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**DRAFT FINAL**

**Dublin Metro**  
**Alignment Feasibility Report**  
**City Centre - Airport**

27 February 2004

Prepared for

**Railway Procurement Agency**

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## Executive Summary

### 1.1 Introduction

The RPA is the statutory agency responsible for the Dublin Metro, including identification of a preferred alignment for decision by Government and implementation of the project.<sup>1</sup> Based on the DTO strategy document *A Platform for Change* and Government guidance since January 2002, RPA has developed an Outline Business Case (OBC) for Metro and conducted an Alignments Study to identify, assess and compare alignment options in the Airport Corridor. This extensive body of work provided the basis for the Revised Proposal to Government in June 2003.

The OBC presented the case for Metro drawing together the project's many aspects, including its costs, benefits, and property development potential and financial implications. The Alignments Study initially examined the system concept, ridership demand and optimum capacity along with a number of regional Metro Corridors. It then focused on the Airport Corridor as the first link in the phased implementation of the Metro system in line with the commitment made in the Programme for Government of June 2002.

This report documents the work conducted as part of the Alignments Study to identify a feasible Metro system and an emerging preferred route in the Airport Corridor from the City Centre to Dublin Airport. The work was initiated in late 2001 and continued through June 2003.

Stakeholders have played a significant part in refining objectives and Metro options, and in reviewing the interim results of the Alignments Study. Since commencement of the work, the Study Team has met with stakeholders on over 155 different occasions. In general, stakeholders have been very supportive of the Metro project. Formal Stakeholder consultation is expected to commence after a Government decision to proceed with the Metro Project.

### 1.2 What is Dublin Metro?

The Dublin Metro will be a high performance state-of-the-art light metro system that is fully segregated from road traffic and pedestrians and integrated with other transportation modes. It will meet the needs of varied passenger markets and geographic areas throughout the day, including airport users, suburban commuters, Dublin residents, tourists, students, workers and shoppers. It is designed to:

- Accommodate upwards of 18,000 passengers per hour per direction, comparable to some of the most highly utilised Metros in Europe.
- Provide capacity to meet demand, starting with the provision of 2-car, 30metre trains operating at 4-minute frequencies, expanding to 3-car trains at 2-minute or less frequencies in the future.
- Ensure fast, reliable rail service between the airport and City Centre that is competitive with auto travel (e.g. 17 to 23 minutes depending on the alignment).
- Provide bored tunnels and underground stations in the City Centre.
- Incorporate opportunities for station area development and higher densities around station and improved accessibility through park-and-ride and bus transfer.

<sup>1</sup> Transport (Railway Infrastructure) Act, 2001

- Employ construction forms, designs and techniques that minimise cost, risk and disruption, and maximise rapid project implementation and safety.
- Ensure a high degree of compatibility between Metro and Luas.
- Permit the future integration of Metro with Luas Line B, and future extensions to Metro.

### 1.3 What are the Airport Corridor Alignment Options?

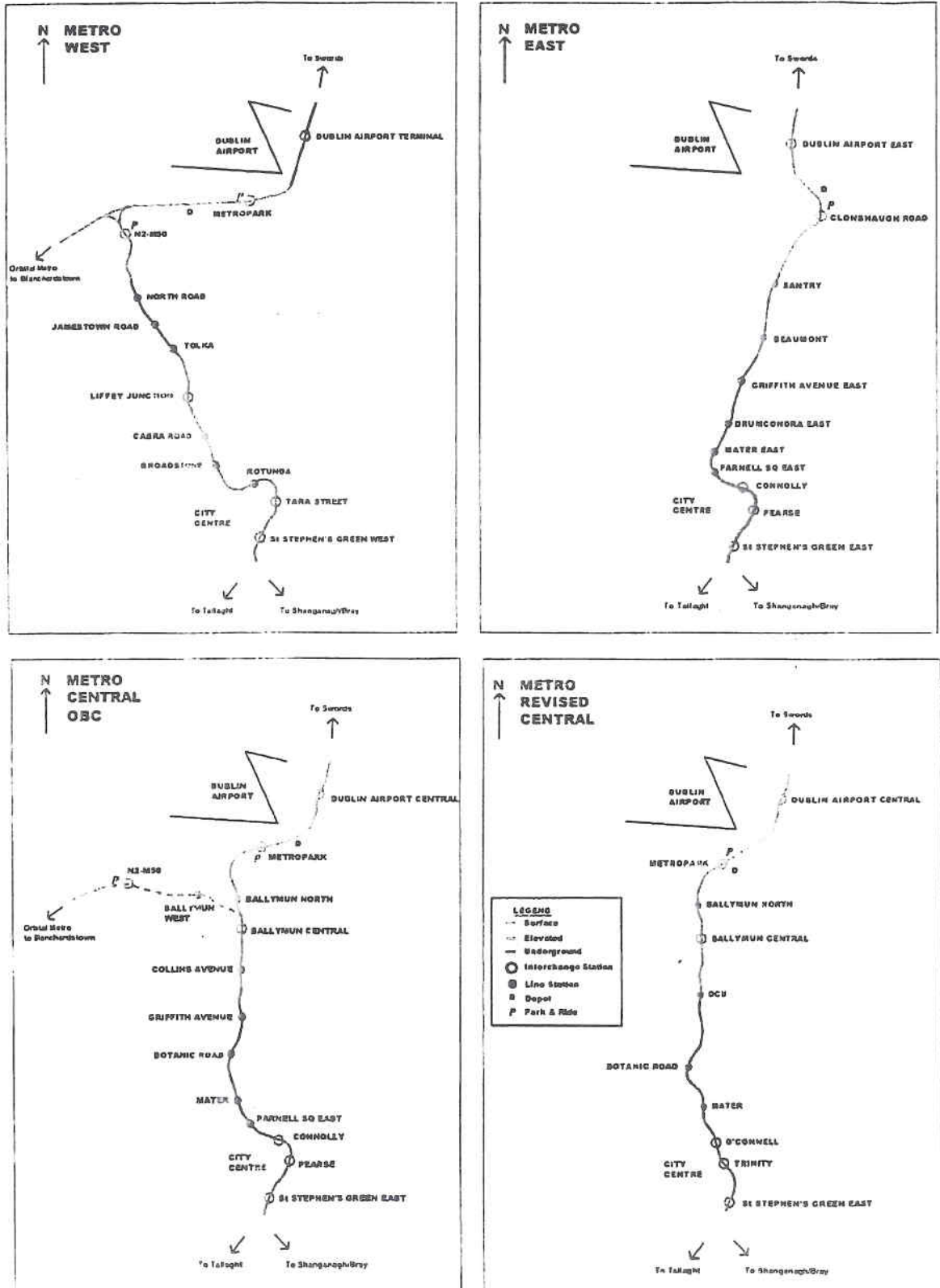
The Alignment Study team identified three possible fully segregated corridor alignments (West, Central, East) from City Centre to the Airport. The OBC presented data and analysis based on the Central alignment from City Centre to the Airport. Subsequently, the Central alignment was refined (Central Revised Option) resulting in four alignment alternatives for feasibility assessment and performance comparison. These alternatives are summarised below, and illustrated in Figure ES1:

- **West** - The Metro West alignment is the DTO Strategic Route presented in *A Platform for Change*, modified to reflect the preliminary design parameters established for the Metro Alignments Study. The route begins at an underground station beneath St. Stephen's Green West, extends to Tara Street and Broadstone and along Finglas Road to an underground station at the airport. It is 15.9km and includes 12 stations. The depot is located east of the N2/M50 interchange and southeast of the Airport in the vicinity of Sillogue. The alignment is in tunnel under the City Centre to Broadstone, north of the Tolka River to Finglas, and at the Airport.
- **Central OBC** - The Metro Central alignment is a more direct route from the City Centre to the Airport than the West alignment, and has a different alignment through the City Centre and north through Ballymun. It begins at an underground station beneath St. Stephen's Green East to Pearse station, Busaras, Parnell Sq. East, Mater Hospital and north through Ballymun to an elevated station at Dublin Airport. The alignment is 12.5km and has 12 stations. The depot is located west of the M50/ Ballymun interchange and southwest of the Airport.
- **Revised Central** - The Metro Revised Central alignment is a refinement of the Central OBC alignment. It begins at an underground station beneath St. Stephen's Green East to D'Olier Street, O'Connell Street Upper, Mater Hospital and north to DCU and through Ballymun to an elevated station at Dublin Airport. This alignment includes terminal station options at either Stephen's Green East or West, and at either an elevated or underground station and alignment through Dublin Airport. It is approximately one kilometre shorter (11.4 km) and has two fewer stations (10) than the Central OBC resulting in reduced cost and a faster journey time for all Metro passengers.

The differences from the Central OBC alignment are due to:

- a shorter and more direct route in the City Centre under the widest streets possible (D'Olier Street and O'Connell Street), rather than tunnelling under buildings;
- a shorter City Centre route resulting in one less station in the city centre;
- relocation of Botanic Road station to minimise property acquisition, utility and traffic disruption;

Figure ES 1 Airport Corridor Alignment Alternatives



Source: Parsons Brinckerhoff (Ireland) Ltd.

- combining two stations (Griffith Avenue and Collins Avenue) into a new DCU station site at the redesigned northern tunnel portal at Hampstead Park, resulting in one less station; and
  - refinements at the crossing of the M50 resulting in a shorter more direct route.
- **East** - The Metro East has the same alignment through the City Centre as the Central OBC, and follows Drumcondra Road northeast from Mater Hospital to Whitehall and along the M1 to an Airport elevated station. It is 11.7km and has 11 stations between St Stephen's Green and the Airport. The depot is located in the vicinity of the M50/M1 interchange southeast of the Airport.

### Pre-Metro Options

An engineering feasibility study was conducted of providing a lower cost Pre-Metro system in the Airport Corridor as an alternative to the fully segregated Metro. Two sequential phases were considered for the West, Central and East alignments: Phase 1 incorporating street-running or tunnel in the City Centre and some at-grade crossings on the route to the Airport; and Phase 2 upgrading to a fully segregated Metro. The main purpose of these Pre-Metro options was to establish their cost and performance in terms of limiting investment to that necessary to meet the projected level of demand at any point in time.

## 1.4 Options Assessment

The corridor and City Centre alignment options were compared in terms of how well they perform with respect to meeting RPA Metro objectives and criteria. RPA's Metro objectives are:

- Environment and Quality of Life
- Safety
- Efficiency in Implementation
- Accessibility and Social Inclusion
- Policy and Transport Integration
- City and Regional Economy
- Practicality and Public Support

These objectives guided RPA to consider a business case for construction of a multi-functional, multi-market rail transit system, pursuant to Government mandate, general published guidance and Metro project specific guidance. RPA Metro objectives are also informed by continuous stakeholder consultation and periodic consultation with the PPP market.

To assist RPA and Government in alignment choice, a multi-criteria analysis was conducted of the alignment options. The multi-criteria framework is at a high-level appropriate to the concept level of Metro development. It is designed to support decision makers in their understanding of the trade-offs among the most important criteria and to narrow the range of options. This approach allows for strong performance on one criteria compensating for weaker performance on another.

Five feasibility assessment criteria categories are summarised below:

- Feasible Construction
- Improved Transportation
- Positive Impacts
- Reasonable Costs
- Expedited Implementation