

**to** Ministry of Infrastructure and Water Management (IenW)  
 Directorate-General for Aviation and Maritime Affairs

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**date** 28 November 2024

**subject** Additional calculation Balanced Approach study

**our reference** 24.171.09

### ***Request***

IenW has decided to shift the noise abatement objectives to november 2025 (from november 2024). As a result the  $L_{den}$  noise abatement objectives are set at -17% compared to the -15% to -17% for the  $L_{den}$  noise abatement objectives as presented in earlier studies (our references 22.171.20, 23.171.27 and 23.171.37). In a third addendum (our reference 24.171.09) a combination of measures that meet all of the noise abatement objectives was determined. IenW has made an additional request to determine the impact on the combination of measures if the  $L_{den}$  noise abatement objectives for November 2025 would be -15% instead of the -17%.

Criteria related to the noise abatement objective	Noise abatement objectives - third addendum	Noise abatement objectives - additional request
Number of houses within the 58 dB(A) $L_{den}$ contour	-17%	-15%
Number of highly annoyed people within the 48 dB(A) $L_{den}$ contour	-17%	-15%
Number of houses within the 48 dB(A) $L_{night}$ contour	-15%	-15%
Number of severely sleep disturbed people within the 40 dB(A) $L_{night}$ contour	-15%	-15%

### ***Approach***

Changing the  $L_{den}$  noise abatement objectives doesn't affect the way the impact on the noise exposure of the combination of measures is determined. The proposed combination of measures as presented in the third addendum (our reference 24.171.09) without the capacity reduction of the annual number of movements is the starting point for this additional calculation.

First, we have determined if the combination of measures will result in meeting all the noise abatement objectives (see table below).

Measure	Number of highly annoyed people within 48 dB(A) $L_{den}$	Number of houses within 58 dB(A) $L_{den}$	Number of severely sleep disturbed people within 40 dB(A) $L_{night}$	Number of houses within 48 dB(A) $L_{night}$
Baseline scenario	111,955	6,962	24,502	5,750
Noise abatement objective	-15%	-15%	-15%	-15%
Impact of combination of measures	96,616 (-13.7%)	6,178 (-11.3%)	15,412 (-36.8%)	3,356 (-41.6%)
Impact on noise abatement objectives	Objective is not met (-1,3%)	Objective is not met (-3.7%)	Objective is met	Objective is met

The results of these combination of measures leads to the following observations:

- Based on the results it can be concluded that the  $L_{night}$  noise abatement objectives of -15% are met with a significant margin;
- The  $L_{den}$  noise abatement objectives of -15% are not met with the combination of measures. A capacity reduction measure of the total number of movements is required to meet the  $L_{den}$  noise abatement objectives;

The  $L_{den}$  noise abatement objectives of -15% are not met with this combination of measures. A capacity reduction measure of the total number of movements is required to meet the  $L_{den}$  noise abatement objectives. The estimated required capacity reduction of the total number of movements to meet all the noise abatement objective has been determined based on the results of previous calculations:

1. Combination of measures including a capacity reduction to 480,000 movements;
2. Combination of measures including a capacity reduction to 475,000 movements;

## Results

The table below provides an overview of the results of the calculations that have been performed to identify the combination of measures that meet all the noise abatement objectives.

Measure	Number of highly annoyed people within 48 dB(A) $L_{den}$	Number of houses within 58 dB(A) $L_{den}$	Number of severely sleep disturbed people within 40 dB(A) $L_{night}$	Number of houses within 48 dB(A) $L_{night}$
Baseline scenario	111,955	6,962	24,502	5,750
Noise abatement objective	-15%	-15%	-15%	-15%
Impact of combination of measures	96,616 (-13.7%)	6,178 (-11.3%)	15,412 (-36.8%)	3,356 (-41.6%)
Impact on noise abatement objectives	Objective is not met (-1,3%)	Objective is not met (-3.7%)	Objective is met	Objective is met

Impact of combination of measures incl. capacity reduction to 480.000 movements	92,596 (-17.3%)	5,947 (-14.6%)	15,412 (-37.1%)	3,356 (-41.6%)
Impact on noise abatement objectives	Objective is met	Objective is not met (-0.4%)	Objective is met	Objective is met
Impact of combination of measures incl. capacity reduction to 475.000 movements	91,619 (-18.2%)	5,880 (-15.5%)	15,412 (-37.1%)	3,356 (-41.6%)
Impact on noise abatement objectives	Objective is met	Objective is met	Objective is met	Objective is met

The results of these combination of measures leads to the following observations:

- Based on the results it can be concluded that the  $L_{night}$  noise abatement objectives of -15% are met with a significant margin;
- The  $L_{den}$  noise abatement objectives of -15% are not met with the combination of measures. A capacity reduction measure of the total number of movements is required to meet the  $L_{den}$  noise abatement objectives;
- The required capacity reduction of the total number of movements to meet all the noise abatement objectives (without overshooting the objectives) lies approximately between 477.000 movement and 478.000 movements per year. This bandwidth is based on the results of the calculations of the combination of measures including capacity reduction to 480.000 and 475.000 movements per year.





