



Linking People to Places



Project Orpheus

Phase 1A Summary Report

May 2003

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Appendices	Date
A Working Note 1	August 2002
B Working Note 2 – Phase 1A Route Assessment and Selection	November 2002
C Working Note 2 – Phase 1A Route Assessment and Selection - UPDATE	January 2003

1 Summary

The work programme for Orpheus has three distinct phases:

Phase 1A - option identification and preliminary assessment

Phase 1B - LRT Option Development

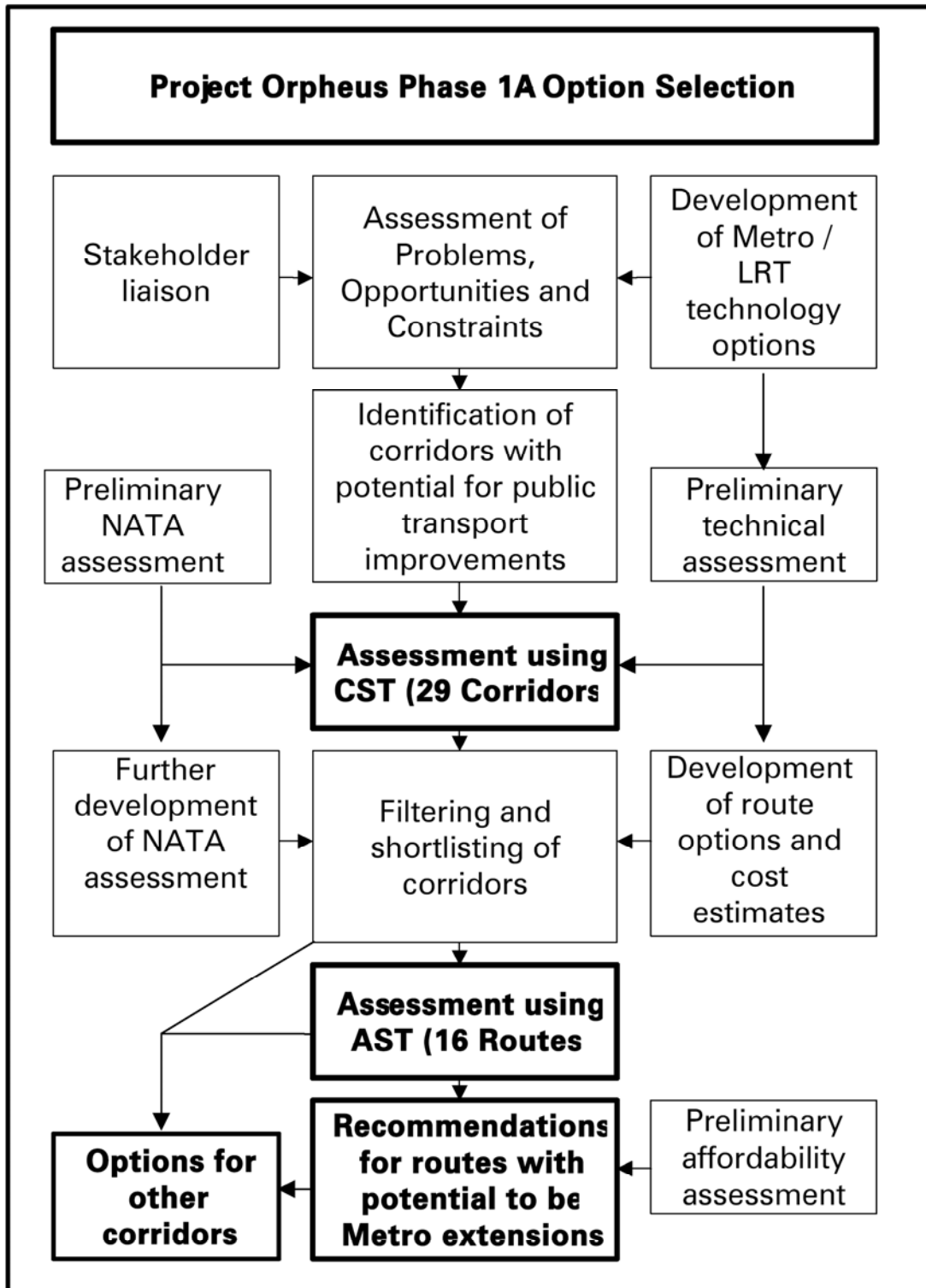
Phase 2 – Seek Government Approval

This report presents and summarises the work carried out in Phase 1A and the recommendations from the consultant team with regards the identification, appraisal and selection of potential Orpheus corridors and routes suitable for taking forward for more detailed appraisal.

All the routes have been appraised in accordance with the latest Department for Transport appraisal criteria for Major Schemes (GoMMMS and updates). This will be drawn up into an Annex E submission to DfT for the preferred routes as part of the Phase 1B work programme.

This information (from 1B) will also form a key element of the Outline Business Case to be put to Central Government for funding support, and a decision to proceed to Transport & Works Act Order (TWAo) proceedings.

The diagram over summarises the process adopted during Phase 1A:





2 Background

In 2001 Nexus published “Towards 2016”, the fifteen year strategy for the development of public transport in Tyne & Wear. Project Orpheus, the development of the light rail network, was a key constituent of this strategy.

Project Orpheus represents the proposed extension of the Metro network by increasing the route length of the Metro system by approximately 100 kilometres.

In Spring 2002, Nexus appointed a multi-disciplinary consultant team to assist in the development of the business case for these extensions as part of Project Orpheus. The consultant team is comprised as follows:

- Ernst & Young LLP - Lead Financial Adviser
- Steer Davies Gleave - Transport Planning & Economics Adviser
- Jacobs Gibb - Technical and Engineering Adviser

Following on from previous preliminary work undertaken on the feasibility of extensions to the system, the objective of the current work is to evaluate the case for possible extensions to the system in line with current government appraisal guidance and develop a business case submission to government based on the conclusions thereof.

3 Overview of Process

A summary of the work undertaken to date during Phase 1A is summarised in the next summary sections 4 to 6. These cover:

- Stakeholder consultation
- Corridor Selection Process
- Route Assessment and Selection Process

The study process has been established on the basis of a three-stage approach:

Phase 1A Scheme option identification and preliminary assessment:

- Build on work undertaken to date for “Towards 2016” and LTP development;
- Identify/update problems, opportunities and constraints individually with stakeholders;
- Identify potential additional extension corridors;
- Develop assessment of benefits, technical feasibility, cost and environmental impact on comparable basis for all routes;
- Assessment of options in accordance with NATA framework, using existing data sources;
- Identification of optimum technology for extensions and incorporation of potential LRT routes into Project Orpheus; and
- Routes for which modes other than Light Rail are recommended to be taken forward separately within the LTP process.

Phase 1A was established so that the large number of routes identified during stakeholder consultations could be appraised to determine their initial suitability for light rail. This sifting process was consistent with DfT appraisal requirements.

Phase 1B LRT Option Development

Within Phase 1B Nexus and the consultant team working with key partners and stakeholders will assess the routes recommended for LRT out of the Phase 1A process. From this an Annex E submission will be developed as part of the Outline Business Case to be put to the Department for Transport. At the time of writing, data collection surveys have been undertaken and the extent of aerial surveys of the routes has been appraised, in order that the detailed route appraisal work can progress.

In parallel, the in-house Metro team have developed an asset register of the existing system. This will be used to inform a major business planning exercise that is being undertaken for



the existing Metro network going forward. The outputs from this work feed into the Orpheus study framework as the base case comparator for both the Annex E submission and the OBC.

In order to maintain the high profile status of the project within Central Government, during the period of option development, a process of continuous liaison with Senior DfT personnel and the economic appraisal team will be adopted.

Phase 2 Seek Government Approval

Following submission of the Annex E submission and business case to government, it is anticipated that there will be a period of review and discussion prior to obtaining any decisions on funding for the project.

4 Phase 1A Stakeholder Consultation

It was recognised that stakeholder consultation and involvement is vital to the success of the Orpheus project, in respect to the identification and assessment of the network development proposals.

Our approach has been to involve the stakeholders at the following key points in the project so far:

- June 2002 - Stakeholder Inception Meeting with GONE, One North East and the seven local authorities, namely Durham and Northumberland counties, North Tyneside, South Tyneside, Gateshead, Sunderland and Newcastle;
- June/July 2002 – One-to-one follow-up meetings with all the seven local authorities to discuss the issues specific to their area;
- December 2002 – to report the findings of the Phase 1A work

Additional stakeholders consulted include Port of Tyne Authority, Newcastle International Airport, Tyne & Wear Health Action Zone and the Learning and Skills Council. This consultation was concluded on 10 July 2002.

5 Corridor Selection Process

Through the workshop and subsequent discussions with the individual Districts, 29 transport corridors were identified as requiring appraisal against Phase 1A criteria. These are listed at the end of this section.

Corridor Sifting

Using an abridged version of the NATA/GoMMMS appraisal criteria, the Consultant Team formulated Corridor Summary Tables (CSTs) for each corridor. These data tables collated information on potential demand and market share, indicative capital and operating costs, local constraints and opportunities, engineering feasibility, and network integration issues.

The 29 corridors identified by the stakeholder consultation exercise were assessed for their ability to deliver the Orpheus objectives and against the following measures:

- Economy
- Environment
- Wider Policy Integration
- Implementability

Where a corridor did not lend itself easily to Orpheus and LRT development, the Consultant team identified the potential alternative solution in the guise of guided bus, Superoute or heavy rail development designation. A separate report covers the options for corridors considered unsuitable as LRT Metro extensions.

This initial sift of the corridors concluded that 16 out of the 29 corridors would be viable in terms of their ability to deliver the Orpheus objectives and were taken forward into Phase 1B as potential Metro extensions. At this point it became necessary to focus in on realistic route alignments in order to assess the technical implications that could affect the ability of the route to show positive cost to benefit ratios, this being a significant test applied by Department for Transport to such major transport investments.

The details of this corridor selection process are set out in Appendix A – Working Note 1.

From this point it became necessary to look at the development of route alignments, primarily to verify the technical deliverability of a route by reference to physical constraints such as space, topography, achievable run-times and existing infrastructure. This approach had the added benefit to better inform the decision making process, from both a transport economics and financial perspective.

The 29 Corridors identified during Stakeholder Consultation

- 1 Sunderland – Seaham via Heavy Rail
- 2 Sunderland – (P&R) – Doxford Park – Ryhope
- 3 Sunderland – Doxford Park – (P&R) Houghton-le-Spring – Hetton-le-Hole – Murton - Seaham
- 4 Sunderland – (P&R) - Doxford Park – Washington
- 5 South Hylton – Washington Extension
- 6 Sunderland – Hylton Castle – Strategic Site – Washington
- 7 Washington – Chester-le-Street
- 8 Washington – Gateshead via A167 or Queen Elizabeth Hospital
- 9 Washington – Gateshead via Team Valley
- 10 Washington – Gateshead via Strategic Site
- 11 Washington – Gateshead via A195
- 12 South Shields – Sunderland via existing Metro
- 13 South Shields - Marsden
- 14 West Harton - Marsden
- 15 South Shields – Bolden – Strategic Site – Washington
- 16 Stanley – Metro Centre
- 17 Rowlands Gill – Metro Centre – Gateshead
- 18 Prudhoe – Metro centre – Gateshead
- 19 Metro Centre – Gateshead
- 20 Metro Centre – Blaydon – Denton – Airport
- 21 Newcastle city centre – Denton
- 22 Newcastle city centre – Gosforth – Regent Centre – Great Park – Airport
- 23 Four Lane Ends – Killingworth – Cramlington
- 24 Airport – Great Park – Shirebrook – North Shields
- 25 Ashington – Newcastle heavy rail conversion
- 26 Stephenson’s Link
- 27 Newcastle city centre – A1055 – Preston Grange – Whitley Bay
- 28 Walker area
- 29 Link between 28 and 23.

6 Route Assessment and Selection Process

For the 16 route options, work has been undertaken to develop Appraisal Summary Tables for each route. This involved developing and refining cost estimates and developing conclusions regarding technical feasibility. It has also involved the development of an economic assessment that incorporates these cost estimates and presents a summary of the key economic indicators relevant to the exercise.

The route assessment incorporated estimates of the economic benefit and revenues based on analysis of the potential effects of the routes on generalised costs of travel and estimates of travel patterns and volumes within the region. The assessment compared these benefits with updated operating and capital costs over a thirty year period yielding an economic net present value and an economic benefit to cost ratio for each route option.

This process has been designed in accordance with the guidelines set by government for scheme development and the process for assessing the options designed to be consistent with the NATA appraisal framework.

In December 2002, 10 routes were recommended to be taken forward into Phase 1B of the study process. The table at the end of this section summarises these conclusions. A schematic map documenting the routes in relation to the existing network has been included at the end of this section. On the 28th January 2003, Nexus hosted a Parliamentary Reception to promote Orpheus, this included invitees from the political arena, the private sector and the wider transportation audience.

Full details of the route assessment process are set out in Working Note 2 and an update thereto (Appendices B and C).

Options for routes not recommended for further analysis as LRT Metro extensions have been set out in a separate report.

TABLE 1 SUMMARY OF PHASE 1A RECOMMENDATIONS

Route No	Extension	Assumed Service	Service Type	Recommendations for Phase 1B
1	Seaham to Sunderland	Seaham to Sunderland Central	Segregated	Recommendations awaiting further discussion of feasibility issues
2	Sunderland to Ryhope via Doxford International	Sunderland Central to Ryhope via Doxford Int.	Street running for 30% of route	Recommendations awaiting further discussion of feasibility issues
5	Sunderland to Washington via S Hylton	Sunderland Central to Washington	Street running for 46% of route	Reject - recommended that non-LRT-based alternatives be pursued for both Sunderland-Washington routes in view of feasibility concerns and poor economic performance. Alternative may include examination of the future potential for the South Hylton route to be extended to a new station on the reopened Leamside Line
6	Sunderland to Washington via Southwick	Sunderland Central to Washington	Street running for 82% of route	
8	Washington to Gateshead via Heworth	Washington to Four Lane Ends	Street running for 39% of route to Heworth	Reject - in view of limited potential for segregated alignments, and other feasibility issues, recommended that non-LRT-based scheme be pursued (possibly extension of existing Superroutes). Potential for segregation may be improved were significant reallocation of roadscape to be achievable.
9	Team Valley to Gateshead	Team Valley to Four Lane Ends	Segregated	Reject - recommended for non-LRT based solution - bus-based option recommended, potentially making use of parts of Centrelink infrastructure, reflecting difficulty of serving dispersed employment area with fixed link
10A	Washington to Pelaw	Washington to Four Lane Ends	Street running for 36% of route to Pelaw	Reject - in view of limited potential for segregated alignments, and other feasibility issues, recommended that non-LRT-based scheme be pursued (possibly incorporating improved access to proposed new stations on Leamside line)
12	West Harton to Biddick Hall	South Shields to Sunderland	Segregated	Recommendations awaiting further discussion of feasibility issues relating to Railtrack line
15A	Tyne Dock to Washington	South Shields to Washington	Street running for 35% of route to Tyne Dock	Reject - bus-based option recommended for further development reflecting difficulty of serving dispersed catchment with fixed link.
19	Gateshead to MetroCentre	Four Lane Ends to MetroCentre	Segregated	Reject – committed Centrelink bus scheme will provide a big improvement in access to MetroCentre from the

Route No	Extension	Assumed Service	Service Type	Recommendations for Phase 1B
Metro network				
21a	St James to Walbottle P&R	Tynemouth to Walbottle P&R	Street running for 66% of route to Walbottle	Include - take forward both route alternatives to Phase 1B, but may require further work to improve journey times by reducing extent of street running
21b	St James to MetroCentre	Tynemouth to MetroCentre	Street running for 66% of route to MetroCentre	
22a	Great Park to Wansbeck Rd	Great Park to Pelaw	Street running for 8% of route to Wansbeck Road	Reject – good integration with policy but high cost/km & difficult alignment produces poor economic case even were significant growth in travel to Great Park above TAMMS 2011 levels to eventuate. Non-fixed link to Metro (Regent Centre) recommended for further analysis.
22b	Airport via Great Park to Wansbeck Rd	Airport to Pelaw	Street running for 8% of route to Wansbeck Road	
23	Cramlington to Four Lane Ends	Cramlington to Pelaw	Street running for 73% of route to Four Lane Ends	Recommendation pending – fairly poor economic performance as examined here reflects difficulty in providing a segregated alignment within new the towns - however good fit with other appraisal criteria and there may be the potential to improve the scheme through improved segregation (potentially through reallocation of roadspace) or through the development of alternative route options and thus recommended for inclusion in Phase 1B
25	Ashington to Backworth	Ashington to Pelaw	Segregated	Reject – heavy-rail based alternative likely to be more cost-effective for distance involved
26a	North Quay to Backworth via road alignment	North Quay to Backworth	Street running for 88% of route to Four Lane Ends	Reject – difficulty of designing fixed link to provide good access to employment opportunities in Stephenson's corridor reflected in high costs and poor economic performance. Committed bus link to provide crucial link to Metro in the medium term.
26b	North Quay to Backworth via rail alignment	North Quay to Backworth	Segregated	
28	Byker to Walkergate	St James to Walkergate	Street running for 96% of route to Four Lane Ends	Recommendations awaiting further discussion of potential cost savings from network effects (particularly integration with route 21) and potential for obtaining segregated route, but currently performs poorly

Schematic Map showing the Ten Corridors going through to Phase 1B Analysis

