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Regionale luchthavens in Nederland
(Regional Airports in the Netherlands)

Een raamwerk voor het bepalen van het maatschappelijk belang van regionale luchthavens in Nederland (A Framework to Determine the Added Value of the Regional Airports in the Netherlands)

BOUKE VELDMAN, IRMA GRAAFLAND-ESSERS, ABIGAIL LIERENS, MAARTEN VAN DE VOORT

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Summary

The Netherlands has six regional airports: Rotterdam, Eindhoven, Maastricht, Groningen, Enschede and Lelystad. The Ministry of Defense owns the infrastructure of two of them (Eindhoven and Enschede). Rotterdam, Lelystad and Eindhoven (51%) are part of the Schiphol Group. The government is involved in the regional airports in different ways. Until recent, they subsidized the financial losses of the airports. Furthermore, they are involved in the control and regulation of the external effects.

Because the regional airports transport relatively few passengers, a first impression is that they have a limited impact on the regions. However, the regions attach a substantial employment and a role as regional attractor to the airport. Environmental groups, on the other hand, claim very high environmental damage and are of the opinion that the regional airports should be closed.

A policy goal of the current government is to develop the external effects policy at a regional level. Duties and powers are to be transferred to the provinces by the end of this government’s term. It is important to determine consistently the added value of an airport by determining (the size of) the different factors that influence the added value when considering support of the regional airports.

The added value of an airport can be defined as the balance between the profitability on an airport and the economic importance as location decision factor on the one hand and environmental effects on the other hand. Sustainability is a situation in which this proportion between positive and negative effects is in balance for a sustained period of time. This study determines the proportion between the different aspects in the year 2001 and thus determines the added value of each of the regional airports in that year. The consequences for Schiphol are not taken into account. The aspects that are discussed are: environmental effects, employment effects and profitability of the airport. Furthermore, an analysis is made of the effects that occur if there would be no airport. The factors discussed in this study are: the value of the real estate (land that can be used for something else) and the additional travel time people incur when having to use other airports.

Environmental effects

The environmental effects of regional airports primarily concern air pollution, noise, external safety and health. Air pollution and noise can be quantified easily. As there is no external safety policy for the regional airports yet, the external safety is quantified by using existing guidelines. The health effects of the regional airports are not yet investigated in such a way that they can be quantified.
Cost of air pollution
The costs of air pollution are calculated by multiplying the unit cost per aircraft movement with the number of movements. The unit costs are an average of the unit costs of different pollutants (e.g. CO₂, CO, VOS).

Costs of noise
The total environmental effects of noise are a unit cost per aircraft multiplied by the total number of movements. The unit cost per aircraft is based on a split of the total noise costs into individual costs per movement.

External safety
Currently, a policy for the external safety around the regional airports is being developed. The calculation made in this study is based on guidelines in the proposed policy. The costs of external safety are based on the number of houses in the surrounding of the airport and the type of flights at that airport. As this detailed information currently is only available for Maastricht and Lelystad, this information was used to estimate the costs of external safety per flight. These unit costs are then multiplied by the number of flights per type for the airports for which no detailed information was available (Rotterdam, Eindhoven, Groningen, Enschede).

Health effects
In contrast with the health effects of Schiphol, the health effects of some of the regional airports are only marginally examined. For other airports no studies are known. The health risks of regional airports are considered to be small. They are therefore not included in the analysis.

Summary environmental effects
To obtain an overview of the total costs of the environmental effects, the costs of air pollution, noise, and external safety are added. Table iv gives an overview of the total environmental cost per airport per year.

<table>
<thead>
<tr>
<th></th>
<th>Rotterdam</th>
<th>Maastricht</th>
<th>Eindhoven</th>
<th>Groningen</th>
<th>Enschede</th>
<th>Lelystad</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air pollution</td>
<td>5219</td>
<td>2748</td>
<td>1906</td>
<td>1168</td>
<td>39</td>
<td>1235</td>
</tr>
<tr>
<td>Noise</td>
<td>9105</td>
<td>4720</td>
<td>3201</td>
<td>2026</td>
<td>66</td>
<td>2195</td>
</tr>
<tr>
<td>External Safety</td>
<td>14</td>
<td>9</td>
<td>8</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>14338</td>
<td>7476</td>
<td>5115</td>
<td>3195</td>
<td>105</td>
<td>3430</td>
</tr>
</tbody>
</table>
Employment

The economic importance of an airport for its region is directly related to the economic activities at and around the airport compared to the economic activity or the whole region. Analyzing the employment and the added value of an airport can result in an estimate of the economic importance. Only direct employment effects are taken into account.

Profitability

The profitability of an airport is determined by the difference between revenue and cost. Airport revenue consists out of landing fees, concessions, rents and parking fees. Costs of an airport consist among others out of personnel costs, safety costs, ground handling, Air Traffic Control (ATC). The part of the costs of ATC that are currently no yet paid by the airports are added as an extra cost.

Value of time and land

If an airport would not exist, people will have to travel longer to other airports. Value of time calculations can attach a value to this prolonged travel time. The land on which an airport is located can be used for other purposes (e.g. development of business parks).

Added value

By weighing the above-discussed aspects, it is possible to determine the added value of each of the regional airports. There are two variants that can be distinguished: low employment and high employment. The results of this analysis can be found in Table v and Table vi. In both variants, the situation with and without airport is compared. In these analyses, the land will get a different function and people will have to travel longer to other airports.

Table v Added value of the regional airports; low employment (million euro)

<table>
<thead>
<tr>
<th></th>
<th>Rotterdam</th>
<th>Maastricht</th>
<th>Eindhoven</th>
<th>Groningen</th>
<th>Enschede</th>
<th>Lelystad</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environment</td>
<td>-14.3</td>
<td>-7.5</td>
<td>-5.1</td>
<td>-3.2</td>
<td>-0.1</td>
<td>-3.4</td>
</tr>
<tr>
<td>Employment</td>
<td>31.0</td>
<td>17.0</td>
<td>14.0</td>
<td>7.0</td>
<td>2.0</td>
<td>5.0</td>
</tr>
<tr>
<td>Profitability</td>
<td>-1.7</td>
<td>-5.0</td>
<td>0.3</td>
<td>-4.5</td>
<td>-0.8</td>
<td>NB</td>
</tr>
<tr>
<td>Land</td>
<td>-1.2</td>
<td>-1.1</td>
<td>-1.0</td>
<td>-0.6</td>
<td>-0.1</td>
<td>NB</td>
</tr>
<tr>
<td>Demolition</td>
<td>NB</td>
<td>-0.7</td>
<td>NB</td>
<td>NB</td>
<td>NB</td>
<td>-0.1</td>
</tr>
<tr>
<td>Value of time</td>
<td>9.5</td>
<td>2.0</td>
<td>5.4</td>
<td>0.9</td>
<td>0.1</td>
<td>NB</td>
</tr>
<tr>
<td>Total</td>
<td>23.2</td>
<td>4.6</td>
<td>13.7</td>
<td>-0.4</td>
<td>1.1</td>
<td>1.5</td>
</tr>
</tbody>
</table>
There are four important issues that have to be taken into account when analysing the added value of each of the airports. First, only direct employment effects are taken into account. This could lead to an underestimate of the employment effects for the airport of Rotterdam, Maastricht and Eindhoven. Second, the costs of demolition in within the $10^5$ contour (that are not taken into account) could have a large influence on the added value for the airports of Rotterdam, Eindhoven and Enschede because of the large number of houses in this contour. Third, too little information is available to make a consistent assessment of the added value of Lelystad airport. Last, Eindhoven and Enschede do not pay for all the cost they incur (e.g. fire department, ATC) as they can make use of the facilities of the military base on which land they are located.

**Internal and external developments**

Regional airport could specialize in a certain market segment. Market segments that regional airports could focus on are: charter, low cost, general aviation or freight.

**Charter**

Charter flights generally use relatively large aircraft which would increase the number of passengers but also the environmental costs. It is plausible that specialization in charter traffic would lead to an increase in employment. This increase has to be weighed against that increase in environmental cost.

**Low cost**

Low cost airlines use relatively large aircraft. This would cause an increase in the number of passengers and in the environmental costs. The profitability will be positively influenced albeit mainly from retail and airport taxes instead of landing fees. This will lead to an increase in employment.

Table vi Added value of the regional airports; high employment (million euro)

<table>
<thead>
<tr>
<th></th>
<th>Rotterdam</th>
<th>Maastricht</th>
<th>Eindhoven</th>
<th>Groningen</th>
<th>Enschede</th>
<th>Lelystad</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environment</td>
<td>-14.3</td>
<td>-7.5</td>
<td>-5.1</td>
<td>-3.2</td>
<td>-0.1</td>
<td>-3.4</td>
</tr>
<tr>
<td>Employment</td>
<td>44.0</td>
<td>24.0</td>
<td>20.0</td>
<td>9.0</td>
<td>2.0</td>
<td>5.0</td>
</tr>
<tr>
<td>Profitability</td>
<td>-1.7</td>
<td>-5.5</td>
<td>0.3</td>
<td>-4.5</td>
<td>-0.8</td>
<td>NB</td>
</tr>
<tr>
<td>Land</td>
<td>-1.2</td>
<td>-1.1</td>
<td>-1.0</td>
<td>-0.6</td>
<td>-0.1</td>
<td>NB</td>
</tr>
<tr>
<td>Demolition</td>
<td>NB</td>
<td>-0.7</td>
<td>NB</td>
<td>NB</td>
<td>NB</td>
<td>-0.1</td>
</tr>
<tr>
<td>Value of time</td>
<td>9.5</td>
<td>2.0</td>
<td>5.4</td>
<td>0.9</td>
<td>0.1</td>
<td>NB</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>36.2</td>
<td>11.6</td>
<td>19.7</td>
<td>1.6</td>
<td>1.1</td>
<td>1.5</td>
</tr>
</tbody>
</table>
General aviation
Through the use of relatively small aircraft a focus on this segment will lead to a decrease in environmental costs. The profitability will be reduced. If an airport only focuses on general aviation, a cost advantage can be achieved as there is less need for ATC services. This would have a negative effect on employment.

Freight
Freighters are in general large aircraft. This would lead to an increase in environmental costs. A specialization in freight can attract logistics companies which would have a positive effect on employment.

Conclusions
It can be concluded that:

- Rotterdam and Eindhoven have substantial positive added value;
- Maastricht could have a positive added value depending on the valuation of the (in)direct employment effects;
- Based on the evaluated aspects Groningen, Enschede and Lelystad probably have a negative added value.

It must be noted that these conclusions are based on the evaluated aspects. Maastricht, Groningen and Enschede also have a function in opening up the area, whereas Lelystad has an overflow function for Schiphol.

For each of the evaluated aspects, certain recommendations regarding further research can be made:

Environment
Because there is a recent Environment-effect report (MER) for Maastricht and Lelystad, it is possible to determine in more detail the effects of noise and external safety. A more detailed estimation of these effects for Rotterdam, Eindhoven, Groningen and Enschede can only be made when a new Environment-effect report is available.

Employment
Most employment studies focus on the influence of large airports on employment. A study into the employment effects of regional (smaller) airports would be useful.
Travel time
In determining the cost of an increase in travel time, certain assumption are made regarding the value of time and the percentage business travelers. Since these costs are a substantial post in determining the added value of an airport, determining these assumptions in more detail would improve the accuracy of the analysis.

Added value
To be able to have a more structured discussion on the future of the regional airports, it is necessary to complement the analysis as described in the report with scenarios. These scenarios should be based on economic expectation of the airports, but also on the expectations of stakeholders, surrounding companies and residents.

Other recommendations
In this study, the role of Schiphol has not been taken into account. As airports are part of networks, a next step would be to include Schiphol in a detailed analysis of the added value of the regional airports.

Summarising, a framework has been developed (and filled in) to determine the added value of a regional airport. In order to use this framework in developing a business plan, scenarios have to be developed for the regional airport in which the role of Schiphol and relevant international airports is included. The social costs in these scenarios can be calculated based on information out of the specific Environmental effect report of the regional airport. Future expectations of different stakeholders can also be built into the scenarios.