Trans-Alaskan Pipeline

Private Industry’s Most Expensive Undertaking

Summary
- History
- Original Proposals
- Political/Environmental Battles
- Final Design
- Economic Impact
- Future Pipelines

World History of Oil
- Oil use documented for more than 5000 years
- 1859-First oil well drilled in Pennsylvania
- 1930s-Texas and Saudi Arabia Oil Fields
- 1946-Oil becomes world’s most popular energy source
- 1960-OPEC formed

Oil in Alaska
- 1968-Announcement of Prudhoe Bay petroleum discoveries
- Prudhoe Bay- largest oil field in the US, total production+reserves=10+ billion barrels
- Took 10 years to bring to market, could have taken 4, costs of nearly $8 billion, almost twice as much when you add in costs of financing and developing oil field

Original Proposals
- Submarine
- Rail
- Tanker Transport
- Pipelines
  - Prudhoe Bay – Valdez
  - Prudhoe Bay – existing Canadian pipelines

Proposed Routes
Final Route

Political, Social and Environmental Battles
- 1970- National Environmental Policy Act
- Pipeline frozen within two months
- EIS for three years
- Legislation shaped by TAPS
- Trans-Alaska Pipeline Authorization Act of 1973 allowed the pipeline to proceed without more interference

Actual Pipeline Costs

<table>
<thead>
<tr>
<th>description of costs</th>
<th>total amount (million $)</th>
<th>time begin (month)</th>
<th>time end (month)</th>
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</thead>
<tbody>
<tr>
<td>exploration costs</td>
<td>40.8</td>
<td>1</td>
<td>24</td>
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<td>archeological survey</td>
<td>2.4</td>
<td>25</td>
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<td>land lease</td>
<td>900</td>
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<td>access road</td>
<td>120</td>
<td>37</td>
<td>42</td>
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<tr>
<td>drill well</td>
<td>277</td>
<td>13</td>
<td>48</td>
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<tr>
<td>pipe &amp; machine</td>
<td>1500</td>
<td>19</td>
<td>22</td>
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<tr>
<td>construction</td>
<td>6380</td>
<td>76</td>
<td>114</td>
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<tr>
<td>repairs to pipeline</td>
<td>240</td>
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</table>

Total Present Worth of Costs: $5,500 million

Expected Revenue

<table>
<thead>
<tr>
<th>Year</th>
<th>Oil shipped to West Coast</th>
<th>Oil exported to Japan</th>
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<tbody>
<tr>
<td></td>
<td>(million b/d)</td>
<td>(100 thousand b/d)</td>
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<td>1977</td>
<td>$17,228</td>
<td>$694</td>
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<tr>
<td>1990</td>
<td>$6,891</td>
<td>$1387</td>
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Total Revenue: $17,922 million

Total Revenue: $8,278 million

PW(Revenue) – PW(Cost) = PW(Profits)
$8,300 - $5,500 = $2,800 million

Cost/Revenue Graph

Sensitivity Analysis
Environmental Considerations

- Earthquakes
- Permafrost
- Animal Migration Patterns
- Oil Spills

Vertical Support Members

Impact on Alaskan Economy

- More than 70,000 workers
- Population of the state increase 50% between 1975 and 1980
- State received 20% royalty, created problems when project was delayed

Impact of Oil Industry Today

- Industry spends $1.7 billion/year on goods and services=State of Alaska’s general fund spending
- Indirectly impacts 25,000 jobs with $880 million in payroll
- 1999- $2.1 billion in spending, $3.1 billion total output with value added
- $258 million in oil royalties
- $2000 yearly dividend
Impact on Payroll

North Slope Oil Delivered to West

Drilling in ANWR

Proposed Pipeline Route

TAPS Daily Throughput

Pump Station Locations
Drag Reducing Agent

Drag reducing agent (DRA) reduces the loss of energy due to friction as fluid travels through the pipeline. DRA allows higher throughput without additional pumps, and allows earlier rampdown of pump stations as throughput declines.

Winter Construction

Wildlife Coexists With The Pipeline

Tanker Route Map

Evolution of a Drill site: 1970-present

Conclusion

- Economic viability does not seem to be a problem with pipelines (unless there is a dramatic change in the price of oil).
- Social, environmental and economic impacts instead are what influence construction
- We recommend further studies before drilling in ANWR