OVERVIEW

LOCATION: LONDON, UK
SCOPE: INTRA-URBAN
TRANSPORT MODE: METRO
PRINCIPAL CONSTRUCTION: TUNNEL
NEW LINK: YES

PRINCIPAL OBJECTIVES

LOCAL TRANSPORT LINK
REGENERATION
ACCESSIBILITY
CONGESTION RELIEF
TRAVEL TIME SAVINGS

PRINCIPAL STAKEHOLDERS

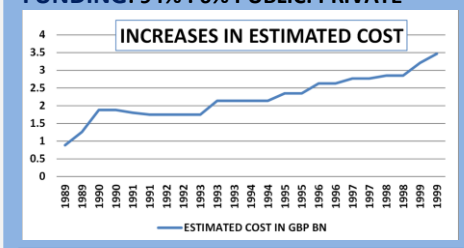
CLIENT: LONDON UNDERGROUND LTD
CLIENT'S ADVISER:
ARUP PROJECT MANAGEMENT
PROJECT MANAGER (FROM 1998):
BECHTEL CORPORATION
MAIN FUNDER: NATIONAL GOVERNMENT

PLANNING AND IMPLEMENTATION

PLANNING START DATE: 01/1988
CONSTRUCTION START DATE: 10/1993
OPERATION START DATE: 12/1999
MONTHS IN PLANNING: 69
MONTHS IN CONSTRUCTION: 74
PROJECT COMPLETED:
21 MONTHS BEHIND SCHEDULE

COSTS (IN 2010 USD)

PREDICTED COST: 4.82BN
ACTUAL COST: 6.83BN
PROJECT COMPLETED:
42% OVER BUDGET
FUNDING: 94% : 6% PUBLIC: PRIVATE



INFRASTRUCTURE QUANTITIES:

LENGTH: 16KM
NUMBER OF STATIONS: ELEVEN
COST PER KM (USD 2010): 0.43BN

PATRONAGE

FORECAST TRAFFIC
127M PASSENGERS PER ANNUM
ACTUAL TRAFFIC
133M PASSENGERS PER ANNUM

INTRODUCTION

An extension to the existing London Underground (LU) Jubilee Line, from Westminster in central London to Stratford in East London, 16km in length.

The project includes six new stations, of which four provide interchanges with other LU lines, and enlarging five existing stations. It is also associated with development and regeneration initiatives at Westminster, Southwark, Canary Wharf, Stratford and North Greenwich.

BACKGROUND

The main objectives of the project were to improve transport links to and from the Docklands (then emerging as a commercial office hub), Southeast and East London, to act as a catalyst for local area regeneration, to relieve congestion on river crossings and other rail lines. Similar schemes had been considered by LU since the late 1960s but were given added impetus by central government plans to regenerate the Docklands and North Greenwich.

The project's history is closely linked to that of the Canary Wharf office development in the Docklands, owned by Canadian developers Olympia & York (O&Y), who lobbied for substantially improved transport infrastructure to serve the building and promised to contribute to its funding. An earlier proposal by O&Y was rejected by London Transport in 1988.

Parliamentary Bills were deposited in 1989 and 1990 (public consultation and environmental impact assessment forming part of the procedure), and Royal Assent was given in 1992. However, O&Y went into administration shortly after and the project was put on hold until equivalent funding was guaranteed in 1993: a European Investment Bank loan covering the first instalment, followed by O&Y's resurrection with the support of a consortium of banks.

The cost-benefit ratio at this time was 0.95:1 (compared to 1.56:1 in 1989) and approval was granted on the assumption of unquantified regeneration benefits. In 2002, a post-project impact study suggested a real ratio of 1.75:1.

Associated developments include 20.5m square feet of commercial development and 16,500 homes. Up to 5,000 people were directly employed, with an estimated 150,000 jobs through associated developments and another 32,000 in the catchment area.

TIMELINE

CONCEPTION: 1968: NEED FOR TRANSPORT LINK TO DOCKLANDS IDENTIFIED

CONCEPTION: 1974/76: NEW LINE PROPOSED AND ENDORSED IN STRATEGIC PLAN

DELAY: 1979: PROPOSED NEW LINE ABANDONED DUE TO COST CONSTRAINTS

CONTEXT: 1984: CONSTRUCTION OF DOCKLANDS LIGHT RAILWAY BEGINS

CONTEXT: 1985/86: CANARY WHARF GRANTED ENTERPRISE ZONE STATUS. 1M SQ FT OFFICE DEVELOPMENT PLANNED

DELAY: 1988: GOVERNMENT REJECTS O&Y PROPOSAL

CONCEPTION: 1988 (JAN): NEW PROPOSAL BY CENTRAL LONDON RAIL STUDY

INCEPTION: 1989: 1ST PARLIAMENTARY BILL. O&Y AGREE TO PROVIDE GBP 0.4BN FUNDING

INCEPTION: 1990: EAST LONDON RAIL STUDY CONFIRMS ROUTE. 2ND PARLIAMENTARY BILL

DELAY: 1991/92: SEARCH FOR PRIVATE FUNDING CAUSES 18 MONTH DELAY

INCEPTION: 1992: PARLIAMENTARY BILL RECEIVES ROYAL ASSENT

DELAY: 1992: O&Y IN ADMINISTRATION. PROJECT ON HOLD UNTIL OTHER PRIVATE FUNDING FOUND

INCEPTION: 1993: O&Y RECOVER, PRIVATE FUNDING SECURED, SECRETARY OF STATE GIVES GO-AHEAD

CONSTRUCTION: 1993: CONTRACTS AWARDED FOR GBP 1.2BN, CONSTRUCTION STARTS

DELAY: 1994: HEATHROW TUNNEL COLLAPSE CAUSES SIX MONTH DELAY

CONTEXT: 1996: NORTH GREENWICH CHOSEN AS SITE FOR MILLENNIUM CELEBRATIONS

CONSTRUCTION: 1996 (JAN): TUNNELLED RIVER CROSSINGS COMPLETE, (AUG): RUNNING TUNNELS COMPLETE

CONTROVERSY: 1997: MOVING BLOCK SIGNAL SYSTEM ABANDONED

CONTROVERSY: 1998: BECHTEL REVIEWS AND TAKES OVER PROJECT MANAGEMENT

DELAY: 1999: ELECTRICIANS' WILDCAT STRIKE

DELIVERY: 1999 (DEC): LINE OPENS

DELIVERY: 2002: IMPACT STUDY

CHARACTERISTICS

The estimated project cost increased steadily from GBP 0.88bn in 1989 to GBP 2.14bn in 1992 (USD 4.82bn, 2010 prices[1]). The final cost was GBP 3.5bn (USD 6.83bn, 2010 prices): GBP 2.2bn ring-fenced central government funding and GBP 1.3bn from LU's core investment programme.

The New Austrian Tunnelling Method (NATM) and sliding platform edge doors were technological innovations used for the first time in London. However, the reputation of the former was tarnished after the collapse of a tunnel on the Heathrow Express link in 1994.

The client, London Underground Ltd (a subsidiary of London Regional Transport), let out the project in 31 separate contracts. Arup Project Management acted as an independent adviser to the government during construction. LUL's project manager was replaced by a team from Bechtel Corporation in September 1998, following Bechtel's critical review of the project management.

TIMELINE ISSUES

Several factors contributed to delays, including the initial funding difficulties caused by the failure of O&Y. Construction conditions were complex, involving proximity to other lines and the Houses of Parliament. The innovative moving block signal system had to be abandoned due to technical problems. The Heathrow Tunnel collapse led to a six-month delay while the safety of the NATM method was reviewed. Labour costs increased as the economy came out of recession and the Millennium deadline approached.

Timeline issues were estimated to have contributed GBP 0.6bn to the cost overrun.

FUNDING

The project was financed primarily by central government grant (GBP 2bn was ringfenced for the project in 1993) and LU's own funds. O&Y's promised contribution of GBP 0.4bn was to be paid in phases over 24 years. However, the initial payment was covered by a European Investment Bank loan. By 2000, O&Y had contributed GBP 0.15bn and had agreed a further, final, payment of GBP 0.05bn. In total, private sector contributions represented about 6% of the final cost.

[1] Costs have been converted to USD at 2010 prices, using historic inflation rates and current exchange rates, to allow comparison between projects.