Report for Resolution

Report to	Norwich Highways Agency Committee 22 July 2010	**Item** 8
Joint Report of	Head of Transportation and Director of Environment, Transport and Development	
Subject	Norwich Area Transportation Strategy Implementation Plan – Dereham Road Bus Rapid Transit (BRT) Corridor	

Purpose

To report on proposed public transport improvements being developed for Bus Rapid Transit (BRT) on Dereham Road as part of a whole corridor strategy.

Recommendations

Members are asked to:

(1) comment on the emerging proposals for Dereham Road BRT so that their views may be taken into account as part of the further development of the scheme;

(2) approve in principle the Phase 1 Works as detailed in paragraph 7.2.2. Note that a further report seeking approval to consult on the detailed elements of the Phase 1 works and approval to progress the necessary statutory procedures associated with advertising Traffic Regulation Orders will be brought to the meeting on 23 September 2010.

Financial Consequences

The first Phase in scheme development and implementation will be funded by the Greater Norwich Development Partnership (GNDP), using Department of Communities and Local Government Growth Point funding. The overall cost of Phase 1 of the works is estimated to be £1,500,000. Following the recent review of spending commitments by the Coalition Government, the Minister for Housing and Local Government has confirmed that the Growth Point funding for 2010/11 has been safeguarded subject to demonstrating we are meeting the governments aims on community engagement. The implications of what this means in detail are currently being explored with the GNDP.

Funding availability and issues such as land acquisition will almost certainly require a phased implementation of individual elements over a number of years, with the corridor therefore being gradually implemented building towards full BRT.

Strategic Objective/Service Priorities

The scheme is part of the Norwich Area Transportation Strategy (NATS) Implementation Plan, which was approved by the Norwich Highways Agency Committee in March 2010 and Norfolk County Council Cabinet in April 2010.

The report helps to achieve the corporate objective to make Norwich safe and secure, building strong and proud local communities and the service plan priority of improving safety on roads and providing realistic sustainable transport options.

This project supports the following County Council Service Plan objectives (2008-11):

Corporate Objectives:

- To improve travel and transport
- To protect and sustain the environment
- Customer focus

Service Objectives:

- Provide safe, reliable, accessible and affordable transport
- To promote the use of sustainable modes of travel for journeys to school and workplaces
- Reduce and adapt to the impacts of climate change
- Ensure easy access to information and services, however people choose to get in touch

Contact Officers

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Background Documents

West Norwich Bus Priority Study: July 2007 – Prepared by Mott MacDonald

Report to Norwich Highways Agency Committee 25 March 2010 on the Norwich Area Transportation Strategy (NATS) Implementation Plan by the Director of Environment, Transport and Development.

Norwich/ Costessey Dereham Road Bus Corridor, Corridor Length Impact Assessment May 2010 – Prepared by the Director of Environment, Transport and Development

Dereham Road BRT Placemaking and Landscape Strategy: February 2010

1. Background

1.1. Members will recall considering a report from the Director of Environment, Transport and Development on the Norwich Area Transportation Strategy (NATS) Implementation Plan on the 25 March 2010. The NATS Implementation Plan was subsequently considered and approved by Norfolk County Council Cabinet on the 6 April 2010.

1.2. The NATS has already brought major improvements to transport and the environment that benefits thousands of people who live, shop and work in and around Norwich. However, our transport system is under strain and pressure will increase over time. We therefore need to create a further step-change in transport provision to realise the full potential of NATS and cater for the transport needs of a vibrant and growing regional centre.

1.3. One of the key elements of NATS is the development of a Bus Rapid Transit (BRT) network. BRT is a holistic approach to the delivery of high quality public transport. It combines high quality vehicles with high quality services supported by physical infrastructure and a campaign of marketing and branding.

1.4. Assessment of transport corridors in Norwich against a clearly defined set of objectives for a high quality rapid transit service identified that up to six corridors could be considered for upgrading to a BRT service. Dereham Road was identified as one of the six corridors.

2. Design of the Dereham Road BRT corridor

2.1. Dereham Road is already a high frequency bus corridor with up to 20 buses per hour in each direction at the eastern end during peak periods. The corridor serves residential and employment areas at Longwater, Lodge Farm, West Costessey (Queens Hills) and Bowthorpe, and it is these areas that will help deliver the projected growth for Norwich. Development in many of these areas is already underway or committed. The NATS report to Norfolk County Council Cabinet (6 April 2010) indicated that work to improve public transport along this corridor could progress as early as 2011/12.

2.2. A whole corridor approach to delivering BRT on Dereham Road will be adopted. This means that the corridor will be designed as one project to ensure that all the proposed scheme elements complement each other. Funding availability and issues such as land acquisition will almost certainly require a phased implementation of individual elements over a number of years, with the corridor therefore being gradually implemented building towards full BRT.

2.3. Transport for Norwich Consultation

2.3.1. An initial concept for BRT on Dereham Road was developed for the NATS Transport for Norwich consultation which was carried out in October 2009. This conceptual design work suggested possible measures that could be introduced and this work was used to inform preliminary design development and traffic modelling work. An extract from the Transport for Norwich public consultation is included as Appendix A.

2.3.2. The most important factors identified in the consultation in terms of bus travel were frequent buses (every 10 mins daytime with a minimum half-hourly evening and Sunday frequency), reliability of service, flexibility of ticketing, better quality bus stops and shelters and improved provision of travel information. All of these are important elements of BRT.

2.4. Placemaking and landscaping strategy

2.4.1. There are significant opportunities for works undertaken to develop BRT to complement other initiatives such as Smarter Travel Choices, Park & Ride, walking and cycling networks and incorporation of green infrastructure. By adopting a whole corridor approach to BRT, it will be possible to identify where linkages with walking and cycling can be maximised and where bus stops should be located to best serve residential areas and access to key services, such as libraries, health facilities, learning centres and local shops.

2.4.2. A placemaking and landscape strategy for the Dereham Road corridor was developed between November 2009 and February 2010. Initially information was gathered on corridor topography, landscape character, existing green infrastructure, crime and deprivation, proposed development sites, bus journey times and reliability, activity centres, cycle routes, accidents and existing bus stop infrastructure. This work was used to further guide the more detailed whole corridor design for Dereham Road BRT

3. Whole corridor treatment

3.1. The implementation of BRT as an upgrade to previously improved bus routes, with dedicated road space at congested points, will require a more radical approach to bus priority including the reallocation to buses of some existing road space currently used for general traffic.

3.2. A BRT scheme on Dereham Road would build upon the significant bus priority measures already in place as a legacy of the 1990's Western Corridor Bus Quality Partnership project. It will give people the choice of taking a bus and avoiding some of the congestion, and also by increasing bus patronage it enables more people to travel down the corridor.

3.3. Improving bus working on Dereham Road would make it more attractive for buses, making the route more reliable and cutting journey times. This could provide particular benefits for the Costessey Park and Ride service, which currently takes a longer route via the Southern Bypass and Newmarket Road because Dereham Road is so much more congested. This may attract more passengers to the service, and would increase the number of buses benefiting from the BRT corridor and could reduce the subsidy required for the Park and Ride service.

3.4. It is proposed to make the bus lanes 24 hour to improve driver awareness and to aid enforcement. Cyclists will also benefit from a 24 hour facility.

3.5. The table below suggests a possible whole corridor treatment (Phase 1 and Phase 2 works combined).

Whole Route Measures

Element	Description	Order of Cost
1	24 hour bus lanes	£5-10k
2	Re-Route Park and Ride service onto Dereham Road	No capital cost
3	Introduce approximately 13 BRT high quality bus stops	£630k
4	Traffic Light Priority (already implemented)	£50k
4	Off bus (paperless) ticketing	County wide strategy
6	Personal marketing of BRT service	
7	Branding	
8	General design development and traffic modelling work to date	£250k
9	Contribution to NATS modelling	£100k
	Total Cost	**£1.1M**

Site Specific Measures

Element	Description	Order of Cost
10	330m outbound bus lane on approach to Outer Ring Road Sweet Briar Roundabout (excluding junction improvement)	£2670k
11	Ban right turns at Old Palace Road junction and introduce pedestrian crossing facilities (Phase 1)	£350k
12	Possible inbound bus lane on approach to Old Palace Road junction (Phase 2)	£940k
13	Inbound bus lane on approach to Inner Ring Road Barn Road/ Grapes Hill junction with St Benedict's Street outbound closed	£400k
14	Southbound (uphill) bus lane on Grapes Hill. Would link Dereham Road to City Centre but would require Chapelfield North to become two way bus only first	£920k
15	Green Infrastructure. (Walking and cycling routes and hard and soft landscaping improvements)	£800k
	Total Cost	**£6.1M**

The whole corridor treatment is estimated to cost £7.2M.

Cost estimates are at 2011/12 prices and include an allowance for anticipated utility diversions and land acquisition where necessary. These estimates are indicative and will need to be confirmed as part of the more detailed design development.

The above site specific measures will require the reallocation of general road space to buses, removal of on street parking, loss of street trees and the introduction of restrictions on some turning manoeuvres

3.6. The site specific measures have been prioritised using the analysis matrix included as Appendix B.

3.7. During the development of the placemaking and landscape strategy a possible longer term aspiration was identified to provide a dedicated busway linking the Costessey Park and Ride site on a new bridge over the A47 to Barnard Road. This would significantly reduce the journey times for Park and Ride buses. This project may be feasible at some point in the future with possible funding from future housing development in the area. The likely cost of such a scheme would be circa £7 million and has not been included within the whole corridor strategy at this time.

3.8. Camera enforcement of bus lanes may be necessary in the future to avoid illegal use by general traffic. The capital cost of each camera is likely to be around £55,000 and would cost about £5,000/year to maintain, as the government has announced that it will no longer fund new cameras.

4. Bus infrastructure

4.1. BRT will be a high quality public transport service and will have its own visual identity and branding. This is fundamental to the perception of the service, particularly where a step change in quality relative to existing bus services is required, and should be co-ordinated across vehicles, infrastructure and travel information so that the service is recognised as an integrated system.

4.2. The quality of the waiting environment at bus stops and interchanges is crucial as part of the overall journey experience. It is proposed to introduce up to thirteen BRT high quality bus stops with real time bus time information. There is an opportunity to consider the provision of new bus shelters as part of the new City Council bus shelter contract which commences in 2011.

4.3. Paperless ticketing systems can make an important contribution to a high quality public transport service by offering customers a range of convenient payment options and reducing dwell times at bus stops. Smart card and mobile phone ticketing technology will be investigated as part of a county wide strategy for BRT.

4.4. As part of the development process for BRT it will be essential to develop a partnership with bus operators to leverage the required investment necessary to deliver the vision for high quality public transport. The existing Joint Investment Plan for bus services in Greater Norwich provides a basis for the development of such a partnership.

5. Whole corridor traffic modelling

5.1. Detailed testing of the proposals has been undertaken to evaluate the impact of the proposed junction modifications. The results of the modelling are contained in the Background Report.

5.2. A whole corridor analysis of average bus journey times for whole corridor treatment described above and including existing bus priority measures was carried out. The results suggest :

- PM outbound journeys time savings of nearly 7 minutes over an anticipated journey time along Dereham Road for general traffic of 19 minutes in 2012.
- AM outbound journey time savings of nearly ¾ minute over an anticipated journey time along Dereham Road for general traffic of over 12½ minutes in 2012.
- AM Inbound journey time savings of nearly 3 minutes over an anticipated journey time along Dereham Road for general traffic of 18 minutes in 2012.
- PM inbound journey time savings of over 1¼ minutes over an anticipated journey time along Dereham Road for general traffic of 17 minutes in 2012.

5.3. It is difficult from the tests carried out to assess the benefits to buses outside of the peak commuting hours. Most of the congestion occurs during these times. However, the proposals for the outbound approach to the Outer Ring Road showed that it formed the bulk of savings in the PM. Queuing though is not limited to the peak hour at this location. On weekday afternoons and for long periods at the weekend there is congestion and there would be material benefit to buses at those times.

5.4. The modelling suggests that none of the proposed modifications should result in a significant increase in delay to non bus road users.

5.5. At the junction with the Inner Ring Road there will be an additional set of traffic lights proposed on the Dereham Road approach to give priority for buses. The timings for the green light will be co-ordinated with the main signals at the Inner Ring Road to limit the potential for any increased delay at this location.

5.6. The journey time saving could increase with the introduction of a southbound (uphill) bus lane on Grapes Hill and Chapelfield North being two way bus only. The bus lane could further reduce bus journey times by over 1¼ minutes per bus in both peaks.

5.7. The longer term aspiration to provide a dedicated busway linking the Costessey Park and Ride to Barnard Road could see additional time savings for buses using this route of up to 4 minutes over general traffic in the AM peak and over 2 minutes in the PM peak.

6. Progress to date

6.1. State-of-the art solar powered bus information displays, which were the first in the UK, were installed during Autumn 2009 along Dereham Road and have received a positive response.

6.2. Traffic Light Priority using Selective Vehicle Detection for late running buses has been introduced at all traffic signal junctions on the corridor. This is a means by which a traffic signal can be told a bus is coming, and take programmed action to improve the reliability of the service if it detects a deviation from its scheduled running time. For example, hold a green for longer, or alter the phase sequence. This will help to improve bus service reliability and impacts of this will be closely monitored.

6.3. In 2009 the left turn lane from Grapes Hill northbound into Dereham Road was extended to improve the reliability of bus services using Dereham Road and reduce delays to other road users. Feedback from bus operators indicates that the reduction in delays to buses has been successful.

7. Implementation of the Dereham Road BRT corridor

7.1. The first priority should be to concentrate on delivering the section between the Outer Ring Road and the Inner Ring Road as there are no existing bus priority measures on this section and BusNet data indicates this is where buses operating on the corridor experience the greatest delay and journey time variability, and more buses would benefit from the improvements.

7.2. Phase 1 Works 2009-12

7.2.1. The first Phase in scheme development and implementation will be funded by the GNDP, using Department of Communities and Local Government Growth Point funding. The overall cost of Phase 1 of the works is estimated to be £1,500,000.

7.2.2. The top priority is the outbound approach to the Outer Ring Road (Sweet Briar Roundabout) junction where average PM peak delay is over six minutes, but the cost of this scheme is not affordable within the budget for the Phase 1 works. Elements that could potentially be delivered within the £1.5 million budget are:

Whole Route Measures

Element	Description	Order of Cost
1	24 hour bus lanes	£5-10k
3	Introduce approximately 3 BRT high quality bus stops	£145k
4	Traffic Light Priority (already completed)	£50k
8	General design development and traffic modelling work to date	£250k
9	Contribution to NATS modelling	£100k
	Total Cost	**£555k**

Site Specific Measures

Element	Description	Order of Cost
11	Ban right turns at Old Palace Road junction and introduce pedestrian crossing facilities (Phase 1)	£350k
13	Inbound bus lane on approach to Inner Ring Road Barn Road/ Grapes Hill junction with St Benedict's outbound closed	£400k
15	Green Infrastructure	£192k
	Total Cost	**£942k**

7.2.3. The above site specific measures will require the reallocation of general road space to buses and the introduction of restrictions on some turning manoeuvres. A further

more detailed report will be prepared for members to consider at their meeting on 23rd September 2010, prior to a full public consultation being undertaken.

7.3. **Green infrastructure**

7.3.1. The Placemaking and Landscape Strategy has proposed a range of green infrastructure and public realm improvement projects that would complement other elements of the BRT project.

7.3.2. The following are considered to be suitable projects to implement as part of the Phase 1 works:

- Costessey Gateway (junction of Norwich Road and Dereham Road) - Remove redundant layby and replace with BRT stop, tree planting, verge and "Welcome to Costessey" sign. Improve the appearance and security of Boatman Way (alley and cycle route leading to Bowthorpe and North Earlham) (£105k);
- Plant a total of 40 trees in the central reservation and 40 trees in the wide verge on the north side of Dereham Road between Breckland Road and Gurney Road (£37k)
- A £50k contribution towards Grapes Hill Community Garden;

7.4. **Phase 2 Works 2012 onwards**

7.4.1. It is expected that funding for the delivery of the remainder of the measures proposed in Paragraph 3.5 would come from a variety of sources, including Growth Funding, developers, Community Infrastructure Levy, Regional Funding Allocation (RFA) or any successor to it and County Council. With the current national position on government funding, particularly related to the government spending review expected in October 2010 the speed of implementation is at present uncertain.

8. Resource Implications

8.1. **Finance :** Scheme development and implementation of Phase 1 will be funded by the Greater Norwich Development Partnership, using Department of Communities and Local Government Growth Point funding.

8.2. **Staff :** The project will be delivered through joint team working involving County and City Officers and partners of the County Council's strategic partnership.

8.3. **Property :** Some schemes will require dedication of land for highway use from the City Council, and purchase of private land.

8.4. **IT :** None.

9. Other implications

9.1. **Legal Implications:** None.

9.2. **Human Rights:** None.

9.3. **Equality Impact Assessment (EqIA**): An EqIA has been completed for the NATS Implementation Plan, which includes BRT. Public transport improvements are generally considered to assist social inclusion and improve access to services.

9.4. **Communications:** None.

10. Section 17 - Crime and Disorder Act

10.1. The scheme will be designed to ensure it has a positive effect on crime and disorder where possible. Care will be taken during construction to minimise opportunities for crime and disorder, for instance the secure storage of construction equipment and materials.

11. Risk Implications/Assessment

11.1. A risk assessment has been undertaken for development of the NATS Implementation Plan. The key risks for delivering this, including Dereham Road BRT are around funding, timescales and planning. These risks are being managed through active project management and ongoing engagement with a wide range of stakeholders.

11.2. A risk register is being maintained as part of the technical design and construction delivery processes.

Appendix A - Extract from Transport for Norwich Public Consultation Leaflet

Transport to and from the city

Access to the city centre is vital in maintaining a thriving economy. Norwich is the commercial centre of Norfolk, with people accessing the city from all directions. Many of the routes to the city centre are lined with historic buildings, parks and trees, contributing to the look and feel of the city as a whole.

The current proposals for growth include a number of new settlements outside Norwich which will create more demand for transport to and from the city and major employment sites. In moving forward, we have an opportunity to design and build these new sites around the transport requirements of the people who will live there, and to ensure a wide number of transport options are available for everyone.

As with other elements of our transport strategy, the speed and extent to which proposals can be developed is dependent on progress with the Northern Distributor Road, the availability of funding and the reduction of traffic on key routes to and from the city centre. Road space is at a premium and we need to use all the available space as effectively as possible.

Bus Rapid Transit

Reliable and Practical

- Priority given to buses to ensure faster journey times to and from the city
- Buses at least every 10 minutes during the day serving modern, practical and accessible bus stops

Sustainable

- Better use of road space, moving more people and taking up less space
- Environmentally friendly buses

Accessible

- Buses which are easy to get on and off, with step-free entrances and exits
- Up to the minute bus departure information at stops and to your mobile phone

What is Bus Rapid Transit?

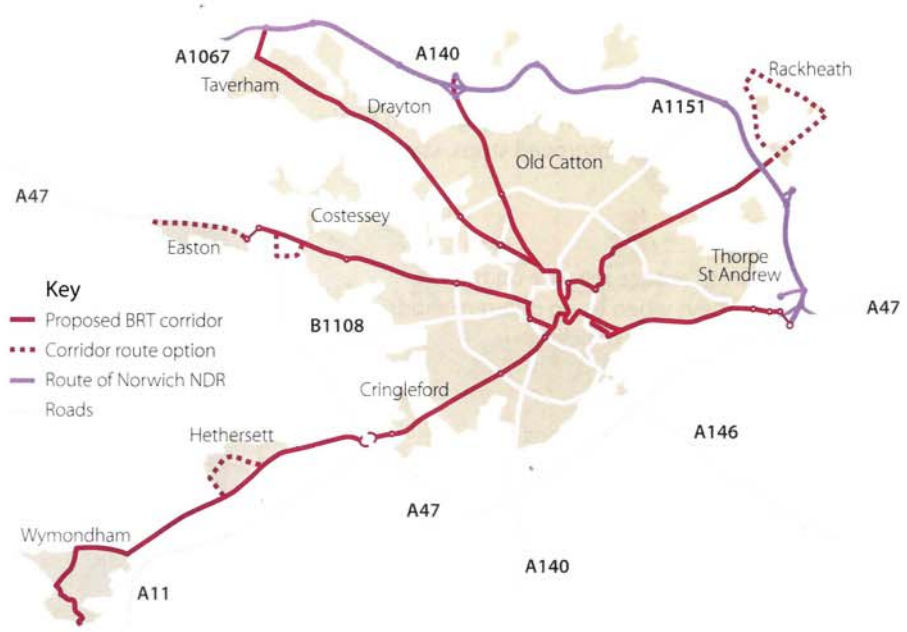
Bus Rapid Transit (BRT) is a new approach to high quality bus travel that will bring faster, more frequent and reliable services on key routes into the city.

BRT improves the entire transport experience, including

- **specific design features of the buses such as increased leg room and air conditioning**
- **up to six easily identifiable BRT routes across the city (see Figure 3)**
- **new systems for buying bus tickets to speed up boarding times and make journeys quicker and more reliable**
- **intelligent traffic lights that recognise when there are buses approaching**
- **better bus stops and shelters**
- **more dedicated bus priority lanes**
- **more frequent and more reliable journeys at affordable prices**

BRT will make it quicker and easier to travel by bus and the high quality of the service will make it a practical and pleasant experience for passengers.

Figure 3 Bus Rapid Transit Route Proposal



Dereham Road BRT route

Dereham Road is currently a high frequency bus corridor with in excess of 20 buses per hour during peak periods. A BRT scheme would build upon the significant bus priority measures already in place making it a more reliable route with reduced journey times.
Possible measures are shown below.

Figure 4 Dereham Road proposal

Appendix B - Ranking of Schemes for Attention

Rankings were calculated on the basis of a simple cost benefit analysis, dividing the cost (in £1000's) by the time savings (minutes) and number of buses in the peak hour in the given direction.

Scheme	**Rank**	**Buses /hour**	**Average peak hour time savings (in minutes:seconds) for buses compared to general traffic in 2012**				**Order of Cost**
			Inbound AM	Outbound AM	Inbound PM	Outbound PM	
Grapes Hill Southbound bus lane	3	19	1:15	-	1:15	-	£920k
Barn Road Junction	2	18	0:30	-	0:40	-	£400k
Old Palace Road Junction Ban Right turns	1	18	Significant benefits to all traffic on Dereham Road which allows the introduction of pedestrian crossing facilities at this busy junction and small benefit to general traffic journey times				£350k
Old Palace Road Junction bus lane	4	18	0:50	-	0:10	-	£940k
Sweet Briar Outbound bus lane	5	10	-	0:40	-	6:35	£2670k
Dedicated busway over A47		4	3:55	1:15	2:10	1:10	£7M