# MEGAPROJECT Case Study

**Case compiled by:** PRINCE BOATENG  
**Contact details:** email: p.boatengh@yahoo.com Mobile: +44 (0) 754 1930 957

## Basic Project Information: History

<table>
<thead>
<tr>
<th>Project Title</th>
<th>EDINBURGH TRAM NETWORK (ETN) PROJECT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>SCOTLAND, UK</td>
</tr>
</tbody>
</table>

### 1871 – 1956 Era
- 1871: First Horse-drawn Trams  
- 1888: First Cable-Hauled Trams  
- 1905: The old tramline circa constructed on Leith Walk  
- 1905-1923: All Tram lines went electrical  
- 1956: End of tram services in Edinburgh

### The new ETN project
- The Tramline is double tracked.  
- Connect Edinburgh Airport to the York Place via the City Centre

### Purpose
- To support the local economy by improving accessibility.  
- To promote sustainability and reduce environmental damage caused by traffic.  
- To reduce traffic congestion.  
- To make the transport system safer and more secure.  
- To promote social benefits.

### Contractual Framework
- The key contracts are as follows:  
  - Development Partnering and Operating Franchise Agreement (DPOFA);  
  - System Design Services (SDS);  
  - Joint Revenue Committee (JRC);  
  - Multi Utilities Diversion Framework Agreement (MUDFA);  
  - Infrastructure provider and maintenance (Infraco); and  
  - Vehicle supply and maintenance (Tramco).
### MEGAPROJECT Case Study

#### Overview of the new ETN Project

<table>
<thead>
<tr>
<th>Overview</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ 2001 – Feasibility studies of the Tram system</td>
<td></td>
</tr>
<tr>
<td>▪ 30 options drawn up</td>
<td></td>
</tr>
<tr>
<td>▪ May 2002 – Formation of Transport Initiatives Edinburgh (Tie) plc by the City of Edinburgh Council (CEC)</td>
<td></td>
</tr>
<tr>
<td>○ Tasked to deliver major transport projects for CEC, its owner.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reasons for Trams construction</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>▪ Expanding population</td>
<td></td>
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<tr>
<td>▪ Vehicular congestion</td>
<td></td>
</tr>
<tr>
<td>○ 160, 000 vehicles enter city every day</td>
<td></td>
</tr>
<tr>
<td>○ 180, 000 by 2016 - CEC forecast</td>
<td></td>
</tr>
<tr>
<td>▪ Frequent road repairs</td>
<td></td>
</tr>
</tbody>
</table>
MEGAPROJECT Case Study
Consultation & Response

- 24th March-18th May 2003
  - 125,000 leaflets distributed
  - Several public meetings & Exhibitions
  - Sectors consulted: Transport, Business, Environment, Tourism, Conservative/Heritage, Disability groups, Utilities, etc.

- Over 3,000 responses (83.6% in support of the new tram network)

- January 2004 - Proposal submitted to the Scottish Parliament to reintroduce tram in Edinburgh
MEGAPROJECT Case Study

System Design Services (SDS)

- 2005 – Appointment of design consultants
- Originally, 3 lines were proposed

- Phase 1a (final route) = 18.5 km, is developed (Case study)
- Phase 1b (proposed) = 5.5 km, to be developed later.

MEGAPROJECT Case Study

Treats

- March 2006 – Tram Bill passed & granted Royal Assent
- 2007- Scottish National Party (SNP) was elected
  - Pledged to cancel project to same money
  - Voted by Parliament to continue project
  - SNP agreed, but emphasised no extra public money would be invested in the project
MEGAPROJECT Stakeholder Identification (Internal)

<table>
<thead>
<tr>
<th>Stakeholder Category</th>
<th>Case-Study</th>
<th>Comments (e.g. maturity, previous experiences of stakeholders, skills, influence on project)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategic goal of tie and its partners: “To successfully deliver, by 2011, a world class tram system in Edinburgh, the Capital of Scotland; safely - together - with commitment, professionalism and expertise.”</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Internal**

<table>
<thead>
<tr>
<th>Supply-Side</th>
<th>Case-Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Client</td>
<td>City of Edinburgh Council (CEC)</td>
</tr>
<tr>
<td>Financiers</td>
<td>Transport Scotland (TS) and City of Edinburgh Council (CEC)</td>
</tr>
<tr>
<td>Sponsors</td>
<td>Transport Initiatives Edinburgh (Tie) and Transport Edinburgh Limited (TEL)</td>
</tr>
<tr>
<td>Client’s Customers</td>
<td>UK Tram, Edinburgh Trams</td>
</tr>
<tr>
<td>Client’s Owners</td>
<td>Transport Initiatives Edinburgh (Tie), Transport Edinburgh Limited (TEL), Lothian Buses (LB)</td>
</tr>
<tr>
<td>Other internal supply-side categories (please specify)</td>
<td>Category</td>
</tr>
<tr>
<td>Tram Project Board (TPB)</td>
<td>A formal sub-committee of TEL. Delegated authority to monitor the delivery of the trams project</td>
</tr>
<tr>
<td>Council Audit Committee (PAC)</td>
<td>Project Audit</td>
</tr>
<tr>
<td>MPs/ Ministers</td>
<td>Parliamentary &amp; political parties representatives</td>
</tr>
</tbody>
</table>

**Demand Side**

<p>| Principal Contractor | Bilsinger Berger Siemens (BBS) - Responsible for infrastructure construction (INFRACO). |
| First Tier Contractors | Construcciones y Auxiliar de Ferrocarriles SA (CAF) - Responsible for tram vehicle construction (TRAMCO). |
| Alfred McAlpine Infrastructure Services/Carillion - Responsible for utilities diversion work |
| Parsons Brinkerhoff/Halcrow - SDS provider to facilitate the early identification of utility diversion works, land purchase requirements and traffic regulation requirements and the completion of design drawings. |
| Second Tier Consultants | Faithful &amp; Gould: Construction cost management consultants responsible for risk management procedures. |
| Hg Consulting - Independent Certifier with a duty of care to CEC |
| Steer Davies Gleave (SDG) – Assessed economic costs and benefits of the Trams project in December, 2007. |
| Professional Services Providers | Transdev - was appointed as the tram operator in May 2004 to assist planning of an integrated service network with TEL. Transdev was later cancelled in December 2009 as a cost saving measure. |
| Other internal supply-side categories (please specify) | Category | Case-Study |
| Financial, Commercial and Legal Committee (FCL) | Financial management - Reporting, control, audit, risk management, insurance; and Contract management – Reporting, compliance, interface with delivery, claims and variations. |</p>
<table>
<thead>
<tr>
<th>Stakeholder Category</th>
<th>Case-Study</th>
<th>Comments (e.g. maturity, previous experiences of stakeholders, skills, influence on project)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>External</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Public</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regulatory Agencies</td>
<td>SEPA, Scottish Water, Parliament, Planning, Road &amp; aviation authority, Network rail, Historic Scotland, Building Standards</td>
<td></td>
</tr>
<tr>
<td>Local Government</td>
<td>City of Edinburgh Council (CEC)</td>
<td></td>
</tr>
<tr>
<td>National Government</td>
<td>Scottish Government</td>
<td></td>
</tr>
<tr>
<td>Other internal supply-side categories (please specify)</td>
<td>Category</td>
<td>Case-study</td>
</tr>
<tr>
<td></td>
<td>CEC councillors &amp; officials,</td>
<td>CEC representatives</td>
</tr>
<tr>
<td><strong>Private</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local residents</td>
<td>Edinburgh residents (Randolph Crescent, Queen Street, Moray Feu, Blenheim, Shandwick, Picardy, Leith Walk, Forth Ports etc..)</td>
<td></td>
</tr>
<tr>
<td>Local Landowners</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environmentalists</td>
<td>SEPA, Friends of the Earth Scotland; Sustainable Scotland Network; Lothian &amp; Edinburgh Environmental Partnership; Scottish Environment Link; Scottish Natural Heritage (SNH). Scottish Executive’s Countryside and Natural Heritage Unit (CANHU).</td>
<td></td>
</tr>
<tr>
<td>Conservationists</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Archaeologists</td>
<td>Headland Archaeology (UK) Limited; City Council Archaeologists – Edinburgh, Glasgow University Archaeological Research Division (GUARD)</td>
<td></td>
</tr>
<tr>
<td><strong>Other External Private stakeholders (please specify)</strong></td>
<td>Category</td>
<td>Case-study</td>
</tr>
<tr>
<td></td>
<td>B.A.A Edinburgh Airport; Henderson Global Investors (St. James Centre); Forth Ports; Edinburgh Business Forum; Essential Edinburgh; Federation of small businesses- Scotland; Edinburgh Chamber of Commerce; and representatives of local communities impacted by the Trams.</td>
<td>Key business and other stakeholders</td>
</tr>
</tbody>
</table>

**SECTION 2 - PROJECT STAKEHOLDERS**
MEGAPROJECT Stakeholder Relationship Maps

- **Funding Authority**
  - Transport Scotland (TS)
  - The Council

- **Project Sponsor**
  - City of Edinburgh Council
  - (Project director)

- **Joint Project Delivery Group**

- **Project Audit Committee**
  - The Council/TS/Elected Member Reps

- **Joint Project Forum**
  - Strategic Direction & Control
  - Council Chair
    - Senior responsible Officer
    - Council/Tie/TS/BB&S/CAF/Tram Operator
    - Employing Audit Scotland
    - Best value advanced practices toolkits

- **Independent Certifier**
  - Risk
  - Design
  - Consents
  - Programme

- **Jointly Appointed Independent Adjudicator**
  - (Engineering Experts)

- **External Stakeholder Group**
  - (Key business & other stakeholders)

- **Traffic Management (CEC)**
- Approvals
- Design (Approvals/Consents/Management)
- Contract Variation
- Construction Progress Reporting
- Valuation/Cost
- Land Acquisitions & compensation
- Remedial Works
- Tram Vehicle Delivery & Integration
- Communications
- Health & Safety / The Railways & Other guided Transport Systems Safety Regulations

- **CONTRACTS**

- **BB & S**

- **CAF**

**Key:**
- **Name of Actor**
- **Description of relationship**

**SECTION 2 - PROJECT STAKEHOLDERS**
### MEGAPROJECT External Stakeholder Attitude Analysis

<table>
<thead>
<tr>
<th>External Stakeholder</th>
<th>External Stakeholder's Attitude to this Project</th>
<th>External Stakeholder's Influence on project</th>
<th>Impact of Project on External Stakeholder</th>
</tr>
</thead>
<tbody>
<tr>
<td>B.A.A Edinburgh Airport</td>
<td>Positive</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Henderson Global Investors (St. James Centre)</td>
<td>Positive</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Forth Ports</td>
<td>Positive</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Edinburgh Business Forum</td>
<td>Positive</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Essential Edinburgh</td>
<td>Positive</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Federation of small businesses-Scotland</td>
<td>Positive</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Edinburgh Chamber of Commerce</td>
<td>Positive</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Representatives of local communities impacted by the Trams.</td>
<td>Positive</td>
<td>Low</td>
<td>High</td>
</tr>
</tbody>
</table>
MEGAPROJECT Project Management

Project Organisation

<table>
<thead>
<tr>
<th>Project Team Size &amp; Structure</th>
<th>350</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contractor Project Team Size and Structure</td>
<td>3000</td>
</tr>
<tr>
<td>Sub-Contractor Project Team Involvement</td>
<td>n/a</td>
</tr>
</tbody>
</table>

Project Tools and Techniques

Please √ if present, x if absent, leave blank if unknown

- Life-Cycle Costing Approaches √
- Project Management Software √
- Lessons Learnt Transfers √
- Stakeholder Involvement √
- Relationship Management Tools √
- Team Building Tools √
- Building Information Modelling (BIM)  
- Project Knowledge Management Tools √
- Competency framework √

Other Tools and Techniques or More Information

SECTION 3 - PROJECT MANAGEMENT
### Project Processes

<table>
<thead>
<tr>
<th>Process</th>
<th>Status</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Risk Management Processes</strong></td>
<td>Present</td>
<td>Short, medium and long term risk management strategies including planning engagement, and co-ordination of risks were approaches used to achieve market commitments for deliverable packages of work and to reach financial close to commence construction activities. The risk management deliverables include the use of Project Risk Management Plan; Assumption Register; Project Risk Register; Risk Progress Report; Project Estimate Reports; risk workshops and one-to-one meetings with those responsible for mitigating project risks.</td>
</tr>
<tr>
<td><strong>HR Management Processes</strong></td>
<td>Present</td>
<td>The people strategy enshrined in the Human Resource (HR) plan has underpinned the Project Management Plan of ETP. Tram Delivery team, resources and capability are used to manage the process required for good project and cost control and undertake sufficient inspection of what is being delivered. This is to provide assurance and confidence in the end product delivery and quality to ETP client and key stakeholders involved such as TEL, CEC, TS and the Scottish Government.</td>
</tr>
<tr>
<td><strong>Procurement Management Processes</strong></td>
<td>Present</td>
<td>The procurement strategy applied to ETNP is entirely compatible with the approach of a staggered implementation of the project Phases. The key contracts relating specifically to the Phase under development are SDS, MUDFA, Infraco and Tramco. The contractual principles for each of these are the same with a specific elements set for other phases of the project.</td>
</tr>
<tr>
<td><strong>Integration Management Processes</strong></td>
<td>Present</td>
<td>To ensure effective system integration management processes, INFRACO – an implementation company was task to be responsible for construction, integration and maintenance of the tram system. Lothian Buses, The principal bus operator in Edinburgh which is wholly owned by the public sector would facilitate tram / bus integration and maximise the operational and service opportunities this presents.</td>
</tr>
<tr>
<td><strong>Scope Management Processes</strong></td>
<td>Present</td>
<td>The Scope Management Procedure has been developed to address the following workflows within the ETNP Workstream: Identification, Modelling &amp; design, Approval &amp; review of required i) Traffic and Pedestrian Management, ii) MUDFA, iii) INFRACO, iv) TRAMCO, v) SDS, and vi) System integration.</td>
</tr>
<tr>
<td><strong>Cost Management Processes</strong></td>
<td>Present</td>
<td>Cost estimates are fully aligned to the Master Programme &amp; are developed to detailed workstream level, enabling the effective management of costs throughout the project lifecycle. These project cost estimates were and continue to be reviewed at principle points of the project and they form the baseline against which the project manages expenditure.</td>
</tr>
<tr>
<td><strong>Quality management Processes</strong></td>
<td>Present</td>
<td>The project adopted quality management system which conforms to the principles and requirements of BS EN ISO 9001:2000 Quality Management Systems.</td>
</tr>
<tr>
<td><strong>Communications Management Processes</strong></td>
<td>Present</td>
<td>A range of communication and media methodologies were used. (Contact database; Bespoke presentations for briefings; Exhibition and banner stands; Construction Newsletters &amp; Tram time newsletter – wider community; Fact Sheets and Concertinas; Tram DVD; Tram branding; Tram models and simulations; and Leaflets; One to one briefings with partners and key stakeholders; Q&amp;As; Key Messages / statements; Key programme dates; Working action plan and Stock photography)</td>
</tr>
</tbody>
</table>
MEGAPROJECT Case Study
Original Tram Project Board governance structure

Source: Audit Scotland
MEGAPROJECT Case Study

Governance Structure for ETN Project as at June 2013

Project Owner - CEC

Joint Project Forum & Principals Forum
Chair: Sue Bruce

CEC Tram SMT Briefing
Chair: Sue Bruce

Senior Responsible Officer (SRO) CEC
Colin Smith

Communications and Stakeholders

Bilfinger Construction (UK)
Siemens plc

TTPM

CAF

Day to day Project Operational Management by TTPM

Source: The City of Edinburgh Council, 2013
One of the many bodies discovered during utility diversion work on Constitution Street.
October 2007 - Vehicle supply and maintenance contract (Tramco) awarded to Spanish company CAF

- £ 40 million
- 27 vehicles
- 250 capacity
MEGAPROJECT Case Study
Construction

- May 2008 – Turnkey Infrastructure Construction contract (INFRACO) awarded to Bilfinger Berger & Siemens (BBS) Consortium
  - Initial planned budget - £498 million
### MEGAPROJECT Project Performance (TIME)
Planned infrastructure construction programme

<table>
<thead>
<tr>
<th>Year Quarter number</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Q2</td>
<td>Q3</td>
<td>Q4</td>
<td>Q1</td>
<td>Q2</td>
</tr>
<tr>
<td>Newhaven to Foot of Leith Walk</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foot of Leith to St. Andrew Square</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>St. Andrew Square to Haymarket</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Haymarket to Edinburgh Park Station</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Edinburgh Park station to Airport</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**Legend:**
- **Utilities**: Green
- **Road and Tramworks**: Red
- **Overhead line equipment**: Blue

Source: Audit Scotland

### SECTION 4 - PROJECT PERFORMANCE
# MEGAPROJECT Project Performance (TIME)

## Delivery against key milestones as at 2011

<table>
<thead>
<tr>
<th>Year quarter number</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 4 1 2 3 4 1 2 3 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Business Case
- **planned**
  - 1 2 3 4
- **Actual**
  - 1 2 3 4

### Design and Traffic Regulation Orders
- **planned**
  - 1 2 3 4 5
- **Actual**
  - 1 2 3 4 5

### Utilities
- **planned**
  - 1 23 4 5
- **Actual**
  - 1 23 4

### TRAMCO
- **planned**
  - 1 2 3 4 5
- **Actual**
  - 1 2 3 4

### INFRACO
- **planned**
  - 1 2 3 4 5 6 7 8
- **Actual**
  - 1 2 3 4 5

### Key Milestones

#### Business Case
1. Approval of draft final business case by CEC
2. Confirmation of INFRACO tender prices to CEC
3. Approval of final business case by TPB
4. Approval of final business case by CEC

#### Design and TROs
1. TRO process commences
2. Completion of const. Drwg - Utilities diversion
3. Completion of planning drawing
4. Completion of detailed design const. Drwg
5. TRO process complete

#### Utilities
1. Award of Utilities diversion contract
2. Completion of pre-const. Period of utilities design contract
3. Commencement of utility diversion works trial site
4. Commencement of utility diversion works
5. Completion of utilities diversion works

#### Tramco
1. Completion of initial evaluation/negotiation of bids
2. Recommendation of preferred bidder
3. Award of Tramco contract
4. Delivery of first tram
5. Delivery of all trams

#### Infraco
1. Return of Stage 1 bid
2. Completion of evaluation/negotiation of Stage 2 bid
3. Recommendation of preferred bidder
4. Award of Infraco contract
5. Construction of track and tram depot commences
6. Depot completion
7. Commencement of test running
8. Delivery into revenue service

Source: Audit Scotland
### MEGAPROJECT Project Performance (TIME)

**Delivery against key milestones**

<table>
<thead>
<tr>
<th>Year</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quarter number</td>
<td>3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td>1 2 3</td>
</tr>
</tbody>
</table>

#### Business Case

- Plan: Green
- Actual: Orange

#### Design and Traffic Regulation order

#### Utilities

#### Tram construction (Tramco)

#### Infrastructure construction (Infraco)

**Legend:**

- **Plan**: Green
- **Actual**: Orange

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**SECTION 4 - PROJECT PERFORMANCE**
Megaproject Project Performance. (COST)

Edinburgh tram network spend to the end of December 2010

Spend by type against budget

- **Infrastructure construction**
- **Tram Vehicles**
- **Utilities diversion**
- **Design**
- **Land and compensation**
- **Project management**
- **Contingency/risk allowance**

- Actual Budget as at May 2008
- Expenditure to end December 2010
- Actual Spend to end December 2010

Projected spend to end December 2010 at financial close (May 2008)

Total budget at financial close (May 2008)

Actual Spend to end December 2010

Financial close (May 2008)

- Total budget: £250 million
- Actual spend: £200 million
- Projected spend: £300 million
MEGAPROJECT Project Performance. (COST)

Planned and actual expenditure profiles

- Cumulative spend to 31 March 2008
- Spend during 2008/2009
- Spend during 2009/2010
- Planned spend during 2010/2011
- Planned spend during 2011/2012

SECTION 4 - PROJECT PERFORMANCE
Megaproject Project Performance (COST)

Spend to the end of December 2010

Note:
- 2008 - Initial cost was £498
- December 2009 – Cost revised to £545 mil
- December 2010 – Cost passed £545 mil
- Final Project Cost unknown

- Infrastructure construction: £67m
- Tram construction: £49m
- Utilities diversion: £27m
- Design: £33m
- Project management: £81m
- Land and compensation: £85m
- Contingency: £67m

![Bar chart showing project expenditure and budget as at May 2008 and expenditure to end December 2010.](chart.png)
Based on desktop search, ETNP source documents and interviews.
MEGAPROJECT: Risk Areas
Causes of Time & Cost Overruns

- **Social risks**
  - Dispute
  - Legal actions
  - Multi-level decision making bodies
  - Stakeholders’ pressure

### Internal
- **Demand side**
  - CEC, TS, TEL, Lothian Buses, TIE, MPs, Ministers
- **Supply side**
  - BBS, CAF, Trandev, T&T, Parson, Alfred McAlpine

### External
- **Private**
  - Edinburgh residents, Scotland residents, UK residents, cycling groups, Business owners, media, other private transport operators
- **Public**
  - HSE, Lothian fire service, Edinburgh Council, National Government, Metropolitan police authority, media

SECTION 4 - PROJECT PERFORMANCE
MEGAPROJECT: Risk Areas
Notices of Claim

- 251 – Still hanging

- Cost of disputes as at 2011 = £23.8 m

- 816 notice of Claims
  - 677 continued with
  - 426 Estimates submitted
    - 198 settled
    - 20 settled thru’ FDRP
      - 7 resolved thru’ negotiation
      - £3.7m
    - 178 settled thru’ IDRP
      - 2 resolved thru’ external mediation
      - £3.5m
      - 11 resolved thru’ adjudication
      - £4.0m
    - 228 not settled
  - 139 withdrawn

- £12.6m
MEGAPROJECT: Risk Areas
Causes of Time & Cost Overruns

- **Technical risks**
  - Utility diversion/ground condition problems
  - Wartime tunnels under Haymarket
  - Construction disruption
Economic risks
- Economic downturn
- Delays of all types
- Changes in project governing body
- Quality deficiency/ rework
MEGAPROJECT: Risk Areas
Causes of Time & Cost Overruns

- **Environmental risks**
MEGAPROJECT: Risk Areas
Causes of Time & Cost Overruns

- **Political risks**
  - Lack of political support
  - Political indecision
  - **Contractual disputes**
    - 2009- BBS demand additional £50-£80 mil before beginning work on Princes Street.
    - Tie refused
    - 2010- BBS announced 30 months delay to 2014
  - 2011- **Tie** released from managing project
  - 2011 - Cost revised from **£545 to £776 mil**
  - 2012- **T&T** appointed to manage ETN Project
# MEGAPROJECT Project Performance.

Aspects of Performance Concerned with Doing the Right Project

<table>
<thead>
<tr>
<th>Stakeholder or Stakeholder Grouping</th>
<th>Original Aims of Project Involvement and Changes to these Aims</th>
<th>Achievement of these Aims</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Community and Business</strong></td>
<td>Facilitate communication to ensure local businesses and residents and other affected parties are kept fully informed of the nature and timing of the works.</td>
<td>Achieved</td>
</tr>
</tbody>
</table>
| **Project Stakeholders**           | • Commit to a one-message approach, owned by all key partners and stakeholders;  
• Generate support and endorsement as required from key audiences: local residents and businesses; commuters; political; media; travelling public; community; special interest groups and visitors to Edinburgh; and  
• Encourage a joined-up working approach between tie, CEC, LB and TEL. | Partially achieved         |
| **Project Communication**          | • Implement a robust public information campaign during construction, and throughout key stages such as utilities diversion; final business case approval; contracts awarded for Tramco and Infraco; tram branding; final tram route design; tram commissioning and driver training; new tram timetable and tram operation by TEL; and ensure all tie and CEC management and operational staff are kept up to date and are fully briefed as appropriate. | Partially achieved         |
| **Media and External Relations**   | • Generate positive media coverage for the tram project, tie, CEC and TEL, focusing on benefits for the travelling public and wider economy;  
• Harness political and public support and media commentary; and  
• Demonstrate competence and efficiency of delivery agent, promoter and funders. | Partially achieved         |
**MEGAPROJECT Project Environment**

**Legal and Regulatory Environment**

| Legal and Regulatory Project Environment (regionally, nationally and Europe wide) | ETNP is governed by the following Legal and Regulatory frameworks (regionally, nationally and Europe wide)  
| - Edinburgh Tram Acts  
| - New Roads and Street Works Act (NRSWA)  
| - Code of Construction Practice (Buildings, Roads, Bridges)  
| - The Road Traffic Regulation for the tram  
| - The Local Authorities’ Traffic Orders (Procedure) (Scotland) Regulations 1999 as amended.  
| - Environmental Impact Assessment (EU) Regulations.  

| Specific Legal and Regulatory events impacting on the project | - Delays in obtaining temporary traffic regulation orders for construction - (Regional)  
| - Delays in obtaining consent – (Regional and National).  
| - Legislative/ Regulatory change -(Regional, National and Europe wide)  
| - Insufficient powers to acquire land.  

**Political Environment**

| Political Project Environment | The political project environment for ETNP varies in influence according to the number of political seats or elected members within the City of Edinburgh Council (CEC).  

| Specific Political Events impacting on the project | - Political opposition;  
| - Lack of political support;  
| - Lack of partner support;  
| - Political indecision.  
| - Project termination  

**SECTION 5 - PROJECT ENVIRONMENT**
Economic Project Environment for ETNP is based on the following economic benefits:

- Reduction of travel time.
- Economic efficiency.
- Employment development.
- Employment generation.
- Residential development
- Economic growth.

### Specific Economic Events impacting on the project

- Incorrect project cost estimate
- Incorrect project time estimate
- Wage inflation
- Changes in VAT
- Global economic recession
- Changes in taxation
- Cost and delays due to utilities diversions
- Changes in inflation as construction works proceed
Acknowledgements

1. SBE Heriot-Watt University
2. EU COST Action TU1003 MEGAPROJECTS
3. Edinburgh Trams
References

References

• Edinburgh-history.co.uk (2012) History of Trams in Edinburgh [online]; archived from the original on 10 February 2012, available: http://www.edinburgh-history.co.uk [accessed 25 September 2013].


• Rail Staff, (2013) Edinburgh wires go up [online], *Rail Staff* (21 June 2013), available: http://www.railstaff.co.uk/2013/06/21/edinburgh-wires-go-up/, [accessed 12 July 2013].
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