the very important air quality issues noted in section 2 above, the rapid increase in the number of people and activities on the Waterfront is likely to result in an increased demand for walking trips between the Waterfront and the town centre. This may include:

- People living on the Waterfront who want to visit the town centre to shop, work and socialise;
- Residents, employees and visitors of Ipswich town centre to visit friends and attractions on the Waterfront;
- Tourists and visitors to Ipswich who want to experience the combined attractions of the town centre and the Waterfront.

3.2.3 It is in the interests of Ipswich to encourage these trips by making them as attractive, safe and comfortable as possible. This is because:

- Walking is healthy and environmental-friendly;
- Walking does not add to existing congestion;
- Waterfront residents spending money in the town will bring economic benefits to town centre businesses;
- Town centre residents, visitors and employees spending money at the Waterfront will be critical in sustaining the existing and proposed businesses there, thus helping to safeguard the mixed use character of the area;
- Strengthening the visitor appeal of the town by offering the combined attractions of a mixed-use Waterfront and historic town centre will bring economic benefits.

3.2.4 In considering the future relation between the town and the Waterfront, we considered two alternative scenarios:

- Ipswich – a town in a ring road
- Ipswich – a town on the Waterfront

Ipswich – town in a ring road

3.2.5 If the links between the town centre and the Waterfront are not substantially improved, the town and the Waterfront will remain two separate quarters and linked trips between the two will not be encouraged. Without many linked trips, it is questionable if the attractions of the Waterfront alone will be enough to

attract a sufficient number of visitors here throughout the day to sustain the proposed shops, restaurants, cafes and cultural facilities. Without these visitors from "outside", the Waterfront development may become a type of "dormitory town". This will have a negative impact of the quality of the Waterfront, both for the Waterfront residents as well as Ipswich as a whole.

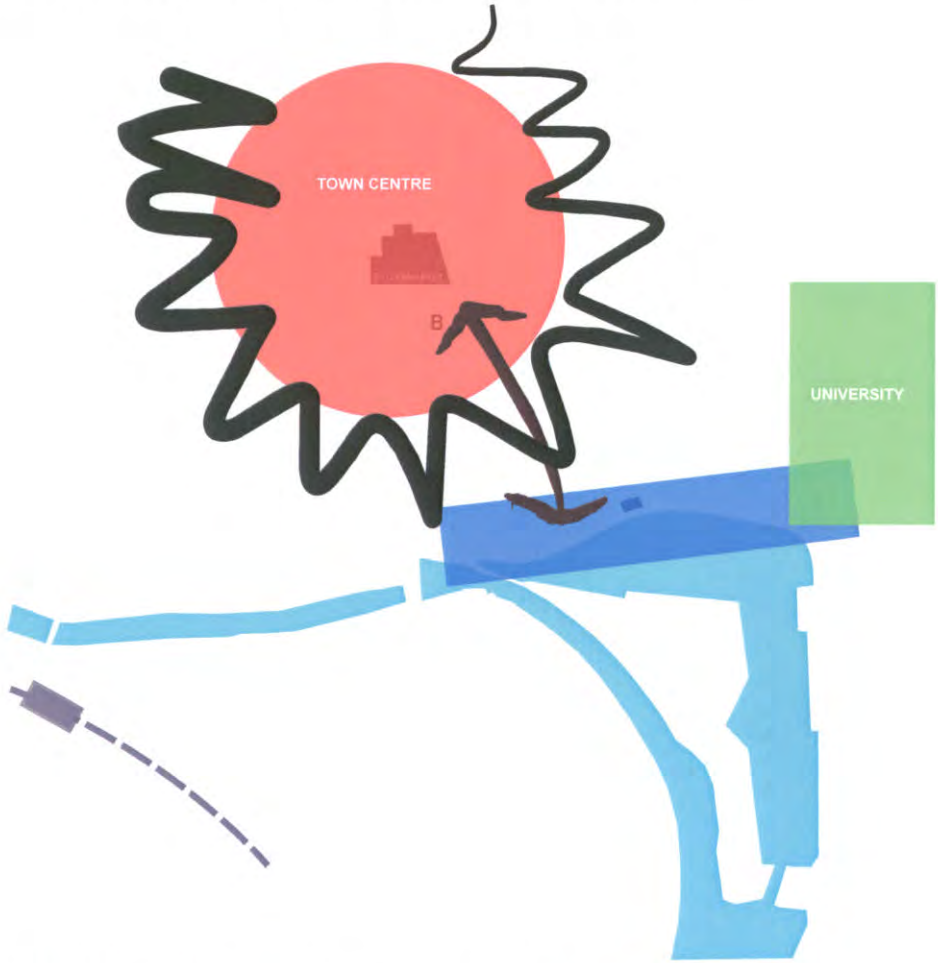

Figure 3.1: Concept 1 – town in a ring road

Ipswich – town on the Waterfront

3.2.6 If the barrier between the town and the Waterfront can be substantially reduced, Ipswich could become "a town on the Waterfront", with people moving freely between the attractions and facilities of each. This will increase the footfall on the Waterfront and help sustain the restaurants, cultural venues and other businesses proposed here. Having an attractive and vital Waterfront, as well as a historic town centre will increase Ipswich's appeal to residents, employees and visitors bringing economic and social benefits to all.

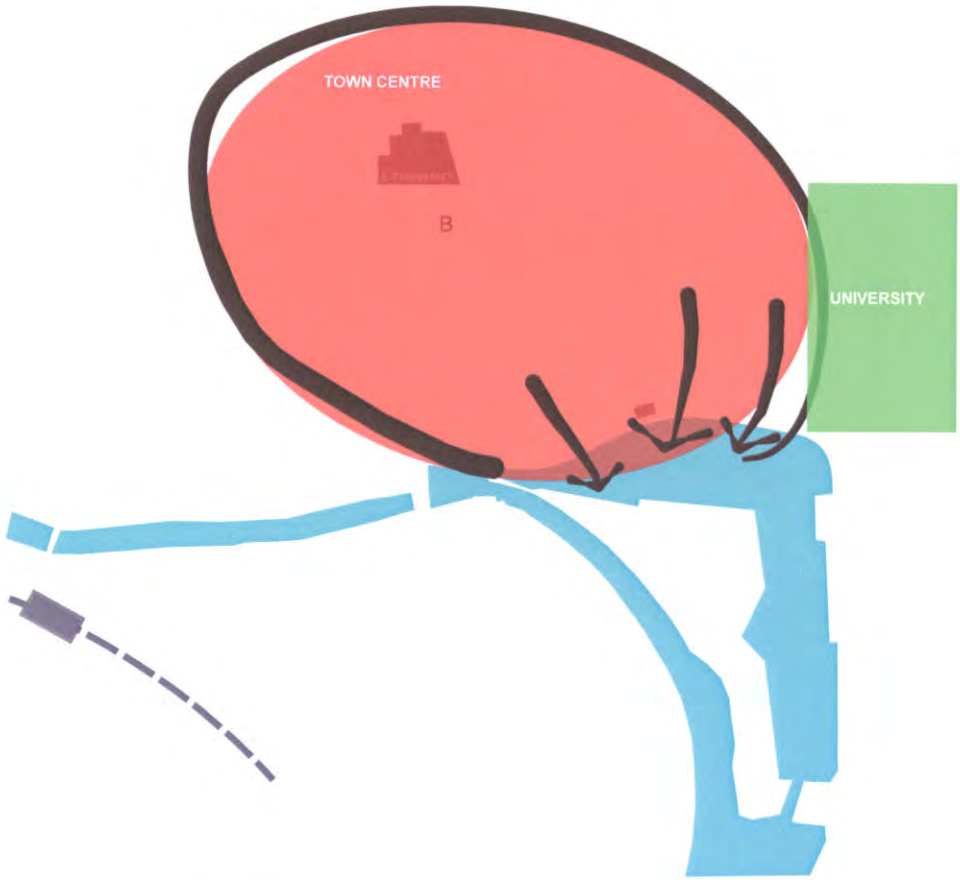

Figure 3.2: Concept 2 – town on the Waterfront

3.3 Breaking the barrier

3.3.1 The 'ideal' way to reduce the barrier between the town and the Waterfront would be to completely remove all through traffic from the Star Lane gyratory. This would address problems relating to air and noise pollution in the area as well as solving the problem of having to cross two busy roads with poor crossing facilities.

3.3.2 However, considering the heavy volumes of traffic on the Star Lane gyratory, this would have a drastic impact on the level of traffic on other parts of the ring road and the accessibility of the town overall. Therefore this is not considered to be an option unless either (1) an alternative east-west link can be found e.g. the Wet Dock Crossing (see Figure 3.3) or (2) some form of demand restraint is applied e.g. road pricing – these options are discussed briefly in section 5.2.

3.3.3 These options are longer-term projects, and have not been considered in detail in this study, which has instead concentrated on looking at a number of alternative, short(er) term options, as set out in Chapter 5.

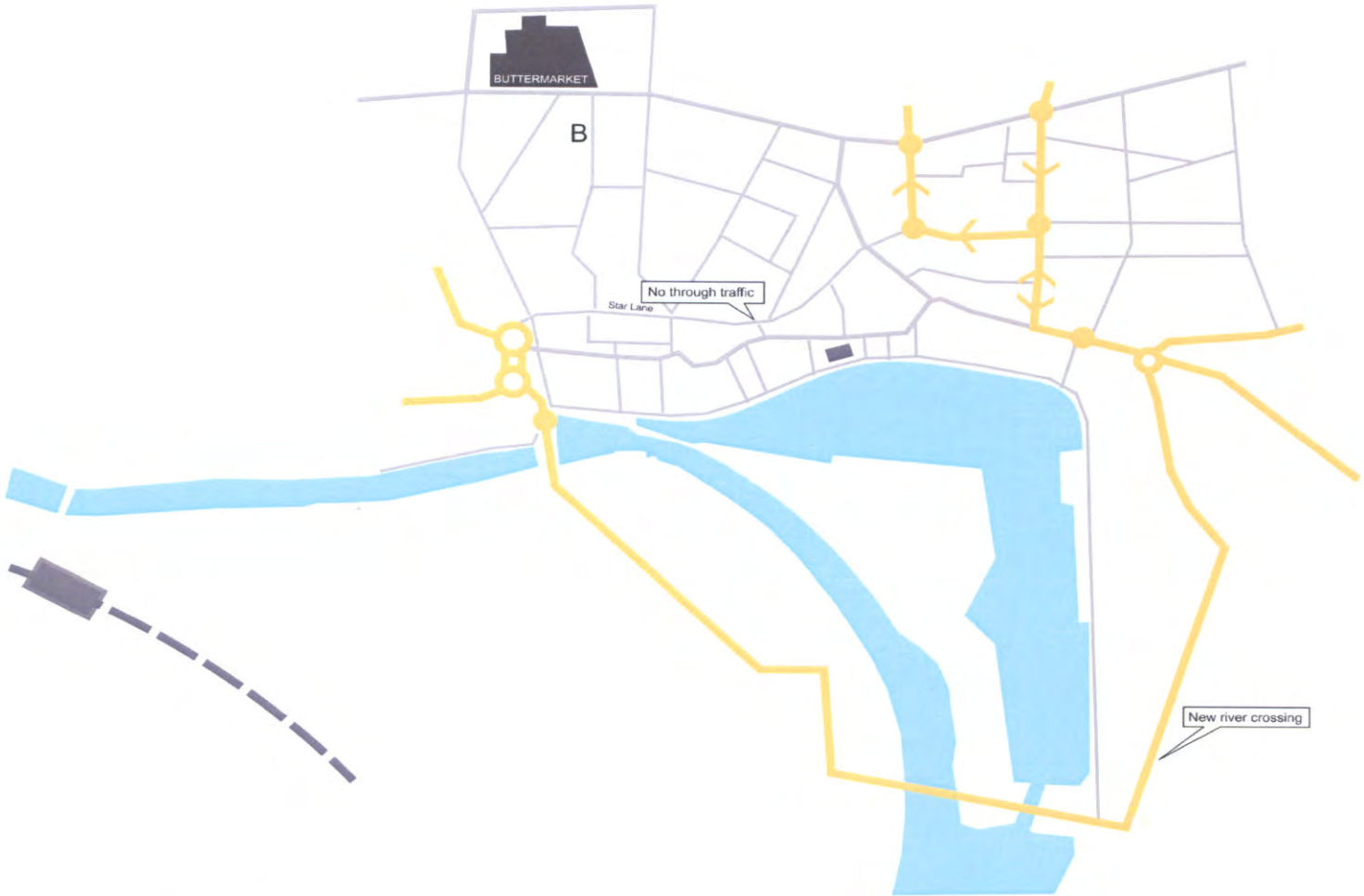

Figure 3.3: Through-traffic removed

3.3.4 As discussed in Chapter 2, it is not only the traffic that causes a barrier between the town centre and the Waterfront. Other issues that need to be addressed include:

- The lack of "town centre" land uses in the area between the town centre and the Waterfront (the "transition zone");
- Poor urban design in the transition zone, including long stretches of "dead frontages".

3.3.5 This needs to be addressed through the redevelopment of sites between the town centre and the Waterfront. However, the quality of the environment of the Star Lane gyratory is likely to have a significant impact on how this area will be regarded in the future and the type of development proposals that will come forward.

3.3.6 For example, if developers feel confident that Star Lane will become an attractive boulevard or traffic calmed street, buildings may be designed to include an active, varied and pedestrian-friendly façade at street level. However, if Star Lane is likely to remain a traffic-dominated "race track", buildings may turn their back towards the road, designating this as an appropriate location for service entrances etc, as is demonstrated by the proposed St Peter's Port development. When considering the road options in Chapter 5 we comment on the impact the road scheme may have on the future streetscape and redevelopment of the area where appropriate.

3.4 Moving around in Ipswich

3.4.1 Figure 2.6 in Chapter 2 illustrated how the majority of traffic on the Star Lane gyratory generally travels relative small distances of less than 2 miles. A large proportion of these trips could therefore be undertaken by alternative modes of transport, i.e. by bicycle, bus or on foot.

3.4.2 In light of the huge potential of modal shift in Ipswich, it is very important to consider the future transport strategy when making recommendations on the Star Lane gyratory options:

- How will people access the town (centre) in the future?
- Will and should the vast majority continue to drive as is currently the case, or can and should a significant shift to other modes of transport be made?
- If the latter, how can this be achieved?

3.4.3 The future direction of Ipswich's transport policies relating car parking, congestion charging, public transport provisions etc, will have a big impact on how people will choose to access the town centre. Even though it falls outside the scope of this study to make recommendations with regard to these issues, it is clear that the potential and desirability to reduce capacity on the Star Lane gyratory will depend strongly on strategic transport policy choices.

4. The Star Lane gyratory

4.1 Introduction

4.1.1 The roads that form the focus of this study are known as the Star Lane gyratory. The gyratory forms the southern section of a number of roads that collectively form a ring around Ipswich town centre. Linking the Novotel Roundabout in the west with the Duke Street roundabout (connecting Duke Street, Fore Hamlet and Back Hamlet) in the east, it includes:

- Star Lane – two lanes eastbound
- Grimwade Street – two lanes southbound
- Fore Street – two lanes, two-way
- Fore Street/Salthouse Street/Key Street/College Street – two lanes westbound
- Slade Street – two lanes, northbound

4.1.2 This chapter looks in further detail at the traffic flows and pedestrian environment on these roads.

4.2 The pedestrian environment

4.2.1 The pedestrian environment on the Star Lane gyratory is poor. This is due to:

- Lack of a continuous and active building frontage to provide interest and variety on the route. This is an issue on Star Lane, although less so on Fore Street/Salthouse Street/Key Street/College Street. Future development on the Waterfront and Key Street and College Street is likely to improve the route (see Chapter 2).
- Noise and air pollution caused by the high number of vehicles
- Narrow pavements
- Lack of crossing facilities.

4.2.2 Figure 4.1 classifies the pedestrian environment of the gyratory in terms of pavement widths and "ease of crossing" of roads. Roads are colour-coded, with green representing relatively good conditions and red extremely poor conditions for pedestrians. This has been based on the following assumptions:

- Minimum pavements widths on ordinary streets should be 2.3 metres. This is to accommodate 0.15 metres for the kerb, 0.35 metres for kerb-side furniture (traffic signs, signals, light columns) while retaining the minimum recommended 1.8 metres of clear walking space.
- On busy or commercial streets, pavements should be wider, to accommodate space for stopping and window shopping, and to introduce a "buffer zone" between the pedestrians and the fast moving traffic. We consider a pavement width of 3.5 metres the ideal minimum on the streets.
- Streets that are quiet enough to be crossed at will – i.e. with no need for formal crossing provisions – are preferable to formal crossings.
- One-stage crossings are better than two-stage crossings.
- The difference between zebra and pelican crossings has not been taken into consideration as preference for these is highly individual.

4.2.3 Figure 4.1 also illustrates the lack of crossing facilities on the gyratory. Considerable improvements to north-south linkages could be made by the provision of conveniently located pedestrian crossings.

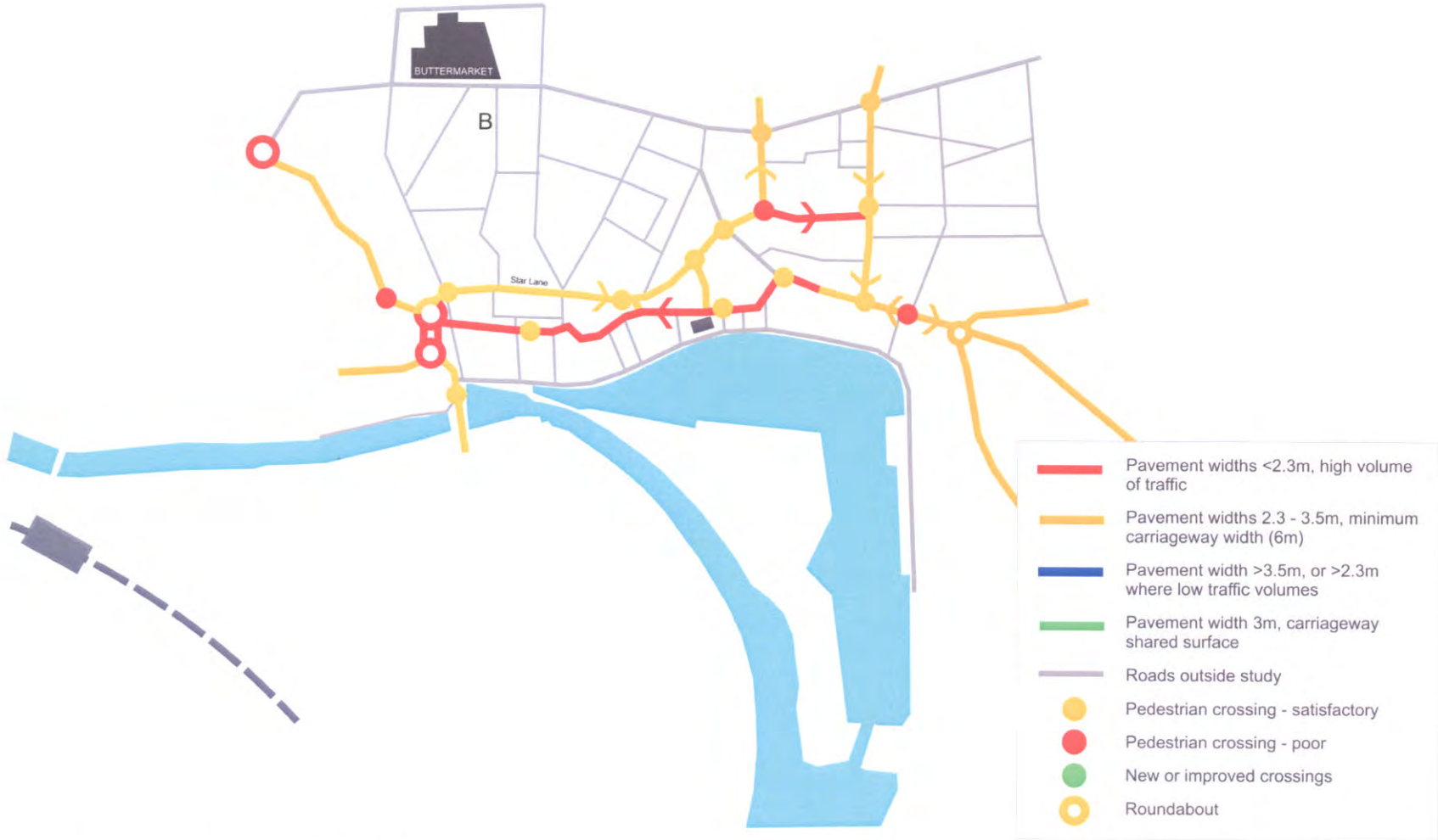

Figure 4.1: Classification of pedestrian environment

4.2.4 Figure 4.2 and Figure 4.3 illustrate that the majority of pavement widths on Salthouse Street/Key Street/College Street are substandard. Considering the proposals for an increase in commercial activity on these streets, this is a key issue to be addressed.

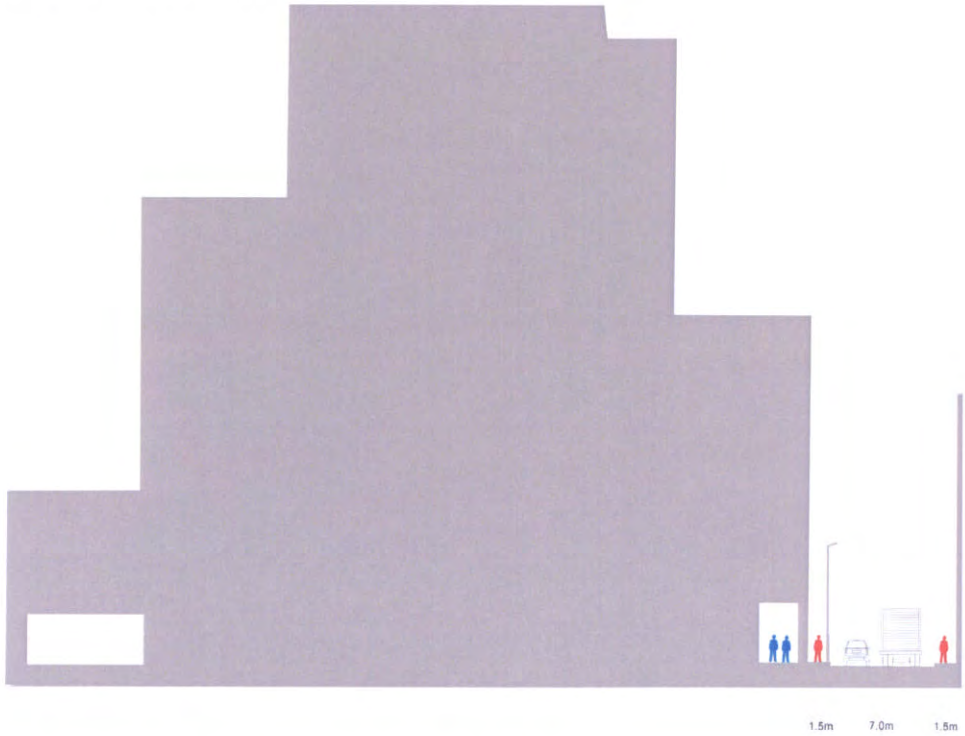

Figure 4.2: Cross-section of College Street

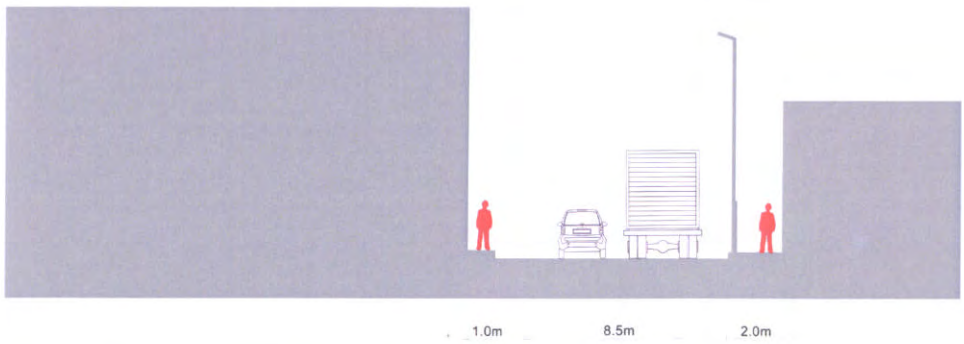

Figure 4.3: Cross-section of Salthouse Street

4.2.5 Clearly pedestrian conditions are poor – the next section describes various traffic options that could improve these.

5. Assessment of traffic options

5.1 Introduction

5.1.1 In the past 5-10 years a large number of traffic schemes have been developed seeking to reduce the severance caused by the Star Lane gyratory. We have reviewed these past studies and selected a number of options we consider to be the most promising. We have also introduced a number of new options bringing the total number of schemes to be assessed to five. This chapter sets out the advantages and disadvantages for each option, in terms of:

- Improvements to the pedestrian environment, including east-west and north-south linkages;
- Impact on bus and cycle network;
- Impact on traffic capacity and vehicle displacement.

5.2 General Options

5.2.1 There would appear to be three broad 'sets' of options to improve conditions on the Star Lane Gyratory:

5.2.2 Demand management – reduce the amount of traffic on the road by e.g. road pricing and/or reductions in city centre parking. Road pricing is clearly outside the remit of this study, but it offers real possibilities to reduce demand by requiring drivers to pay more to use sensitive streets such as those in the air quality management area. Based on experience elsewhere, reductions of 10-30% of traffic and significant increases in the use of other modes are possible using road pricing. While not part of this study, we commend it as a potentially highly effective longer-term policy tool for use in this area. A parking strategy for Ipswich is also outside this study remit, but the existence of plentiful and relatively cheap parking in central Ipswich works against other policies seeking traffic reduction and improved air quality, and we believe that reductions in commuter parking has an important part to play in future reductions in city centre traffic and congestion.

5.2.3 Provide additional capacity to relieve the corridor. One potential solution to the high traffic volumes running through the city centre on the Star Lane gyratory would be to construct a new route 'bypassing' the area. In this connection a "Wet Dock Crossing', linking Duke Street to Wherstead Road, has been considered in the past. This new set of bridges would need to be subject to periodic closure due to the needs of river traffic, and current estimates indicate that it would cost some £60 million to implement. Tests indicate that this bridge would relieve town centre traffic, although volumes on Star Lane and College Street would remain high, and as traffic demand grows, these benefits would start to erode. This bridge remains a long-term possible solution, but given the current lack of funding for such a major scheme, this report has not considered these options further.

5.2.4 An 'East Bank Link Road' has also been proposed in the past – this road would link Duke Street with a new junction on the A14, offering easy access to the A14 from the eastern bank of the river. Tests indicate that this road does not really reduce existing volumes on the Star Lane gyratory, and this has not been considered further in this study as a solution to this area's problems.

5.2.5 An eastern extension to Star Lane through the proposed Education Quarter to Duke Street has also been proposed – options to link this road through to Duke

Street include consideration of closure of Back Hamlet. Tests show that if traffic restrictions are placed on access via Fore Street, with traffic being rerouted via the link road, that the schemes will increase flows on Star Lane and decrease flows on College Street (see 2.8.1)

5.2.6 Traffic management to make the corridor more pedestrian and cyclist friendly. The current approach in the SCC major scheme bid is to introduce more pedestrian crossings on the gyratory – this could be extended to widen pavements where possible and to improve access across the Novotel roundabout. Other options could include restricting access to one or other of the roads, or to changing the way they operate – **these options have been the main focus of this study**.

5.3 Traffic management options

5.3.1 The options have been considered in order of impact on traffic capacity, from no impact to considerable impact. The introduction of more pedestrian crossings is included in all options. In summary, they include:

1. Traffic calming:
   - Reducing carriageway widths;
   - Widen pavements and introducing trees or appropriate street furniture where pavement widths allow.

2. Realignment:
   - Realigning Star Lane between Foundation Street and Slade Street / Fore Street;
   - Making realigned section of Star Lane two-way;
   - Closing Key Street to through traffic (section between Foundation Street and Slade Street).

3. Two two-way streets
   - Removing the gyratory by converting Star Lane and Fore Street/Salthouse Street/Key Street/College Street into 2 two-lane, two-way streets from the Novotel roundabout in the west to Grimwade Street in the east.

4. Single carriageway gyratory:
   - Making Star Lane one lane eastbound;
   - Making Fore Street/Salthouse Street/Key Street/College Street one lane westbound;
   - Retaining Slade Street / and one-way northbound Grimwade Street one-way southbound in 2 lanes.

5. Star Lane two-way:
   - Closing Fore Street/Salthouse Street/Key Street/College Street to through traffic;
   - Diverting all traffic to Star Lane which will become a two-way street.

5.4 Option 1: Traffic calming

5.4.1 The traffic calming options reduces carriageway width throughout the area to 6 metres and introduces seven new pedestrian crossings as illustrated in Figure 5.1.

Urban design

5.4.2 As a result of the carriageway narrowing, pavement width can be increased along the whole of the route. Figure 5.1 illustrates how long sections of previously substandard pavement widths can be upgraded to a minimum of 2.3 metres.

5.4.3 Despite opportunities to widen pavements, the new widths along most of the southern section of the gyratory (i.e. College Street / Key Street) will still fall short of the minimum desired standard of 3.5 metres for commercial streets. Furthermore, because traffic flows remain the same, problems relating to noise and air quality are not addressed. The impact on the overall road environment is relatively small and developers are likely to continue to regard the roads as "issues to be addressed" rather than design buildings that have a positive interaction with the roads.

5.4.4 The new pedestrian crossings create several direct links with the town centre via Turret Lane / Foundry Lane, Lower Brook Street / Foundation Street, and Shire Hall Yard / Pleasant Row / Lower Orwell Street, thereby much improving the north-south links between the town centre and the Waterfront. However these are recommended to be part of all of the options.

Traffic and transport

5.4.5 There will be a small impact on traffic using the gyratory from adding additional crossings - these are likely to have a very small impact on overall journey times along the corridor, and it is not expected that any significant rerouting will take place.

Figure 5.1: Option 1 – Traffic Calming

5.5 Option 2: Realignment

5.5.1 The realignment option replaces the existing two-lane, one-way section of Star Lane between Foundation Street and Fore Street with a two-way section of road. This is illustrated in Figure 5.2. If this new section of road includes four lanes of traffic (i.e. two lanes each way) the capacity of the gyratory is unlikely to be affected significantly. This new section of road could create a relatively attractive pedestrian environment including spacious pavements and tree planting.

5.5.2 The new road would be located to the north of the existing Star Lane, on land that is currently vacant or in industrial use.

Urban design

5.5.3 The realignment of Star Lane will benefit the pedestrian environment by:

- Introducing a section of the ring road where there is only one road to cross. Although the crossing will be wider, we believe the "psychological" benefits of having only one road to cross will outweigh this. If pedestrian crossings are introduced as shown in Figure 5.2 this means that three routes between the town centre and the Waterfront will take advantage of this.
- Enabling the exclusion of through traffic from Key Street, which accounts for approximately 20% of the total length of the study area (i.e. the area between Novotel and Duke Street roundabouts). Within this 200 metre stretch, the quality and "feel" of the Waterfront can be extended back to "meet" the town centre by some 30 - 40 metres.

5.5.4 In addition to these benefits there are also advantages to the future development of the land between Star Lane and Key Street. These plots are currently very narrow, making them difficult to redevelop. The realignment of Star Lane will help to rationalise the plots making redevelopment with an attractive urban form easier to realise.

5.5.5 The realignment option can be combined with the traffic calming option to widen pavements on the sections of the gyratory that do not directly benefit from the realignment.

5.5.6 As well as these benefits, there are a number of drawbacks that need to be considered:

- Because vehicle flows will remain the same, the realignment has no positive impact on noise and air pollution;
- The junctions at Foundation Street and Slade Street will need to be flared to accommodate large volumes of turning vehicles. This will take up a considerable amount of land and have a negative impact on the overall streetscape;
- Foundation Street will become part of the gyratory. To accommodate this high number of vehicles the road needs to be widened, which may impact on the St Peter's Port development;
- Despite major disruption and costs, the advantages are relatively small, with access to only 20% of the total length of the Waterfront improved;
- Building the road will involve site assembly, which is likely to be a costly and time consuming process. Therefore this option is unlikely to be a short term solution.

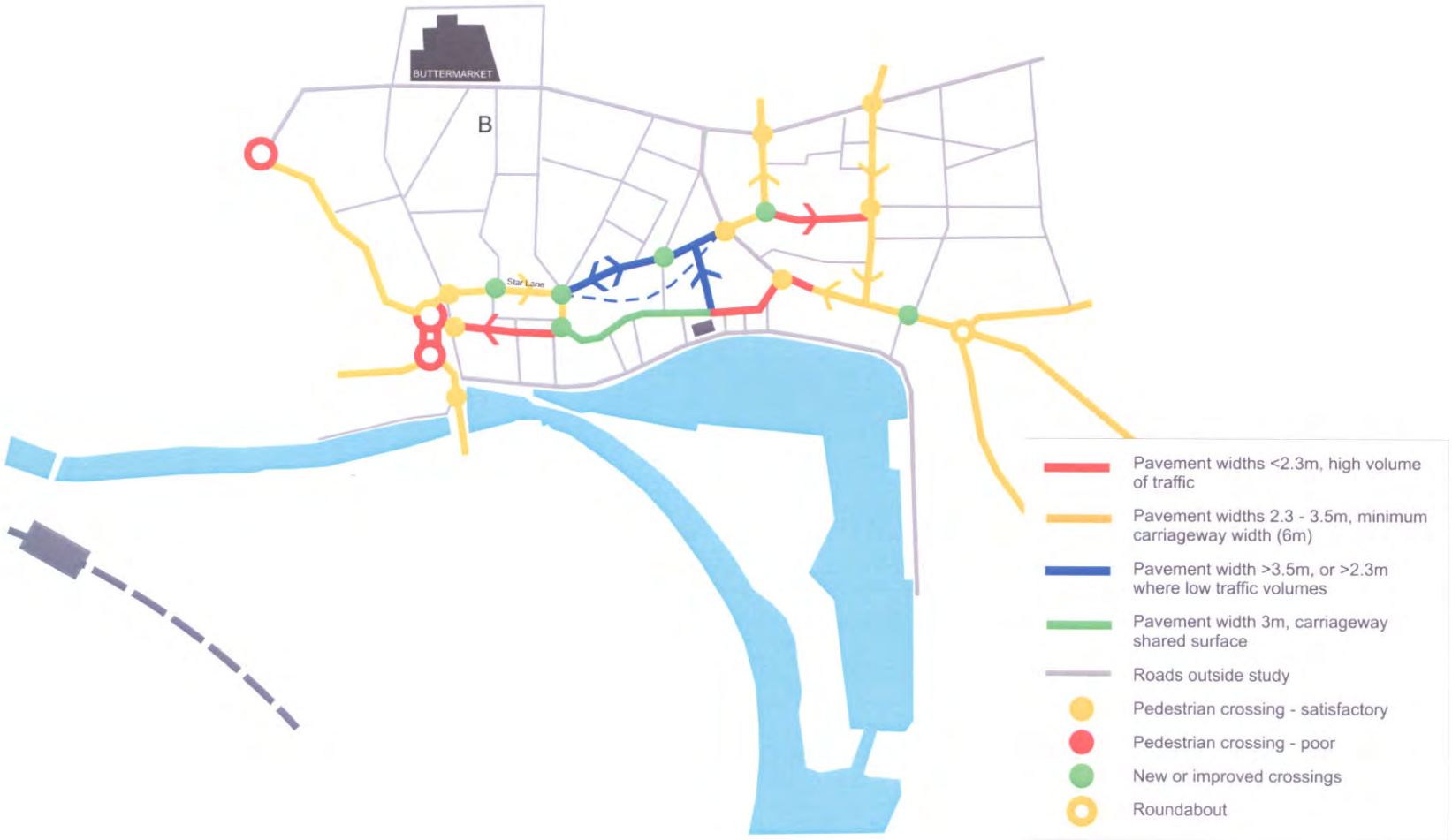

Figure 5.2: Option 2 – Realignment of Star Lane

Traffic and transport

5.5.7 If a 4-lane carriageway can be achieved, the overall capacity of the gyratory is unlikely to be affected significantly. However Slade Street will need to accommodate significantly higher flows, most of which will need to turn left into the re-aligned Star Lane. The signals here will need to be adjusted to cater for this heavy traffic movement and the heavy movement eastbound on Star Lane, but no significant capacity reduction is expected here if sufficient width is available.

5.6 Option 3: Two-times two-way

5.6.1 This option amends the existing gyratory to create two, two-way roads. This will necessitate the introduction of signal controlled junctions at Fore Street / Grimwade Street and Star Lane / Grimwade Street which will result in the loss of some capacity as discussed in further detail below. This option is illustrated in Figure 5.3.

Urban design

5.6.2 At first sight, the two-times two-way options has relatively few benefits for pedestrians; although carriageway widths may be reduced in places, the minimum road widths are higher than for a one-way street and vehicle numbers remain the same. However, there are some advantages over the other options.

5.6.3 The first advantage of introducing two-way working in relatively narrow and curving streets is its automatic 'traffic-calming' effect, with drivers reducing vehicle speeds on account of the oncoming traffic. Some pedestrians also find two-way streets easier to cross than two lanes of one-way traffic, since it is a more "natural" situation. The design may also help to convince developers of building sites to treat the road as a street, and introduce a pedestrian-friendly facades at ground level.

5.6.4 However, the main advantage of this option, and the key reason for it being included in this short-list of options is the opportunity it provides for the occasional closure of one of the two streets in times when traffic demand is lower. This could for example include the closure of Fore Street/Salthouse Street/Key Street/College Street on one Sunday a month to accommodate a market, fair or other event (see Figure 5.4). This would be a good way to promote the Waterfront as a visitor destination and to test the viability and popularity of permanent closure of this section of the ring road.

5.6.5 As in previous options, new pedestrian crossing facilities may be introduced as shown, enhancing north-south links. The locations of crossings shown in the option illustration will require further detailed assessment.

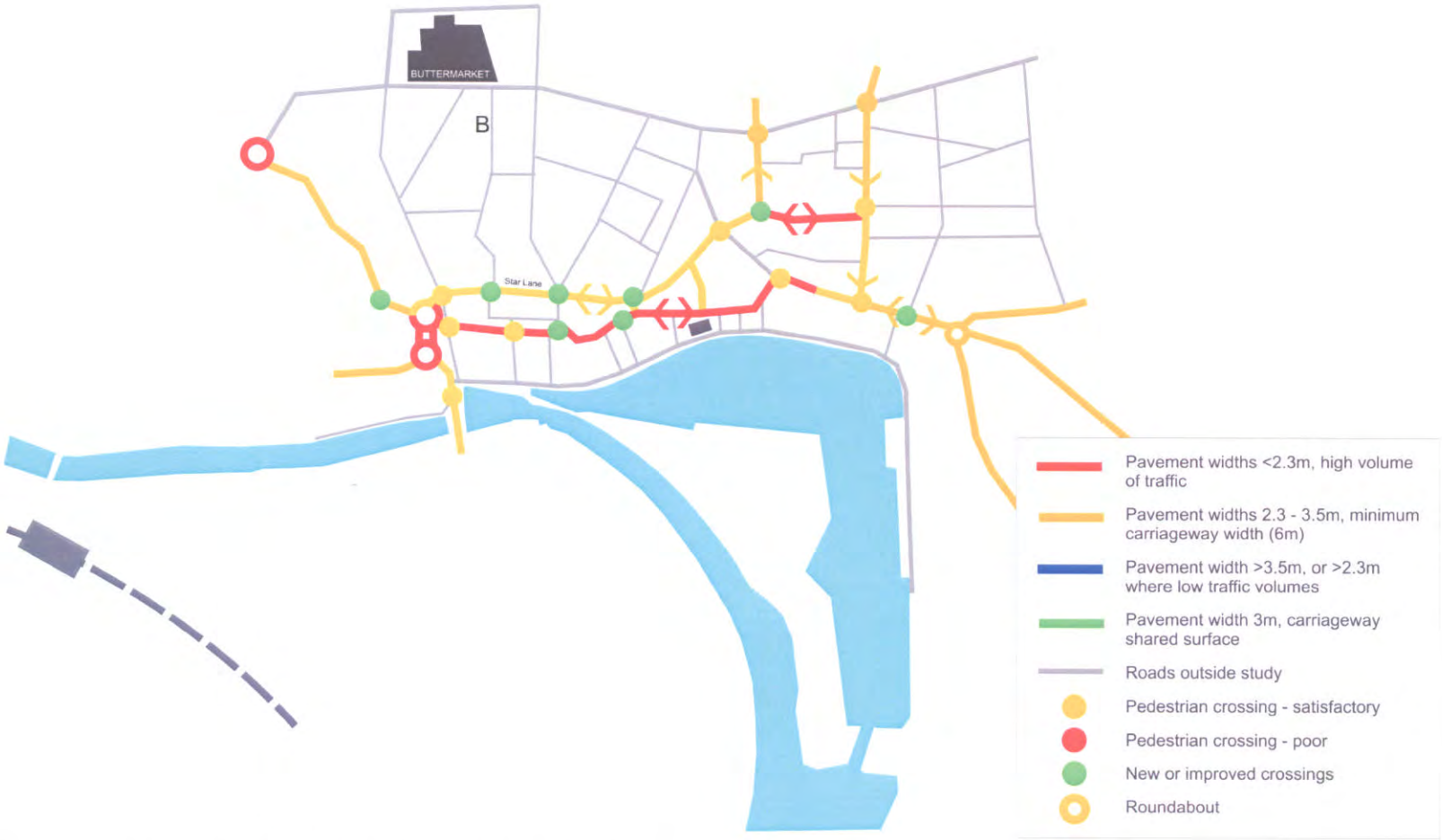

Figure 5.3: Option 3 –Two-way Star Lane and College Street

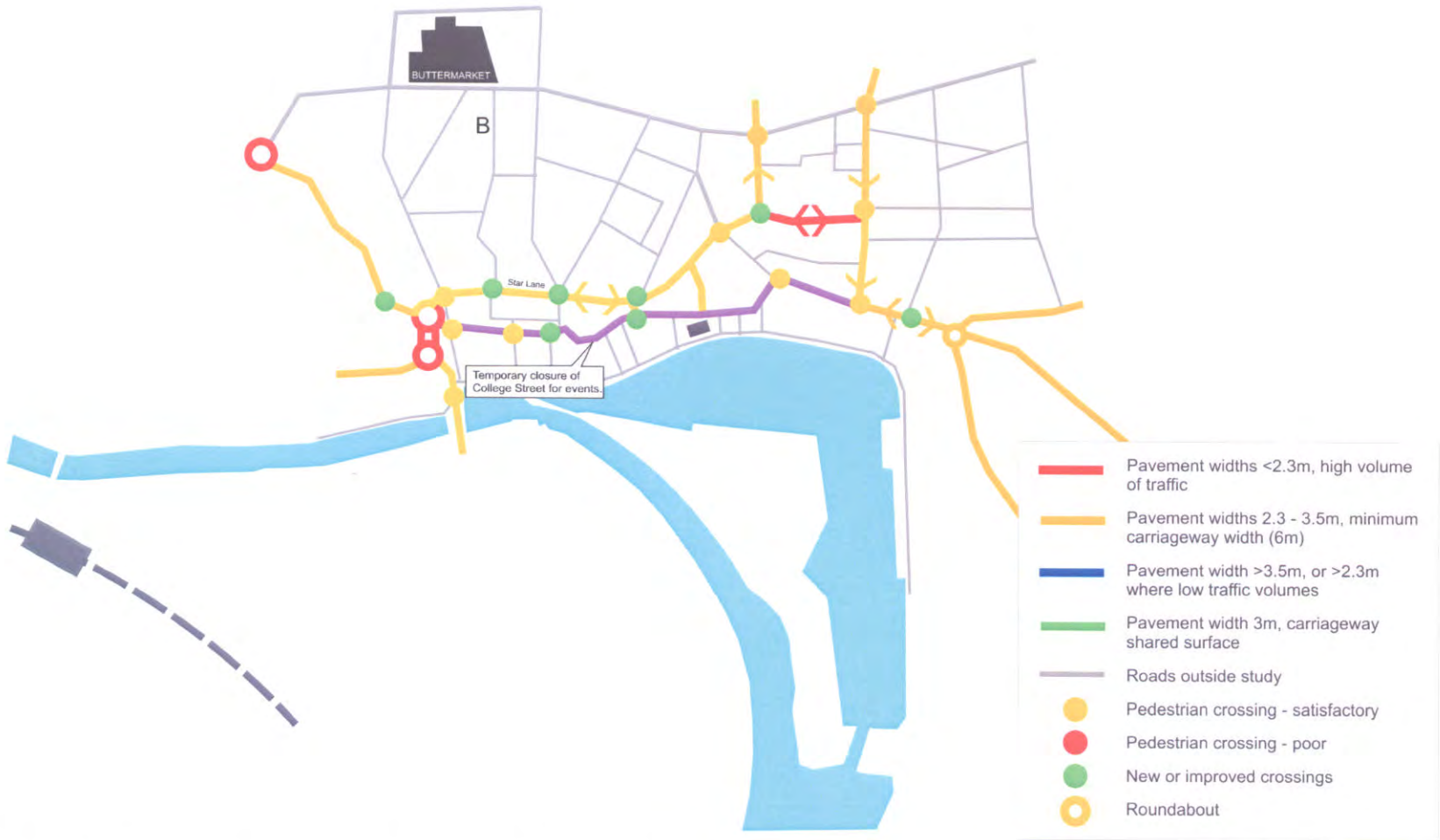

Figure 5.4: Option 3 – Two way Star Lane and College Street showing temporary road closure

Traffic and transport

5.6.6 Star Lane is assumed to be 2-way between Novotel and Grimwade St, and Grimwade St assumed to remain one-way from Star Lane to Fore Street. College St/Key St. is assumed to be two-way between Novotel and Grimwade Street.

5.6.7 Tests indicate that the Star Lane/Grimwade St junction would operate within capacity most junctions would operate within capacity (assuming a one-way southbound Grimwade Street) but capacity problems would be experienced at the Novotel roundabout.

5.6.8 There is also a potential safety issue of this option on the 'S-bend' section of Key Street , where the road is narrow. The street did previously accommodate 2-way traffic, but modern safety standards may raise this as an issue.

5.7 Option 4: Single carriageway gyratory

5.7.1 The single carriageway gyratory option retains the existing direction of traffic flows around the gyratory but reduces carriageway widths from two lanes to one on both Star Lane and Fore Street/Salthouse Street/Key Street/College Street. This will require a minimum carriageway width of some 5.5 metres to allow for breakdowns etc, although this could be used to provide cycle lanes or parking areas. In addition, more pedestrian crossing will be introduced as illustrated in Figure 5.5. Note that the location of crossing points illustrated is an aspiration and requires more detailed assessment.

Urban design

5.7.2 The single carriageway gyratory will have considerable benefits for the pedestrian environment:

- Pavements can be widened throughout the gyratory to the ideal minimum of 3.5 metres without the need for taking up additional (and developable) land. Hard and soft landscaping can be introduced throughout. Both Star Lane and Fore Street/Salthouse Street/Key Street/College Street will become attractive east-west pedestrian routes.
- In addition to widening of the pavements, some of the wider sections of the gyratory could accommodate on-street parking or loading. On busy roads, the introduction of on-street parking can have a traffic calming effect, as well as forming a protective barrier between the pedestrian and the traffic. In general, on-street parking helps to "civilise" a road, i.e. turn it into a street with a multi-functional character. This in turn may encourage future development to face and interact with the street, creating a more attractive and vital pedestrian environment. However any proposed parking would need to also carefully consider the impact on traffic flow and safety.
- Able-bodied persons can cross single lane roads with one-way traffic with relative ease without the need for formal crossing points.
- The steady levels of traffic will help to make the street feel secure at times when there is little footfall.
- By reducing the number of cars travelling through the area air pollution and noise will be significantly reduced.
- Sufficient carriageway width (or 'overrunable' areas) should be retained to deal with occasional breakdowns.

Figure 5.5: Option 4 – one-lane Star Lane and College Street

Traffic and transport

5.7.3 Tests for this study indicate that the junctions would operate within capacity if overall traffic volumes were reduced by some 20%.

5.8 Option 5: Star Lane two-way

5.8.1 Introducing two-way traffic on Star Lane will allow for through traffic to be excluded from Fore Street/Salthouse Street/Key Street/College Street. This is illustrated in Figure 5.6. A number of variations have been considered under this option including:

1. Two-way, two-lane Star Lane with signal controlled junction at Grimwade Street;
2. Two-way, two-lane Star Lane with signal controlled junction at Grimwade Street and right turn lanes at key junctions;
3. Two-way, two lane Star Lane with gyratory junction at Grimwade Street, also including Waterworks Street and Rope Walk;
4. Two-way, three lane Star Lane with gyratory junction at Grimwade Street, also including Waterworks Street and Rope Walk.

5.8.2 All these options will reduce the capacity of the road, in descending order from most severe to least severe.

5.8.3 During the stakeholders workshop and subsequent discussions with the client team it became clear that making Rope Walk (currently a moderately busy, but residential street and important part of the cycle network) part of new gyratory would be undesirable. Therefore only the first two options have been considered as part of this report.

Urban design

5.8.4 Excluding through-traffic from Fore Street/Salthouse Street/Key Street/College Street will have considerable benefits for the pedestrian environment:

- Opportunity to make Fore Street/Salthouse Street/Key Street/College Street a shared surface and pedestrian friendly environment, introducing an additional high quality east-west link to Ipswich's pedestrian grid;
- "Only one road to cross" along the whole of the Waterfront area. This also means that the quality and "feel" of the Waterfront can be extended back inland to "meet" the town centre;
- Considerable reductions in the number of vehicles passing through the area, resulting in noise reduction and better air quality;
- An automatic traffic calming effect on the two-way Star Lane with drivers reducing vehicle speeds on account of oncoming traffic;
- Additional pedestrian crossings on Star Lane (as in other options) and improved north-south connectivity. Some pedestrians also find two-way streets easier to cross than two lanes of one-way traffic since it is a more "natural" situation.

5.8.5 In the case of option 5(2), the provision of right turning lanes will necessitate land acquisition outside of existing highway boundaries. Although this will be more costly and time-consuming to implement than Option 5(1), it does provide opportunities to introduce wide pavements and attractive landscaping within the new and wider road profile.

Traffic and transport

5.8.6 All of the available modelling indicates that operating a 2-way Star Lane, with local access only on Fore Street/Key Street/College Street, will result in a significant reduction of traffic on the Star Lane corridor.

5.8.7 Current tests indicate that the Star Lane/Grimwade St, Fore Street/Grimwade St and Novotel roundabout junctions would be significantly over capacity and traffic reductions in excess of 30% would generally be required.

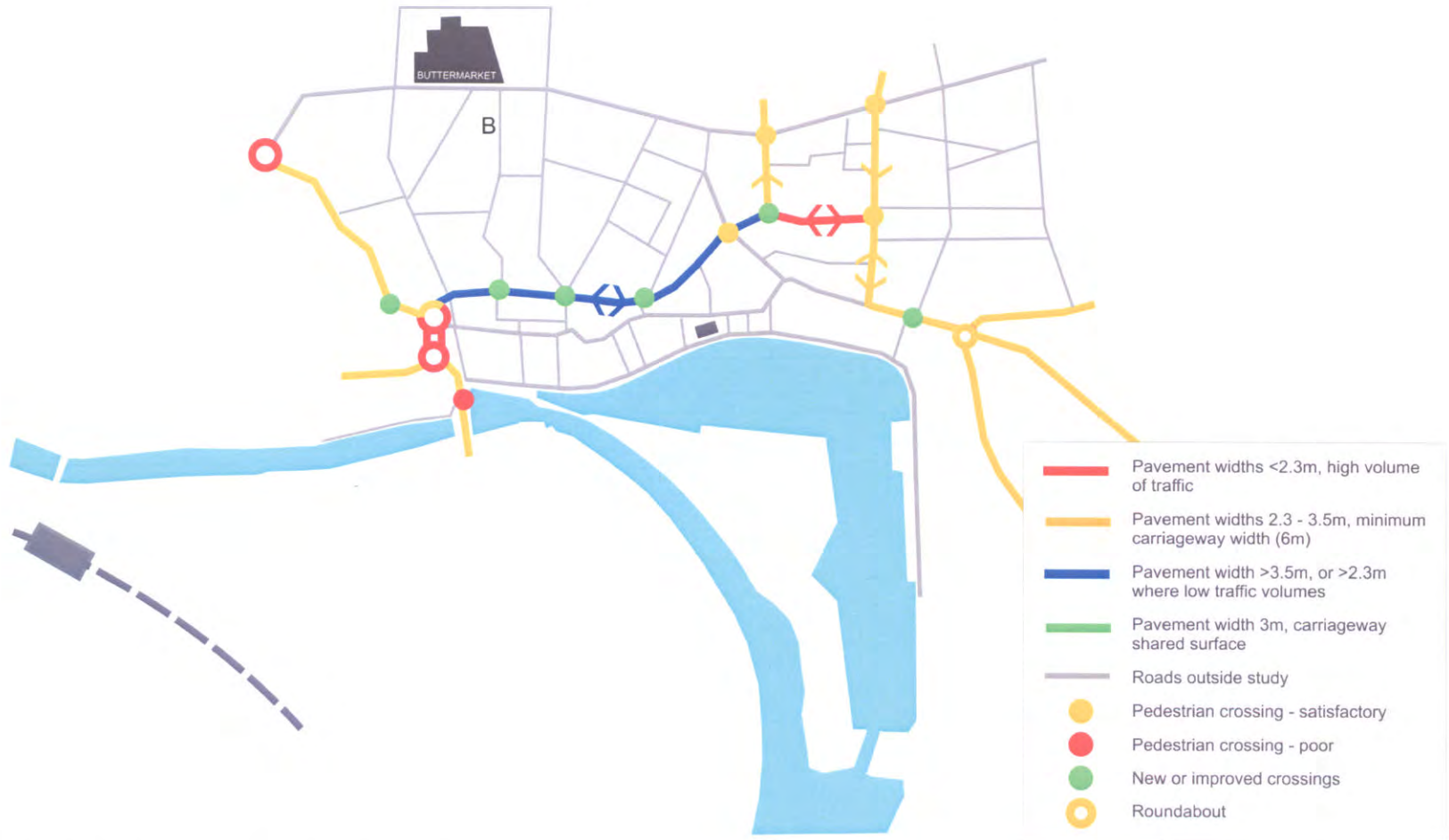

Figure 5.6: Option 5 two-way Star Lane

6. Stakeholder consultation

6.1 Stakeholder appraisal consultation

6.1.1 In the first, a selection of some 12 key local stakeholders were interviewed to discuss the importance of various appraisal factors, and to obtain their views on the relative local importance or weighting of these. There was a variety of views expressed, but a simple average of the scores shows safety objectives coming out on top, with environment, accessibility and the economy all achieving similar scores. Planning objectives achieved a significantly lower average score than the other four criteria. The key conclusion to be drawn was that the 'economic' objectives were not regarded as having priority over other objectives relating to safety, the environment and accessibility in the local context. The full assessment is included in Appendix C.

6.2 Stakeholder Workshop

6.2.1 A letter was sent to approximately 70 key stakeholder organisations (using the Council's stakeholder mailing list), along with relevant Councillors from Ipswich Borough Council and Suffolk County Council inviting them to attend a stakeholder breakfast workshop, to be held on Tuesday 25th July 2006. A copy of the letter can be found at Appendix C.

6.2.2 The aim of the workshop was to provide an opportunity to hear about the options proposed for Ipswich Waterfront and discuss views on each. The conclusions are summarised below.

Vision

6.2.3 Each of the visions developed by the groups were all slightly different to each other, focusing on a particular relevant feature that they felt was important. i.e. one of the groups felt that the environment was a key aspect to attracting visitors to the Waterfront.

6.2.4 The three groups were divided on whether or not the town centre should be integrated with the Waterfront. However, the majority of groups agreed that the success of the area is dependent on good transport linkages for all modes of traffic, but particularly for green modes. There was concern over reducing capacity for motorists as it would mean a decrease in accessibility.

6.2.5 All but one of the groups suggested that the area would be used mainly for tourists, and that it would be unlikely for residents to use the Waterfront as part of the town centre. One of the groups noted that one of the main users would be students from the college/university campus and therefore pedestrian, cycle facilities and public transport would be key.

Problems

6.2.6 Only one group suggested that Star Lane was the main problem to achieving their vision. However, all groups noted that the problem was related to poor east/west traffic routes, and in particular, one group noted that most of the car parking was located on the west side of Ipswich, further encouraging trips across town.

6.2.7 Many of the problems noted such as volume of traffic and air pollution were also noted as problems impeding the identified visions. Such problems were city wide, and therefore the solution would come from a package of measures.

Options

6.2.8 The general consensus was that something should be implemented in the short term until larger schemes such as a possible a new road bridge or bypass around Ipswich could be developed. Therefore, the most appropriate option would be traffic calming. The other two options (re-alignment of Star Lane and Star Lane two-way) could compromise the capacity of east-west links in Ipswich.

6.2.9 Options 2 (re-alignment) and 3 (Star Lane 2-way) were met with caution. Participants were divided within groups on what was most important in achieving their vision for the Waterfront, in terms of retaining capacity versus the environment.

6.2.10 The majority of participants felt that the problems identified above are as a result of the wider network problems and therefore requiring a more holistic approach.

6.2.11 Some of the groups identified other solutions including:

- relocation of car parks to the eastside of the town centre
- Improved public transport (internal park and ride)
- A new bypass
- Pedestrianisation of the town centre, and introducing a ring of car parks on the periphery.

7. Conclusions

7.1 General

7.1.1 It seems clear to the consultant team that the long-term retention of the 'status quo' of the Star Lane gyratory will not promote the future development of Ipswich and that a move to a 'town on the Waterfront' must be the way forward in the future. It is also our view that the current traffic volumes using the Star Lane gyratory are inappropriate for the existing air quality in the area and proposed development, and for the long-term future of an Ipswich that has a town centre integrated with its Waterfront.

7.1.2 It seems clear from consultation undertaken that there is a desire to improve the links between the city centre and the Waterfront, but there are major concerns about the possible congestion that the more radical options could result in.

7.2 Appraisal of options

7.2.1 Table 7.1 sets out a summary of the traffic implications of the various options.

- Option 1 - traffic calming (more pedestrian crossings and carriageway reductions to 6m where necessary to create better footways) and Option 2- realignment of Star Lane with a 4-lane stretch between Slade and Foundation Streets, would not have significant capacity implications.
- Option 3- with both College Street and Star Lane two –way is predicted to have capacity problems at the Novotel junction.
- Option 4 –Star Lane and College Street as existing but with single lanes, would require traffic volume reductions of some 20%. The remaining space created by the reduction in carriageway width from one lane to two lanes could be used in either of two ways:
  - (i) to create wide footways, while leaving some vehicle bays at intervals long the roads for e.g. parking and occasional breakdown use (these could also be designed as 'overunnable' areas or
  - (ii) As a bus lane for cycles and buses. This option is probably only justifiable if one or more frequent bus services are rerouted via College Street and Star Lane.
- Option 5, with only Star Lane as a two-way road, and College St/Key Street closed to all but buses and access traffic, would require traffic reductions of some 20-30%.

Table 7.1: Summary of traffic implications of options

	Option	Traffic Issues/Impact
1	Traffic calming	All crossings should be within capacity, and delays to traffic should average less than 20 seconds per vehicle across the gyratory in each direction. Carriageways narrowed to 6m in relevant sections, so some minor delays where HGV's need to take up 2 lanes on bends. Pedestrian crossings can be linked together to ensure progression and as a speed management measure.
2	Realignment	4-lane stretch of road on Star Lane between Foundation Street and Slade Street assumed, with new junctions at these locations. The option is predicted to operate within capacity at peak times. The option assumed that Foundation Street between Star Lane and College St can be adapted for 2-lane working, and that Slade Street can be adapted to create a 3-lane one-way northbound road.
3	Star Lane and College St both 2-way	Star lane assumed 2-way between Novotel and Grimwade St, and Grimwade St assumed southbound from Star Lane to Fore Street. Novotel roundabout (full or partial gyratory) would be over capacity in both peaks
4	Star Lane and College St single-lane	Novotel within capacity if flare of 50m east of current slip road provided. Volume reduction of some 30% required to make junction operate within capacity.
5	Star Lane 2-way, College St bus and local access only	Traffic reduction of some 20-30% required.

7.2.2 Table 7.2 sets out the consultant's views of the performance of the different options against the study objectives. Each option was scored between +3 – best - on that objective, to -3 (worst). The scoring was somewhat subjective, but gives an indication of the likely impact in relation to each objective. No weighting was included. The preliminary cost estimates for each option have also been included in the table.

7.2.3 Based on this appraisal, Option 4 (Star Lane and College St one –lane) and Option 5 - Star Lane 2-way, with College Street bus and access only, would appear to be the options closest to achieving the stated objectives, followed by the realignment option (Option 2) and then Option 3 – (College Street and Star Lane two-way). However it is our view that the benefits and cost of these options are relatively close, and each has their merits.

7.2.4 However, given that that the realignment option 2 is likely to be long-term given the requirement for land acquisition, and is also high cost, and that it will not reduce traffic volumes in the AQMA, it is not preferred as the short term solution for this study.

7.2.5 Option 3, with both roads two –way, would enable periodic closure of one or both roads to enable events to take place. This option has more benefits when the two-way sections run through all the way from the Novotel roundabouts Grimwade Street, but this creates capacity problems, and an interim, solution by only having 2-way from Slade Street would work much better in traffic terms. However this latter scheme reduces some of the advantages of the option, as the traffic routing remains as existing for some of the gyratory. There would be benefits for pedestrians in crossing 2 two-way roads, and the ability to close the road periodically is a distinct advantage over all other options.

7.2.6 Option 4 (single lane gyratory) results in less of a traffic capacity reduction than Option 5 (Star Lane 2-way) as it maintains the current junction arrangements to a large extent. The consultant's view is that the single lane working is preferable on both traffic and pedestrian grounds to the 2-way Star Lane option.

Table 7.2: Summary Appraisal of options

Option	1. Traffic calming	2. Realignment[1]	3. College St/Star Lane both two-way	4. College St/Star Lane both one-lane	5. Star Lane 2-way
Preliminary Cost Estimate	***£2m***	***£3.9m***	***£3.5m***	***£2.1m***	***£4.5m***
Improve connectivity in town centre	+1	+2	+2	+3	+3
Support development of Waterfront	+1	+2	+2	+2	+2
Support development of Education Quarter	+1	0	+1	+1	+1
Improve quality of the urban environment	+1	+2	+2	+3	+2
Improve urban form and structure	0	+2	+1	+1	+1
Encourage a shift from car use	+1	+1	+1	+2	+3
Improve air quality in AQMS	0	+1	0	+2	+1
Relieve congestion in and around town centre	0	-1	-1	-2	-3
Total	**5**	**9**	**8**	**12**	**10**

[1] Note that costs do not include land acquisition and demolition.

7.3 Recommendations

7.3.1 Based on our analysis and consultation, it is clear to us that in the short to medium term aim of the councils should be to move towards reducing traffic on the Star Lane gyratory to reduce air quality problems and integrate the Waterfront with the city. We do not recommend that this reduction of traffic should be left to longer-term solutions such as a new river crossing, as tests have indicated that even with such a crossing, flows on the Star Lane gyratory will only reduce by some 15% (although this would still provide some alternative capacity if the capacity of the Star Lane gyratory were to be reduced).

7.3.2 It seems clear to the consultant team that the long-term retention of the 'status quo' of the Star Lane gyratory will not promote the future development of Ipswich and that a move to a 'town on the Waterfront' must be the way forward in the future. It is also our view that the current traffic volumes using the Star Lane gyratory are inappropriate for the existing air quality in the area and proposed development, and for the long-term future of an Ipswich that has a town centre integrated with its Waterfront.

7.3.3 We believe that the medium-term (5 years) aim of the Councils should be to move towards a single lane Star Lane and College Street, maintaining the existing one-way nature of these roads. This will enable pavements to be widened where necessary to improve east/west links, and easy crossings of a single traffic lane in a north/south direction. Figure 7.1 indicates how such a scheme might look on Key Street, with a one-lane one-way road, a cycle lane and widened pavements.

Figure 7.1: Key Street existing

Figure 7.2: Key Street proposed layout

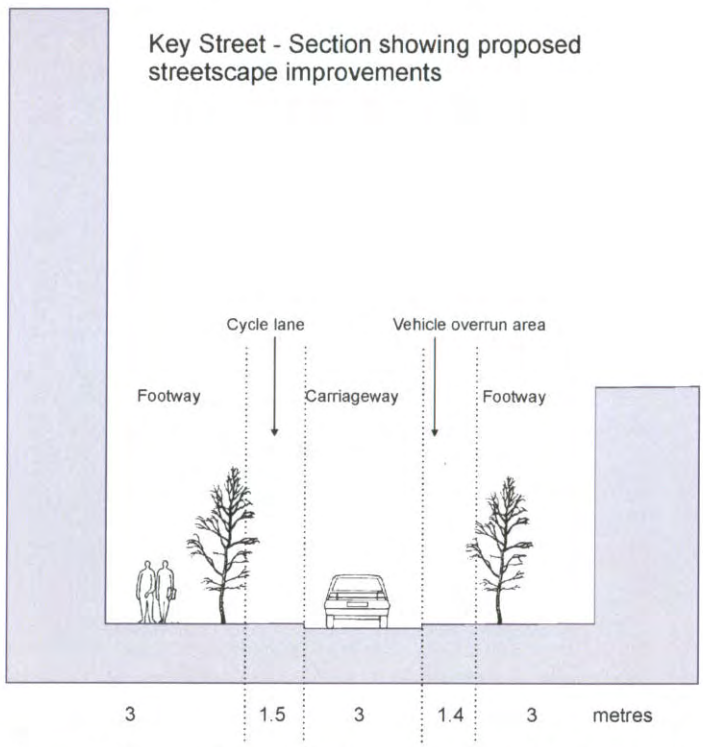

Figure 7.3: Section showing proposed streetscape improvements

7.3.4 We believe this offers advantages over e.g. a scheme with Star Lane 2-way, and local access only on College Street. Permitting a carriageway of some 3m on each road will allow the introduction of cycling lanes and/or parking bays

alongside the running lane but also retaining some 'over-runable' areas – this will enable temporary obstructions such as vehicle breakdowns to be bypassed as well. Tests indicate that this option will work within capacity.

7.3.5 Initial tests indicate that this arrangement is likely to result in a capacity reduction of some 20% on the corridor, which will reduce volumes, improve air quality and help the integration of the Waterfront and the city centre. It seems clear from consultation undertaken that there is a firm desire to improve the links between the city centre and the Waterfront, but there are also concerns about the possible traffic impacts such a scheme could cause. It is our view that these reductions are possible over time given the actions recommended below.

7.3.6 We also note however that in our experience, predictions of long-term traffic problems with these types of capacity –reduction schemes are invariably overestimated prior to the event. In all the cases we have dealt with, traffic rapidly adjusts to the new arrangements, some trips transfer to bus, walking or cycling and the final result is less congested than expected. Introduction of the scheme in a quieter time of year such as the school holidays also allows more scope for gradual adjustment.

7.3.7 Appendix D sets out a summary of the traffic work and the expected change necessary. We recommend that the preferred scheme be introduced in stages over a few years, with complementary measures to encourage mode shift over this time. Our view is that the total reduction in traffic required is likely to be in the region of 4 – 5% in any one year, and any rerouting affect is likely to be smaller than this i.e. some 2 – 3% per year as some travellers change mode. Together with the introduction of measures set out in our action plan we believe that these changes can be achieved.

An action plan for implementation

7.3.8 We recommend that the introduction of a 1-lane Star Lane and College Street could be accomplished in stages, all of which need to complement each other. It will be important to encourage and support a change in travel behaviour while ensuring that the public are aware of the reasons and benefits behind the changes. Not least, attention will need to be paid to the use of the Waterfront itself, to ensure that people want to use it and its facilities.

- Firstly, it will be important to encourage use of other modes by current car users on Star Lane. Over time information should be provided to these car users about (1) the current conditions in Star Lane, and in particular the AQMA issues (2) the alternatives available to them for travel and (3) the development and events taking place in the area and the Council's vision for an Ipswich on the Waterfront. This could be reinforced by particular measures such as trial free bus passes for some households or employees, car sharing initiatives for employees using this route from the east and other promotions. The Councils and the university themselves, as major local employers also have a major part to play in this process.
- Hand in hand with these initiatives should be improvements to cycling, walking and bus facilities on the corridor – a particular challenge will be to try and ensure good connections between east Ipswich and the main employment areas to the west of the town centre .
- The Councils should also start to encourage better linkages between the centre and Waterfront and use of the facilities of the Waterfront – this could take the form of events and promotions to get people to use the Waterfront and appreciate the benefits of the integration of the area with the city centre.

- Developers should be encouraged to develop the ' transition' area between the city centre and the Waterfront, particularly on key pedestrian routes, and to ensure their developments ' face' the roads on the gyratory, making them more ' human scale' and supporting the traffic reduction work.
- New car parking for commuters should be discouraged within the 'core 'city centre, and the scope for some parking on the eastern edge of the gyratory could be considered – in this respect the University or adjacent sites may be a possible 'park and walk' (or park and free bus ride) location
- Finally, the traffic management measures should be introduced incrementally, and timed to minimise impact, such as in the school holidays.

7.3.9 We have noted concerns expressed during consultation on the impact of significant reductions of capacity on the corridor, and while we still recommend the move to a one-lane gyratory as the preferred option, we recognise that the Councils may require interim steps to this final layout, probably aiming at smaller 'stepping stones' of traffic reduction and travel behaviour change.

7.3.10 We recommend that this be achieved by progressive reductions in capacity over a 2 – 4 year period, by the introduction of new pedestrian facilities and/or other traffic management phases, leading to the desired one-lane in each direction scheme. The changes should go hand in hand with the other measures noted above.

Conclusion

7.3.11 The Star Lane gyratory has been studied on a number of occasions in the past, and each time the recommendations for reducing traffic on the corridor have been outweighed by concerns about the impact. In the interim, traffic volumes and congestion have increased, with a consequent deterioration in air quality, which has now reached serious proportions. The longer-term solutions such as new bridges or roads are expensive, and there is no guarantee that the benefits from these will not be rapidly eroded in any event. Dependence on these longer term solutions alone will not serve in the interim to improve the integration of the city and local air quality, and indeed is likely to make future action to reduce volumes and improve the environment here even harder to achieve.

7.3.12 We firmly believe that to achieve the long-term aims of the councils for a sustainable and thriving Ipswich, progression towards significant traffic reduction on this corridor is the only way forward that will integrate the city with its Waterfront and reduce existing air quality problems, while at the same time encouraging development of the city centre.

7.3.13 We believe that the long-term advantages of traffic reductions on the Star Lane gyratory are so important for Ipswich that they outweigh any short-term concerns about traffic impact, and that the respective councils, with joint working and the support of other key stakeholders, can mitigate any such impact and achieve the integration and future development of the Waterfront and city centre.

Ipswich Waterfront Transport Study

Final Report - Appendices

Suffolk County Council & Ipswich Borough Council

November 2006

Ipswich Waterfront Transport Study

Final Report - Appendices

Project No: 113731
November 2006

Newcombe House
45 Notting Hill Gate,
London, W11 3PB
Telephone: 020 7309 7000
Fax: 020 7309 0906
Email : London@cbuchanan.co.uk

Prepared by:	Approved by:
Annemarie de Boom	Atholl Noon

Status: Final Issue no: 1 Date: 01 November 2006

document2

Contents

Page

APPENDIX A - PEDESTRIAN ROUTE ANALYSIS **2**

APPENDIX B – LITERATURE REVIEW **4**
Ipswich Wet Dock Traffic Study 4
College Street Closure 5
Ipswich IP-One Area Action Plan 5
Ipswich Major Schemes 6
Star Lane Gyratory Assessment 8
Suffolk County Council Local Transport Plan 9

APPENDIX C - CONSULTATION **11**
Stakeholder Consultation Exercise Summary 11
Stakeholder Consultation Letter 14

APPENDIX D – TRAFFIC NOTE **15**

Appendix A - Pedestrian Route Analysis

Route 1 – Lloyds Avenue, Queen Street, St. Nicholas Street, St Peter's Street

- Imposing buildings on Lloyd Street and Cornhill – traditional financial heart of Ipswich
- Queen street some architectural interest, shop fronts of poorer quality
- St Nicholas' and Peter's Streets very pleasant - the public realm: street furniture and paving is of high standard and street parking is organised along one side of the street; shop facades retain plenty of architectural detail, some of the buildings dating from the 17th Century providing interest for the pedestrian; café-bars, restaurants and antique shops predominate ensuring this is an active street in the night time also.
- Route reasonably busy throughout
- Direct views are provided from St Peters Street of St Peters Church and the R&W Paul Ltd. mill behind it, on the waterfront.
- Controlled pedestrian crossing facilities provide easy access to the waterfront for those on foot.

Route 2 – Tower Street, Dial Lane, St Stephen's Lane, Turret Lane

- Tower Street is wide and verdant.
- Dial lane and the beginning of St. Stephens's lane are very narrow, intimate streets almost alley-like with bijou shops and small cafés. St Stephens's lane widens substantially at the church becoming Arras Square, where a little outdoor market and the Buttermarket Shopping Centre are located
- At the bus station the route loses definition becoming more of a destination than a route to somewhere else
- Turret's Lane is predominantly office/ business and residential and evolves to include more industrial units as Star Lane is approached
- A direct view is provided of St Peter's Church on approaching Rose Lane
- Blank and relatively inactive (back of Evening Star premises) frontage is evident on the approach to Star Lane making the route less pleasant for pedestrians by night in particular.
- Route lacks definition at junction of Star Lane where car park is located
- No formal crossing facilities provided access for pedestrians to the Waterfront

ROUTE 3 – Northgate Street, Upper Brook Street, Lower Brook Street

- Northgate Street is a pleasant street with plenty of architectural interest, the bus station is close by and the hill gently descends to Upper Brook Street
- Upper Brook Street is one of the primary shopping streets in Ipswich with some architectural interest but also with many low quality shop frontages, very busy traffic wise and little space for the many pedestrians using the footways
- Lower Brook Street is narrower and notably less busy, office/business use predominates
- St Mary's Church on the Quay is clearly visible from Lower Brook Street. A view of the R&W Paul Ltd. becomes apparent as Star Lane is approached
- No formal pedestrian crossing facilities to Waterfront
- The most direct route from Ipswich town centre

ROUTE 4 – Cox Lane, Foundation Street

- Cox lane is approached from Carr Street through a partially covered pedestrian walkway, a huge surface car park emerges at this point and the route thus loses definition; two churches are situated at the car park's entrance/exit.
- A view to St Mary's Church on the Quay and the R&W Paul Ltd. is obvious from the junction of Tavern Street with Foundation Street.
- Foundation Street is quiet; residential and office/business uses predominate. The NCP is the most prominent building and Tooley Court adds architectural interest to the route. Surface car parks dominate the street as Star Lane is approached causing the route to lose definition
- Generally the route is not very busy
- There is not much in the way of architectural interest for the pedestrian
- There are no formal pedestrian crossing facilities providing direct access to the Waterfront

ROUTE 5 – Upper Orwell Street, Fore Street

- Upper Orwell Street is a shopping street; more local in scale; laid back atmosphere; colourful facades provide interest for the pedestrian even though sometimes shabby, alternative/funky themed shops; some boarded up shops. St Michael's Church also located on Upper Orwell Street, grounds quite verdant, ground floor boarded up.
- Quality of public realm and shop frontages improves considerably as route progresses beyond Orwell Place to Fore Street, shops continuing the funky/alternative theme, route reasonably busy.
- In general very pleasant route, especially as route progresses to Fore Street, lots of cafés and restaurants ensuring the route will also be active by night.

ROUTE 6 – Bond Street, Waterworks Street, Fore Street

- Bond and Waterworks streets are less busy, more suburban streets; they are dominated by residential use as well as some municipal/offices/industrial. Uses other than residential are located at the junctions of St. Helens Street, Eagle Street and Star Lane
- Some buildings of architectural merit provide interest for the pedestrian – these include the Ipswich County Council offices and the Nursery School located on Bond Street
- There is a certain amount of confusion for the pedestrian regarding how to progress from Star Lane to Fore Street – the route through Angel Lane is not obvious

ROUTE 7 – Grimwade Street

- Grimwade Street has a suburban feel – residential, office/business, educational and municipal uses predominate with some retail use opposite Suffolk College. Mix of scales in building height: 2 storey, semi detached 1920's residential mixed with municipal buildings including Suffolk College (approximately 12 storeys, behind street frontage), Suffolk County Council (4 storeys) and County Hall (3 storey); club (single storey);
- Route gently descends to Star Lane
- Very direct route to Waterfront
- View to Neptune Square from junction with Fore Street
- Traffic very busy at junctions with Fore Street and Star Lane; relatively quiet route for pedestrians though busy at intervals throughout the day by the college
- Pedestrian crossings provided at both junctions

Appendix B – Literature Review

Ipswich Wet Dock Traffic Study

Assessment Of Two-Way Star Lane (Suffolk Highways Engineering Consultancy, February 1999)

In their Development Framework for the Ipswich Wet Dock Steering Group, Llewelyn-Davies recommended the conversion of the Star Lane gyratory to provide two-way traffic on Star Lane, with College Street reserved for buses, cycles and access traffic only.

The first stage of this feasibility study by SHEC indicated that such a scheme would be possible with small areas of land purchase to improve corner radii, and that no properties would require alteration or demolition. The proposed scheme considered did not include land purchase for tree planting to fulfil the concept of a tree-lined boulevard given in the Development Framework.

SHEC used a localised SATURN traffic model to assess traffic capacity of the proposed network.

Model runs on the existing road layout indicated that the Bridge Street and Duke Street roundabouts were the major restraints on network capacity, acting as “partial dams” restricting flow from entering the gyratory system. In addition, junctions along Star Lane were considered to be just below operational capacity during peak hours. The existing average 2-way peak flow east-west through the study area is approximately 3,230 vehicles/hour.

The Town Centre Sustainable Access Strategy proposal to ban through traffic on Dog’s Head Street would result in 50% of that displaced traffic being transferred to the gyratory system.

Modelling of the proposed scheme indicated the following:

- Star Lane junctions at capacity at 2-way flows of 2600 veh/hour – approximately 75% of full demand flow;
- Peak hour traffic demand approx. 133% of operational capacity, leading to:
  - Traffic redistribution of east-west movements to alternative routes;
  - Changes in driver behaviour (peak spreading, traffic evaporation);
  - Additional delays at Bridge St and Duke St roundabouts, affecting non-east-west trips;
- An increase in modelled eastbound journey time from 4 minutes 20 seconds to 9 minutes 15 seconds;
- An increase in modelled westbound journey time from 2 minutes to approximately 8 minutes;
- Air Quality issues regarding NO2 for 21 hours a year on Star Lane and Grimwade Street;

SHEC recommended modelling on a wider area using the Ipswich SATURN traffic model, but incorporating an elastic trip matrix allowing for trip suppression and modal shift.

Modelling Methodology

A localised SATURN model was used, as IBC’s Ipswich SATURN model had not been comprehensively updated for some time, and an O/D matrix was estimated using local

turning count data. Junction performance parameters were set using journey times and queue lengths from site observations.

Traffic Redistribution and Evaporation

Evidence from MVA's '*Traffic Impact of Highway Capacity Reductions*' report suggests an overall reduction in traffic of up to 25% on treated roads is possible, with a more realistic figure of around 14%.

SHEC conclude that the most likely diversionary routes for traffic squeezed out of the gyratory would be north of the town centre via Crown Street, and the A14 over the Orwell Bridge.

College Street Closure

Ipswich Traffic Model 2000 – College Street Closure (Atkins, 2001)

Atkins used the Ipswich Traffic Model of 2000 to test the implications of closing College Street to through-traffic and converting Star Lane to a partial two-way route. The resulting positives and negatives can be summarised as follows:

Positives

- Opportunity to address balance between motorised traffic and sustainable modes of transport
  - Pedestrian and cycle crossings on College Street/Key Street
  - Local traffic reduction would make area more attractive for bus routes
- Opportunity to re-establish links between the lower section of the gyratory and the Wet Dock. This could serve as an initial step to the full integration of the town centre and the waterfront area

Negatives

- A modest reduction in traffic on Greyfriars roundabout is offset by the increase in traffic in the vicinity of the Duke Street roundabout
- Limited scope for widening Star Lane results in a displacement of traffic onto other roads, meaning that there is no improvement to the circulation of traffic throughout the town centre
  - 3-5% rise in traffic flows on the A14 (A12)
  - substantial increase in traffic on Wherstead Road, Nacton Road and Felixstowe Road
- Reduction of total east/west road capacity across the town centre and in the Star Lane/College Street area

Overall, the report concluded that the local benefits of this scheme are overshadowed by the spreading of congestion over a wide area of the town and onto the major trunk roads in the area.

Ipswich IP-One Area Action Plan

Ipswich IP-One Area Action Plan (GVA Grimley/Urban Initiatives, 2003)

The AAP was produced as part of Ipswich Borough Council's Local Development Scheme. It is focussed on ensuring the urban renaissance of the IP-One area, covering the town centre, the waterfront area, Ipswich Village, and Suffolk College.

The document highlights problems that need to be overcome in central Ipswich, including:

- The need for improved connectivity within the town centre;
- Constrained accessibility within the town centre;
- Long-term erosion of the town's legibility, urban form and structure
- The requirement to deliver a sustainable retail offer;
- The potential for over-development of certain land uses;
- Historic buildings requiring economic re-use;
- The disconnection of the town centre from the waterfront.

In terms of transportation problems in the town centre area, the report highlights the increasing reliance on the private car to the detriment of other modes, which has resulted in severance issues from the inner town areas to the west, south and east.

The report highlights the following proposed major highway schemes, in descending order of priority according to **Policy T22** of the Ipswich Local Plan:

- Wet Dock Crossing;
- West Bank Link Road;
- East Bank Link Road – running on from Duke Street to the A14 southern bypass, and only considered if further improvements to the Port are proposed following the introduction of the schemes above;
- waterfront Green Route – running along Star Lane and involving a new route through the Suffolk College site connecting to the Duke Street/Fore Street junction, and only to be considered if the Council is satisfied it will not lead to adverse traffic and environmental conditions.

The report judges existing bus services to be generally good, particularly following the introduction of the bus gyratory system around the retail core in 2002. However, it notes that the strongly radial nature of the network has left the waterfront area and Ipswich Village poorly served.

The poor quality of pedestrian and cycling environment in the outer town centre is identified, particularly around the Star Lane gyratory. Three signed local cycle routes run into the town centre. These are Route 2 (Bolton Lane), Route 4 (Rope Walk) and Route 12 (Fonnereau Road). In addition, a Suffolk CC 'Cycle Map for Ipswich' sets out a large number of suggested routes that are currently unsigned. Cycling is prohibited in pedestrianised streets in the town centre.

The Action Plan

The AAP contains four key goals:

1. Linking the Core to its surroundings (waterfront, Station and College);
2. Developing the waterfront as a mixed use area while protecting and enhancing its special character;
3. Developing an office/commercial heart to Ipswich around existing and proposed PT and ped links;
4. Developing a University in the Education Quarter.

The AAP promotes the development of the Wet Dock Island as a high-quality mixed residential and leisure environment.

Ipswich Major Schemes

Highway Strategic Planning and Regeneration Tests – Technical Note 1 (Atkins, January 2005)

Economic assessment and NATA for a series of traffic options for central Ipswich.

Based on the Ipswich Traffic Model of 2000, which was growthed from a 1999 model. Model characteristics were as follows:

- Separate morning and evening peak hour models;
- Traffic growth from 1999 to 2000 based on all developments taking place between 1992 and 1999;
- Traffic growth up to 2021 based on development forecasts in the SCC Adopted Local Plan and First Deposit Drafts. This included type (category), location, extent, and year of commencement of developments, and Ipswich revised planning data on employment;
- Trip rates established using the TRICS v2004 database;
- One broad category of vehicles, including cars, vans, HGVs, and PSVs. PCU conversion factors used, based on an average HGV proportion for the road network, estimated from 1999 manual classified counts;
- Constant value of time used - £9.63 per hour;
- No distinction between journey purposes.

An off-peak model was created based on the peak hour matrices, using 1999 peak and off-peak traffic counts.

Fifteen different scenarios were tested. An economic evaluation was solely based on journey time savings between the reference case and 'do-something' scenarios. The following options scored highest in the BCR analysis:

- Northern and waterfront development (3300 homes), twin Wet Dock Bridge allowing traffic across at all times, and New Cut crossing (**BCR = 11.1, PVC = £38.8m**);
- Northern and waterfront development (3300 homes), twin Wet Dock Bridge allowing traffic across at all times, New Cut crossing, and East Bank Link Road (**BCR = 7.5, PVC = £77.8m**);
- Northern and waterfront development (3300 homes), twin Wet Dock Bridge allowing traffic across at all times, New Cut crossing, SLG modified to 2-way operation, 2-way link across Suffolk College between the Fore Hamlet roundabout and Grimwade Street, and traffic restricted to access only in Fore Street and the southern end of Grimwade Street (**BCR = 7.3, PVC = £47.1m**);
- Northern and waterfront development (3300 homes), twin Wet Dock Bridge allowing traffic across at all times, New Cut crossing, SLG modified to 2-way operation, 2-way link across Suffolk College between the Fore Hamlet roundabout and Grimwade Street, traffic restricted to access only in Fore Street and the southern end of Grimwade Street, and Suffolk College Eastern Access Road linking the waterfront Green Route with St. Helen's Street via Milner Street (**BCR = 7, PVC = £51.8m**).

The worst scenarios in terms of BCR are summarised below:

- Northern and waterfront development (3300 homes), Urban Initiative proposed Star Lane 2-way operation, College Street/Key Street/Fore Street open to 2-way traffic but traffic-calmed, 2-way link across Suffolk College site between Duke Street and Grimwade Street, signalised junctions between link road and Grimwade Street, Back Hamlet, Fore Hamlet and Duke Street, buses and cycles only at the southern end of Grimwade Street, and **no** New Cut crossing (**BCR = -15.5, PVC = £12m**);
- Northern and waterfront development (3300 homes), SLG modified to 2-way operation, 2-way link across Suffolk College between the Fore Hamlet roundabout and Grimwade Street, traffic restricted to access only in Fore Street and the southern end of Grimwade Street, and Suffolk College Eastern Access Road linking the waterfront Green Route with St. Helen's Street via Milner Street (**BCR = -7.6, PVC = £23.6m**);

- Northern and waterfront development (3300 homes), Urban Initiative proposed Star Lane 2-way operation, College Street/Key Street/Fore Street open to 2-way traffic but traffic-calmed, 2-way link across Suffolk College site between Duke Street and Grimwade Street, signalised junctions between link road and Grimwade Street, Back Hamlet, Fore Hamlet and Duke Street, buses and cycles only at the southern end of Grimwade Street, and Suffolk College Eastern Access Road linking the waterfront Green Route with St. Helen's Street via Milner Street (**BCR = - 5.5, PVC = £27.4m**).

Star Lane Gyratory Assessment

Star Lane Gyratory Assessment (Faber Maunsell/AECOM, April 2005)

Faber Maunsell conducted a study of nine different options for altering the Star Lane Gyratory, to determine the most suitable option to take forward in the 'Sustainable Transport' Major Scheme bid to Central Government as part of the LTP2 process.

The LINSIG micro-simulation modelling tool was used to assess five key signalised junctions along the existing road network, based on the assumption that the individual capacities of these junctions will control the overall performance and capacity of the gyratory. All were modelled as stand-alone junctions with ped phases added where beneficial and staging and phasing optimised. The five junctions are as follows:

- Star Lane / Fore Street;
- Star Lane / Grimwade Street;
- Fore Street / Grimwade Street;
- Star Lane / Slade Street;
- Star Lane / College Street / Bridge Street (Novotel roundabouts).

Due to the lack of accurate Origin and Destination data, assumptions about the redistribution of traffic when the network was altered were made using "engineering judgement and practicality".

The nine options, and corresponding conclusions, are shown in the table below:

Table B1: Summary table of options for Star Lane Gyratory

Option No	Option Description	Total Cost (£m)	Capacity reduction (% of existing)	NATA Score	Overall Conclusion
1	Preserve existing layout/facilities	~	~	~	
2	7 new toucan crossings, 1 new puffin crossing (Fore St/Grimwade St), partial additional ped crossings within existing signalised jcts, removal of all existing zebra crossings, widening of footways where highway width allows.	1.6	0	+9	**Should be adopted for Major Scheme bid**. Best improvement with least cost and no third-party involvement
3	As option 2 but with Star Lane/College Street/Key Street operating with one lane for buses/cycles and one lane for other vehicles	1.6	30	+9	No merits over option 2 unless much higher bus flows were being diverted to the corridor
4	Star Lane/College Street/Key Street as two-way routes, no restriction on access, improved ped signalisation	3.7	10	-1	Little merit. High costs, capacity loss and negative assessment score
5	Star Lane two-way operation with improved ped signalisation, College Street/Key Street two-way PT/cycles/ped/access only with frequent crossings and shared space layout	3.7	60	+10	Drastic loss of capacity but could be taken forward if reduction is re-provisioned elsewhere or mitigated
6	College Street/Key Street two-way operation with improved ped signalisation, Star Lane two-way PT/cycles/ped/access only with frequent crossings and shared space layout	2.8	60	0	Drastic loss of capacity. Cannot be taken forward without wider traffic impact study or establishment of new east-west capacity
7	As option 2, plus Star Lane two-way extension through the College site to Duke Street, Back Hamlet retained, Fore Street PT/cycles/ped/access only	1.6 + major road	0	+11	**Longer term possibility** as Education Quarter and east Ipswich developments take place
8	As option 2, plus Star Lane two-way extension through the College site to Duke Street, Back Hamlet closed, Fore Street PT/cycles/ped/access only	1.6 + major road	0	+12	**Longer term possibility** as Education Quarter and east Ipswich developments take place
9	As option 5, plus Star Lane two-way extension through the College site to Duke Street, Back Hamlet closed, Fore Street/Grimwade Street (southern end) PT/cycles/ped/access only	4.1 + major road	60	+13	Drastic loss of capacity. Perverse option, eliminating Duke St jct bottleneck while reducing corridor capacity

Suffolk County Council Local Transport Plan

Suffolk County Council Local Transport Plan, 2006-2011 (Faber Maunsell/AECOM)

Appendices

Appendix D of the LTP is a note describing the validation of the Ipswich Traffic Model and providing details of the assumptions used in the quantitative economic appraisal.

The Ipswich Traffic Model was last updated by Atkins in 2000 when it was calibrated to a set of 1999 flow counts and speed surveys. The model was first developed in 1989, updated in 1992, and the networks further updated in 1996, prior to the 1999 re-calibration. The model has the following characteristics:

- Separate AM and PM peak models;
- Detailed site inventories from 1999 to derive junction saturation flows and signal cycles;
- Matrices developed from RSIs in 1989, subject to matrix estimation to counts in 1992, and then further updated with development traffic, and re-matrix estimated using 85 count locations in the 1999 exercise;
- Single passenger-car based matrix, combining all vehicle types.

The Atkins validation in 2000 showed a model reasonably validated in overall flow terms, but lacking in detailed coverage in the centre. The journey time validation was reasonable, but with a distinct bias to faster journey times. The following conclusions were drawn with regard to appraising the impact of the Major Scheme bid:

- Weak local basis of elderly trip matrix – not fit for purpose of detailed link-by-link flow forecasts in the town centre;
- Outer focus of network detail – shouldn't be relied on to investigate localised bus priority issues on the inner radials;
- Under-representation of congestion due to faster journey times bias;

A comprehensive update of the models' demand forecasts was carried out in 2004, based on a site-by-site review of new developments for 2011 and 2021 in collaboration with Ipswich Borough Council planners.

Appendix C - Consultation

Stakeholder Consultation Exercise Summary

Introduction

This note summarises the development of a set of performance criteria and weightings which will feed into the assessment of the different transport options proposed for the Star Lane Gyratory.

Objective

The purpose of the stakeholder exercise was to understand how different interest groups prioritise various objectives connected with transport schemes, which would enable us to develop a set of stakeholder weightings for the Star Lane assessment. Presently, it is not clear how the Department of Transport weights the different benefits of schemes, although it is generally thought that the more easily quantifiable benefits e.g. economic receive a higher weighting. This is due to the fact that we can assess values of time, operating costs and trips generated, whereas environmental and other effects are less tangible and more difficult to quantify. As such these criteria tend to be given a lower weighting with the exception of cases where the impacts are clearly disproportionate.

However, applying standard weights to schemes can be flawed as it ignores local context and the wider objectives of the transport scheme. For the purposes of the Ipswich Waterfront Study, this procedure had to bear in mind the overriding objective of improving pedestrian links between the Waterfront and Town Centre, and the inevitable increase in congestion from the reduction in road capacity.

In order to derive weightings that may provide a truer picture of how different sections of society view the objectives of transport, a number of stakeholders were drawn from a list. These comprised five groups; planner, developer, business representative, bus operator and cyclist. The groups were chosen on the basis of their perceived interest in transport in Ipswich and particularly the context of the development of the Waterfront and its accessibility to the town centre.

A total of 12 individuals were interviewed. The interview comprised 3 stages; initially participants were given 10 point to allocate among 5 key criteria on which transport schemes were assessed. These followed the NATA objectives of Environment, Safety, Economy, Accessibility and Integration (named Planning to avoid confusion). The second step revealed a set of sub-objectives for each of the key criteria, again these generally followed the NATA guidance. Interviewees were asked to reallocate the points given to each key objective among the subheadings. The third step described each of the sub-objectives in more detail with more relevance to issues regarding the Star Lane Gyratory, Waterfront and the town centre. Participants were asked if they wished to reallocate their original scores once they had given more thought to each of sub-objectives and how they relate to Ipswich.

Results

Table 1 summarises the weighting results for the NATA sub objective criteria and Table 2 summarises the weights for the NATA headline objectives, for each interest group. There is a reasonably good spread of scores for most the key categories, the largest of which - 60% - is for safety. This is mainly attributable to the cyclist scoring this category very highly. The next variable range of scores were for the economy and environment categories.

Some of the scores follow what we would typically expect from particular stakeholders. For example, the businessman rates environment and safety relatively low while scoring economy and accessibility highly. Similarly, the developer gives a low rating to wider planning policy while scoring accessibility as highest. The cyclist gives a zero score to the economy while rating safety very highly. The planner weighs economic objectives as equal to those of planning and the environment.

A simple average of the scores shows safety objectives coming out on top, with environment, accessibility and the economy all achieving similar scores. Planning objectives achieve a significantly lower average score than the other four criteria.

The key conclusion to be drawn from this part of the exercise is that when put to economic objectives are not weighted disproportionately positive over objectives when averaged across different interest groups. This is likely to be in marked contrast to the weights usually applied by the Department.

Table 1: Percentage weights given to NATA sub-objective

NATA	Sub-objectives	Stakeholder Weightings					
Key Ob		Planner	Public	D'veloper	Business	Bus Op	Cyclist
	Local Air Quality	8	8	10	2	15	10
	Town/Landscape	9	10	8	6	15	0
	Physical Fitness	5	5	5	3	5	5
	Accidents	8	13	8	8	30	60
	Security	7	13	5	3	5	10
	Cars & Freight	9	3	8	18	2	0
	Buses	10	5	8	9	6	0
	Wider Econ. Imp	5	5	13	11	2	0
	Pedestrians	14	12	13	12	8	10
	Vehicles	4	8	18	16	2	5
	P&D Policy	22	17	8	15	10	0
	Total	100	100	100	100	100	100

Table 2: Summary of Weightings for Key NATA Criteria

	Planner	Public	Developer	Business	Bus Op	Cyclist	Average
Environment	22	23	23	10	35	15	21
Safety	15	27	13	10	35	70	28
Economy	23	13	28	38	10	0	19
Accessibility	18	20	30	28	10	15	20
Integration	22	17	8	15	10	0	12

Scoring

The next step is to understand how each of the potential transport solutions perform on the basis of different weightings. This requires another set of scores to be applied for each option and so far the only attempt to quantify an assessment of the Star Lane options exists in the work carried out by Faber Maunsell (see Star Lane Options report for details). This consists of a qualitative analysis of each option based on a performance criteria that loosely follows the NATA appraisal framework, with scores for each objective ranging from -3 to +3.

However, it is not clear in the methodology how Faber arrived at the individual scores and this is not provided in Faber's report.

It is also worth noting that as our NATA scorecard does not entirely match that of the Faber scorecard, values for some of the criteria (e.g. townscape, wider economic impacts) had to be imputed, therefore the validity of these scores is open to debate (and comments are welcome!).

In order to rank the options by different interest groups it is a simple process of multiplying the scores by the percentage weightings as displayed in table 3. On this basis option 9 comes out ranks highest in all but one case.

Table 3: Ranking for each option (Faber score x stakeholder weighting)

Option	Planner	Pub Sector	Developer	Business	Bus	Cyclist	Average
2	6	6	6	6	4	5	5.5
3	3	3	3	3	3	3	3.0
4	8	8	8	8	8	8	8.0
5	2	2	2	2	1	1	1.7
6	7	7	7	7	7	4	6.5
7	4	4	4	4	5	5	4.3
8	4	4	4	4	5	5	4.3
9	1	1	1	1	2	1	1.2

A further step is to derive rankings according to value for money for each group, which simply involves dividing the total points score given by each group by the total cost. As table 4 shows this process gives a different set of results than the sole weightings analysis, with option 3 emerging consistently as the preferred option.

Table 4: Rankings for each FM Transport Option by Stakeholder

Option*	Cost (£m)	Planner	Public Sector	Developer	Business	Bus	Cyclist	Average
2	1.6	4	4	4	4	2	2	4
3	1.6	1	1	1	1	1	1	1
4	3.7	8	8	8	8	8	8	8
5	3.7	6	6	6	6	5	5	6
6	2.8	7	7	7	7	7	7	7
7	1.6	2	2	2	2	3	2	2
8	1.6	2	2	2	2	3	2	2
9	3.7	5	5	5	5	6	5	5

*option 1 is do-nothing

Stakeholder Consultation Letter

«Title» «Initial» «Last_Name»	
«Job_Title»	
«Company»	
«Address_1»	
«Address_2»	
«City»	
«POST_CODE»	

26 June 2006

Dear «Title» «Last_Name»

Ipswich Waterfront Transport Study – Stakeholder Breakfast Workshop

Colin Buchanan has recently been appointed by Suffolk County Council and Ipswich Borough Council to undertake the Ipswich Waterfront Transport Study. The purpose of the study is to consider traffic and urban design impacts of a number of transport options that seek to reduce the severance between the Ipswich Waterfront and the surrounding areas, including the town centre and the Education Quarter.

We would like to invite you to attend a Stakeholder Breakfast Workshop on **Tuesday 25th July 2006** (9.00am – 11.45am) at The Novotel, Grey Friars Road, Ipswich IP1 1UP.

This is an opportunity to hear about the options and discuss your views on each. The format of the workshop will be as follows:

9.00 am	Arrival - Breakfast
9.15 am	Welcome/purpose of the event
9.25 am	Presentation by Colin Buchanan
10.10 am	Breakout groups/workshop
11.10 am	Report back and summary
11.45 am	Workshop close

If you would like to attend, please contact me by **Tuesday 18th July 2006**, so we have an idea of the numbers attending. This can be done in a number of ways:

- Call us on (020) 7643 5642
- E-mail: Ipswichwaterfront@cbuchanan.co.uk
- Fax: (020) 7309 0906
- Write to us at: Ipswich Waterfront Transport Study, Colin Buchanan and Partners, FREEPOST PAM 5181, 45 Notting Hill Gate, London W11 3BR **(no stamp required)**

Yours sincerely

Caroline Geary
Consultation Co-ordinator, Colin Buchanan

Appendix D – Traffic note

Memorandum

Newcombe House
45 Notting Hill Gate
London, W11 3PB
T 020 7309 7000
F 020 7309 0906
www.cbuchanan.co.uk

To	Dave Watson, Russell Williams
From	Atholl Noon
Date	07/11/2006
CC	
Job number	113731
Subject	**Ipswich Waterfront - Preferred option traffic analysis**

The TRANSYT analysis of the key junctions on the Star Lane gyratory and the preferred option (one lane –one way as per the existing configuration) are attached for a scenario in which 15% of traffic on all approaches to the key junctions have been removed. (The key junctions do not function satisfactorily under existing flows for the preferred option.)

Under the condition of these reductions, the key junctions on the network will operate within capacity, although even with these levels, the Fore St/Grimwade Street node **in the morning peak only**, operates at 100% of capacity with some resultant queuing, and the exit flows to Fore Street (west) are too high for a single lane. Based on tests at the Slade Street/Key Street junction, we estimate that the maximum flow that can be carried by a single lane westbound on College Street is approximately 1,450.

Consequently, we have also tested the Fore St/Grimwade St junction at a reduction of 25% capacity for the morning peak hour - at this level the junction works well within capacity and flows exiting to Fore Street (West) are close to the 1,450 limit noted above.

The main conclusion is therefore that for the junctions tested, a 15% reduction on all arms would enable them to work satisfactorily, with the exception of Fore Street/Grimwade Street, where an approximate 25% reduction on westbound movements will be needed in the morning peak only. We have estimated the approximate reduction required per gyratory approach in the attached spreadsheet.

Estimated impact

The next issue relates to the likely impact of these reductions. We recommend that the scheme be introduced over a 4- year period, with changes taking place probably in the summer school holidays, and in conjunction with appropriate marketing and encouragement of use of alternative facilities. At all times the public should be aware of the reason for the changes (primarily the AQMA) i.e. they should not be introduced by ‘stealth’ but by an active marketing campaign with complementary measures. Introduction over a period of time also allows changes in travel behaviour in more achievable ‘stepping stones’. Throughout the process, another objective will be to manage capacity through signals to ‘smooth’ traffic flows and reduce congestion within the AQMA.

Breaking down the 15-25% overall reduction required, in any one year, a total reduction of about 4-5% in capacity is needed, which is lower than most ‘normal’ day to day variation in traffic – typical changes from ‘normal’ flows to ‘school holiday flows’ are some 10%. This will be further reduced by changes to other modes. These capacity reductions would be introduced by new pedestrian

crossings, adjusted signal timings and finally carriageway changes. So the impact in any one year is likely to be very small.

There are three likely reactions of travellers as a result of the recommended changes:

1. Transfer to other modes- walking, cycling, buses – given the relatively short distance nature of most of the trips using the gyratory, we believe that given the right marketing and facilities, a change to these modes of some 10% of total traffic is possible. This implies that approximately half of the likely impact of the capacity reduction is likely to be removed by this transfer. We do not think this is unrealistic given the low level of promotion of alternative modes at present, targeted marketing effort and travel plans on the part of major local employers such as the Council's and University. As a working assumption, we have assumed less than this i.e. of the total 4-5% reduction needed per year, a third, or some 1-2% will transfer to other modes.

2. Retiming of journeys – this will also occur – we have no evidence to suggest the likely extent of this, but the likelihood is that a proportion of the remaining travellers (say 10%) will retime their journeys – this means a further 0.5% of the required 4-5% pa reduction are likely to retime their journeys rather than change to other modes.

3. Rerouting – if we assume that the remainder of trips will reroute, this would be a total of some 2.3-3.1% of the required 4-5% pa reduction – we discuss below the likely rerouting effect of these trips.

4. Trip suppression – some trip suppression may also occur, but none has been included in the estimates.

The estimates of the above are based on professional judgement – they have been checked against information on e.g. the London Congestion Charge, where some 7.5% of trips retimed, 60-70% used other modes and about 20-30% rerouted. We believe that less trips will move to other modes in Ipswich (London has a very good public transport network, but in Ipswich central car trips are short distance) but slightly more may retime their journeys.

Rerouted traffic estimate

As a guide to the likely rerouting impact, the results of SATURN test NT15 compared to test NT14 (undertaken by Atkins in Nov 04) have been used as a proxy. (This was the test of the Urban Initiatives scheme of a 2-way Star Lane without New Cut crossing). This distribution has been used to estimate the likely impact by road on the screenline of the preferred option in the attached spreadsheet. The alternative routes were Crown Street, the A14 and Valley Road. Some traffic may have used other routes, but we believe this 'screen line' would have captured most redirected trips.

The attached spreadsheet estimates the impact of the 'net' rerouted traffic on the above screenline in any one year, summarised below.

Estimated rerouting effect by road per year (pcu/hr)

	AM peak	Pm peak
Crown St eastbound	25	19
Crown St westbound	15	10
A14 eastbound	12	9
A14 westbound	34	22
Valley Road eastbound	12	9
Valley Road westbound	23	15
Total eastbound	50	37
Total westbound	72	48
Total	**122**	**85**

Based on the above assumptions, which are believed to be relatively conservative if the appropriate complementary actions are taken, the actual traffic effect of the capacity reduction could be as low as 2-3% per year. Given the above likely rerouting of traffic, the actual impact on any one road in a year is not regarded as significant. It is also believed that with appropriate support and complementary measures, the 'stepping stones' of travel behaviour change will be achievable.

Conclusions

To achieve the preferred scheme, a 15% reduction in traffic is required, apart from the morning peak hour when a decrease of some 25% is required on the northern and eastern approaches to the Grimwade Street/Fore Street junction. Estimates have been made of the likely rerouting effect of this reduction in traffic, and in all cases this is not regarded as significant.

Impact on buses

Currently, very few buses use Star Lane/College Street west of Fore Street. In the initial stages of implementation we would recommend protecting buses by e.g. keeping the existing bus lane on Star Lane. For the final scheme we would anticipate bus journey times on the gyratory to be protected by:

- management of internal queues (e.g. keeping the queue on Star Lane on the Grimwade Street approach to relatively low levels, allowing buses joining this road southbound from the town centre to pass through the junction quickly)
- Some queue relocation and bus priority provision e.g. Bishops Hill at Duke Street roundabout, which could be signalised, and the entries to the Novotel roundabout where a similar approach could be taken.

If more bus services were introduced on the rest of Star Lane and College Street, queues on the gyratory itself could be managed in conjunction with signals at Novotel and Duke Street roundabout to minimise overall delays to buses. There is also the possibility that buses could run (one-way) along the Quayside.

Atholl Noon
Director

atholl.noon@cbuchanan.co.uk

Ipswich Waterfront - Estimated impacts of preferred option

From/to	Existing flow IN	Existing flow OUT	% of original traffic required	1x2 One way system - One lane IN	1x2 One way system - One lane OUT	Difference	
East	1410	1305	75%	1058	979	353	326
West	1620	1834	85%	1377	1559	243	275
North	935	609	75%	701	457	234	152
Total	3965	3748	79%	3136	2994	829	754

From/to	Existing flow IN	Existing flow OUT	% of original traffic required	1x2 One way system - One lane IN	1x2 One way system - One lane OUT		
East	1185	1491	85%	1007	1267	178	224
West	1652	1740	85%	1404	1479	248	261
North	929	626	85%	790	532	139	94
Total	3766	3857	85%	3201	3278	565	579

Assumptions

		Am	Pm
	Number of years over which reduction spread	**4**	**4**
1	% reduction in traffic required each year	**5.1%**	**3.8%**
2	% of (1) assumed as mode share change	**30%**	**30%**
3	% of (1) assumed as trips retiming	**10%**	**10%**
4	Final traffic rerouting %	**3.1%**	**2.3%**

Estimated rerouting effect per year

AM Peak

From	**IN**	**OUT**
East	43	40
West	50	56
North	29	19
Total	**122**	**115**
Assumed eastbound	50	56
Assumed westbound	72	59

PM Peak

From	**IN**	**OUT**
East	27	34
West	37	39
North	21	14
Total	**85**	**87**
Assumed eastbound	37	39
Assumed westbound	48	48

Estimated rerouting effect by road per year

	Estimated distribution	AM peak	Pm peak
Crown St eastbound	51%	25	19
Crown St westbound	21%	15	10
A14 eastbound	24%	12	9
A14 westbound	47%	34	22
Valley Road eastbound	25%	12	9
Valley Road westbound	32%	23	15
Total eastbound	100%	50	37
Total westbound	100%	72	48
Total		**122**	**85**