Bypass Stockholm

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Essingeleden
160 000 vehicles/day
Bypass Stockholm

- **Total length**: 21 km
- **Tunnel**: 17 km
- 3 lanes in each direction
- Separate tunnels north and south
- 140 000 vehicles/day 2035
Road planning process in Sweden

EIA Guidelines för Road Planning

Assessment of the effects of CO2-emissions, and the possibilities of contributing to “long-lasting sustainable development”, are more relevant at system level for a larger urban area or a region than for a single road project.
Initial study for Bypass Stockholm, 2001

- Growth of traffic of different alternatives: Bypass Stockholm 5 %, other alternatives: 1-2 %. This increases the emissions of CO2.

- Less traffic jam leads to less emission of CO2 on existing roads. The differences in CO2-emission of the alternatives is therefore less than traffic growth.

- Climate change is not mentioned.

- Direction of EIA for Feasability study does not list CO2 or Climate impact.
Feasability study, 2002-2006

• Result of the Early consultation of Initial study:

  The County Administration Board used a special paragraph in the Environmental Code: "required an analysis of other comparable ways to reach the goal of the project"

• Alternative of combination
  Combination of:
  1. Minor road constructions
  2. A new regional railway between the north and south of Stockholm
  3. Congestion charging tolls
  4. Cheaper public transport
Bypass Stockholm

- Planned since 1960’s

Conflicts:
1. Big impact on valuable cultural and natural environments
2. Big impact on green areas used for recreation
3. Conflict with housing environment
17 of 21 km in tunnel
# Emissions of carbon dioxide, County of Stockholm

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Traffic, million km</th>
<th>Emission of CO2, thousand tons</th>
<th>Difference from Do-nothing alternative, thousand tons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 2000</td>
<td>9 510</td>
<td>2 330</td>
<td>- 440</td>
</tr>
<tr>
<td>Do-nothing alternative, 2015</td>
<td>13 270</td>
<td>2 770</td>
<td>0</td>
</tr>
<tr>
<td><strong>Bypass Stockholm, 2015</strong></td>
<td>13 870</td>
<td>2 900</td>
<td>+ 130</td>
</tr>
<tr>
<td>Ulvsunda Diagonal, 2015</td>
<td>13 930</td>
<td>2 910</td>
<td>+ 140</td>
</tr>
<tr>
<td><strong>Combination Alternative, 2015</strong></td>
<td>12 500</td>
<td>2 600</td>
<td>- 160</td>
</tr>
</tbody>
</table>
Result of EIA of Feasability study

- Longer parts in tunnel → more CO2-emission for constructing, running and in maintaining the tunnel (ventilation, light etc)

- More focus on CO2-emission and Climate impact

- States that Bypass Stockholm works against the Climate goal and that the Combinationalternative supports the goal
Permissibility Assessment
– requirements of more studies

An up-to-date description, including the environmental consequences, of calculated use of energy and emission of greenhouse gases. The study should include construction, running and maintenance of the tunnel.

It should be specified how the project affects the possibility to reach the national Goal of Climate.
Study of emissions from construction and maintenance

- **Construction**: 8 years, 129 000 tons (1.29E+008 kg)
- **Operation/running**: 52 years, 67 000 tons (6.68E+007 kg)
- **Maintenance**: 52 years, 58 000 tons (5.8E+007 kg)

Total: 60 years: 254 000 tons CO2

With today’s Swedish produktion of electricity

![Graph showing CO2 emissions from different stages of a building's life cycle](image)
Study of CO2-emission from traffic

- New, more accurate, calculations
  1. Calculation from Feasability study (2015): 130 000 tons more
  2. Economic Analysis (2015): 2 000 tons less CO2-emission
  3. General Planning of Transport System in Sweden (2020): 56 000 tons more
  4. Calculation in Road Design plan (2035): 12 000 tons more

- Bypass Stockholm works against the Climate Goal. Reaching the goal requires other measurements.

Analysis shows that it is possible to reach the climate goal with Bypass Stockholm, but only by using strong economic regulations in traffic.
Permissibility Assessment

- Approval of Bypass Stockholm in September 2009

- Bypass Stockholm is built for the vehicles of the future. In the future Sweden will have cars with no emission of CO2

- Bypass Stockholm is an environmental project
## Road Design – Sensitivity Analysis

<table>
<thead>
<tr>
<th></th>
<th>Traffic in region, compared to 2007</th>
<th>Traffic in region, compared to main scenario</th>
<th>Traffic on Bypass Stockholm</th>
<th>CO2-emissions, million tons</th>
<th>CO2, less than 1990</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td></td>
<td></td>
<td></td>
<td>2,4</td>
<td>10 %</td>
</tr>
<tr>
<td>Do-nothing</td>
<td>+ 64 %</td>
<td>- 3 %</td>
<td></td>
<td>2,24</td>
<td>16 %</td>
</tr>
<tr>
<td>Do-nothing, area tolls, economic regulations</td>
<td>+ 40 %</td>
<td>- 17 %</td>
<td></td>
<td>1,86</td>
<td>31 %</td>
</tr>
<tr>
<td>Bypass St. main scenario</td>
<td>+ 70 %</td>
<td></td>
<td>140 000</td>
<td>2,26</td>
<td>16 %</td>
</tr>
<tr>
<td>Bypass St, fuel expensive</td>
<td>+ 59 %</td>
<td>- 7 %</td>
<td></td>
<td>2,13</td>
<td>20 %</td>
</tr>
<tr>
<td>Byp. St. area tolls</td>
<td>+ 52 %</td>
<td>- 10 %</td>
<td></td>
<td>2,03</td>
<td>24 %</td>
</tr>
<tr>
<td>Byp. St. area tolls, ec regulations</td>
<td>+ 43 %</td>
<td>- 20 %</td>
<td>110 000</td>
<td>1,89</td>
<td>29 %</td>
</tr>
<tr>
<td>Strong economic regulations</td>
<td>- 33 %</td>
<td>- 60 %</td>
<td>60-70 000</td>
<td>0,92</td>
<td>65 %</td>
</tr>
</tbody>
</table>
## Climate Goals

<table>
<thead>
<tr>
<th></th>
<th>Year</th>
<th>Climate Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>National goal</td>
<td>2020</td>
<td>- 27 %</td>
</tr>
<tr>
<td>Regional goal for traffic</td>
<td>2030</td>
<td>- 30 %</td>
</tr>
<tr>
<td>National vision</td>
<td>2050</td>
<td>No emission of green house gases</td>
</tr>
<tr>
<td>2-degree goal, ambition for</td>
<td>2050</td>
<td>- 80 %</td>
</tr>
<tr>
<td>industrial countries</td>
<td></td>
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</table>
Road Design, 2008-2011

- Dealing with climate issues in the Road Design phase
  - Is it necessary with 3 lanes in each direction?
  - Adaptation

- Too late to contribute to a sustainable transport system
Why wasn´t the Combination Alternative succesfull?

1. Road Administration responsible, Railway Administration not involved

2. Goal of the project: Create a bypass for longdistance vehicles

3. Calculations of traffic did not capture the stuctural effect of a new motorway
   - same assumption of new settlements, no consideration of urban sprawl
   - no consideration of ”free space in roads” makes people use the car more

4. No economic frame for new infrastructure

5. Comparison with global, national and regional CO2-emission
   → small increase

6. Uncertainty of the development of vehicle, future emissions of CO2

7. The Initial and Feasability study were mainly carried out before the Climate issue reached the attention that it has now.
Has the climate issue had any impact on the project *Bypass Stockholm*?
Thank you for your attention!