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Calculating Aircraft Utilization

Purpose – This project introduces the equation for calculating aircraft utilization and describes the parameters in the equation. Aim is also to point out differences in the notation used in the literature.

Methodology – Aircraft utilization is explained based on the chapter "Design Evaluation / DOC" from the lecture notes "Aircraft Design" by Scholz (2015). Parameters that are kept generic in this reference, are mapped to reality with definitions from Thorbeck's DOC method from TU Berlin. Statistics of these parameters are obtained from a literature review.

Findings – Aircraft utilization depends on two parameters. The block time supplement (taxi time plus turnaround time) and the annual operation time (annual potential operation time minus annual downtime). Downtime is caused by scheduled maintenance (A, B, C, D checks), un-scheduled maintenance (repairs), and night curfew. Practical values are given. Taxi time (in and out) is together about 20 minutes.

Research Limitations – Turnaround time can vary widely (both among aircraft types and airline philosophies). Delays can change turnaround and taxi time. Maintenance programs are structured differently among airlines, and night flying regulations are much different at different airports. Fixed values do not exist for these parameters.

Practical Implications – It is essential for airlines to keep utilization high. The project shows how this can be achieved.

Social Implications – Public and airline interests clash when discussing night curfew (Figure 1). Noise versus profit. Utilization is the parameter in question.

Originality – A comparable report with a review of aircraft utilization was not found.

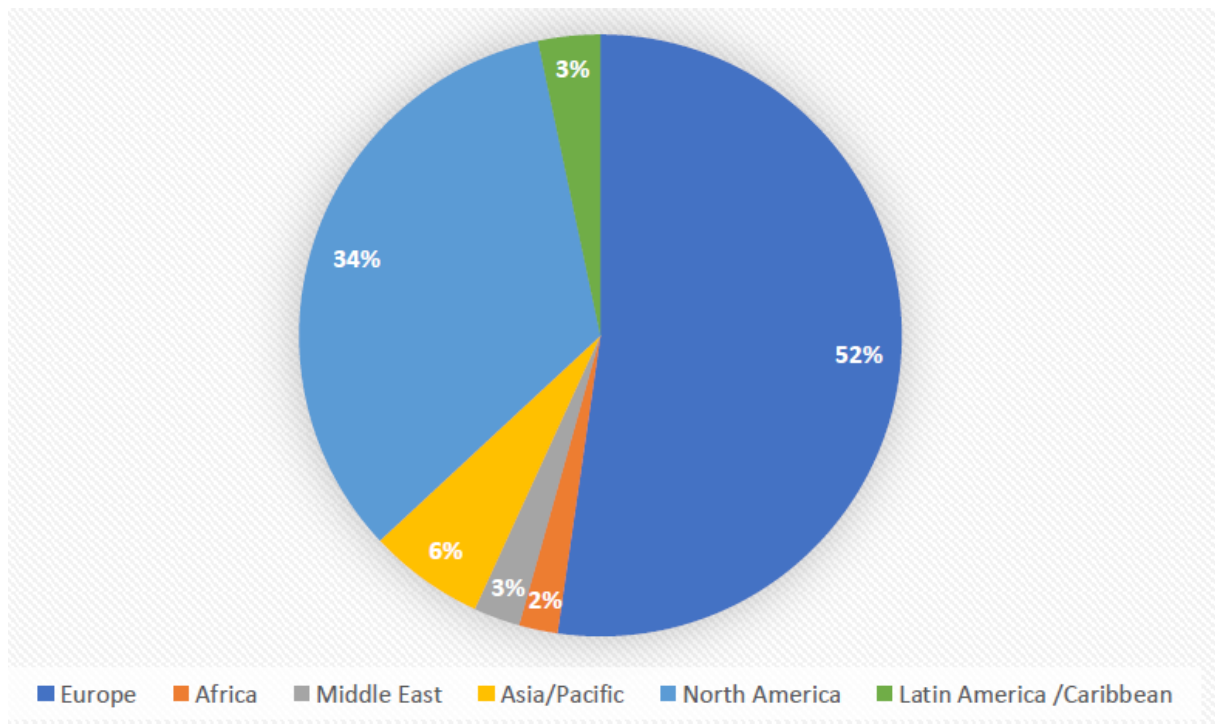This informative poster is based on a student project with the same title. Details here:
https://nbn-resolving.org/urn:nbn:de:gbv:18302-aero2022-06-07.017

Figure 1:   Distribution of airports with night flight restrictions (ICAO 2013)

This is an abstract answering the Call for Papers of the German Aerospace Conference 2025 for an informative poster at the conference.

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