



Notice of meeting of

Traffic Congestion Ad-Hoc Scrutiny Committee

To: Councillors Merrett (Chair), Hogg, Hudson (Vice-Chair), Moore, Morley, Pierce, Simpson-Laing and Mr M Smith (Co-opted Non-Statutory Member)

Date: Tuesday, 4 September 2007

Time: 5.00 pm

Venue: The Guildhall, York

AGENDA

1. Declarations of Interest

At this point Members are asked to declare any personal or prejudicial interests they may have in the business on this agenda.

2. Minutes (Pages 3 - 8)

To approve and sign the minutes of the last meeting of the Committee held on 17 July 2007.

3. Public Participation

At this point in the meeting members of the public who have registered their wish to speak regarding an item on the agenda or an issue within the Committee's remit can do so. Anyone who wishes to register or requires further information is requested to contact the Democracy Officer on the contact details listed at the foot of this agenda. The deadline for registering is Monday 3 September at 5.00 pm.

4. Interim Report for Traffic Congestion Ad-Hoc Scrutiny Committee (Pages 9 - 44)

This report presents an update on work completed to date and asks Members to form some recommendations in relation to key objectives and a work plan for the Traffic Congestion Scrutiny review.

5. Any other business which the Chair considers urgent under the Local Government Act 1972

Democracy Officer:

Name : Jill Pickering

Contact Details:

- Telephone : 01904 552061
- E-mail : jill.pickering@york.gov.uk

For more information about any of the following please contact the Democracy Officer responsible for servicing this meeting:

- Registering to speak
- Business of the meeting
- Any special arrangements
- Copies of reports

Contact details are set out above.

About City of York Council Meetings

Would you like to speak at this meeting?

If you would, you will need to:

- register by contacting the Democracy Officer (whose name and contact details can be found on the agenda for the meeting) **no later than 5.00 pm** on the last working day before the meeting;
- ensure that what you want to say speak relates to an item of business on the agenda or an issue which the committee has power to consider (speak to the Democracy Officer for advice on this);
- find out about the rules for public speaking from the Democracy Officer.

A leaflet on public participation is available on the Council's website or from Democratic Services by telephoning York (01904) 551088

Further information about what's being discussed at this meeting

All the reports which Members will be considering are available for viewing online on the Council's website. Alternatively, copies of individual reports or the full agenda are available from Democratic Services. Contact the Democracy Officer whose name and contact details are given on the agenda for the meeting. **Please note a small charge may be made for full copies of the agenda requested to cover administration costs.**

Access Arrangements

We will make every effort to make the meeting accessible to you. The meeting will usually be held in a wheelchair accessible venue with an induction hearing loop. We can provide the agenda or reports in large print, electronically (computer disk or by email), in Braille or on audio tape. Some formats will take longer than others so please give as much notice as possible (at least 48 hours for Braille or audio tape).

If you have any further access requirements such as parking close-by or a sign language interpreter then please let us know. Contact the Democracy Officer whose name and contact details are given on the order of business for the meeting.

Every effort will also be made to make information available in another language, either by providing translated information or an interpreter providing sufficient advance notice is given. Telephone York (01904) 551550 for this service.

যদি যথেষ্ট আগে থেকে জানানো হয় তাহলে অন্য কোন অর্ধাতে তথ্য জানানোর জন্য সব ধরনের চেষ্টা করা হবে, এর জন্য দরকার হলে তথ্য অনুবাদ করে দেয়া হবে অথবা একজন দোঅবী সরবরাহ করা হবে। টেলিফোন নম্বর (01904) 551 550।

Yeteri kadar önceden haber verilmesi koşuluyla, bilgilerin terümesini hazırlatmak ya da bir tercüman bulmak için mümkün olan herşey yapılacaktır. Tel: (01904) 551 550

我們竭力使提供的資訊備有不同語言版本，在有充足時間提前通知的情況下會安排筆譯或口譯服務。電話 (01904) 551 550。

اگر مناسب وقت سے اطلاع دی جاتی ہے تو ہم معلومات کا ترجمہ مہیا کرنے کی پوری کوشش کریں گے۔ ٹیلی فون (01904) 551 550

Informacja może być dostępna w tłumaczeniu, jeśli dostaniemy zapotrzebowanie z wystarczającym wyprzedzeniem. Tel: (01904) 551 550

Holding the Executive to Account

The majority of councillors are not appointed to the Executive (38 out of 47). Any 3 non-Executive councillors can 'call-in' an item of business from a published Executive (or Executive Member Advisory Panel (EMAP)) agenda. The Executive will still discuss the 'called in' business on the published date and will set out its views for consideration by a specially convened Scrutiny Management Committee (SMC). That SMC meeting will then make its recommendations to the next scheduled Executive meeting in the following week, where a final decision on the 'called-in' business will be made.

Scrutiny Committees

The purpose of all scrutiny and ad-hoc scrutiny committees appointed by the Council is to:

- Monitor the performance and effectiveness of services;
- Review existing policies and assist in the development of new ones, as necessary; and
- Monitor best value continuous service improvement plans

Who Gets Agenda and Reports for our Meetings?

- Councillors get copies of all agenda and reports for the committees to which they are appointed by the Council;
- Relevant Council Officers get copies of relevant agenda and reports for the committees which they report to;
- Public libraries get copies of **all** public agenda/reports.

City of York Council

Committee Minutes

MEETING	TRAFFIC CONGESTION AD-HOC SCRUTINY COMMITTEE
DATE	17 JULY 2007
PRESENT	COUNCILLORS MERRETT (CHAIR), HOGG, HUDSON (VICE-CHAIR), MOORE, MORLEY, PIERCE, SIMPSON-LAING AND MR M SMITH (CO-OPTED NON-STATUTORY MEMBER)
IN ATTENDANCE	MATTHEW PAGE – INSTITUTE FOR TRANSPORT STUDIES, LEEDS UNIVERSITY

6. DECLARATIONS OF INTEREST

Members were invited to declare at this point in the meeting any personal or prejudicial interests they might have in the business on the agenda.

Councillor Merrett declared a personal non-prejudicial interest in agenda item 4 (Interim Report for Traffic Congestion Ad-Hoc Scrutiny Committee) as an honorary member of the Cyclists' Touring Club and a member of Cycling England.

Councillor Hogg declared a personal non-prejudicial interest in agenda item 4 (Interim Report for Traffic Congestion Ad-Hoc Scrutiny Committee) as his work for the National Railway Museum did involve contact with EWS.

7. MINUTES

RESOLVED: That the minutes of the last meeting of the Committee held on 19 June 2007 be approved and signed by the Chair as a correct record.

8. PUBLIC PARTICIPATION

It was reported that there had been no registrations to speak at the meeting under the Council's Public Participation Scheme.

9. INTERIM REPORT FOR TRAFFIC CONGESTION AD-HOC SCRUTINY COMMITTEE

Members considered a report, which updated them on the work completed to date on the Traffic Congestion Scrutiny Review. The report included the following annexes:

- Annex A** – Programme for carrying out mapping works
- Annex B** – Evidence of the soft measures presently in place to encourage a reduction in car travel in York

- Annex C** – Statistics showing vehicle fleet in use in York
Annex D – Paper on alternative environmentally viable and financially practical methods of transport
Annex E – Paper on City of York Council's view on journey times and reliability of public transport.

Consideration was also given to an additional sheet, circulated at the meeting, prepared by the Transport Planning Unit, which outlined further points on bus reliability.

The following representatives from the bus companies and the Quality Bus Partnership were in attendance:

Jonathon Stewart	- First
Colin Newbury & Paul Adcock	- Arriva
Peter Dew	- Toplevel Travel & Veolia
Geoff Lomax	- Coastliner
John Carr	- Quality Bus Partnership

The Chair confirmed that the aim of the meeting was to understand the topic area and the issues involved. It was not proposed to make judgements or criticism but to find potential solutions to improve traffic congestion in the city for recommendation to the Executive.

The Head of Network Management, City Development and Transport, referred to his briefing notes at Annex D and E and he indicated that a lot more work was still required in relation to journey times and reliability of public transport. He asked Members not to draw conclusions from the two bus surveys undertaken on Services 2 and 10. He drew attention to the patterns and indicated that a possible solution to improve bus reliability may be for the timetable to more closely reflect journey times particularly at peak times. He confirmed that the Authority did also have some part to play in assisting the companies.

Members questioned certain aspects of the report and made the following points:

- Questioned the legal status of bus timetables, it was confirmed that if the timetable was not consistently met the Traffic Commissioner could impose sanctions. The Commissioner expected 95% of services to be on time.
- Referred to foreseen difficulties affecting journey times e.g. pavements, delivery vehicles in the town centre etc.
- Rawcliffe Bar Park and Ride where additional stops had now been added which resulted in a bus service rather than a high frequency express service this change had not been made clear to the public.
- Problems with bus services on Eastfield Lane on the Haxby/Wigginton route not adhering to the 20mph speed limit.
- Steer Davies Gleave, Consultants report had also examined the reliability of the bus services and the reasons leading to unreliability which included dwell time, ticketing, congestion of the road network and money in the capital programme.

- Agreed that six years on from the above report, the issues relating to bus service unreliability were still very much the same.
- Questioned the length of time taken to install BLISS (Bus Location and Information Sub System) and BLISS enabled vehicles.
- Questioned variations in peak traffic flows during school holidays, which it was confirmed was between 8-10% lower than usual, but which made a significant difference to reliability.
- Felt that the relocation of large delivery vehicles to transshipment centres could create problems elsewhere.
- The attractiveness of the bus package was not helped by bus stops not having timetables or shelters or by passengers crossing the city having to purchase different tickets.
- Raised the relative cheapness of the Park and Ride fares relative to local bus services creating a perverse incentive for local residents in Rawcliffe to drive to the Park and Ride site.
- Questioned the views of Officers and the industry on the expansion of the Park and Ride services.
- Number of buses in operation that were still not Disability Discrimination Act (DDA) compliant.

John Carr, Chair of the Quality Bus Partnership (QBP), confirmed that the Partnership was shortly due to be relaunched. Referring to the Highway Infrastructure side he flagged issues over waiting restrictions and enforcement (or lack of it). He stated that there was a perception that the Police were not active in keeping traffic flow running smoothly and he felt that more Police input would be useful in the discussions and they could do with being represented on the Partnership. He stated that roughly calculated it appeared that around 10% more buses were used in York to cope with traffic congestion. He stated that York had had great success in persuading people to purchase tickets in advance and he felt that this would continue to improve, but that operators could do more to reduce boarding times. The Partnership would like traffic management operators to examine the amount of their investment in such things as vehicle tracking, BLISS and dynamic bus priority systems which gave buses priority at junctions and a clear run. The Partnership was also looking to tackle congestion issues as part of the proposed Quality Improvement Partnership (QIP).

Head of Network Management confirmed that there were some areas that the City of York Council, as the Highway Authority, could control or prohibit but heavy goods and delivery vehicles were not one of them. Measures that could be taken included lorry bans in the town centre, additional bus lanes although problems had been found with a number of routes into the city and he felt there was limited scope for additional ones. Officers stated that the enforcement of waiting restrictions was not carried out by the Police but by the Council as Highway Authority. He also confirmed that the Authority had no powers relating to moving traffic offences. He indicated that nationally the Police had been taken away from road policing and that North Yorkshire Police carried out no highway policing even for planned events e.g. York Races, only emergencies. The Authority unfortunately had no powers to enforce or direct vehicles.

The bus company representatives made the following points:

- There was no such thing as “early running” on Service 2 as it was a high frequency service which met its criteria of running 6 bus’s per hour at not greater than 15 minute gaps between services but it was confirmed journey times could vary within this.
- In terms of the extra stops on Service 2 these had been added at the request of Norwich Union.
- The Park and Ride services were shortly due for renewal so there was little that could be done with the contact in the short term. Confirmation that in the longer term expansion of the service could form part of discussions with the QBP, including investment in new sites.
- Indications that the Park and Ride Service did have a negative side e.g. unnecessary local journeys by car to Park and Ride sites causing more congestion.
- Park and Ride services had resulted in reduced numbers using normal service buses.
- Congestion of A19 Fulford Road entry to the city at peak back to Escrick, sometimes even Riccall and the need to address with bus lanes.
- The speeding of buses was a serious health and safety issue and would be examined. Members were asked to report any incidents to the bus company concerned.
- Confirmation that cross ticketing would be reviewed.
- Final deadline for DDA compliant vehicles was not for a number of years, which all companies confirmed that they were on target to meet.
- Jonathan Stewart circulated a plan at the meeting showing First’s perceived hotspots for congestion in the city. He confirmed that he would be happy to work through this list to prioritise and help resource.

Officers confirmed that the authority were heavily involved in traffic management with the use of virtual bus lanes, queue relocation systems and the city was possibly more advanced in this than other cities. However they were limited to what could be achieved when the system was running close to capacity as in York. Then the solutions were either to increase capacity or reduce the loading on the system. They confirmed that, in line with the Transport Planning Units notes on bus reliability, there were problems for which a radical solution was required. In answer to a question they confirmed that the cost of installing the BLISS system on one bus route was in the region of £10,000.

The Chair thanked the Head of Network Management for all his work on traffic and transport issues in the city and wished him a long and happy retirement. He also thanked the representatives of the bus companies for their attendance and for their open and helpful contributions. He stated that their comments would be welcomed on the final draft report and recommendations of the Committee.

Mike Smith confirmed that he disagreed that York was doing well in respect of traffic management, as there were still some areas for

improvement. He stated that York had the first generation BLISS system and that further developments had been made which the Authority could take up. Improved journey times was he felt the next step together with deterring other vehicles from using frequent user bus routes e.g. bus pricing focussing on heavily used routes.

Members indicated that the plan circulated by First was incomplete and that there were a number of additional hotspots for congestion in the city. Members agreed that it was appropriate for a review of the congestion hotspots to be undertaken by Officers.

Owing to the lateness of the hour Members agreed to defer consideration of the remaining appendices to a further meeting to be arranged prior to the September meeting of the Committee.

RESOLVED: That the following items be considered at the next meeting:

- Annex A** – Programme for carrying out mapping works
- Annex B** – Evidence of the soft measures presently in place to encourage a reduction in car travel in York
- Annex C** – Statistics showing vehicle fleet in use in York
- Annex D** – Paper on alternative environmentally viable and financially practical methods of transport

REASON: To ensure full consideration of all the objectives and progress the scrutiny of traffic congestion in York.

CLLR D MERRETT, Chair

[The meeting started at 6.00 pm and finished at 8.20 pm].

This page is intentionally left blank



Traffic Congestion Ad-hoc Scrutiny Review

4 September 2007

Interim Report

Background

1. In coming to a decision to review this topic, the Scrutiny Management Team recognised certain key objectives and the following remit was agreed:

2. **Aim**

To identify ways including Local Transport Plans 1 & 2 (LTP1 & LTP2) and other evidence, of reducing present levels of traffic congestion in York, and ways of minimising the impact of the forecast traffic increase.

Objectives

Having regard to the impact of traffic congestion (based on external evidence and those measures already implemented in LTP1 or proposed in LTP2), recommend and prioritise specific improvements to:

- i. Accessibility to services, employment, education and health
- ii. Air Quality, in particular looking at the five hotspots identified in the LTP2
- iii. Alternative environmentally viable and financially practical methods of transport
- iv. CO² Emissions
- v. Journey times and reliability of public transport
- vi. Economic Performance
- vii. Quality of Life
- viii. Road Safety

Accessibility to services, employment, education and health

Information Gathered

3. Two informal meetings were held to consider this first objective (6th and 21st March 2007). Members considered information provided by the Head of Transport Planning and information contained within LTP2. As a result, a number of factors were identified which could affect a positive change in more than one of the objectives set out in the agreed remit for this review. These were presented in an interim report on 4 April 2007 and members requested that additional mapping work be carried to investigate these factors. Members were informed that due to limited staffing resources the mapping work required as part of LTP2 was yet to be completed. Members recognised the importance

of this work and requested a clear prioritised work programme, plus a costing for carrying out the additional mapping work identified in the interim report of 4 April 2007. This programme was originally presented at a meeting on 17 July 2007 but Members agreed to defer consideration of it until this meeting – see annex A attached.

4. Members also requested evidence of the soft measures presently in place to encourage alternatives to car travel in York. This information was also presented at the meeting on 17 July 2007 but again Members agreed to defer consideration of this until this meeting – see annex B attached.

Air Quality, in particular looking at the five hotspots identified in the LTP2

Information Gathered

5. At a meeting on 19 June 2007, the Assistant Director of City Development & Transport gave a presentation on where congestion is at it's worst in York, the expected effects of the measures to be implemented as part of the second Local Transport Plan (LTP2) and a fifteen year view.
6. Members also received a presentation on the Management of Air Quality in York, from the Environmental Protection Manager which:
 - highlighted the five Air Quality Management Areas (AQMAs) in York identified in 2002
 - detailed the actions taken to date as part of the two Air Quality Action Plans (AQAP1 & AQAP2), published in 2004 and 2006 respectively
 - identified the methods used to record levels of pollutants in the air and identified their sources
 - detailed the current position both inside and outside of the AQMAs
 - listed the successes and ongoing threats to be addressed in the future

Issues Arising

7. As emissions from vehicles are the main factor affecting air quality it was recognised that the number, types and age of vehicles on York roads was relevant to the levels of pollutants recorded. Members requested details on the vehicle fleet in use in York and this was included in the agenda for the meeting on 17 July 2007. At that time, it was agreed to defer consideration of the information provided until this meeting – see annex C attached.

Alternative environmentally viable and financially practical methods of transport & CO² Emissions

Information Gathered

8. At the meeting on 17 July 2007 the Head of Network Management provided a paper on sustainable fuels and the effects of CO² Emissions. It sought to put the term 'environmentally friendly' into context and indicated potential responses that could have a measurable impact on the environment. It also provided facts on carbon emissions and identified alternative green transport

fuels. Members agreed to look more closely at this paper, at this meeting – see Annex D attached.

Journey times and reliability of public transport

9. Representatives of the local bus service providers were invited to a meeting on 17 July 2007 to discuss this key objective. John Carr (Chair of the Quality Bus Partnership) attended together with the following representatives from the bus companies:

Jonathon Stewart	- First
Colin Newbury & Paul Adcock	- Arriva
Peter Dew	- Topline Travel & Veolia
Geoff Lomax	- Coastliner
Bob Rackley	- East Yorkshire Motor Services

Information Gathered

10. In order to provide a context for the discussion, the Head of Network Management provided a paper giving City of York Council's view on journey times and reliability, which highlighted the issues reported by York residents.
11. It was recognised that a lot more work was required in relation to journey times and reliability of public transport and it was indicated that one possible solution to improve the public's perception of bus reliability would be for the timetable to more closely reflect actual journey times particularly at peak times. It was also recognised that the Authority did have some part to play in assisting the bus companies.

Issues Arising

12. Members raised a number of queries:
- The legal status of bus timetables - it was confirmed that the Commissioner would expect 95% of services to be on time, and if the timetable was not consistently met he could impose sanctions.
 - Unforeseen difficulties affecting journey times e.g. delivery vehicles in the town centre etc – it was recognised that the relocation of large delivery vehicles to transshipment centres could create problems elsewhere
 - The need to make clear to the public any changes to services i.e. Rawcliffe Bar Park and Ride where additional stops had now been added which resulted in a bus service rather than a high frequency express service
 - Problems with buses not adhering to the speed limit in an effort to stick to the timetable
 - the number of BLISS (Bus Location and Information Sub System) enabled vehicles in use in York, the costs involved and the length of time taken to install BLISS – it was confirmed that the cost of installing the BLISS system on one bus route was in the region of £10,000

- variations in peak traffic flows during school holidays - it was confirmed that flow was between 8-10% lower and that this made a significant difference to reliability.
 - the relative cheapness of the Park and Ride fares relative to local bus services – it was noted that this created a perverse incentive for local residents to drive to a Park and Ride site.
 - The number of buses in operation that were still not Disability Discrimination Act (DDA) compliant
13. Members were informed that six years previously, Steer Davies Gleave Consultants also examined the reliability of the bus services in York and their final report highlighted reasons leading to unreliability which included dwell time, ticketing, congestion of the road network and money in the capital programme. It was acknowledged that the issues relating to bus service unreliability were still very much the same today.
14. Finally, Members agreed that the attractiveness of the bus package was not helped by the fact that not all bus stops had timetables or shelters and that passengers crossing the city were having to purchase different tickets.

Options

15. Having regard to the aims and objectives of this topic remit and having considered the information provided in Annexes A-D, Members may wish to:
- request some further information relating to key objectives (i) – (v), or;
 - agree some recommendations relating to key objectives (i) – (v), so that future meetings can concentrate on the remaining objectives listed below:
 - vi. Economic Performance
 - vii. Quality of Life
 - viii. Road Safety

Corporate Priorities

16. It is recognised that any recommendations made as a result of this scrutiny review could contribute to Corporate Priority no 2 – To increase the use of public and other environmentally friendly modes of transport.

Implications

17. There are no known Financial, HR, Equalities, Legal, Crime and Disorder, IT or other implications associated with this report.

Recommendations

18. Members are asked to note all of the information provided, formulate some recommendations relating to key objectives (i) – (v) and agree a workplan for future meetings of this ad-hoc scrutiny committee

Reason: To ensure full consideration of all the objectives

Contact Details

Author:

Melanie Carr
Scrutiny Officer
Scrutiny Services
Tel No. 01904 552063

Chief Officer Responsible for the report:

Suzan Hemingway
Head of Civic, Democratic & Legal Services

Interim Report Approved

Date 20 August 2007

Wards Affected:

All

For further information please contact the author of the report

Annexes

- Annex A** – Programme for carrying out mapping works
- Annex B** – Evidence of the soft measures presently in place to encourage a reduction in car travel in York
- Annex C** – Statistics showing vehicle fleet in use in York
- Annex D** – Paper on alternative environmentally viable and financially practical methods of transport

This page is intentionally left blank

Scrutiny Committee 17th July 2007
Notes on Accession Modelling/Mapping

Definitions of Accessibility Planning and 'Accession'

Accessibility Planning is a process that aims to promote social inclusion by helping people from disadvantaged groups or areas access jobs and essential services. Is not just governed by transport but can be influenced by decisions on the location, design and delivery of other services and by people's perceptions of personal safety.

"Accession" is a bespoke accessibility planning software tool. The use of Accession can help authorities to identify local areas and communities that are poorly served by jobs, local facilities or transport services and investigate a wide range of scenarios for policy and planning purposes. It can also help authorities to develop, and evaluate the benefits of, potential alternative solutions.

Accessibility Strategy

The Councils Accessibility Strategy is contained at Annex A to the City of York's Local Transport Plan 2006-2011 (LTP2). From mapping audits and consultation with stakeholders the following areas, in no particular order, were identified as a priority for improvement:

- Access to Health
 - Access to York Hospital
 - Access to GPs
- Transport Information
- Rural Accessibility Problems

Over the duration of the Accessibility Strategy the following areas will also be assessed:

- Access to Work
 - Access to out-of-town centres
- Access to Education
- Access to Leisure
- Local accessibility assessments

Based upon these priorities the following policy framework was derived:

- Policy A1 - Utilise accessibility criteria in the prioritisation of resources.
- Policy A2 - Appraise and assess the accessibility implications of transport projects and schemes

- Policy A3 - Ensure the proactive circulation of information regarding existing, new or altered transport services.
- Policy A4 - Incorporate accessibility criteria into new development appraisal and Section 106 funding considerations.
- Policy A5 - Ensure that disabled people and other minority groups are involved in the designing of transport networks and facilities with particular attention given to the divergent needs encountered.
- Policy A6 - Incorporate users needs into existing restrictions and licensing conditions
- Policy A7 - Ensure that accessibility and transport impacts are considered when locating and delivering other services and opportunities.

Elements suitable for Modelling and mapping using Accession

A list of Strategic Priorities was also derived. Some of these would appear to be suitable to investigate using Accession modelling and mapping, and these are listed below:

- Improved image of public transport through marketing of the generally good public transport accessibility that already exists in York
- Improve cycle access by delivering a more complete network and an audit of cycle parking facilities

Education

- Local Accessibility Audits of school, college and university public transport provision
- Continued improvements to Safe Routes to School, improving walking and cycling access
- Changes to transport timetables and lecture/class timetables to better suit the students

Employment

- Improved public transport accessibility, filling the gaps identified in the strategic audit with orbital routes, a city centre shuttle and Demand Responsive Transport.
- Changes to transport timetables and working hours to better suit employees
- Park & Ride to serve key employment sites

Retail

- Improved public transport accessibility, filling the gaps identified in the strategic audit with orbital routes, a city centre shuttle and Demand Responsive Transport.
- Improve access to Out-of-town destinations.
- Developer contributions to be invested in cycle and pedestrian routes to developments

- Encourage more smaller more localised supermarkets and district centres to reduce the need to travel

Leisure

- Improved public transport accessibility, filling the gaps identified in the strategic audit with orbital routes, a city centre shuttle and Demand Responsive Transport.

Rural

- Improved public transport accessibility, filling the gaps identified in the strategic audit with new/altered routes and Demand Responsive Transport.
- Provision of feeder services to Park & Ride sites

Other factors identified by Scrutiny Committee on 4th April 2007

Members acknowledged that the mapping work completed to date had been limited but having considered the information provided, were able to identify other factors which could further affect a modal shift in travel. These included:

- **Extending the Park & Ride service to improve access to York Hospital outside of peak hours**
- **Identifying under used bus services**
- **Increasing the number of buses in use during 'school run' times to reduce gaps in service**
- Improved interchange points in the city centre
- Improved safety measures for taxis e.g. CCTV in cars
- Sustainable Tourism – a tourist tax with monies collected being used in total to deal with accessibility issues
- **Access to primary school education**
- Publicising good practices by employers across the city i.e. Green Travel Plans
- Ensure the implementation of the Council's own Green Travel Plan
- **Relocation of bus stops**
- **Additional bus lanes on key roads into the city** (although Saturn Modelling may be more appropriate)

Not all of the above factors are suitable for modeling and mapping in Accession. Those that are have been shown in bold font.

Local Accessibility Assessments

The Accessibility Strategy's programme for undertaking Local Accessibility Assessments to determine local accessibility actions is shown in the following table. Due to the timescales involved it was envisaged the local analysis will spread out over the 5 year period of LTP2.

Table 1 Accessibility Strategy's programme for undertaking Local Accessibility Assessments

	2006/07	2007/08	2008/09	2009/10	2010/11
Acomb		✓			
Bishopthorpe				✓	
Clifton	✓				
Derwent		✓			
Dringhouses & Woodthorpe			✓		
Fishergate		✓			
Fulford			✓		
Guildhall		✓			
Haxby & Wigginton				✓	
Heslington					✓
Heworth				✓	
Heworth without				✓	
Holgate					✓
Hull Road			✓		
Huntington & New Earswick			✓		
Micklelegate					✓
Osbalwick	✓				
Rural West York				✓	
Skelton, Rawcliffe and Clifton without					✓
Strensall		✓			
Westfield	✓				
Wheldrake			✓		
Note. Mapping for Westfield, Osbalwick and Clifton wards has been undertaken.					

Factors affecting the modeling/mapping programme

The primary factor affecting the delivery of the accessibility modeling and mapping programme has been the lack of resources to undertake the work since the departure of the Council's Transport Strategy Unit's (TPU) Transport Planner (Strategy), with the expertise in using the Accession software, in April 2006. It is anticipated that this post will soon be filled. In the meantime some officers within the TPU are receiving training in the use of Accession, but it will be some time before they become suitably proficient in its use. In addition recruitment is underway to fill the vacant Transport Planner (Strategy) post.

Timeframe for continuing the programme

For the short term it is intended to utilise the Council's call-off consultant (Halcrow) to undertake the accession modeling/mapping work. The intended priorities for this is as follows:

- Access to education – August to November 2007
- Underutilized bus services and bus service gaps - August to December 2007
- Extensions to Park & Ride Services December 2007 to February 2008

The local accessibility assessment programme will be compressed to be completed by the end of the originally proposed 5-year programme. The exact timings within this overall programme are to be determined.

Other Modelling/mapping is dependent on the implementation of the LTP2 capital programme and other projects and is likely to be undertaken in the medium term 2009/10 to 2010/11.

Financial Implications

For the short term it is intended to utilise the Council's call-off consultant (Halcrow) to undertake the accession modeling/mapping work. The anticipated rate for this work is £ 350/day. A typical Accession modeling/mapping assignment takes two days to complete, so each task would cost £700. An example costing for 'Education' would be in the order of £24,000.00.

This page is intentionally left blank

Smarter Choices Actions

● General Sustainable Transport Activities

- Up to the present
 - Bus information services to residents (via libraries, council outlets, EYMS call centre, internet and 'Cityspace' columns etc.)
 - New arrangements for issuing concessionary passes
 - Cycle Map 9th Edition, cycle promotion events and cycle training
 - Promotion and relaunch of Yozone scheme
 - Email promotion of car-share scheme
- Future/ongoing
 - Cycle Map 10th Edition, cycle promotion events and cycle training
 - Information and maps on the internet
 - Participation in national sustainable travel campaigns & events
 - Employer travel plans (inc CoYC)
 - Promotion of car-sharing web site and Whizz-go car-club

Smarter Choices Actions

- **Education Activities**

- Up to the present

- School travel plans including workshops for teachers and parents, presentations at assemblies and travel exhibition
- Walk to school weeks
- YOzone card re-launch
- Sponsored high visibility tabards and slap-wraps (Ware & Kay)
- School safety banner competition

Smarter Choices Actions

- Future/ongoing
 - School travel plan writing kit
 - York-specific walk to school week material (walk to School Weeks May & October)
 - Long-term Curriculum linked walking and cycling initiative(s) for all schools
 - Schools debating contest in Guildhall
 - Promotion of Cycling in Schools

This page is intentionally left blank

Year	BUS&COACH	CAR	HGV 1	HGV 2	HGV 3	HGV 4	HGV 5	HGV 6	LGV	M.Bike	TAXI														
1967		1										Pre - Euro 1													
1968		2											Pre - Euro 1												
1969		3												Pre - Euro 1											
1970		1													Pre - Euro 1										
1975		1														Pre - Euro 1									
1976		1															Pre - Euro 1								
1979									1									Pre - Euro 1							
1981	2		1																Pre - Euro 1						
1983	3	16	2							3										Pre - Euro 1					
1984	2	10							1	1											Pre - Euro 1				
1985	4	12								2	1											Pre - Euro 1			
1986		14							1		2												Pre - Euro 1		
1987		27							1	3														Pre - Euro 1	
1988	2	57							1	1															Pre - Euro 1
1989	1	91	3						7	1	1														
1990	2	114	3						3	5	1	Pre - Euro 1													
1991	2	179	2						17	3	2		Pre - Euro 1												
1992	2	213	5	1					14	4	2			Pre - Euro 1											
1993	1	457	4	1					15	8	4				Euro 1										
1994	3	590	9	1	3		1		36	10	10					Euro 1									
1995	4	668	6	1				2	61	5	8						Euro 1								
1996	2	1051	27	1	1				127	15	11				Euro 2										
1997	18	1324	35	1	1			2	173	11	34					Euro 2									
1998	12	913	16	1	3			1	116	6	35						Euro 2								
1999	4	1489	29	3	1	1		2	227	19	35							Euro 2							
2000	89	1703	49	5	2	1	2	10	260	30	46				Euro 3										
2001	194	2196	81	13	3	1	1	5	365	27	33					Euro 3									
2002	77	2566	80	13	2	1	2	7	369	43	42						Euro 3								
2003	8	2879	94	25	6		5	11	500	39	26							Euro 3							
2004	44	2725	105	22	8	5	2	4	587	30	18								Euro 3						
2005	19	2647	120	23	7	1	2	5	579	47	11	Euro 4													
2006	7	1797	67	11	6		2	9	411	20	9		Euro 4												
Totals	502	23747	738	122	43	10	17	58	3872	333	331														

	BUS&COACH	CAR	HGV 1	HGV 2	HGV 3	HGV 4	HGV 5	HGV 6	LGV	MB	TAXI	%
Pre-Euro 1	4.0	3.1	2.2	0.8	0.0	0.0	0.0	0.0	1.2	6.9	2.7	
Euro 1	1.6	7.2	2.6	2.5	7.0	0.0	5.9	3.4	2.9	6.9	6.6	
Euro 2	7.2	20.1	14.5	4.9	14.0	10.0	0.0	8.6	16.6	15.3	34.7	
Euro 3	82.1	50.8	55.4	63.9	48.8	80.0	70.6	63.8	53.7	50.8	49.8	
Euro 4	5.2	18.7	25.3	27.9	30.2	10.0	23.5	24.1	25.6	20.1	6.0	

Briefing Note

'Alternative environmentally viable and financially practical methods of transport'

Introduction

The term 'Environmentally Friendly Transport' is much used but little understood. In terms of the movement of people in general it is applied to anything that is not a conventional bus or car as if by so doing it elevates the object to some greater status in terms of its environmental acceptability as a means of transport. There is invariably no scientific justification or comparison given to warrant this. Surprisingly this term is also not normally associated with the movement of goods as if this significant sector of the transport industry has no impact upon the environment at all. This note seeks to put this term into context and to indicate potential responses that may have a measurable impact in respect of the environment.

Clearly the first consideration when attempting to understand this subject and identify options is to define the outcomes required. The 'Environment' is now a well understood concept but for something to be 'environmentally friendly' it is necessary to form a view about just what is intended by such transport. Is it [a] transport, which in terms of its consumption of finite non renewable resources, has the least effect, or [b] transport which in terms of its effect upon air quality and quality of life has the least effect, or [c] both?.

If just [a] then the focus needs to be on the provision of renewable energy sources and the maximisation of the efficiency of the use of both these and non renewable sources.

If just [b] then the focus needs to be on the emission of vehicles, their noise and the amount they are used.

With regard to this latter issue the Sub Committee fundamentally needs to be clear about what they are seeking to achieve. They need to be clear if they are concerned about the impact on local air quality (mainly NO_x and PM₁₀ emissions) or the impact on global air quality (CO₂ emissions) or both? – the answer will influence what aspect of a vehicles emissions is scrutinised and clearly this will reflect in any recommendations they make as in general what is 'good' for a local situation is not necessarily 'good' for a global context (and vice versa).

Without any debate of substance there seems to be a growing assumption within the lay community that any true 'environmentally friendly transport' must satisfy both criteria. Leaving to one side that this objective is not one that can be delivered by a single nation state acting alone, it follows that any such transport meeting both criteria needs to be radically different to that which are in use today. In other words the solution is not something that can be readily sourced or indeed, rapidly deployed. It is also not something that any individual or organisation within a single nation state can individually expect to influence. The delivery of true 'environmentally friendly transport' needs the intervention of national Governments working in concert, a structure of legislation and the support of individuals/organisations. In other words, the solution can be influenced by individuals/organisations but only delivered through national Government actions supported by the world community.

Oil and natural gas are fuels of choice for the majority of combustion engines. They are clearly a finite resource. Vehicles are in general manufactured from steel and plastic. Steel is also a finite resource and plastic, being a derivative of oil, has a finite supply. Both, however, have the advantage that they can be recycled almost indefinitely. This suggests that a core element of any 'environmentally friendly transport' is that it is manufactured from recyclable materials and at the end of its service life, is able to be readily reprocessed into raw materials for other purposes. A further core element is clearly that the fuel used is used with the maximum efficiency and is derived from renewable sources.

Whilst there is a great deal of scientific argument concerning the reason for global warming and in particular what the role of vehicle generated CO₂ actually is in that process, there is a consensus concerning the adverse impact of the combustion engine upon local air quality. Equally there is ample evidence that supports the view that the volume of vehicles using our highways is now damaging the local environment enjoyed by local communities, both through their presence and the noise they generate. It therefore seems inescapable that the final core aspects of any 'environmentally friendly transport' are that [1] it has a minimal polluting impact, [2] it is quiet and [3] it is only used when and where absolutely necessary.

These considerations therefore provide the 'shopping list' for any environmentally friendly transport options. Any such needs to be:

- Manufactured from recyclable materials
- Easily reprocessed at the end of its service life
- Powered by renewable energy in as energy efficient manner as possible
- Produce nil or minimal pollutants
- Inherently quiet when in use
- Operated within a Transport Policy that reduces the need to travel (for people) and minimises movement (for goods)

Discussion

Facts

The transport sector, including aviation, produces about one quarter of the UK's total carbon emissions, with road transport accounting for 85% of this and passenger cars accounting for around one half of all carbon emitted by the transport sector (51%).

HGV's and Buses between them account for some 42% of the carbon emitted by the transport sector, this despite the fact that there are some 26 million passenger cars but less than a total of 1 million HGV's and Buses. There is thus a clear link between transport and the production of CO₂ but an even clearer link between the polluting impact of HGV's and Buses.

Evidence for the impact of this gas upon the environment is however not as clear cut as many in the media would have it with the connection between it and global warming being far from proved. What is clear is that the gas has an adverse impact upon the local environment in terms of damage to vegetation, bio diversity and the human body. A reduction in the production of this gas for this reason alone is thus highly desirable.

By 2010, transport is in fact expected to be the largest single contributor to E.U. green house gas emissions. This is likely to compromise the Kyoto protocol, and hinder the chances of meeting the E.U's target of reducing greenhouse gas emissions by 8% by 2012. The government has responded to this prediction by granting £16.6 million to the development of greener transport methods, £9.3 million to renewable technology, and £6.1 million to bio-processing.

The Pan-European environmental objectives for the aeronautical industry (through ACARE¹) seek 50% reductions in CO₂ and noise and 80% reductions in NO_x in new products by 2020, whilst requiring lower costs and enhanced safety and security. The European Powering Future Vehicles Strategy also sets a target of 10% of new road vehicles emitting less than 100g/km CO₂ by 2012.

Other pollutants (oxides of nitrogen, particulates, etc) from transport also have a considerable adverse impact on local air quality and public health. Road transport emissions currently make up about 49% of total UK emissions of nitrogen oxides. These pollutants are known to increase the symptoms of respiratory illnesses, mainly amongst the young and very old. PM₁₀ concentrations are also linked to the incidence rate of heart attacks.

Due to the adverse impacts on public health national air quality objectives are already in place in the UK for a number of vehicle related pollutants (including nitrogen dioxide and particulates). Where these objective levels are not met local authorities are tasked with declaring Air Quality Management Areas

¹ Advisory Council for Aeronautics Research in Europe

(AQMAs) and drawing up Air Quality Action Plans (AQAPs) for improving air quality. There are currently more than 200 AQMAs in the UK. Mandatory EU limits for nitrogen dioxide (NO₂) and fine particulate matter (PM₁₀) limits are due to come into force in 2010 and will impose a significant driver for the shape of the future transport systems both nationally and locally.

In 1992 the European Commission initiated a tripartite research programme with the European oil and motor industries aimed at identifying technical measures to help improve air quality at least cost to society. The Auto/Oil programme as it known has led to the gradual introduction of vehicle emission standards for all newly manufactured vehicles. These are commonly referred to as 'Euro emission standards'. The most recent standards are Euro IV with Euro V due to be released in 2008.

The Euro emission standards have reduced the impact of individual vehicles but improvements in air quality are being rapidly outstripped by the continued exponential growth in total vehicle numbers. Another problem is that much of the technology designed to reduce emissions of NO_x and PM₁₀ reduces the efficiency of engines and increases the oxidation of CO to CO₂ emissions. The overall result is a reduction of the pollutants of local concern but an increase in those of global concern. In general there is a fine balance to be struck between reducing 'local pollutants' and reducing 'global' pollutants. For this reason the choice of vehicle should include some consideration of the types of journey being made. For short trips around urban environments improving local air quality (ie reducing nitrogen dioxide (NO₂) and fine particulate matter (PM₁₀)) should be the first priority. For long distance trips between urban centres reducing CO₂ emissions should be of greater concern.

Public Transport

The National Environment Technology Centre data shows that an average diesel engined bus emits as much particulate pollution as 128 cars, and as much oxides of nitrogen (NO_x) as 39 cars. The University of Tokyo has found the chemical 3-nitrobenzanthrone in diesel bus exhausts when the engine is under load, e.g. when pulling away from a bus stop. At the time of its identification this chemical was, and probably still is, one of the most carcinogenic chemicals known to science. With one bus transporting some 45 people and the cars transporting some 154 and 47 individuals respectively these figures point to the fallacy in the oft repeated simplistic argument that the solution to air quality problems lies in the significant expansion of the bus fleet.

Studies on the sustainability of public transport versus private transport² have also concluded that that buses and their public transport alternatives consume 60% more energy than cars per person transported. Given that diesel fuel used by the bus industry is subsidised by the Government by some £365 million a year the incentive to improve energy efficiency by engine manufacturers is blunted and thus greater use of buses would in effect have a

² Automotive Advisers and Associates, Hilden, Germany,

disproportionate adverse impact upon the consumption of non renewable energy.

Buses in their present guise are thus clearly not any form of environmentally friendly transport other than in their ability to significantly reduce the amount of road space used by transport. The ability of a bus (ie a multi passenger vehicle) to contribute to the delivery of a balanced Transport policy thus rests upon the solving of these motive power issues. In that regard the key to solving the adverse impact of buses is also the same as solving much of the adverse impact of private vehicles – namely the use of Green Transport Fuels.

Freight

Since the early 1950's the proportion of freight transported by rail has been in decline and now almost exclusively this sector is concerned with the movement of bulk goods such as quarry products and coal. Bulk movement of oil, petrol, gas and water is now undertaken by an extensive network of pipelines. With a very limited exception all 'consumer goods' are now transported by road. Clearly these facts are self evident, however what is not so apparent is that since the 1950's there has been an increasing trend towards larger and larger vehicles covering more and more miles so that today, proportionately (based upon the Gross Domestic Product) the transport industry moves by road many times more goods and over longer distances than at any time in the country's history.

Part of the reason for this change is the investment made by successive governments in the national motorway system and key trunk routes. This network makes the use of large vehicles feasible. That in turn means that a single vehicle can move more goods and hence the cost per ton transported drops. This in turn makes goods more affordable and hence more are purchased. The consequence of this approach is, however, that retailers service a series of stores with a single large vehicle carrying out what is known as 'multi-drop' deliveries.

The multi-drop approach has three key impacts:

- a. The vehicle is invariably unsuited to the local environment within which the store is situated
This leads to physical damage to the environment
- b. Because of the physical size of the vehicle and the layout of the roads which it needs to use in a town or city centre the vehicle is forced to travel at relatively slow speed and hence in a lower gear than is optimum for engine efficiency.
This leads to air quality damage to the environment
- c. Towards the end of its delivery run the vehicle load inevitably reduces
This means that a huge vehicle can be delivering a small load to an individual store.

These considerations together with the disproportionate carbon footprint of current HGV's means that an 'environmentally friendly' local freight solution must incorporate the following elements:

The vehicle used to deliver to its destination must be of a physical size appropriate to the local environment at its destination

The vehicle must only transport full loads to its destination and must be powered by a low/nil polluting engine when travelling close to its destination

Legislation must be in place to prevent vehicles failing to meet the above requirements from accessing environmentally sensitive areas

Facilities must be in place to enable the economies of scale provided by the use of the Motorway and Trunk Road network to be fully exploited.

In part these considerations have led to the development – almost exclusively on the continent – of Freight Transshipment Depots and Urban Consolidation Centres where goods brought along the Motorway and Trunk Road network are either broken down into loads for a specific local destination for onward transport by a smaller vehicle or where part loads are consolidated from several vehicles into one which then continues with deliveries either direct or to Transshipment locations.

Green Transport Fuels

The alternatives are:

Bio-diesel

This is a clean-burning bio-fuel. Separating glycerine from natural oils including that of oil seed rape, sunflowers, soybeans and most vegetable oils produces it. This ensures it is an entirely renewable energy source. Bio-diesel is also completely bio. This is already available in the U.K, but as yet is being used in combination with mineral diesel. If a diesel compound is 5% bio-diesel, this increases the fuel economy of the vehicle by 12%, whilst increasing engine life by 40%. Some studies have however shown that bio-diesel (or bio-diesel blends) can give rise to greater emissions of NO_x than conventional mineral diesel.

Liquefied Petroleum Gas (LPG)

LPG is produced from natural gas (usually methane) fields. This is however not a 'renewable' fuel, as obviously eventually the gas fields will run dry. Many vehicle manufacturers have already produced cars that run on LPG and conversions of existing conventional engines are widely available. LPG vehicles have been shown to reduce greenhouse gas emissions by 10% and to give rise to less NO_x and PM₁₀ emissions than conventional fossil fuels.

Around 8 years ago LPG was being hailed as the fuel of the future with many local authorities converting their own vehicles to LPG and encouraging others to do the same. In recent years enthusiasm for

LPG has waned. This has been driven by problems with the reliability and efficiency of LPG vehicles (particularly conversions), a reduction in the emission differential between LPG powered vehicles and petrol driven vehicles, and the ceasing of grant assisted conversion programmes across the UK.

Fuel Cell Vehicles

Fuel cells are electro-chemical devices that turn hydrogen to oxygen, and oxygen to water or steam. Electricity is produced in this process, and it is this electricity that provides fuel for the vehicle. The only emission therefore, is water, making this potentially a green fuel. However, the cell needs a supply of the two component gases and the production of Hydrogen involves the consumption of energy and hence, depending upon how it is obtained the overall process may not be as environmentally friendly as would first appear. Fuel cells are nevertheless said to be the most promising development in environmentally friendly transport fuel.

Stored Electricity

Whilst not strictly a 'fuel' this is a source of energy and in a suitable vehicle it can be used to provide the motive power to electric motors. The method of storage, however, is inefficient, heavy and has a limited life. Dependant upon the type of battery disposal of exhausted batteries can pose some significant issues and in environmental terms there is a cost to be paid in reclaiming the materials used, some of which are exceptionally toxic.

Compressed Air

Again this is not strictly a 'fuel' but is a means of storing energy produced by whatever means so that it can be used in a mobile situation. How environmentally friendly this might be will depend upon the energy source used to compress the air at the point of delivery. (ie the garage forecourt). Invariably this is likely to be from an electrical source and thus whilst the compressed air driven vehicle will produce no pollutants with respect to the local environment, on a global view how that electricity is produced will determine just how 'green' the overall impact is.

India's largest motor vehicle manufacturer, Tata Motors, has recently announced that it will be producing a compressed air driven car – the MiniCAT costing £5,500 within the near future. This vehicle is claimed to be able to operate with a range of up to 124 miles of city driving on a single tank of compressed air costing around £1 to produce. The vehicle is claimed to have a top speed of 68mph.

The likely development of hydrogen supplies for the UK

There are several ways of making hydrogen in the UK. The cheapest is to convert natural gas into hydrogen by a process called reformation. Reforming natural gas into hydrogen produces CO₂ but no more than burning it. However, using the hydrogen in a hydrogen fuel cell or using the natural gas itself in a natural gas fuel cell produces at least twice as much useful energy for a given amount of natural gas than burning it (in a natural gas fuel cell the natural gas is 'reformed' inside the fuel cell).

There are four main alternative methods available at present for producing hydrogen without producing CO₂ or adding more CO₂ to the atmosphere:

- 1) The electrolysis of water using electricity from renewable resources such as wind power, hydro-power and solar photo-voltaic cells. This method produces no carbon dioxide.
- 2) The chemical or thermal reformation of biomass feedstocks such as SRC (short rotation coppice) wood chips or methanol manufactured from biomass. This method releases carbon dioxide but it is all recycled by the growth of more biomass.
- 3) The biological reformation of biomass using micro-organisms. This method releases carbon dioxide but it is all recycled by the growth of more biomass.
- 4) The direct splitting of water using light with special catalysts or extreme heat, this method produces no carbon dioxide if the heat is produced from a carbon neutral source.

Of these four processes only the production of hydrogen by the electrolysis of water using electricity generated by windpower is financially viable on a large multigigawatt scale in the UK.

The transport of hydrogen

Hydrogen is a gas and as such could be transported over long distances economically via a pipeline to a local distribution point or potentially individual homes. However to be financially viable sales of hydrogen would need to be significant and it is unlikely that this could be expected at least in the short to medium term. This then means that the gas would need to be transported by road and this can be done either by compressing it or by liquefying it. The storage of compressed hydrogen requires heavy and bulky tanks and hence there is a cost in moving these around the country.

Storage of liquid hydrogen requires much lighter tanks thus reducing this cost but some 29% of the energy in hydrogen is required to liquefy it thereby increasing its actual and environmental cost. On the other hand liquid hydrogen is much lighter than diesel or petrol (1/10th the weight of petrol) and is safer and easier to use as a portable fuel for road vehicles than compressed gas.

Cost of hydrogen power

Studies have suggested that the extra cost of using liquid hydrogen to power a bus would be around 2 pence per passenger mile. This represents about an increase of 8%.

To generate the electricity to produce the hydrogen would need a 2 MW offshore wind turbine for every 18 large buses or 864 cars operating under city driving conditions. Each such unit would cost in the region of £3 million. Given that there are some 90,000 buses and some 25 million cars this would therefore require the provision of some 34,000 2 MW generating units at a cost of some £10.2 billion.

The location of such a large volume of turbines around our coasts would be problematic and studies have indicated that in any significant number the actual units would themselves have a detrimental impact upon marine life, and hence the environment.

Electric Vehicles - The alternative to Hydrogen?

At present, battery electric vehicles (EVs) are the most common zero emission vehicle (ZEV). ZEVs produce no vehicle tailpipe emissions in the course of their operation and EVs, which are recharged using energy sourced from renewable energy technologies are as close to being zero emission as possible (there are emissions associated with their manufacture). Even when EVs are charged using standard grid electricity, they are still cleaner than all other cars on the road.

EVs consist simply of a large rechargeable battery which stores electrical energy and this coupled to an electric motor which drives the wheels. This combination is far more efficient than internal combustion engine powered cars and is the reason for their very low emissions. The wheels are either

powered by an electric motor in each of the wheels themselves or, more commonly, a single central electric motor is connected to the wheels through a transmission. Unlike a conventional engine, an electric motor works efficiently at a wide range of speeds, so an electric car does not need a gearbox. Also electric motors may be used to slow the vehicle and pass the energy back to the battery. When an EV has its motors in the wheels there is no need for a transmission. This makes more space available and reduces the weight of the car. A lighter car is more fuel efficient and less dangerous when impacting a pedestrian.

Because their power source is currently much heavier than the power source of a conventional car, the fuel tank, EV's are more limited in their range (the distance they can travel between recharges of the battery). For example, it takes about one ton of batteries to store as much energy as seven kilos of petrol. Many of the smaller commuter EVs have ranges of around 30 to 60 miles (50 to 100 km), while some higher performance examples have ranges of 150 miles (240 km).

The reason for their short range is the state of battery technology today. A variety of battery types are used in EVs with three main types: lead-acid, nickel metal hydride (NiMH) and lithium-ion. Lead-acid batteries are the same as conventional car batteries and have the lowest energy density (resulting in a low energy to weight ratio). Nickel metal hydride batteries have a higher energy density and are similar to the more familiar nickel-cadmium (NiCad) batteries but do not contain the expensive and environmentally damaging metal cadmium. The use of cadmium in batteries has been banned by the European Union. Lithium-ion batteries (as used in mobile telephones and laptops) have the highest energy density and a slow loss of charge when not in use.

While fast recharge times are very useful (enabling recharge stops of a similar duration to refuelling stops for internal combustion engine vehicles), the most important breakthrough will be in the battery's energy to weight ratio. A high energy density will enable EVs to have a range comparable to internal combustion engines and will increase their marketability.

EV's generally have a low top speed (although electric cars have surprisingly quick acceleration, so they can keep up with city traffic without any difficulty).

One of the EVs great assets could also be one of its weaknesses. Electric vehicles are almost completely silent and in cities it has been found that this can create a safety problem as pedestrians and cyclists do not hear them coming. Solutions such as artificial engine noise or some other form of audio or visual alert have been proposed. EVs quiet operations make them an attractive option as delivery vehicles, especially in cities.

The environmental benefits of EVs are dependent on the energy source. It is often forgotten that while EVs produce no tailpipe emissions, they can cause emissions indirectly because the electricity needed to power them is often generated from fossil fuels. However, it is possible to purchase electricity

from suppliers who only use renewable sources. In this case, the vehicle can be considered to be more or less completely free of carbon and particulate emissions in operation.

EV's use energy far more efficiently than internal combustion engine vehicles so even if the electricity is sourced from fossil fuel power stations, the carbon and particulate emissions remain significantly less than internal combustion engines.

However an EV's battery is not cheap and after a while, its capacity to hold its charge reduces until it becomes unusable and needs replacing. The time this takes depends on the battery technology, how often it is used and how deeply it is charged and discharged.

Electric vehicles can be recharged simply by plugging them into an existing conventional electrical socket however this can take some time. A number of city councils are installing electric recharging points in car parks and the first on-street recharging points have been installed in London.

Non powered solutions

York has a high level of short commuting trips (56% of commuting trips by York residents were less than 5km in 2001). This suggests that walking and cycling could be important in providing an alternative mode of transport for commuters and therefore particularly effective at helping to reduce traffic at peak times. Clearly much has been done in the recent past to encourage cycling but this approach has now faltered and the increase in cycling's share of the travel market has remained largely static for a few years. Equally walking has been encouraged but also seems to have reached a point where additional trips are not being made.

Whilst it is clear that there are a number of measures that could be introduced to increase the share of cycling and walking (and the now adopted Local Transport Plan has a range of initiatives targeted at this objective), it needs to be recognised that these modes will always be in the minority. The young, the elderly and those with young children are target groups that through their special circumstances are just three examples of those for whom it would not be reasonable to anticipate high levels of use. Equally it must be recognised that the modern lifestyle and the layout of the city are constraints that will always result in a demand for vehicle based travel.

To a degree these vehicle trips can be accommodated by the use of vehicles provided by Car Clubs. Equally public transport, be it by multi passenger type vehicles or taxis/private hire will provide a solution. These 'shared' vehicles can be of an environmentally friendly type and thus provide transport at a reduced cost to the environment. However, what is very clear from all the studies that have been done around the world on this topic is that given the option, individuals will generally opt for the use of their own private transport in preference to the use of shared transport.

The key to reducing the environmental footprint of transport thus lies in having a properly balanced Transport Strategy that provides transport options that are genuinely environmentally friendly, significantly support the use of non vehicle based travel and actively reduces the use of private transport. This latter could be achieved by a simple reduction in the need to travel or by preventing use through regulation or fiscal means.

As the development of such a Strategy is outside the scope of this note, no further discussion of this matter takes place here. However, it is important to recognise the potential role of Freight Transshipment Depots and Urban Consolidation Centres in managing the core environmental problems of HGV's.

Urban Consolidation Centres (UCC)

In a major study by the Transport Studies Group of the University of Westminster for the Department of Transport (November 2005), it was concluded that UCCs have the greatest prospect for success if they meet one or more of the following criteria:

- Availability of Capital and on going Revenue funding
There is no strong evidence that any truly self-financing schemes yet exist
- Strong public sector involvement in encouraging their use through the regulatory framework
- Significant existing congestion / pollution problems within the area to be served
- Bottom-up pressure from local interests (e.g. retailers in a Street Association)
- Locations with a single manager/landlord

From the evidence available, UCCs are most likely to be successful in situations similar to those detailed below:

- Specific and clearly defined geographical areas where there are delivery-related problems
- Town centres that are undergoing a "retailing renaissance"
- Historic town centres and districts that are suffering from delivery traffic congestion
- New and large retail or commercial developments (both in and out of town)
- Major construction sites

The study further suggests that, from a logistics perspective, the major potential beneficiaries from the establishment of UCCs would be:

- Transport operators making small, multi-drop deliveries
- Shared-user distribution operations

- Businesses located in an environment where there are particular constraints on delivery operations (e.g. limited access conditions – physical or time related)
- Independent and smaller retail companies

Interestingly the study also concluded that the traditional concept of a transshipment centre, with loads transferred into smaller vehicles, has generally not succeeded. Recent developments, with the main focus on improving vehicle utilisation and integrating the operation into the supply chain, seem to offer more potential.

Transshipment Centres

A Transshipment Centre is a physical location where goods transported in bulk may be broken down into smaller loads for onward delivery to a specific location. In the early days of the railway system such an arrangement was a common feature of most towns, cities and indeed quite small habitations. Virtually everything required by a particular community was brought in by rail and then off loaded into first horse and carts and latterly small lorries for delivery to shops, etc.

This railway system worked [a] because it was under the control of a single operator, [b] because that operator was contracted to deliver the goods 'to the door' and [c] labour costs were cheap. Today none of these apply and indeed the delivery of goods is a highly competitive £billion industry with costs cut to the bone. The industry is thus institutionally disinclined to share facilities or to use any arrangement which would add to its costs – unless required to do so by legislation. This latter effectively 'levels the playing field' and means that all operators are incurring the same costs (and of course delays since Transshipment clearly adds time to the delivery process).

Successful Transshipment centres do exist (Stockholm, Sweden; Lille, France for example) – but exclusively on the continent where there are some 68 sites in use. However they work only within the context of two particular sets of circumstances:

- a. The geographical isolation of the centre served from other alternative shopping centres
- b. The presence of a strong regulatory framework that effectively prohibits the use of HGV's within the town/city centre

There is a significant amount of evidence that even with these conditions such centres are not self financing and require subsidy from the local authority within which they are situated.

Clearly transshipment is an added expense to the delivery of goods and one that is passed on to the eventual consumer. This simple fact has a range of significant implications for the transport network, and in particular for road travel, the key ones being:

- Where reasonably convenient alternatives exist for shoppers to travel to and where they will be able to offset their travel costs by the purchase of cheaper goods, the town/city centre will decline.
This effect can be seen close at hand where the Meadowhall shopping centre has significantly affected Sheffield city centre and virtually eliminated many suburban shopping centres within a relatively short distance of the centre. Regrettably this is not an isolated example but universal experience around the UK.
- The travel generated by the movement of people to such alternative centres adds to the use of congested highways and of course adds to the impact of vehicles upon the environment.

Without a regulatory framework there is no 'level playing field' for delivery operators and hence in such a cut throat business the use of a transshipment centre becomes financial suicide for an operator.

The implications of these considerations for York are significant – and because of the way the city has developed far higher than for most. Control of the city centre will:

- Increase the use of the Monks Cross, Designer Outlet and Clifton Moor shopping centres.
- Increase the use of the Acomb shopping centre
- Potentially result in alternative shopping being undertaken in Leeds, Beverly, Hull and Malton and thus lower the retail spend overall within the city.

The outcome will thus be:

- Greater use of the A1237
- Greater use of the A64
- Increased congestion at the Hopgrove junction and the A19 south/A64 junction
- Increased pressure upon on street parking around the Acomb centre
- Potentially a loss of jobs within the city centre (an possibly elsewhere in the city bearing in mind that 1 person employed generates sufficient wealth to employ roughly 1.5 others).

It can therefore be seen that the simplistic concept of solving York's HGV issues by the construction of a Transshipment centre is in fact far from simple and indeed requires the concept to be:

Fully embedded within a holistic transport policy that fundamentally addresses the travel transfer issues

Structured such that there is an effective regulatory framework in place

Organised in such a way that on going revenue finance is available

These conditions clearly rule out any early introduction of a centre and indeed point to the conclusion that this is one of the last elements to be put into place within a holistic transport structure rather than one of the first.

Options

The preceding will have identified that there is currently no such thing as a truly environmentally friendly powered vehicle. It should also have shown that there is a long way to go before there is such a vehicle (or vehicles) and that the infrastructure required to support those vehicles is significant. It would therefore be natural to assume that there is nothing that could be done here in York on a local scale that would make any difference.

Whilst perhaps this is all too true with respect to measures that would impact upon the mass travel market there are options that could make a difference (albeit small) and which might be practical in the medium term.

The key to taking such action lies in dealing with those activities over which the City Council can have a direct influence, either because it owns the vehicles concerned or can, through contracts or legislation, exert direct control. This also limits the number of vehicles involved and can therefore be more readily adapted to the use of alternative fuels. Although the number of vehicles may be small they have the potential to move large numbers of people and hence in terms of travel movement, the potential for a disproportionate air quality impact.

The areas that the council could exert an influence are:

1. Stage carriage services (currently bus operated)
2. Park and Ride operations
3. School Transport
4. Dial a Ride
5. Social services transport
6. Taxi's and Private hire operations
7. Fleet services (ie the council's own vehicles)
8. The movement of freight – and the types of motive power used by freight providers

Looking at these, four vehicle groups emerge:

- a. For operations 1 and 2 these are mass people movers working to fixed routes predominantly within the Outer Ring Road
- b. For operations 3, 4 and 5 these are mass people movers working on flexible routes both in and outside the Outer Ring Road
- c. For operations 6 and 7 these are effectively conventional vehicles that reflect the general availability of such in the marketplace
- d. HGV's

Vehicle group [a]

Working fixed routes lends itself to the development of Conventional Light Rail (CLR), Ultra Light Rail (ULR) or guided solutions. The first two make use of the friction reducing characteristics of operating on steel rails. This ability means that they are at least three times as fuel efficient as buses operating on a tarmac road. In addition the vehicles experience less wear and tear and therefore can be amortised over a period of up to 30 years compared to 8 – 12 for a bus. Both mean that the cost per passenger mile of running the vehicle is significantly lower than a bus and hence, all other things being equal, lower fares can be offered.

Guided solutions do not have the cost advantage of rail but do have the ability to operate 'off route' and thus have a degree of flexibility to cope with road works and obstructions. Conventional guided solutions, however require significant dedicated infrastructure making this unsuited for narrow urban highways. CLR also suffers from the same problem in that the infrastructure can itself obstruct the free movement of other vehicles.

ULR uses a much lighter infrastructure which is considerably cheaper than CLR or conventional guided solutions (around £1 million per km compared to a guided bus-way at between £3 and 4 million and a CLR at £10 million a km). A ULR vehicle is powered by fuel cell technology which, due to the friction reducing characteristics of the steel rail arrangement is sufficient to provide power for a reasonably sized passenger carrying body comparable to that of present buses.

There are guided solutions which do not have any above ground infrastructure and which if the need arises can operate remote from the guideway. Based around the concept of detecting low frequency signals generated through underground cables, the vehicle follows a predetermined route and is based upon a rubber tyre solution. The guidance system can ensure precise steering along narrow transit corridors. This is especially relevant in situations where conventional bus lanes or tram lines would be impractical. This solution employs a fuel cell vehicle powered by hydrogen and the infrastructure costs compare with that for ULR. Because the power of fuel cells is limited at the present stage of development the vehicle is relatively small (in the order of 20 passengers).

Clearly conventional vehicles could continue to operate but using bio fuel rather than diesel. In the longer term hybrid buses might be specified which could run on bio-diesel outside the Air Quality Management Area (AQMA) and switch across to electric for the period they are in the AQMA. Whilst such vehicles are just emerging onto the market they are as yet underpowered and therefore not suited to the mass movement of the sorts of volumes now moved by the conventional Park and Ride fleet.

Vehicle group [b]

This vehicle group is essentially a conventional multi seat vehicle powered by fuel cell technology, stored electricity or bio fuel. Essentially they operate within a limited daily range, not at night or weekends. This makes them

suitable for overnight recharging but the vehicle loading is at present unsuited to stored electricity for anything over around 12 seats. The use of a fuel cell powered vehicle would allow the capacity to be increased perhaps to 16 seats at the present state of technology.

The use of bio fuel is currently the only option for powering a conventionally sized vehicle.

Vehicle group [c]

Here the options are very limited since the reality is that technology has yet to catch up with the power requirements of the majority of vehicles now in use and manufacturers are not yet providing new vehicles with truly environmentally friendly power sources.

The range demanded by taxis and private hire vehicles also rules out the use of stored electricity solutions.

For this group the most practical option would be to use replacement bio fuel at least until such time that more powerful alternative power sources became available.

Delivery options

For group [a] the council owns the Park and Ride service and 'owns' a significant proportion of the stage carriage network as a consequence of its role in providing socially necessary services. With limited exceptions the majority of services operated after 6pm and at week ends are controlled by the council. Given the finance to fund the necessary infrastructure it would therefore be open to the council to require the operators of both services to deliver their services by the use of a vehicle solution identified by the council.

The cost of this would be significant (approximately £120 million for the Park and Ride service alone) and realistically therefore whilst there may be vehicle solutions that might be useable the reality is that a requirement that vehicles operating these services do so only if using bio fuel is the only practical response.

Given that this is also the same solution that at least in the medium term will limit the environmental impact of the other three groups the council's key contribution could thus realistically be to:

- a. specify the use of bio fuel powered engines in all those vehicles which it contracts, or licences
- b. facilitates the use of such fuels by providing a refuelling source at convenient locations that it owns around the city
- c. incorporates measures in regulations as appropriate as part of the emerging Air Quality Emissions work

The impact of NO_x emissions would however need to be looked at much more closely in relation to the use of bio-diesel as some studies have shown it increases NO_x emissions – clearly not the answer for a city with an NO₂ problem.

HGV's

The council would have within its legal power the opening up of Bus Lanes for use by 'cleaner' vehicles as is being looked at in Norwich – the idea being to encourage the use of cleaner delivery vehicles. This concept however needs to be treated with caution until the considerable difficulties surrounding its enforcement can be resolved. Clearly there is also the issue of the degree of interference that such use would have upon public transport movements and hence the consequence for the delivery of the councils' overall Transport objectives.