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 Project NGT Project No. 20759509

Subject Definition of the Preferred Option, Next Best Alternative and Lower Cost Alternative

COMMERCIAL - IN CONFIDENCE

Summary

- 1 In his statement to Parliament on 3rd November 2005, then Secretary of State for Transport Alistair Darling invited the Metro to develop proposals for a high quality bus-based rapid transit system for Leeds. He described the features of such a system as: "superior quality vehicles with many features similar to trams, including high quality vehicle interior, air conditioning, double glazing etc ... accompanied by fixed physical infrastructure in terms of dedicated stops, high quality shelters, real time information, off-board ticket machines etc." He said "it would be developed to operate as a complete system, with distinctive branding, priority at junctions, lengths of segregated track etc." He concluded, "the funding will be there for the right proposals."
- 2 Working together, to meet the Secretary of State's challenge Metro and Leeds City Council ('the Promoters') have developed the Leeds New Generation Transport (NGT) scheme. As per the scheme specification which was prioritised by the Region for the Regional Funding Allocation, the Promoters' Preferred Option is a trolleybus network serving radial corridors in north, south and east Leeds. The Promoters intend to submit a Major Scheme Business Case for NGT at the end of October 2009.
- 3 This note sets out in summary the rationale for the definition of the Promoters' preferred NGT trolleybus option (the 'Preferred Option') as well as the specification of the Next Best Alternative (NBA) and Lower Cost Alternative (LCA).
- 4 To ensure that the outturn scheme meets the Promoters' objectives in the way intended and that the economic benefits of the scheme are delivered to the extent that underpins the funding case, the Promoters have identified that there is a need to be able to limit the use of the Preferred Option's infrastructure to specified NGT vehicles. Furthermore, the benefit case is maximised by (and presumes) a step change in the quality of public transport in the corridors served by NGT. The preferred way to deliver this step change in the way intended is through an operating concession as this gives the Promoters the wherewithal to incentivise the NGT operator to deliver specified outputs. These two goals can best be achieved through a TWAO approach. Of the technologies considered, only a trolleybus option would be eligible for a TWAO covering the whole route.

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- 5 The goal for the NBA and the LCA is to act as a comparator to the Preferred Option. To be a meaningful comparator, there needs to be an identified, deliverable and practical approach for the Promoters to gain the powers needed to construct the system and for the system to be operated.
- 6 Without the use of a TWAO, a bundle of different powers would be needed to deliver the NBA and LCA as separate powers for land acquisition, planning and operation would need to be used. To deliver either the NBA or LCA in the same timeframe as the Preferred Option, after careful consideration of all available options the most appropriate procurement approach for the NBA and LCA is through a Quality Partnership Scheme (QPS). The specification of the NBA and LCA services and infrastructure reflects this. The NBA has been specified to have a level of priority and segregation similar as practicable to the Preferred Option. However, with a QPS approach, it is neither feasible nor appropriate to provide all Preferred Option infrastructure. The LCA is a much lower specification option making use of conventional bus priorities.
- 7 The NBA has been specified as a diesel/electric hybrid vehicle. The LCA has high specification diesel bus operation.
- 8 The Next Best Alternative capital costs are around 50% of the Preferred Option. The Lower Cost Alternative is a further 50% cheaper than the NBA.
- 9 Integral to the note is identification of the supporting documentation that underpins the Promoters' specification.

NGT Objectives

- 10 The NGT Preferred Option has been developed to meet insofar as possible seven objectives. It has also been developed recognising five deliverability constraints, which, significantly, include affordability, public and political acceptability and outcomes realisation.
- 11 The NGT Objectives have been developed with reference to the local and regional planning framework, as well the Department for Transport's *Delivering a Sustainable Transport Strategy* process.
- 12 The objectives and constraints are repeated in the text box below. A key consideration has been that meeting these objectives will require a step change in public transport punctuality and reliability, capacity and overall quality of the journey (stops as well as vehicles).

Objectives

- | Maximise growth of the Leeds economy by enhancing its competitive position and facilitating future employment and population growth
- | Support and facilitate the sustainable growth of Leeds, recognising the importance of its City Centre to the future economy of the Leeds City Region
- | Support and facilitate targeted regeneration initiatives and economic growth in the more deprived areas of Leeds
- | Improve the efficiency of the City's public transport and road networks.
- | Reduce transport's emissions of CO2 and other greenhouse gases
- | Promote quality of life through a safe and healthy built and natural environment
- | Contribute to enhanced quality of life by improving access for all to jobs and services

Deliverability Constraints

- | Affordability
- | Public and political acceptability
- | Potential for system expansion
- | Commercial case
- | Outcomes realisation

Supporting documentation: Strategic Fit - Objectives Issue 2: Technical Note, May 2009

Corridors

- 13 The Preferred Option and the NBA and LCA have each been specified to serve the same corridors, namely from Stourton south of the city to the City Centre, the A660 corridor from the city centre to the Outer Ring Road (Bodington) via the University and Headingley, and from the city centre to St James' Hospital in East Leeds. These corridors were identified in the Strategic Fit work.

Supporting documentation: Investing in Public Transport: A Framework for Leeds, March 2009

Modes Considered for NGT

- 14 Following a review of technology options, four feasible alternative modes have been considered for NGT:

- | Tram - while this option would maximise benefits, it has been ruled out as at present it is unaffordable and therefore not deliverable.
- | Trolleybus - which can provide many of the benefits of a tram, but at a lower cost. Given deliverability constraints (in particular, affordability), this is the Promoters' preferred technology
- | Diesel/Electric hybrid - this would return lower benefits than either the tram or trolleybus option. While at present there is no Business Case advantage that outweighs the additional capital cost/operating cost of current generation hybrid vehicles when compared with diesel equivalents, the ability to operate using electric traction is seen by the Promoters as an advantage when set in the wider policy context. The NBA alignment does not pass through any locations where electric traction is a policy imperative, however the electric traction capability could potentially contribute to overcoming acceptability issues at some sensitive locations. Consequently a hybrid vehicle is the preferred technology for the NBA.
- | High spec diesel bus - this is the preferred technology for the LCA.

Supporting documentation: Transit Mode Options Report

Powers and Procurement

- 15 As well as striving to meet their defined objectives and maximise the value for money case, when specifying the Preferred Option the Promoters had to be mindful of the deliverability constraints. For the NBA and LCA to be meaningful comparators these too need to be deliverable options. It became clear to the Promoters early in the process of option development that the specification of the options could not be considered independently of the powers that are available to construct and operate the system. The available powers are themselves a significant constraint on the Promoters' ability to act and these constraints have been reflected in the option specification.
- 16 To ensure that the outturn scheme meets the Promoters' objectives in the way intended and that the economic benefits of the scheme are delivered to the extent that underpins the funding case, there is a limit to the number of vehicles that can use the Preferred Option's infrastructure. This is to allow journey time and reliability benefits to be delivered as intended. The greatest flexibility in specifying the use of infrastructure is offered by the TWAO route. While Traffic Regulation Orders/Conditions can be used to specify use to a degree, their scope is more limited.
- 17 The Promoters have also identified that attainment of their objectives will be maximised by a step change in the quality of public transport in the corridors served by NGT. Moreover, unless the specified step change is delivered, as well as the objectives not being met, the scheme will not return the benefits that underpin the value for money case, so this is also a key consideration for outcome realisation. Learning the lessons from interventions such as the Leeds guided busways where benefits have been eroded over time by a reduction in the relative service quality compared with the bus offer through operators ceasing to use branded and higher quality vehicles, the Promoters have identified that the optimum way to deliver this step change in the way intended is through an

operating concession which gives the Promoters the wherewithal to incentivise the NGT operator to deliver specified outputs.

- 18 The following considerations then informed the specification of the Preferred Option, NBA and LCA:

Preferred Option

- | TWAO is available for the trolleybus option by virtue of it being a trolleybus, a mode specifically covered by the Transport & Works Act.
- | Using TWAO is the preferred approach for the trolleybus option. It offers the advantage of a single application process for all the powers the Promoters need to construct and operate the system. In particular, it offers the option for the Promoters to take powers to let an operating concession. The Promoters have identified an operating concession as the optimum procurement approach to deliver their overall objectives for NGT as it offers a mechanism to define and then maintain the desired service standards, which in turn will realise the scheme's planned benefits. In particular it allows the Promoters to protect the journey time and reliability benefits by prioritising NGT over other traffic.

NBA and LCA

- | If the technology is not trolleybus then the maximum degree of possible system segregation (and hence also the maximum degree to which the system could be guided) is unlikely to be sufficient to warrant a whole system TWAO. Alternative approaches to powers and procurement are needed.
- | This has two consequences:
 - | The infrastructure for a hybrid/diesel vehicle option can only be implemented using a bundle of processes. The Promoters would have to proceed with utilising planning and CPO powers to build the system, and then procure operations at a later date. The planning and CPO powers may constrain the procurement approach which could be put in place.
 - | The operation of the hybrid/diesel vehicle could take place either in a 'status quo' environment (i.e. operators register services commercially in the established way and Metro tenders additional services it sees as socially necessary), through Voluntary Partnership Agreements, under a QPS, or as part of a QCS.
- | The reasons why the Promoters have reached this position are described below.

Status Quo Operation

- | The Promoters have dismissed this option for implementing the NBA/LCA. The reason for this, is that whilst the Promoter could tender services to ensure that high quality services used the segregated infrastructure, without other protections (such as QPS), the Promoter would not be able to protect those services from on-road competition, and therefore tender pricing is

likely to be high. This approach therefore does not guarantee value for money benefits that could justify the capital investment in infrastructure..

Voluntary Partnership Agreement

- I The Promoter has considered the use of VPAs for the delivery of services to the scheme and concluded that they are not a viable way forward. It seems likely that, given the high capital investment required for infrastructure, that any such VPAs would be viewed as service contracts subject to European procurement rules, due to the value of benefit that operators would receive from the facilities. Where operators invested under such a VPA it seems likely that they would require their investment to be protected (as a VPA itself does not protect operators from on-road competition), and therefore any VPA would need to be introduced in conjunction with a QPS, which would face the same difficulties as with the QPS approach identified below.
- I With a VPA off-road infrastructure could be regulated using access licences, however the proposed scheme has a relatively small amount of wholly off-highway infrastructure to which this could apply and it is therefore not deemed practicable. Consequently an alternative method would need to be used to regulate off-highway service standards.

Quality Partnership Scheme

- I No significant deliverability issues have been identified for the QPS option.
- I Under a QPS the use of NBA/LCA infrastructure, including off-highway busways would be available any operator that meet the defined quality threshold. The Promoters could not set the quality threshold for services so high that this introduced a disproportionate barrier to entry into the market for new operators, or otherwise disproportionately affected existing competition.. The Promoters would therefore have to plan on the basis that NBA/LCA infrastructure would be available to a volume of vehicles akin to the current flows. This means that the Promoters could not provide the same level of priority at junctions as they can for the Preferred Option.
- I A QPS would provide some certainty that scheme benefits would be delivered since the Promoters would have the ability to specify certain quality standards; however, the quality standards would be subject to periodic operator challenge which could have an impact on scheme benefits. Moreover, when compared with a TWAO approach the scope of a QPS specification is somewhat more limited. Together, and combined with the fact that the technology for the NBA/LCA will be much closer to current buses than the trolleybus option and that the distinction between NBA/LCA and bus will be further diminished by the necessary despecification of priority, has the consequence that the NBA will be inherently less attractive than the Preferred Option to car users in the corridor and to P&R, as well as delivering lower benefits to bus current users (which will also reduce its attractiveness).

Quality Contract Scheme

- I Potentially a QCS would provide greater certainty of scheme benefits being realised because the Promoters would have greater influence over the specification of inputs and outputs of the scheme.
- I However, there are a number of obstacles to successful delivery of this option. The current process for a QCS does not sit easily with the process for procuring a large infrastructure project, and would potentially mean that construction would need to be substantially complete before QCS powers were obtained. Whilst the Promoters would aim to mitigate this risk, through timing of CPO, planning and QCS processes, there is still a risk that legal challenge could significantly impact on programme and therefore deliverability of the scheme. If the scheme was progressed on this basis it would be one of the first quality contracts, creating legal challenge concerns as a number of operators have stated that they are likely to strongly oppose such schemes, and the scheme would cover areas of operation of a number of major bus operators. The Promoters do, however, see that a QCS could be used to retain or realise benefits from an already delivered scheme, if other options had not proved effective. For example, if a QPS based scheme failed to deliver all planned benefits then a QCS could later be introduced to increase the benefits from the existing infrastructure.
- I A QCS therefore does not appear to be a solution for initial delivery of either the NBA or LCA.

Summary

- I The table below summarises the assessment of the alternative procurement options against the Promoters' Procurement Objectives.

Procurement Objective	Status quo	VPA	QPS	QCS
Maximise the deliverability of the procurement approach	●	○	●	○
Secure a level of investment that optimises the fulfilment of the overall NGT Scheme Objectives	○	◐	◐	●
Ensure the long-term affordability of NGT for the Promoters	○	◐	◐	◐
Maximise the Value for Money of NGT within the affordability envelope	○	◐	◐	◐
Lock-in delivery of the NGT Scheme benefits	◐	◐	◐	●
Ensure the scalability of NGT	●	●	●	●

(Key: ● = Strongly supportive ◐ = Supportive but some issues identified
○ = Material issues identified)

NBA/LCA - Approach to Procurement

- I Having carefully considered all the available options, the Promoters have concluded that the most appropriate procurement option for the NBA/LCA is via a QPS (combined with appropriate CPO and planning powers).

Supporting documentation: Outputs of Procurement Working Group

Planning and Infrastructure Considerations

- 19 To meet the project's objectives, the trolleybus Preferred Option has been designed to have the greatest degree of priority over other traffic that is (a) affordable within the overall expenditure limit and (b) fits with other deliverability constraints. The preferred option has been refined through an iterative process of "design freezes" leading up to the MSBC specification.
- 20 To be comparators of any worth, the NBA and LCA each need to be deliverable options. The consideration of the powers and procurement options outlined above shows that the NBA/LCA cannot simply be the Preferred Option using alternative vehicle technologies. Rather an alternative infrastructure specification is also required which goes insofar as possible to meet the Promoters' objectives while also reflecting the deliverability constraints. The key deliverability constraints are a combination of the available mechanisms to obtain powers to build and operate the system as well as the public and political acceptability of using those powers.
- 21 With these considerations in mind the NBA has been specified to:
- I Mirror the Preferred Option's infrastructure insofar as possible but reflecting that:
 - I Any new infrastructure would have to be available to all buses that met a specified standard on the corridor, which for planning purposes has to be taken to be all vehicles currently operating on those corridors covered by the QPS. A QPS could not be used to specify a particular make or model of vehicle, or a particular power source (e.g. diesel/electric hybrid, or bio-fuel). As well as reducing the journey time and punctuality and reliability benefits compared with the Preferred Option, this also raises issues where segregated alignments could potentially be used for high volumes of buses with consequent adverse impacts on noise, severance, urban realm and potentially, air quality. Whilst registration restrictions could be used to limit these impacts they would not necessarily mitigate the effects sufficiently to gain public acceptability. In turn this presents a risk to the Promoters as they seek powers.
 - I Signal priorities would have to be shared with all buses on the corridor that met the QPS standard. Given junction capacity constraints this means that the same level of priority could not be given as for the Preferred Option. In turn this means that infrastructure required to support the use of this priority may also not be required, for example bus pre-signals can be ineffective with high demand and any loss of pre-signals may mean that a section of approaching bus lane then has no merit.
 - I It is not desirable to split services operating on the same corridor between two similar routes with the same catchment area.

- 22 Reflecting these considerations, significant alignment differences between the Preferred Option as the NBA include:
- I Through Headingley the NBA does not follow the Preferred Option's segregated alignment east of the Arndale Centre, rather vehicles operate on Otley Road/Headingley Hill. This has been adopted because:
 - I In the NBA infrastructure needs to be available to all buses operating in the corridor. As already noted, the QPS approach has no effective mechanism to limit use of infrastructure to a sub-set of routes or operators (providing the quality standard is met), and the Promoters would need to avoid any structure that distorted competition in the bus market by benefiting certain operators to the exclusion of others..
 - I Given local environmental sensitivities, the use of the segregated alignment at the frequency of current bus operations on the Otley Road corridor is considered by the Promoters as undeliverable. Compared with the trolleybus option this is due to the much greater impacts on noise, visual intrusion, safety for pedestrians (noting that the alignment crosses the access route to the Shire Oak centre for the blind/visually impaired), the impact on the urban realm as well as the view that a bus-only road would be seen as an unacceptable increase in radial highway capacity. While a hybrid vehicle may go some way to mitigate these impacts, the Promoters consider that it would not be sufficient to overcome them in a way that would be acceptable locally or politically.
 - I Even if powers could be obtained for the proposition to operate hybrid/diesel buses on a segregated alignment, it is not clear that the operators on the corridor would see commercial advantage in doing so. This is because the volume of buses is such that the same level of priority could not be offered as for the Preferred Option and so the same journey time advantage would not be available, so while a segregated alignment may offer peak journey time advantages it is not clear that it would do so in the inter-peak. Moreover, the alignment takes buses away from the areas of largest demand and the reduced journey time advantages and lower quality offered by the NBA when compared with the Preferred Option is not sufficient to compensate for this. Finally, there appears no viable mechanism available to the Promoters using QPS that could ensure operators use the segregated alignment and hence the benefits cannot be secured against the investment. Whilst use of VPAs in conjunction with a QPS may provide some short term security that the investment would be used, it would not provide the long term security required to secure the benefits of the investment.
 - I Approaching the City Centre, the NBA operates along Albion Street and joins the Headrow. This contrasts with the Preferred Option which operates via Cookridge Street and Millennium Square before reaching the Headrow. This has been adopted because:
 - I The NBA would be operated by vehicles that meet the QPS threshold operating on existing routes. Inbound, buses currently access the City

Centre via Albion Street before around half the vehicles (routes 1 and 95) turn right into the Headrow before turning left into Park Row. The other half (routes 28, 96 and 97, as well as route X84) turn left onto the Headrow *en route* to the bus station. Outbound vehicles follow the same routeing in reverse.

- | While there may be some advantage for routes 1 and 95 to operate via Millennium Square, routes 28, 96 and 97 would experience extended journey lengths and (more than likely) times with no demand advantage (also recalling that it would not be possible to offer NBA vehicles the same level of traffic signal priority as Preferred Option trolleybuses).
- | The Albion Street and Merrion Centre stops are the most significant stops in the City Centre for bus services on the Otley Road corridor. It is undesirable for bus operators to split the market by diverting half their vehicles via Millennium Square and half via Albion Street.
- | Therefore in the NBA it has been assumed that all services will route via Albion Street.
- | If Eastgate is made available to the NBA, it would also be available to any vehicle that met the specified quality threshold. This would potentially include vehicles operating on other routes in the city, not just those on the NGT corridors. In such circumstances, the Promoters have identified that Eastgate could be used by up to 60 buses per hour per direction. This would not be acceptable to either the Promoters or the Eastgate developer. Therefore the assumed routeing of NBA vehicles in the Preferred Option infrastructure is such that Eastgate is no longer required.
- | On the south route, the NBA follows Wakefield Road/Low Road rather than following the largely segregated Preferred Option alignment until Chadwick Street from where it follows the Preferred Option. This is because:
 - | The Preferred Option alignment creates a new route through the south of the city that is not currently available. The QPS approach offers no effective mechanism for the Promoters to compel bus operators to use this route if it were provided as part of the NBA. Furthermore, the Promoters have no basis for procuring a tendered service for services to operate on this alignment as part of the NBA as such services would compete with other commercially operated routes, unless the operators make use of the other facilities and are required by the scheme to use the route. In these circumstances this may simply mean that the operators use none of the facilities on the route, reducing the benefits of the investment.
 - | Previous work by Metro looking at conventional bus-based rather than rapid transit options for the Stourton P&R site has identified routeing the new P&R service that would be required via Wakefield Road/Low Road as the optimum economic and financial approach. In the NBA, the P&R service would operate non stop on Wakefield Road/Low Road to maximise the attractiveness of the P&R option as well as avoid

competing with commercial services. Also in the NBA, the opportunity is taken to use the tendered route to serve the Clarence Dock area.

- I The provision of bus priorities on Wakefield Road/Low Road extends the benefits of the NBA on this corridor as these priorities can be used for other services.

- 23 On the east route inbound bus lanes are provided between St James's Hospital and the A64, as well as other smaller scale priorities
- 24 The LCA option has been specified to link park and ride sites at Bodington and Stourton with the city centre using conventional bus priorities and diesel vehicles. From the Stourton P&R site the LCA runs on existing highway to the city centre. In East Leeds, a more limited set of bus priority measures have been specified when compared with the NBA.

Supporting documentation: Mott Macdonald reports/technical notes, Steer Davies Gleave's Stourton P&R Study

Specification of Preferred Option, NBA and LCA

- 25 The specifications of the Preferred Option, NBA and LCA are summarised in Annex A overleaf. A breakdown of the comparative capital costs of the options is provided in Annex B.

Annex A: Specification of Preferred Option, NBA and LCA - Summary

	Preferred Option	Next Best Alternative	Lower Cost Alternative
Vehicle Specification	Trolleybus (articulated vehicles, electric overhead power)	High specification bus (articulated vehicles, hybrid diesel/electric power)	High specification bus (articulated vehicles, diesel power)
Operation	Stand-alone concession	As part of a QPS. All existing services on corridor get the infrastructure benefits providing they are operated to the specified standard.	As per NBA
Operation of other bus services	Service 1 frequency halved between Holt Park and City Centre. Service 95 removed entirely. Service 96 frequency halved along its entire length	No Changes on North and East corridors. Bodington P&R to be served by diverting established routes. On the South corridor as there is no current service from Stourton to the city centre, new dedicated P&R service.	As per NBA
Infrastructure	<p>P&R at Bodington</p> <p>Dedicated NGT alignment in Headingley east of the Arndale centre.</p> <p>Dedicated NGT alignment through Millennium Square.</p> <p>City Centre Loop</p> <p>Utilises much of former Supertram alignment/land to the South</p> <p>Dedicated NGT alignment through Whitfield Way.</p> <p>P&R at Stourton</p> <p>Extensive on-street priority</p> <p>Priority at signals</p> <p>Dedicated NGT infrastructure to St James' Hospital from the City Centre</p>	<p>P&R at Bodington</p> <p>On-street alignment through Headingley</p> <p>Does not go through Eastgate or Millennium Square</p> <p>Buses terminate at bus station, as at present</p> <p>Additional bus lanes including:</p> <ul style="list-style-type: none"> • In-bound bus lane to Shaw Lane. • Hyde Park corner junction improvements. • Shared Bus Lane in-bound at Woodhouse Moor. <p>Bus Lane on Woodhouse Lane where it crosses the Inner Ring Road.</p> <p>Some new infrastructure provision to the south of the city, making best use of the existing highways</p> <p>P&R at Stourton</p> <p>Some infrastructure provision to St James' Hospital from the City Centre</p>	<p>P&R at Bodington</p> <p>On-street alignment through Headingley</p> <p>Does not go through Eastgate or Millennium Square</p> <p>Buses terminate at bus station, as at present</p> <p>Hyde Park corner junction improvements.</p> <p>Some new infrastructure provision to the south of the city, making best use of the existing highways</p> <p>P&R at Stourton</p> <p>Some infrastructure provision to St James' Hospital from the City Centre</p>

Service A (North & East)	Preferred Option	Next Best Alternative	Lower Cost Alternative
Routeing	Bodington to St James (City Centre routeing along Park Row, Boar Lane, New York Street, York Street)	Current bus services	Current bus services
Frequency	10 NGT vehicles per hour in each direction Service 1 frequency halved between Holt Park and City Centre. Service 95 removed entirely. Service 96 frequency halved along its entire length	Same as at present	Same as at present
Journey Time	37 minutes end to end in each direction, plus 7minute layover at each end	Journey Times better than existing journey times.	Journey Times slightly better than existing journey times.
Service B (South)	Preferred Option	Next Best Alternative	Lower Cost Alternative
Routeing	Stourton to City Centre (City Centre Loop from Lower Briggate, Boar Lane, Park Row, Headrow, Eastgate Development Route, Kirkgate)	New non stop dedicated P&R service from Stourton to City Centre. Similar to current 110 routeing Current bus services	As NBA
Frequency	10 NGT vehicles per hour in each direction Current services unchanged	New Stourton service has 10 buses per hour. Current services unchanged.	As NBA
Journey Time	19 minutes in each direction, plus 10 minute layover at Stourton only	Journey Times better than existing journey times.	Journey Times slightly better than existing journey times.

Annex B: Capital Costs of Preferred Option, NBA and LCA - Summary (£000s)

Major areas of difference	Preferred Option	NBA	LCA
Depot	4,500	0	0
Vehicles	16,800	0	0
OHLE & Substations	11,725	0	0
NGT Stops	8,246	0	0
P&R	8,064	6,048	3,780
Electromagnetic Capability P Sum	2,000	0	0
Land Acquisition and Compensation	31,400	17,000	10,000
Professional Fees	24,155	17,625	8,000
Routeing Differences			
Arndale	4,301	791	200
South Route Alignment	8,115	1,612	759
Eastgate	2,188	783	41
Millennium Sq	2,967	1,875	86
Add on percentages			
Preliminaries	26,428	11,915	2,867
Contractors Design	4,263	1,922	462
Traffic Regulation Orders	853	384	92
Testing and Commissioning	1,705	769	185
Monitoring and Evaluation	853	384	92
Estimating Uncertainty	12,166	7,687	1,850
Risk	37,318	17,609	8578
Total	208,047	86,404	36,992
Actual Total Cost (exc inflation)	244,939	115,278	42,386