Falkirk Wheel, Scotland

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Overview

- Magnitudes & Costs
- Project Use and Social and Economic Benefits
- Technical Issues and Innovations
- Social Problems and Policy Challenges
Magnitudes

- **Location:** Central Scotland
- **Purpose:** To connecting the Forth and Clyde canal with the Union canal. To lift boats from a lower canal to an upper canal.
Magnitudes

- Construction Began: March 12, 1999
  - Officially at Blairdardie Road in Glasgow
- Construction Completed: May 24, 2002
- Part of the Millennium Link Project undertaken by British Waterways in Scotland
  - To link the West and East coasts of Scotland with fully navigable waterways for the first time in 35 years
Magnitudes

- The world’s first and only rotating boat wheel
- Two sets of axe shaped arms
- Two diametrically opposed water-filled caissons
Magnitudes

- Overall diameter is 35 meters
- Wheel can take 4 boats up and 4 boats down
- Can overcome the 24m vertical drop in 15 minute (600 tones)
- To operate the wheel consumes just 1.5 kilowatt-hours in rotation
Costs and Prices

- Total Cost of the Millennium Link Project: $123 M
- $46.4 M of fund came from Nation Lottery
- Falkirk Wheel Cost: $38.5 M
Financing

- Project was funded by:
  - British Waterways
  - Millennium Commission
  - Scottish Enterprise
  - European Union
  - Canalside local authorities
Fares for Wheel

- The Falkirk Wheel Experience Tour:
  - Adults: $11.60
  - Children: $6.20
  - Senior: $9.75
  - Family: $31.20
Social Benefits

- Proud Scots
  - Queen of Scotland supported the Falkirk Wheel→ revived an important facet of Scotland’s history and heritage
  - A triumph in engineering

- Better Standard of Living
  - Falkirk used to be a coal mining town→ after wheel was built cleaned up
  - Near Glasgow a blocked canal basin had rubbish strewn stagnant water → now residents have a better standard of living
Completion of Millennium Link Canal
- Provided a link that stretched across Scotland’s central belt from coast to coast
Economic Benefits During Construction

Economic Impact Studies prior to the completion of the project showed:

- During the peak period of construction over 600 people were employed
- Long Term: 4,000 new full-time jobs were created across Central Scotland
Economic Benefits

- Commercial Opportunities because of network of linked canals from Glasgow to Edinburgh
  - First time in 35 years
  - 'It is much more about the social and commercial regeneration of an area blighted by high unemployment.'

- Boat oriented developments built around new canal infrastructure
  - $580M worth of wide ranging developments – office, residential and leisure spaces
  - Edinburgh Quay – new 'Canalside' development
Tourism to Scotland

- Tourists visit to see the world’s first revolving boatlift
- In 2002, there were an expected 200,000 tourists/year
- As of 2008, 501,000 tourists visited the wheel
Previous Canal Network

- 100 bridges – Most of Union Canal’s 62 masonry bridges needed refurbishment; all of the Forth & Clyde’s 32 swing or lift bridges were replaced by road embankments

- 49 aqueducts – needed refurbishments

- 40 locks – leaked heavily
## Technical Issues

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<tr>
<td>March 1999</td>
<td>October 2000</td>
<td>Duntreath Avenue Obstruction</td>
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<td>March 1999</td>
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<td>Great Western Road Obstruction</td>
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<td>May 1999</td>
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<td>Vellore Road Obstruction</td>
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<td>June 1999</td>
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<td>Greendykes Road Obstruction</td>
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<td>July 1999</td>
<td>March 2000</td>
<td>Cleveden Road Obstruction</td>
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<td>August 1999</td>
<td>May 2001</td>
<td>Falkirk Obstructions</td>
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<td>January 2000</td>
<td>January 2000</td>
<td>Millennium Link - Smaller Works</td>
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<td>May 2000</td>
<td>March 2001</td>
<td>Wester Hailes Obstruction (Phase 1 &amp; 2)</td>
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<td>July 2000</td>
<td>August 2000</td>
<td>Union Canal Dredging, Redding, Falkirk</td>
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<td>October 2000</td>
<td>Spring 2001</td>
<td>Clydebank Obstructions</td>
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Technical Issues

- Vandalism, April 18, 2002
  - Vandals broke into a control room
  - Water flooded the lower basin
  - Electric and hydraulic equipment in the dry well was damaged

→ Increased Security
→ Built up dry well wall
Technical Issues

- Boat Lift – 1st and only rotating lift
  - Major Challenge: to link the Union Canal to the Forth & Clyde Canal
  - 79 ft elevation difference
  - Until 1933 joined by a flight of 11 locks (stepped down across 1.5 km)
Innovations

- Two Water Filled Caissons
  - Diametrically opposed
  - 110 ft diameter
  - Capacity of 96,000 gallons per caisson
  - Archimedes Principle
Innovations

LIGHTING

HYDRAULIC PUMPS

DRY DOCKING

AXLES
Original 1999 design was not used

- No one liked the Victorian style Ferris wheel gondola
- Victorian style was not representative of Scottish and Celtic culture.

  - The public’s other design specifications included
    - Viking long boats
    - Spine and Rib cage design
    - A working sculpture that was futuristic
The Falkirk council wanted to build a casino in Falkirk

- Negative Impacts may include:
  - Personal Bankruptcy
  - Health and mental Problems including an increase gambling, drug and alcohol addiction
  - Transportation issues in the immediate area
  - Community impacts including crime, domestic violence, divorce and child abuse
However

- Casinos already exist in Glasgow and Edinburgh
- The Falkirk Council indicated that a casino would be mean of securing enhanced regeneration of the area
- Benefits may include
  - Attracting a potentially high spending segment of tourism
  - Boosting Falkirk’s overall appeal
Policy Issues

- Regeneration has become a key battle ground for those opposing neo-liberalism in Scotland.

- People and Place Regeneration Policy - 2006:
  - Regeneration of our poorest communities
  - Transforming heavy manufacturing communities
Policy Issues

- Better Communities in Scotland – a regeneration of policy from 2002
  - Particular duty to the poorest 15% of areas
  - Created Community Planning Partnerships (CPP)
Policy Issues

- CPP have been the approach of implementation of the People and Place policy
- But the intention of People and Place was to privatize regeneration efforts
  - And create globally focused companies
- Some concerned that Privatization would lose focus on helping the poorest communities
Thank You!!!

http://www.youtube.com/watch?v=9bTeKS6QJNE&amp;feature=quicklist