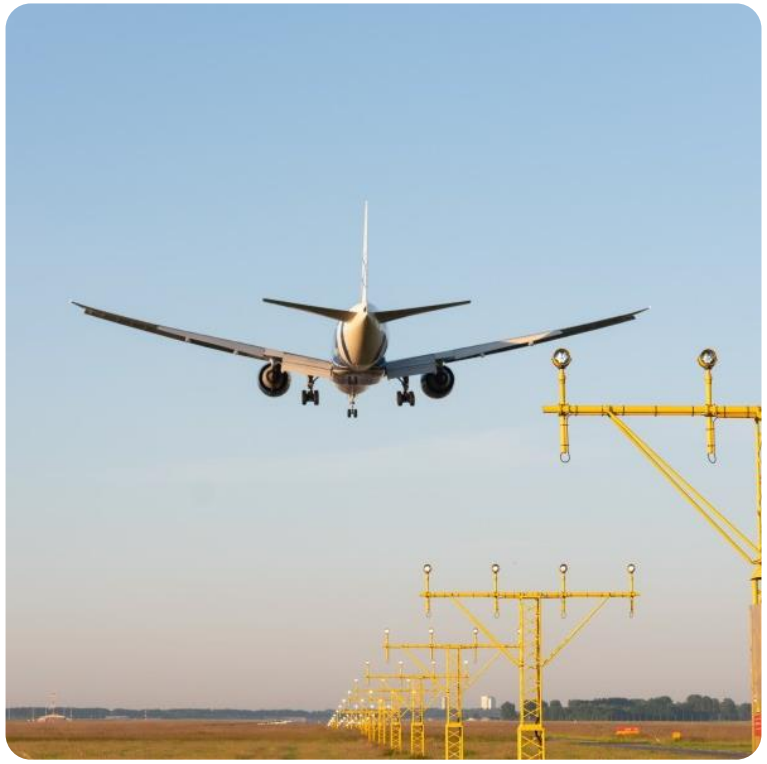

Night Measures for Schiphol

A study on the likely effects of proposed night flight measures and three variant approaches for a potential curfew at Schiphol Airport upon the aviation sector and air connectivity of the Netherlands

Final Report (English Version) - Update

27 September 2024

Prepared for:

Ministry of Infrastructure and Water Management

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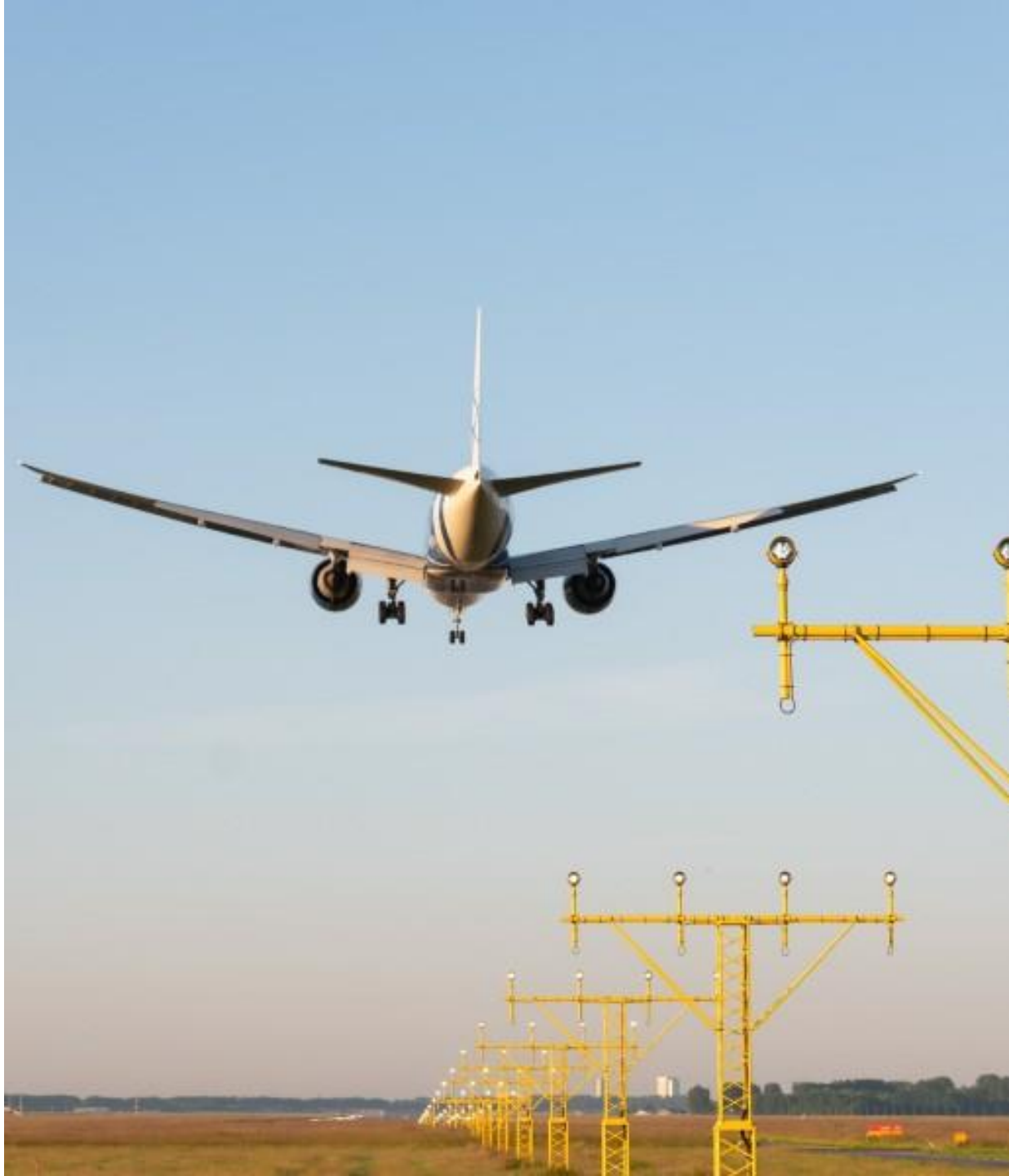

Source: Amsterdam Airport Schiphol

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Executive Summary

PA Consulting has completed an independent study of possible options related to night flights at Schiphol Airport

PA Consulting Services B.V. (hereafter PA) has reviewed the likely impact of a number of measures at Schiphol Airport with regards to limiting night-time nuisance, including three varying scenarios for a potential night curfew, upon the aviation sector in the Netherlands on behalf of The Ministry of Infrastructure & Water Management

In doing so we analysed available slot and scheduling data and consulted numerous stakeholders including those advocating for curfew implementation, those that were concerned about the curfew being implemented and those who will be tasked with facilitating and managing whichever policy comes to pass.

Three Variants of the night curfew were considered with Variant 1 being the most restrictive, Variant 2 resembling the one put forward in the 2023 Schiphol '*Achtpuntenplan*'[1] and Variant 3 being less restrictive in its guidelines and the time period covered.

Various other potential Measures were also put forward with a goal of minimising nuisance in the night period, four of which we evaluated.

This document represents Part A of the Study. A second document, Part B focused on the noise, nuisance and hindrance aspects of the issue, will be delivered by To70, Decision and Beelining working independently but with inputs from our assessment.

[1] https://www.schiphol.nl/nl/schiphol-group/pagina/kiezen-voor-een-stiller-schoner-en-beter-schiphol/

The focus of the study has been the likely impacts on the aviation industry; however, perspectives from other stakeholders are also captured

The clearest conclusion that can be drawn from the consultations is that the design of the proposal put forward (both the Variants and Measures) inherently leaves little common ground between the interests of the airline sector and those of the groups in the Schiphol community.

Some measures put forward are potentially achievable but, depending on when they might be implemented on a timeline between now and 2030, could be seen as a further point of contention between industry and community interests.

As presently framed, the options are somewhat binary in terms of those who stand to gain or lose the most from a curfew and other measures.

While from a local community noise hindrance perspective a curfew is clearly desirable, from an aviation perspective it risks causing significant impact on the operators financially and operationally, potentially reducing consumer choice and disrupting important supply chains.

This report was commissioned to evaluate the impact on the airline sector. The focus is therefore primarily on those parties though we have included input from other key impacted stakeholders including MRS and BRS.

Royal Schiphol Group (Schiphol) uniquely has stood in the middle, indicating that Variant 1 is inherently too damaging to the Dutch aviation sector but that the other Variants and the Measures are, in some form, worthy of consideration.

Trying to value two important but differing agendas is clearly something that must be left to the elected representatives of the Dutch population who form their government.

PA has sought to equip the Ministry of Infrastructure and Water Management with the best information and insights we can, to ensure that consequences (intended and unintended) for the government and industry are properly understood as future policy is developed.

The airline industry claims to have taken a range of other measures to address sustainability objectives and have set out many of their views in publicly available documents. We have not evaluated those measures.

While many airlines would be impacted and have been considered, home-based carriers warrant the greatest attention

The report may appear to focus a disproportionate amount of attention on the AirFrance-KLM Group Companies (KLM, Transavia and the Martinair freighter operation) This is not to discount the concerns of others so much as to acknowledge that they are by far the most impacted parties by what is proposed.

This is due to:

- The three carriers within the AF-KLM Group hold the vast majority of nighttime slots (78%) and therefore they carry most of the impact.
- A base carrier in any market is inherently impacted more than other since most of its aircraft will seek to maximise utilisation but ideally seek to start and finish their day at Schiphol.
- In the case of widebody long haul aircraft, both KLM and Martinair often try to fly through the night and return in the early morning to allow another departure later the same day.
- While the Group has the most slots, they have flexibility limitations if they hope to maximise utilisation and remain cost efficient and competitive.
- The entire fleet of the three carriers flows through Schiphol while most other carriers have the ability to reallocate aircraft destined for Schiphol to meet the requirements of the measures proposed.

The fleet replacement plan of the AF-KLM Group spans to 2030 which, in aircraft delivery terms, is not far in the future but they can only meet the proposed Measures gradually beforehand.

This can be considered in the context that the AF-KLM Group and many other airlines believe they are already taking significant steps, including investing €m's in fleet replacement, to reduce noise and improve air quality.

TUI, Corendon and easyJet also have Schiphol bases. TUI and Corendon are also impacted but all of these carriers have access to commercially viable redeployment opportunities that would not be readily available to KLM or Transavia.

Three night curfew Variants have been defined for the impact assessment study undertaken

A (partial) night closure refers to a daily recurring consecutive period of suspension of aviation activity for all or part of the night period. This is presently defined as 23:00 in the evening until 07:00 in the morning plus the shoulders (a 20 minute buffer in place between the parking stand 'slot' and the actual runway occupancy), during which no regular (planned) air traffic is allowed to take off or land at the airport.

Three illustrative scenarios were created (Variants) although these are not definitive. They can be adjusted or amended as policy makers see fit but we believe they allow an overview of the likely impacts of a strategy to implement curfew.

A partial night closure can be implemented in many ways. What is certain is that the length of the closure and the start and end times of that closure will affect noise, nuisance, operational and business economic aspects and other matters. It is therefore important to visualise the implications of this on the basis of a limited set of Variants.

	Definition	Characteristics	Rescheduling
Variant 1: COMPLETE CLOSURE IN THE NIGHT PERIOD	• Variant 1 is a complete night closure from 23:00 to 07:00 (night period) for take-off and landing air traffic.	Night closure including shoulders: • Arrivals 23:00-7:19 • Departures 22:40-6:59	• Reschedule only in the daytime
Variant 2: NIGHT CLOSURE ALIGNED TO THE SCHIPHOL 2023 ACHT PUNTENPLAN	• Variant 2 is Schiphol Group's proposal from their Eight-Point Plan for a night closure from 00:00 and 05:00 for landing aircraft and from 00:00 to 06:00 for take-off aircraft.	Night closure including shoulders: • Arrivals 00:00-05:19 • Departures 23:40-05:59	• No rescheduling within the night period not impacted by curfew, only in daytime. • Slot swaps allowed between arrivals and departures
Variant 3: LIMITED CURFEW WITH SHOULDERS APPLIED ON BOTH SIDES	• Variant 3 is a proposed limited scenario with a five hour period of suspension of runway activity.	Night closure including shoulders: • Arrivals 00:20 - 05:19 • Departures 00:20 - 05:19	• Rescheduling allowed within the night period not under curfew and daytime. • Slot swaps allowed between arrivals and departures

All three Variants studied would result in a negative impact on the aviation industry, with Variant 1 the most impactful for home-based airlines

Each Variant impacts the industry to a material degree, but some are potentially less damaging than others.

All 3 Variants produced significant negative impacts for the aviation sector. Variant 1 impacted KLM as well a wide range of foreign airlines who depend on the hub structure that exists today. The cargo and integrator sector as well as the holiday airlines are also severely impacted. Variant 2 and 3 had no direct impact on KLM and most other long-haul operators but continued to have an impact on holiday carriers, integrators and cargo operators. For Variant 3, the impact remains but is significantly moderated. Many raised a concern that all variants may compress the day and create challenges for facilitating parties including LVNL and Schiphol.

	Overall impact
Variant 1: COMPLETE NIGHT CLOSURE	• The financial impact of Variant 1 is the highest with severely damaging impacts upon the entire sector. • The majority of the airlines based outside of the Netherlands that are impacted should be able to accommodate the changes with limited disruption. Home-based carriers will suffer a disproportionately high level of impact. • Transavia and KLM may need to undertake independent but significant restructuring of their respective businesses. • Schiphol's leading hub position (inherently tied to KLM) will be eroded and would be challenged to be considered a peer to Frankfurt, Paris, London, Istanbul and others. • We have not identified any option that allows the integrators (DHL / FedEx) to maintain their current product. However, special measures could be put in place if it was deemed necessary not to disrupt these supply chains.
Variant 2: INTERMEDIATE NIGHT CLOSURE	• Variant 2 is less damaging to the industry than Variant 1 as it does not hit the core of the hub structure but mainly impacts the home-based leisure airlines, cargo integrators and freighter operators. • The impact upon them is significant and will certainly impact their profitability and competitiveness. • It will also have a further impact upon freighters.
Variant 3: BALANCED CURFEW WITH SHOULDERS APPLIED ON BOTH SIDES	• Variant 3 has limited damage, primarily to the Dutch based holiday carriers and the integrators. • There could be some impact upon the freighter sector • In all cases, we assume the parties will be able to adjust to accommodate this scenario even though there could be some impact on the resilience, quality and costs of the products delivered by these carriers. • Variant 3 is the least impactful change upon the aviation sector and the most achievable of the three options proposed as it is likely to shift activity to late evening and early morning, but any related hindrance impacts will be addressed within the parallel study.

In addition to the Variants defined, a number of additional / alternative Measures have been considered

In addition to the scenarios whereby noise pollution caused by traffic landing and taking-off at Schiphol is reduced to zero during specified hours of the night, the Ministry also requested insights into other targeted measures that can be taken to substantially reduce noise pollution at night.

6 Measures were proposed by the Ministry, 4 of which fell into areas PA was able to comment on. Specific characteristics for the measures were not defined, therefore there is only an overview approach to the assessment with much less detailed analysis than with the Variants.

	Definition
Measure 1	• Prohibition of certain types or noise classes of aircraft at night
Measure 2	• Reducing the use of noisy appliances in other ways, for example by differentiating tariffs;
Measure 3	• Night quotas for aircraft types;
Measure 4	• Penalty system for latecomers;

Measures 5 and 6 were in areas that were closer to Part B of the assessment carried out by our counterparts.

The lack of detailed characteristics resulted in the airlines being unwilling to offer little more than high level commentary. A key issue of concern was the lack of a timeline for likely implementation. Some indicated that some of the points suggested would be worthy of consideration if a reasonable timeline was set out.

Furthermore, the airlines generally felt that the views they had put to government previously, which are articulated in the *'Schoner, stiller, zuiniger'*[1] and the 10 commitments made in *'Toekomstbestendige luchtvaart voor Nederland'*[2], had not been fully considered so there was a reluctance to engage on these alternatives.

[1] https://nieuws.klm.com/plan-klm-groep-geeft-grotere-reductie-geluidshinder-in-de-nacht/
[2] https://www.nlr.nl/wp-content/uploads/2024/01/Luchtvaartsector-inbreng-Regeerakkoord-PAMFLET-10-commitments-Toekomstbestendige-luchtvaart-voor-Nederland-2023-2027-v.final-11-januari-2024.pdf

The Measures warrant further exploration and clearer definitions along with detailed and realistic timelines

Concerns were raised by the airlines that the Measures needed specific guidelines and clear definitions, along with a detailed and realistic timelines for implementation. The overriding concern is that the actions proposed did not take into account the time required to secure newer models from the manufacturers.

At a higher level, it would seem that the dialogue between government and the sector has been challenged by events in recent years. Industry players, rightly or wrongly, expressed a view that they feel they are not being heard nor being given due consideration. PA has not been part of this process so we cannot agree nor disagree with the comments noted, and we are aware that the Ministry holds differing views on this point.

Still, the industry was specific in saying it would be helpful if the government could set out an achievable long-term target and not revise policies within timeframes that are unachievable. They also requested that targets and goals could be discussed before public policy expectations are set out in a way that may not be reasonably achievable.

For the specific Measures proposed, PA believes that they may have longer term benefits for 2030 and beyond but to implement them sooner may lead to an outcome that is punitive to the carriers and not within their gift to resolve. Measure 1 and 3 could be effective in the longer term. Measure 4 is the one that requires far more detailed forethought before considering when and how it might be implemented.

Overview of the assessment of the proposed measures

	Assessment
Maatregel 1: PROHIBITION OF CERTAIN TYPES OR NOISE CLASSES OF AIRCRAFT AT NIGHT	• PA believes that prohibition of certain types and classes of aircraft at night is a tool that is open to government and should be considered, but it will need to be phased in gradually recognising the available aircraft today and order books for the existing carriers. • Demanding to an airline to meet a goal in one or two years when the manufacturer has no ability to deliver that aircraft for up to five years or more serves as an unrealistic expectation upon a carrier who has demonstrated a financial commitment to upgrade their fleet.
Maatregel 2: REDUCING THE USE OF NOISY APPLIANCES IN OTHER WAYS, FOR EXAMPLE BY DIFFERENTIATING TARIFFS;	• PA is of the view that differentiated tariffs are unlikely to modify behaviour of the majority of airlines and they are diluted within the carrier's cost structure. • Differentiated tariffs are already in place and it is unclear why increasing them further is likely to secure behaviours that have not already occurred. • There are only a limited number of flights where the airline can make a choice between one aircraft and another and for the rest of the operation this just becomes a punitive tariff until order books can be fulfilled as highlighted in our response to Measure 1.
Maatregel 3: NIGHT QUOTAS FOR AIRCRAFT TYPES;	• Night quotas for different aircraft types is something that can be discussed with the different carriers operating at Schiphol with a 5+ year outlook. • Commitments from each carrier that they believe they could live by in line with the new aircraft delivery strategies highlighted in Measure 1. • Collective quotas run the risk that carriers that stay within their targets run the risk of being penalised by others that don't within the assessed period.
Maatregel 4: PENALTY SYSTEM FOR LATECOMERS;	• PA is concerned that penalty systems do not tend to drive better outcomes. If they are too weak, they are just seen as a cost of doing business. If they are raised to punitive levels, they can be effective but cause airlines to simply cancel flights, leaving passengers in difficult situations. • There are penalties such as EU-261 that are meant to drive airlines to operate on schedule with mixed results. Having more penalties may not improve matters further if key factors are beyond the airline's control. A significant issue is what is and is not deemed force majeure.

The PA team has also proposed additional ‘Alternative Measures’ that are considered achievable and could create a win-win outcome

The Ministry asked PA to propose alternate Measures beyond those out. After careful consideration of a number of ideas, we felt that three of them were worthy of further consideration.

These are only ideas to consider and will likely require appropriate policy and legal review as well as a public consultation process.

None of them will remove the issue of night slots, but we believe they have the potential to contribute, to a limited reduction in the hindrance experiences even if they only manage to reduce a small percentage of slots going forward.

While the impact may be limited and it certainly will not resolve the wider matter, these proposals offer the opportunity to make more immediate progress since the Variants and other Measures proposed have a high likelihood of being subject to legal challenge from whichever party feels they either did not achieve their goals or that their interest were compromised.

We believe Alternative Measure 7 & 8, if carefully designed have the chance to be seen as a potential win for all stakeholders, avoiding the otherwise binary equation that has developed between the aviation industry and the community groups.

The major disadvantage to each of these three Measures is that while we believe they are achievable, they are also only likely to have a limited success in reducing more than a small portion of the total night movements.

	Overall impact
Alternative Measure 7	• Set out policy to allow slot trading for compensation in the Netherlands with a structure that only allows night slots to be traded for day ones • The value of sale exists since no further day slots (movements) are available for airlines wishing to serve/increase service to Schiphol.
Alternative Measure 8	• The airport and/or government offers financial or other incentives (Subject to appropriate reviews to avoid state aid claims) to reward a public good of a night slot being forfeited in exchange for a day one • This may be more attractive to AF-KLM Group who would not necessarily want to sell to a potential competitor per Alternative Measure 7
Alternative Measure 9	• Discontinue the allocation of any further ad hoc slots in the night period • This would not be well received by the freighter, integrator and charter market but is a measure the government can implement promptly

Overall impact levels of on key stakeholders

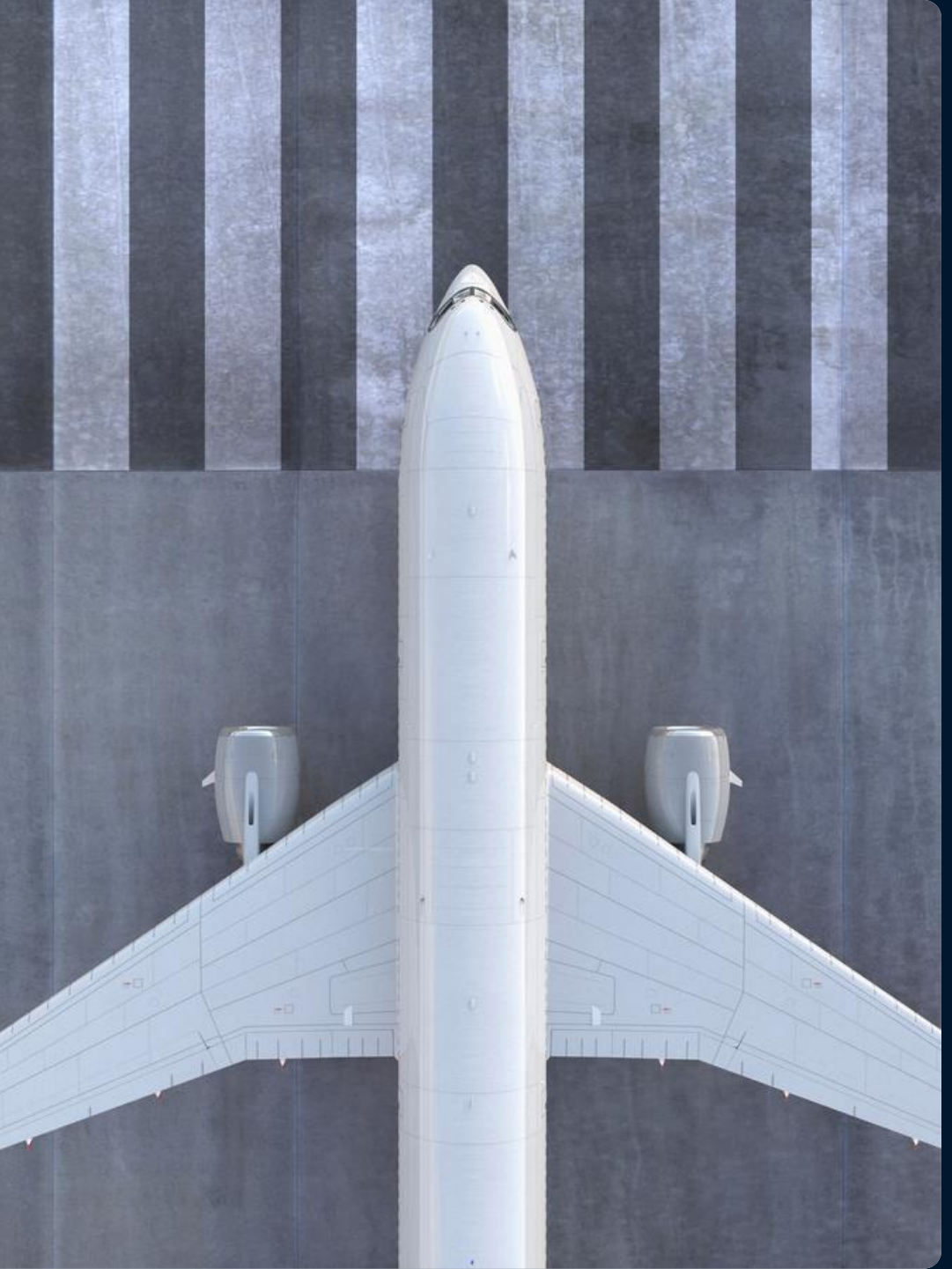
Summary of the impact of reviewed variants on Stakeholders

		Variant 1	Variant 2	Variant 3	
Airlines	Impact on KLM				KLM is concerned about all scenarios but only Variant 1 impacts their planned schedule directly.
	Impact on Transavia				Transavia is one of the most impacted parties in each Variant
	Impact on Corendon/TUI				These parties are impacted but have more mitigation opportunities through sister companies
	Impact on easyJet				easyJet experiences minimal impact but is concerned about the impact on Schiphol's resilience
	Impact on other passenger airlines				Other carriers' concerns were presented via BARIN
Cargo	Impact on integrators (DHL/FedEx)				The integrators are among the most impacted parties by any Measures implemented
	Impact on all freighters (flights)				Even where the impact is minimal, Schiphol's leadership may see some erosion due to limited flexibility and capacity
Airport & airspace	Schiphol, LVNL, ACNL	Potential impact for Schiphol			The key issue for LVNL and ACNL would seem to be the timing for any material change – not the change itself
Community	Impact on consumers				The impact on consumers will be most apparent with Variant 1 but in most other scenarios, foreign carriers will backfill lost flights

No material impact	Significant
Limited impact	Severe impact

Summary of the impact of Measures

- **Measure 1 and 3** will only be functional if they can be implemented in a gradual manner over a number of years aligned with aircraft manufacturing capacity.
- If imposed too soon, it will disproportionately impact the AF-KLM Group airlines, freighter operators and the integrators. This is detailed in Chapter 6.
- It is not clear that **Measure 2** will modify airline behaviour in any case.
- **Measure 4** can be pursued but if the penalty is too weak, airlines tend to absorb the costs while if it substantial it can drive cancellations and other behaviours that may have a significant negative impact upon consumers but only offer a limited noise reduction benefit.



01 Introduction & objective

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Introduction to the study scope and context

PA, in agreement with the Ministry of infrastructure and Water Management (hereafter the Ministry), assessed the likely impact upon Dutch aviation of various night measures including three possible Schiphol night curfew Variants and four other Measures. The assessment takes into account feedback from stakeholders including community groups, the airport, the airlines (both passenger and freighter) and their representative bodies, as well as industry bodies including ACNL, ILT and LVNL.

This report assesses the impact of three Variants and four Measures that move Schiphol away from the status quo, and the modelling of each Variant is based on three sample weeks of airlines' schedules. The outcome of the modelling of the sample has been amalgamated and expanded to represent a view of a full-year impact. This is a frequently used industry methodology to secure an indicative impact of various variants.

The PA team includes three members who have executive level airline network planning experience. With that background the team have focused on using their insights and experience to identify possible strategies and mitigations the airlines might consider as feasible.

It is important to highlight that while airline schedules are accessible, financial, commercial and strategic data is not so it is difficult to determine likely mitigation and rescheduling strategies the airlines might employ to address impacted flights within each Variant.

Taking all the above factors into account, the reader should see this assessment as illustrative, though reliable for comparing impacts upon the aviation community at a high level. We believe the delta between the status quo and the three Variants is clearly spelled out, and from that, the reader has a better understanding of the impact this might have upon each of the major stakeholders.

Please note that many different parties expressed strong concerns, and we do not question the sincerity of their claims as seen from their perspective. We have not attempted to judge which issues have more merit to the Netherlands as this is a role for policy makers. We also recognise that different parties feel that each Variant laid out may cause varying levels of harm to their interests. We have tried to simply illustrate the consequences, both intended and unintended, upon Dutch aviation of each Variant, should it be implemented without judging wider implications.

The primary focus of the study has been the likely operational and commercial impacts on airlines and other industry segments of the defined scenarios

The first part of the work sets out the assumptions and describes the three Variants PA has modelled plus other measures considered, based on the expected behavioural responses of the airlines. This impact analysis aims to provide answers to the following questions put to us by the Ministry:

1. What are the operational and business economic effects on individual airlines and segments that currently operate at night at Schiphol?

- In each case focus is on the top-5 airlines that operate at night, and on those that operate with different business models: network carriers, leisure airlines, LCCs, air freight and express services.
- Specific attention was given to the ability/inability of some operators to retime their night operations to times between 07:00 and 23:00 at Schiphol and, where possible, highlighting risks at the other end of the route.
- Practical considerations including slot, aircraft and crew availability determine much of what the airlines can (and cannot) do in each Variant. This is a theoretical model, based on a view of what will likely occur if everything works out as would normally be expected. In our experience, the airlines are unlikely to successfully execute 100% of the proposed measures though we cannot predict where exactly things may go awry. Therefore, this should be considered a realistic assessment of the impact that potentially errs upon the side of optimism. If individual carriers are unable to enact the mitigations proposed, the effects could be more negative than envisaged.
- General Aviation (GA) is not included in this study, nor are positioning flights which are sometime required for maintenance or irregular operations requirements and are needed to restore schedules. Government, Military, Coast Guard and Air Ambulances services are also excluded from the analysis, as they operate under a different regime. That said, if the airport is fully closed at night (over which there are mixed views) it is not clear if and how such services will be supported.
- The research methodology uses a bottom-up approach that looks at current actual slots and operations at night, rather than applying generic assumptions to the published timetable. This should produce a more realistic overview of the likely impact of each Variant, should it be implemented.

We will look at some of the likely impacts on network quality including potential impacts that PA feels are worth noting, even if they do not fall within the definition for Network Quality as published by the Ministry.

Additional considerations have included wider industry impacts across the industry and the Netherlands

2. What are the **preconditions and sensitivities** of the Variants or Measures?

- PA considered the potential impact of flights arriving early in the morning, before the closure ends, or departing late, after the closure has started.
- PA also assessed how different implementation time-frames may drive different reactions and impacts.

3. **What are the effects on (the use of) regional airports?**

- PA considered the impact on diversions and the ability to deal with other operational challenges.
- PA assessed the opportunities to relocate flights to other airports, including – possibly in the future – Lelystad.

4**. What is the effect on connectivity for the Netherlands (network quality)?**

- PA explored the impact on overall connectivity of the Netherlands by testing different variants against the principles of the network quality policy framework.
- This also includes the effect of the variants on:
  - the hub-and-spoke model in place at Schiphol, and
  - the effect on the freight sector.

*Note: A separate, more technically focused study is being undertaken by the aviation consultancy To70 and partners (Part B) to focus on, amongst other topics, the noise impacts on the residential communities adjacent to Schiphol. It will be informed by some of the details and data from our report**,** but the two documents have been drafted independently.*

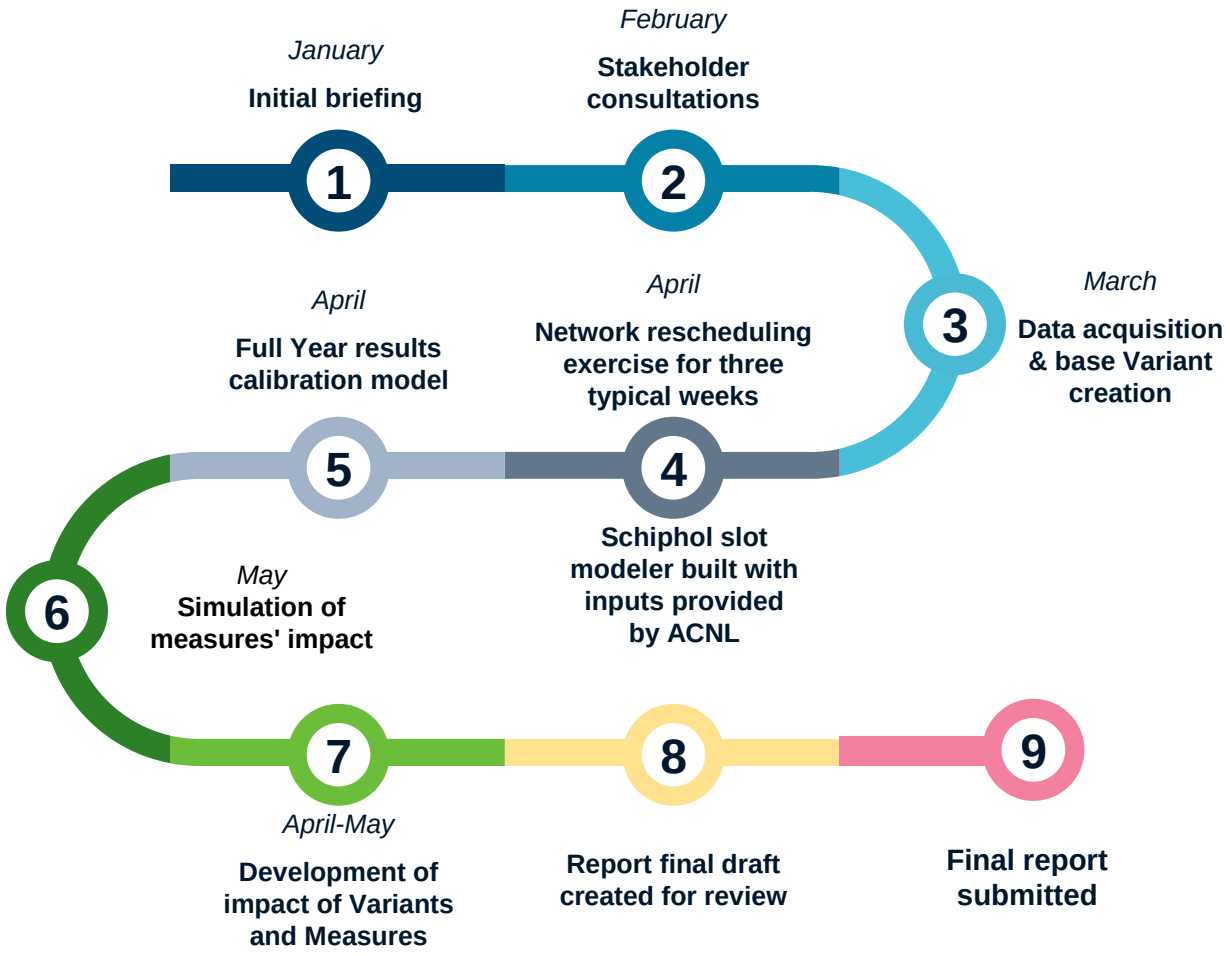
The study process has lasted around 5 months, including primary and secondary research

PA has been engaged in this process since the beginning of 2024.

All parties and/or their representative bodies had a chance to present their views. In the case of the most impacted parties including KLM, Martinair, Transavia, DHL, FedEx and others, follow on sessions were held to make sure our assumptions were consistent with their understanding of the situation, though we did not compare our modelling directly to any efforts being carried out by those carriers. These further conversations ensured this paper contained the widest understanding of all the consequences of the proposed curfew.

The final paper does have some open questions that would be difficult to answer due to external factors as well inability to access commercially sensitive information, but it has also explored consequences that were not identified or fully appreciated (by ourselves included) at the start of this assignment.

Key to this process is a a detailed rescheduling exercise applied to all three Variants. The rescheduling methodology is articulated in detail in Chapter 5.



19 in-depth interviews have been conducted across the airport stakeholder community

In order to gain a good insight into the effects of a night curfew and specific measures, PA interviewed a stakeholders representing all aspects of the industry and the community.

During the in-depth interviews, the effects of the Variants and Measures on individual stakeholders were explored. This engagement was a mix of face-to-face and digital meetings.

Questions were focused on 5 key elements:

- Overall concerns
- Stakeholder specific questions: how the Variants & Measures impact their organization's objectives and/or business model
- Timing / phasing in period required for any measures and other implementation challenges
- Input to a third Variant of a night curfew and measures
- Alternative suggestions to address public concerns

The discussions were not consistent. Some parties chose to engage within the framework created while others did not accept the legitimacy of the process as structured. In those cases, the conversations were reformulated to elicit key information without compromising their views.

In total PA interviewed 19 parties from both community groups and industry stakeholders

Figure: Overview of key stakeholders interviewed

Community stakeholder groups

- Maatschappelijke Raad Schiphol (MRS)
- Bestuurlijke Regie Schiphol (BRS)

Dutch passenger airlines

- KLM Royal Dutch Airlines (KLM)
- Transavia
- Corendon
- TUI

Other airlines and their representative bodies

- Delta
- easyJet
- Board of Airline Representatives in the Netherlands (BARIN)
- Dutch Association of Travel Agents and Tour Operators (ANVR)

Cargo (freighters) and Integrators (express couriers)

- Air France KLM Martinair Cargo (hereafter Martinair)
- DHL
- FedEx
- Air Cargo Netherlands (ACN)
- European Express Association (EEA)

Other stakeholders

- Royal Schiphol Group (Schiphol)
- Luchtverkeersleiding Nederland (LNVL)
- Airport Coordination Netherlands (ACNL)
- Inspectie Leefomgeving en Transport (ILT)

Introducing the structure of this report

A matrix of issues arises from the 3 Variants and the other measures proposed. PA developed this paper with the following structure to help the reader navigate the issues at hand:

Chapters 1 to 3 are focused on introducing the objective and chosen approach and methodology. General introduction to capacity allocation and management

Chapter 4 provides an overview of different night curfew and enforcement regimes at other airports

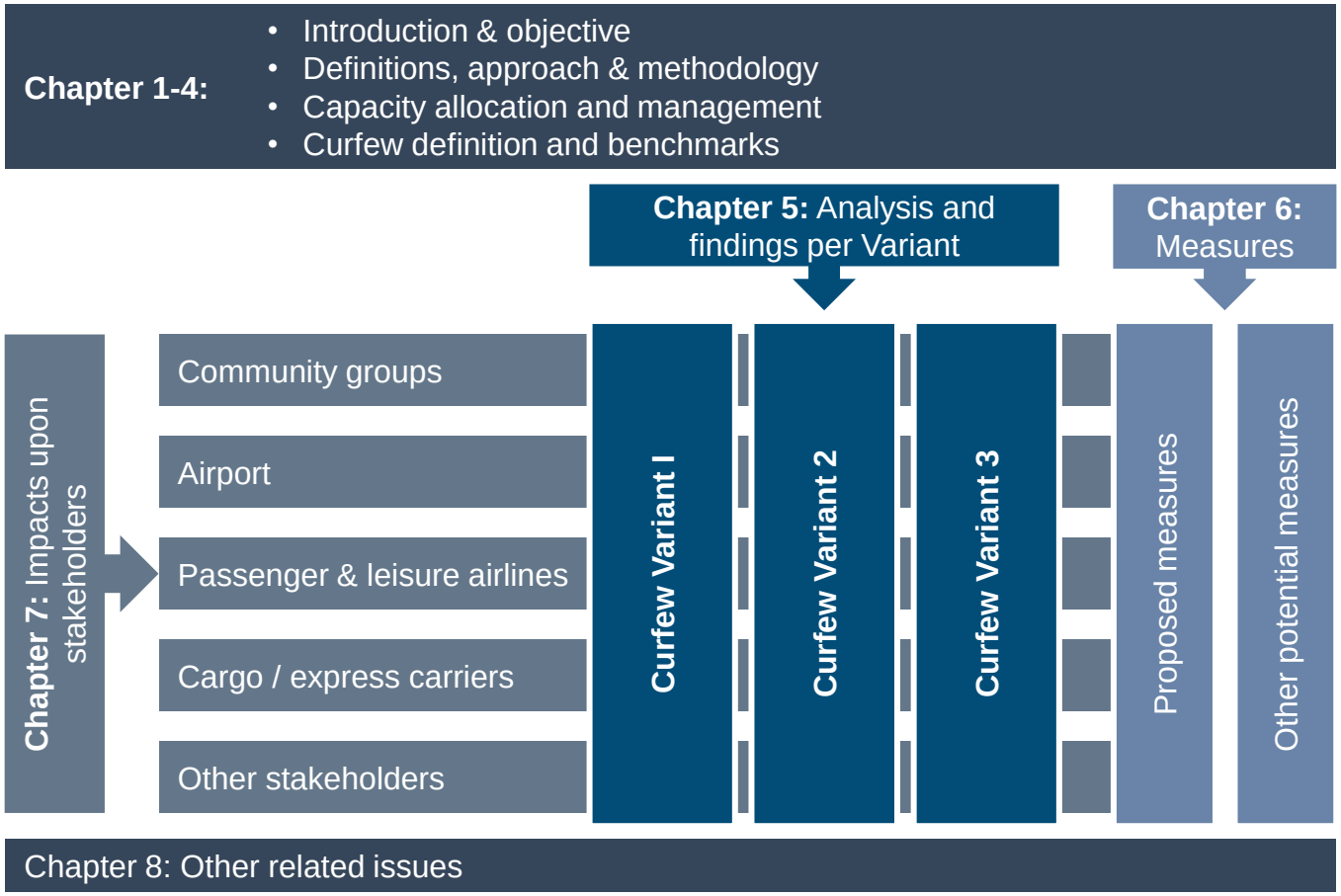
Chapter 5 focusses on the impact of the 3 Variants of a night curfew

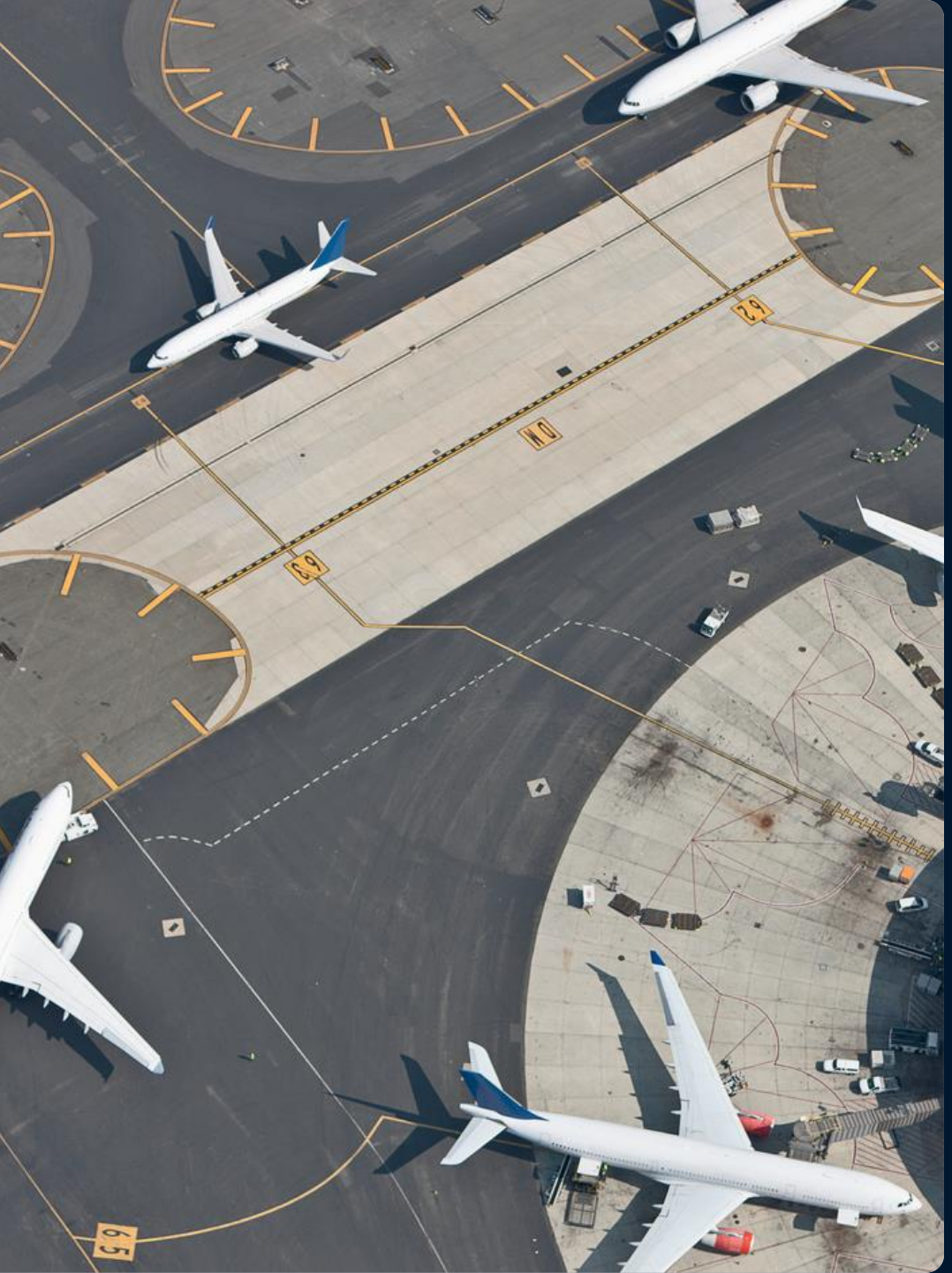
Chapter 6 addresses a review of proposed measures and provides other potential measures

Chapter 7 focusses on the unique impact upon stakeholders

Chapter 8 includes other related issues to this research

Figure: Overview of structure of the report





02 Definitions, approach & methodology

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Several sector specific technical terms are contained in the report, so the following definitions are included to help clarify the contents (1)

Slot	The EU Commission defines a 'slot' as meaning the scheduled time of arrival or departure available or allocated to an aircraft movement on a specific date at an airport coordinated under the terms of this Regulation. At Schiphol, a set number of slots are declared as night slots, the remainder are available for use during the daylight period.
Air Transport Movements	Landings or take-offs of aircraft engaged on the transport of passengers, freight or mail on commercial terms. All scheduled movements, including those operated empty, loaded charter and air taxi movements are included. *Note: Confusingly, ATM is also used for Air Traffic Management, defined by EASA as the aggregation of the airborne and ground-based functions (air traffic services, airspace management and air traffic flow management) required to ensure the safe and efficient movement of aircraft during all phases of operations.*
Scheduling Period	The EU Commission defines as scheduling period either the summer or winter season as used in the schedules of air carriers. The seasons are defined by IATA and published in the Worldwide Airport Slot Guidelines (WASG) as part of the annual Scheduling Calendar. The **Summer Season** usually runs from the last Sunday in March to Saturday in October and the **Winter Season** from the last Sunday in October to the first Saturday in March.
ATM Cap	At Schiphol ATMs are historically capped at 500,000 per year, which puts a limit on the number of slots that can be declared by Schiphol and allocated to operators by ACNL. In recent years, the airport has operated below the cap because of the Covid-19 pandemic and associated progressive recovery, plus other operational challenges. In this document we generally refer to slots, but the link to ATMs is important to keep in mind when considering the role that the cap plays in how much Schiphol capacity is available to use in each scheduling period.
Historic Rights (and 80/20)	From both the EU Slot Regulation and IATA WASG, Historic Rights are attached to a slot, meaning it is available in a future scheduling period, if the operator can demonstrate to the satisfaction of the coordinator that it has used the slot 80% of the time in the current scheduling period. Calculated Summer on Summer, Winter on Winter, it is often referred to as the '80/20 Use it or Lose it' Rule.

Several sector specific technical terms are contained in the report, so the following definitions are included to help clarify the contents (2)

Declared Annual Capacity	This is the allowed slot capacity during two consecutive IATA scheduling periods. It is defined and declared by Schiphol, then allocated by ACNL for each of the two periods in the scope of this study: Winter 23-24 and Summer 24. It is also published in a Capacity Declaration sent by Schiphol to ACNL, who then publish it on their website. The declared capacity used as the basis for this study is set at 482,741 slots, of which 31,766 are night slots. This parameter is a key limiting parameter for the airport.
IATA Seasons/year	The IATA slot year is composed of two seasons, a Summer and Winter season, and has 52 weeks (364 days). Therefore, the calendar year and the IATA year can lead to slightly misaligned numbers that need to be adjusted for.
Slot capacity	This is the allowed planning capacity for flights, as defined by Schiphol and assigned by ACNL every 5 minutes, twice yearly for the two IATA planning seasons. This delivered through a Declaration of Capacity Letter. It indicates the maximum number of departures or arrivals allowed for any given 20-minute period for any 24 hours day, with a further constraint placed upon certain periods during the day, with a maximum number of departures or arrivals during a rolling hour. This has left only a limited number of slots available at different points throughout the day.
Night period	The night period is set between 23:00 and 06:59 and it is the period for which the 31,766 night slots are allowed. This period has been maintained constant for all three Variants investigated.
Night planning Period	This period includes a 20-minute shoulder period which extends the night period for departures from 22:40 to 06:59 and for arrivals from 23:00 to 07:19. In order to schedule flights during these periods, an airline must have a Night Slot. But for clarity, the total slots for planning purposes is 33,709 when the shoulder periods are considered. Please see the next slide for further clarification.

Schiphol faces a number of specific capacity limitations today

As highlighted on the definitions slides, Schiphol has two different capacity classifications – Slots and Air Traffic Movements (ATMs) – as well as two different capacity regimes – day and night period.

The night period limit of 31,766 applies to movements on the runways of the airport. It is a reference that cannot be used by airlines as they do their schedule planning.

An airline schedule is defined by 'block time' - the total time spent taxiing then flying from when the plane moves off the blocks from its departure gate until it parks on blocks at its destination arrival gate. This is of course beyond the runway occupancy time.

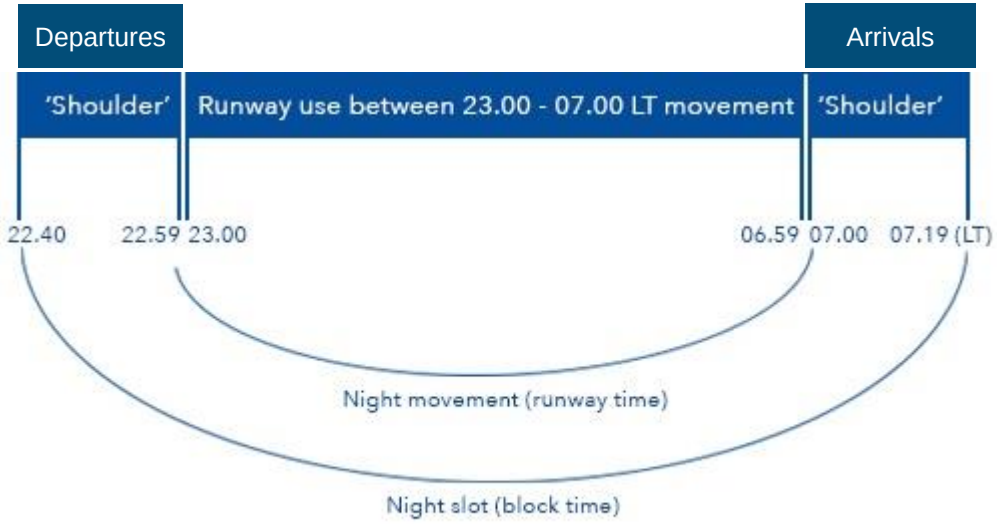
The permission to fly into an airport is therefore given by assigning two slots for each flight operated – one for when the plane departs from the gate at one airport and another for the gate arrival at a second airport. Slots are an internationally recognised system of allocating schedules.

Therefore, to align the runway limitations with planning limitation used by airlines (block times) and recognising the significant taxing distance between the terminal and certain runways, Schiphol differentiates itself from most other airports with a second constraint to the night regime. This is used to assign slot capacity to an airline, by applying an extra 20-minute shoulder period which practically brings forward the effective night period for departures to 22:40 until 6:59 while extending arrivals from 23:00 until 7:19.

This means that the total planned slots for the entire night period (when one includes the 20-minute shoulder periods) is higher than the 31,766 threshold that exists in the night period.

Therefore, for our assessment the total number of slots assessed was 33,551 (see the following page) of the total 33,709 in the night planning period which includes the shoulders.

Figure: Overview of night period *(Source: ACNL website)*



Overview of airlines with current night slots

- The home based carriers hold the vast majority of night slots.
- Early long haul arrivals feeding a bank of morning flights is consistent with the networks of most hub airlines.
- Certain North American and Asian carriers also arrive early to take advantage of night flying.
- The integrators are also prominent within this group.

Figure: Overview of (night) slots (movements) per airline by volume
(Source: Operators' published IATA Winter 2023/24 and Summer 2024 schedules as of 29th February 2024)

	Night movements		Total movements	
Airline	**Total**	**% of Night**	**Total**	**% of Total**
KLM	13,997	41.7%	256,576	5.5%
Transavia	11,711	34.9%	30,680	38.2%
TUI	1,703	5.1%	7,777	21.9%
Delta	1,302	3.9%	11,452	11.4%
Corendon	717	2.1%	3,026	23.7%
Martinair	619	1.8%	1,152	53.7%
DHL	618	1.8%	1,721	35.9%
Singapore Airlines	571	1.7%	1,300	43.9%
United Airlines	388	1.2%	3,332	11.6%
Cathay Pacific	351	1.0%	789	44.5%
FedEx Express	328	1.0%	416	78.8%
China Southern Airlines	327	1.0%	2,449	13.4%
Turkish Airlines	275	0.8%	4,368	6.3%
Air China	260	0.8%	1,040	25.0%
Nippon Cargo Airlines	209	0.6%	511	40.9%
easyJet	65	0.2%	36,188	0.2%
Pegasus Airlines	36	0.1%	2,126	1.7%
MNG Airlines	32	0.1%	164	19.5%
China Airlines	22	0.1%	416	5.3%
Emirates	20	0.1%	3,119	0.6%
Total	**33,551**	**100%**		

Three Variants have been defined, representing different night curfew options for consideration

The final definitions for Variants 1 and 2 were provided of by the Ministry while Variant 3 was agreed within guidelines after stakeholder consultations.

- Variant 1 is a full closure during the night period including the 20-minute shoulders in line with some community group ambitions
- Variant 2 is closely aligned with the 'Schiphol scenario' from the 2023 'acht punten plan'[1]
- Variant 3 is an alternative based on more limited parameters that tries to address many of the airline community's concerns.

Our approach is applied to the treatment of night movements at Schiphol and could be applied regardless of whether it is the presently declared capacity of Schiphol, ~483,000 (or up to the 500,000 ATM legal maximum – this difference will be addressed in the following slides).

A key focus of our efforts is to conduct an indicative rescheduling exercise to demonstrate how much capacity can be retained through retiming within the 3 Variants

	Current scenario	**Variant 1:** COMPLETE NIGHT CLOSURE	**Variant 2:** INTERMEDIATE NIGHT CLOSURE	**Variant 3:** BALANCED CURFEW WITH SHOULDERS APPLIED ON BOTH SIDES
Night Curfew definition	No curfew. Night period operates with limited activity: • Arrivals 23:00-7:19 • Departures 22:40-6:59	Night closure including shoulders: • Arrivals 23:00-7:19 • Departures 22:40-6:59	Night closure including shoulders: • Arrivals 00:00-05:19 • Departures 23:40-05:59	Night closure including shoulder: • Arrivals 00:20 - 05:19 (Runway) *00:40 - 05:39 (Planning)* • Departures 00:20 - 05:19 (Runway) *00:00 - 04:59 (Planning)*
Rescheduling Rules		• Reschedule only in daytime	• No rescheduling allowed within the parts of the Night Period that are outside of the curfew • Slot swaps allowed between arrivals and departures.	• Rescheduling allowed within the night period not under curfew and daytime. • Slot swaps allowed between arrivals and departures.

[1] https://www.schiphol.nl/nl/schiphol-group/pagina/kiezen-voor-een-stiller-schoner-en-beter-schiphol/

PA consulted stakeholders to develop the optimal airline scheduling option for Variant 3 within the guidelines provided by the Ministry

The main goal for determining Variant 3 was to propose a scenario less impacting for the airlines, allowing a better assessment of the balance between reduction of noise and maintaining viable operations.

The minimum condition given was to ensure 5 consecutive hours of closure.

Three different options were created and discussed with the Ministry following stakeholder consultations.

Variant 3b was finally selected because it facilitated a curfew while retaining the highest number of existing movements, thus requiring the least amount of schedule changes that could lead to cancelled services.

Figure: Overview of options for a possible third Variant

		Variant 3a	Variant 3b	Variant 3c
		5 hours balanced curfew with shoulders applied one sided	5 hours balanced curfew with shoulders applied on both sides	5 hours staggered curfew with shoulders applied one sided
Departures	**Runway closure**	00:00 - 04:59	00:20 - 05:19	00:00 - 04:59
	Planning closure	23:40 - 04:59	00:00 - 04:59	23:40 - 04:59
Arrivals	**Runway closure**	00:00 - 04:59	00:20 - 05:19	01:00 - 05:59
	Planning closure	00:00 - 05:19	00:40 - 05:39	01:00 - 06:19

The Variants have been defined to a high level of detail

Defining the 3 Variants
The definitions for the first two curfew Variants evaluated were provided by the Ministry while the third was chosen as noted above.

We complemented the definitions by clarifying key details to support a rescheduling model within the parameters noted including the application of rescheduling rules to the night period that did not fall within the curfew for Variant 2 and 3

For Variant 3, we applied the 20-minute shoulder period to both sides of each threshold, arrivals and departures, to better secure the benefit on one side by offsetting the loss on the other. In Variant 1 & 2 this does not occur which only extends the effective curfew.

- For the threshold set at 05:19, the application of the 20-minute shoulder is:
  - Arrivals: +20 minutes so 5:39
  - Departures: –20 minutes so 5:00
- Similarly, for the 00:20 threshold, the application of the 20-minute shoulder is:
  - Arrivals: +20 minutes so 00:40
  - Departures: –20 minutes so 00:00

In Variant 1 rescheduling of flights occurs only outside of the night period, but we introduced the possibility of partial rescheduling for Variant 2 and full rescheduling to capacity for Variant 3.

The references used for capacity declaration are the Schiphol letters dated April and December 2023, reflecting the capacity declared by Schiphol Airport, where the night planning limit is set at 33,709 while the operational limit is set at 31,766 as shown in the previous slide.

Our analysis looks at planned activities as published by the airlines for the same period (Winter 23-24 and Summer 24 airline IATA seasons). All the assessments presented in this document are therefore based off planned flight schedule upon commencement of this study linked to existing, previously allocated slots.

Our analysis does not go into the details to analyse possible differences between historical slots or future assigned slots but looks only at what the airlines have planned and redefines the schedules under different Variants for a night curfew.

PA has not assigned slots to any new routes or additional frequencies for destinations already served, and we have not assessed connectivity, nor can we determine impact on yields, as we have insufficient data to make such a determination. Inevitably the carriers will try to find alternative options for their capacity even if it is suboptimal compared to the current program.

In the impact assessment model, a number of assumptions have been made, reflecting standard airline and airport operating procedures

Certain fundamental assumptions have been made to configure the model used for the impact assessment.

We have identified key ones listed below. In addition, we have taken onboard feedback during the development process to refine them.

Total available capacity
For the total available capacity, the decision was made, under guidance from the Ministry, to use the number of Schiphol's current capacity declaration: 482,741.

The decision surrounding the assumption to use the current capacity limitation was challenged by various parties:

- Several stakeholders felt that the environmental capacity of 500,000 should be used, as any other figure might be seen as a justification to reduce capacity by stealth.
- Other parties wanted PA to model the Variants in 440,000-460,000 ATMs future capacity figures that were proposed as part of a different government initiative.

While these particular suggestions were not accepted, we do not believe the 500,000 ATM figure requested by the carriers would have had any material impact upon the findings of this study since we would still have had the ability to retime flights. However, if it had been lower, the options to reaccommodate would have been more restrictive, causing further cancellations and damage to the airlines.

Night period structure
The assumption in terms of what constitutes the night period is that it stays the same as today, but with a night closure in it as defined in each variant.

Typical weeks
Airlines schedules have different profiles during the year. We have focused on three periods: Winter (November to March with exceptions during the Christmas period), Summer (April to mid-June and mid-September to October), Summer Peak (mid-June to mid-September). So, to model the impact of the scenarios on the base schedules of the affected airlines, we have built the rescheduling exercise on three sample weeks of the year that are representative (weekly flight movements within 2/3% of the average weekly movements for the specific period) of the three periods. This is a common practice for sampling purposes in aviation for indicative assessments though scheduling and slot opportunities in any given week may not prevail throughout the entire period.

Slot and Movements retention
We would expect that all operators would do their utmost to maintain a commercially viable schedule within any new operating restrictions and maximise the retention of their slot and ATM portfolios without taking commercially irrational measures. Our assumption, in the short-term at least, is that it is unlikely that there will be any more ATMs allowed at Schiphol, and so protecting these scarce assets is a key objective of all airlines at Schiphol, as it is at any slot constrained airport.

Additional assumptions include the use of slots in the pool, group operations, and the timescale for implementation

Loss of slots to the pool
Any slot that cannot be utilised at least 80% of the time within an IATA season is forfeited and returned to the 'pool' for the coordinator to reallocate. We have assumed that lost slots will be quickly reallocated to another carrier, most likely based outside the Netherlands. This is because an airline with fleet at other airports has the flexibility to adapt their schedule to fly opportunistically for any slot a Dutch based carrier finds itself unable to maintain. A Schiphol based carrier has limited flexibility, as they have to schedule a continuous series of commercially viable flights from their constrained home base from morning to evening.
Because of the times of day when remaining capacity would be available (after midday), it is more likely that nearly all slots handed back would be taken up by a narrowbody (A320/B737 family) operator. This is due to the fact that most long-haul widebody services tend to fly in overnight, landing in the morning hours.

AF-KLM Group companies
KLM, Transavia, Martinair as well as their partners (Air France, Delta etc.) were treated as independent operators for the sake of simplicity, though in reality they may have opportunities to optimise capacity within the Group and without involving the slot coordinator.

A minimum three-year delay
The likely impacts of the Variants are influenced by the time of implementation. The more time each airline has to adjust its schedule, the more successful the transformation is likely to be. This is because each operator will have at least a few seasons to try and obtain slots at other end of route airports that would fit within the restructured Schiphol timings.

Therefore, we have positioned the activation of the three Variants after three years and have evaluated the impact of the curfew on that assumption. This delay reflects a minimum period that parties will need for their preparations (several non-airline stakeholders we spoke with coalesced around this number and PA would agree that anything sooner would increase risk, stretch available resources throughout the ecosystem and exacerbate the damage upon the carriers).

For the proposed Variants to have a meaningful impact (i.e. a reduction of noise without flight cancellation that grounds the fleet for a significant part of the day), they will likely require even more time since the fleet replacement required by the Dutch based carriers is unlikely to be completed before the end of the decade. This will be discussed in further detail later in this document.

In addition to the pre-defined Variants, a number of Measures have been considered in the study; these present independent options

On top of the three Variants previously described, PA was also assigned to consider and seek input on certain other potential measures that could be considered and deployed independently to limit the impact of aviation in the night period.

This may include measures at the source, in spatial planning, operational, or (operational) restrictions in other ways, such as:

1. Prohibition of certain types or noise classes of aircraft at night*
2. Reducing the use of noisy appliances in other ways, for example by differentiating tariffs
3. Night quotas for specific aircraft types*
4. Penalty system for latecomers
5. *Alternative runway and/or route use***
6. *Alternative procedures***

The evaluation of Measures 1 to 4 is described in this report. PA considered Measure 1 and 3 (*) to be intrinsically related and therefore they will be considered together. Measures 5 and 6 (**) were deemed to be closer to the work of the parallel study – Part B..

The stakeholders were asked about other measures that could be considered. One group mentioned allowing limited earlier flights where the economic value to the Netherlands could be deemed exceptional and another mentioned expanding morning operations to allow 2+2 runway operations (2 departing and 2 arriving – presently the maximum is 3 – 1+2 or 2+1). We asked the carriers for their proposed measure but they generally declined to engage and instead set forth a view that their 'measures' had been very well articulated in the *'Schoner, stiller, zuiniger'* report[1] and the 10 commitments from *'Toekomstbestendige luchtvaart voor Nederland'*[2], which they asked to be considered with the same level of engagement as the 8 measures (Achtpuntenplan[3]) proposed by Schiphol.

PA was also asked to propose other potential measures that could merit further consideration. We have put forward three proposed Alternative Measures within this paper. The measures we have crafted should be considered at the concept stage and would be subject to a further review and public consultation to ensure they could be implemented in a manner that would be practical, effective and compliant with all regulatory requirements. Although they will only have a limited beneficial impact, we believe they would still improve upon the status quo.

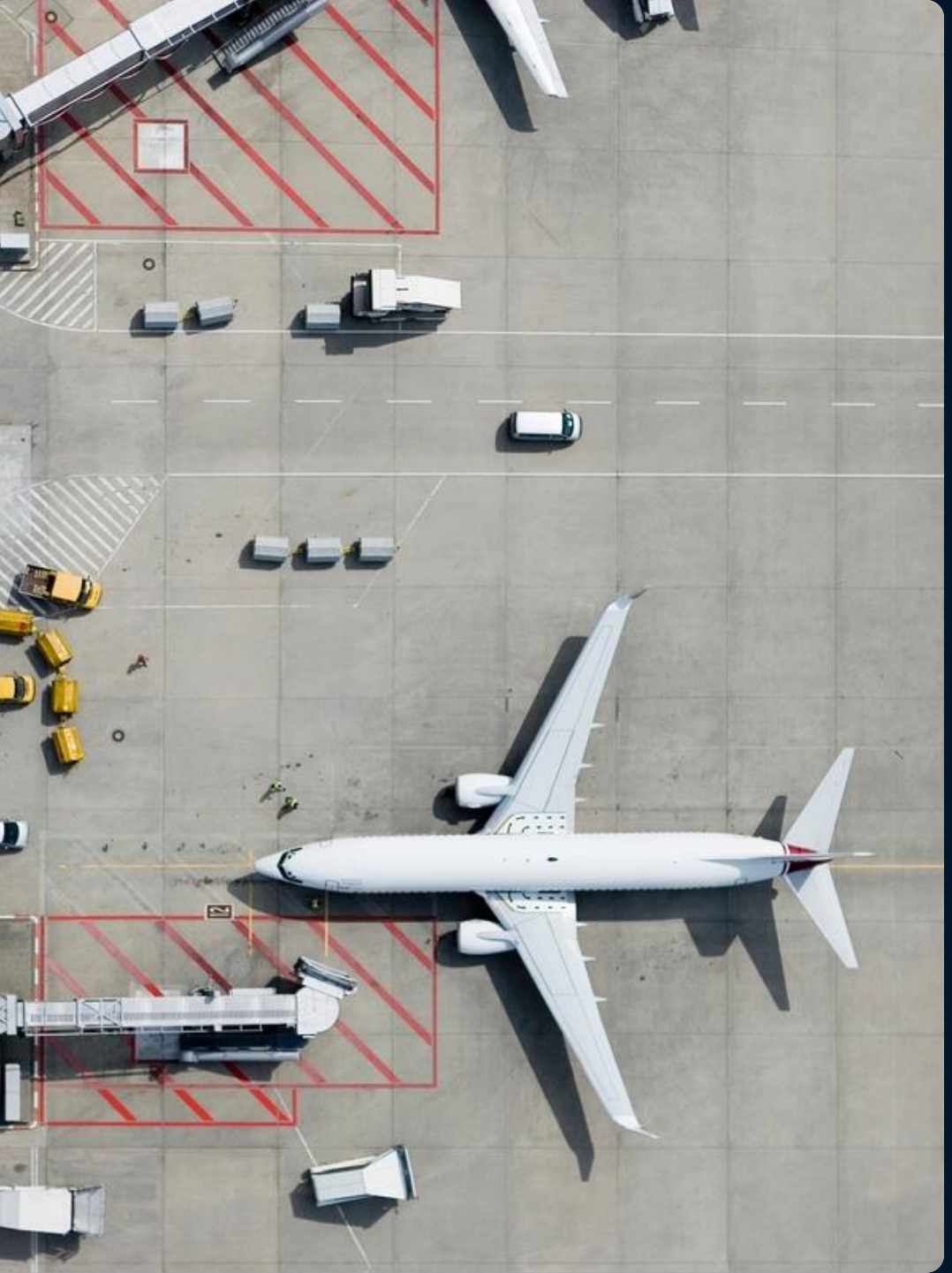
They are described below with more detail in the Measures section

7. Allowing slot trading for compensation in the Netherlands to allow night capacity to be replaced by day capacity.

8. Offering financial incentives for night slots to be forfeited in favour of day ones

9. Discontinue the allocation of ad hoc slots in the night period

[1] https://nieuws.klm.com/plan-klm-groep-geeft-grotere-reductie-geluidshinder-in-de-nacht/
[2] https://www.nlr.nl/wp-content/uploads/2024/01/Luchtvaartsector-inbreng-Regeerakkoord-PAMFLET-10-commitments-Toekomstbestendige-luchtvaart-voor-Nederland-2023-2027-v.final-11-januari-2024.pdf
[3] https://www.schiphol.nl/nl/schiphol-group/pagina/kiezen-voor-een-stiller-schoner-en-beter-schiphol/



03
Capacity allocation and management

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Key takeaways capacity allocation and management

- Allocation of capacity at Schiphol is carried out in line with EU95/93 - the Slot Regulation, creating the framework in which slots are allocated and may be forfeited by operators.

- The Slot Regulation is silent on capacity reductions.

- Slot Monitoring and Enforcement is in place to ensure overall slot compliance including with the current night period restrictions. This is carried out by ACNL and ILT in line with the Dutch Slot Enforcement Code.

- The Slot Misuse Code allows ILT to sanction operators for repeated and intentional slot misuse, including breaches of night restrictions. While repeated is easy to track, proving intent is more difficult as factors that entitle the operator to force majeure may be in place.

- The ability to re-time flights out of the night period into the early morning peak will be exceptionally challenging for potentially 10 years due to planned wide-body stand infrastructure works.

Introduction to capacity allocation and management at Schiphol

Before going into the detailed work undertaken, it is important to set out the roles of the parties who facilitate capacity management at Schiphol:

- The Ministry of Infrastructure & Water Management (I&W) provides policy guidance within the relevant EU and national regulatory frameworks.
- Royal Schiphol Group (Schiphol) determines and declares operational capacity each IATA season.
- ACNL allocates the declared capacity (as take-off and landing slots, and by proxy aircraft movements). They then monitor slot compliance.
- ILT investigates apparent slot misuse and imposes penalties when appropriate.

It is important to understand the roles of ACNL and ILT, as how they manage any future night curfew, variants or other measures, will have a significant impact on curfew structure and implementation. The role of ACNL and ILT and its impact on (the effect of) a night curfew and night measures are described on the following pages. We have included some of these parties' feedback in this forward chapter where it impacts the reader's understanding of the study. Further feedback follows later.

Ministerie van Infrastructuur en Waterstaat

Schiphol

airport coordination netherlands

Inspectie Leefomgeving en Transport
Ministerie van Infrastructuur en Waterstaat

Airport Coordination Netherlands (ACNL) and their role

ACNL is a key party that will be involved in the implementation of any curfew or other measures. We have added this briefing for those unfamiliar with slots to assist in understanding their role in shaping and implementing any future curfew or other measures.

In addition to our discussions with them, we have also drawn on the following documents:

- *'EU Slot Regulation'*[1]
- *'ACNL Policy Rule Slot allocation in case of exceedance of historic rights'*[2]
- *'ACNL Advisory Paper on Night Flight Reductions'*[3]

ACNL confirmed that it is their role to allocate the slots reflecting capacity that Schiphol declares (but not 'movements' where governance is not clear), in compliance with the relevant regulations and the policies set out by the Ministry[4].

They noted that any policy change should start with a clearly defined goal, and that any changes to existing procedures or operational restrictions should only be implemented if they are necessary to achieve that goal.

ACNL also explained that under the current procedures every year around 5,000 designated night movements typically slip and operate during the day period due to taxiing times at Schiphol.

ACNL outlined the current night period procedures, which are jointly managed with ILT in line with the Slot Enforcement Code. ACNL confirmed that enforcement would most likely need to be customised depending on the type of curfew and rules implemented.

ACNL also reiterated the point that the EU Slot Regulation and the IATA Worldwide Airport Slot Guidelines are silent on capacity reductions. To this point, ACNL have asked that rules for capacity reductions are added to the EU Slot Regulation as part of the current review process.

In discussions with ACNL, we discussed parties that were at risk of being legally challenged as follows:

- The Ministry for a policy decision that could potentially lead to outcomes that are not compliant with the EU Regulation
- Schiphol for a reduced capacity declaration
- ACNL for a slot allocation decision

[1] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A01993R0095-20221026
[2] https://slotcoordination.nl/wp-content/uploads/2023/09/230907-Policy-Rule-ACNL-exceedance-historic-rights-v1.0.pdf
[3] https://slotcoordination.nl/wp-content/uploads/2021/02/210201-Slotcoordination_Advice-reduction-night-flights-2021-EN-summary.pdf
[4] https://slotcoordination.nl/wp-content/uploads/2024/05/2024-May-Slot-Enforcement-Code-v1.1.pdf

The scope and parameters within which ACNL can operate (1)

While we acknowledge that any moves to reduce annual ATMs at Schiphol are out of scope of this work, it must also be stated that any reduction in overall ATMs will make re-timing flights out of the night, and into the day, significantly more challenging from a practical perspective.

From a regulatory perspective, ACNL have been very clear that they cannot make policy. They can only implement policy and rules based on that policy; and even then, only do so in a way that is compliant with the EU Slot Regulation. The EU Slot Regulation describes two scenarios where the coordinator has the power to withdraw slots that have historic rights attached:

- Continued and intentional misuse of slots
- Failure to meet the 80/20 'use it or lose it' requirement

Clearly, neither of these scenarios are applicable if a night curfew is introduced, as the slots are not technically withdrawn. But we are not confident that the recent policy rule will allow ACNL to forego reallocating historical slots to operators without being subject to legal challenge (despite capacity not being declared). While an approved Balanced Approach process should allow for a night curfew that may not reallocate impacted slots, in our view it leaves the question of existing slot-holder concerns unresolved and therefore there is a risk of conflicting legal arguments.

Previously, airports including London Heathrow and Sydney, have allowed special exemptions for historical slot holders to land in the 05:00 hour even though both airports are official curfewed until 06:00 local time. Often settlements are reached in collaboration with the airlines, but it requires a win-win solution to be found

We know that where night curfews have been introduced at other airports, this has been linked to an overall increase in airport capacity (usually the opening of a new runway or terminal) which has created significant flexibility for re-times, which can be given priority over the allocation of new slots. This was the approach taken in Frankfurt as an example.

It is also often the case that airports introducing night curfews have a designated alternative airport, which again creates flexibility. However, Schiphol is the only airport open at night in the Netherlands, so no alternatives will exist within the country if a curfew is introduced.

In our section on Measures, we have suggested some alternative approaches to creating slot mobility that offer incentives to airlines to re-time flights. We believe these alternative measures are compliant with the EU Slot Regulation.

The scope and parameters within which ACNL can operate (2)

Should it find itself in a position where it cannot allocate slots that have historic rights attached to them, ACNL intends to apply the mentioned recent Policy Rule *'Slot Allocation in case of Exceedance of Historic Precedence*' already published. ACNL is able to do this under the General Administrative Law Act, which states that:

"A 'Policy Rule' means an order, not being a generally binding regulation, which lays down a general rule for weighing interests, determining facts or interpreting statutory regulations in the exercise of a power of an administrative authority."

Rules such as this have been used for temporary or interim situations such as runway closures at some airports and can also be used to allow for unforeseen situations such as the challenges that Schiphol has faced in facilitating its potential 500,000 movement capacity.

ACNL also highlighted that capacity changes may be required due to the planned infrastructure works at Schiphol. This 'temporary situation' could restrict wide body capacity for up to 10 years. (PA recognises that 10 years could be seen a very long interpretation of the word 'temporary', but as long as there is a clear plan for ACNL to restore capacity eventually, we believe this approach is plausible).

They also noted without further explanation that 2027 would be a reasonable implementation timeframe and PA would agree that anything sooner would be challenging and potentially more damaging to the home carriers.

But if this Policy Rule were to be used as a mechanism for future non-allocation (i.e. loss) of historical night slots, a number of the airlines and their representatives suggested it would be open for legal challenge. If that was the case, we would make the assumption that ACNL will bear significant legal costs.

Even if the Balanced Approach was followed there is still a question of the potential expectation of commercial remedies for those presently holding slots in the night period. With Schiphol potentially setting the precedent for European airports in this regard, it would be reasonable to assume that any case would have a high likelihood of escalation, potentially to the Court of Justice of the European Union.

The scope and parameters within which ACNL can operate (3)

Whatever policy is put forward, ACNL suggested if a curfew was introduced, implementation prior to Winter 2027 could prove challenging. It was also suggested that clear policy guidelines would need to be set out in advance. Then ACNL would expect at least a one-year notice period along with the preparation time prior.

ACNL did mention the idea of incentivising voluntary retimes. Others noted that voluntary slot re-timings have had limited success in the past. We do not have knowledge of what may have occurred, but it would be reasonable to assume airlines would not be motivated to swap their night slots to the day up until now.

Looking forward, if voluntary slot retiming is a policy that is deemed desirable, it would be worth considering an incentive structure that could be applied to secure tangible gains.

Under Article 14.4 of the EU Regulation, swaps are already allowed between those that hold slots, but ACNL does not intend to facilitate slot mobility by allocating ‘dummy slots’ (utilisable slots used for the purpose of exchanges with parties that do not hold slots, as happens in the UK). ACNL also mentioned the risk of retaliations, and that working collaboratively, rather than starting with an outcome, can greatly reduce this risk.

ACNL explained that after Flybe’s failure, the slots were held back by Schiphol to ease pressure on operations, though at some point they would be returned to the slot pool for reallocation. This means that, up until now, no one has been compelled to forfeit capacity to reach the present declaration.

ILT's role in implementing and managing a potential curfew

Another issue that seemed better to raise in this early section of the document is that the decisions made by the ILT regarding how they interpret and enforce the rules surrounding any designated curfew will have a material impact upon its operational viability and effectiveness in achieving desired outcomes.

Their role will place them in a delicate position balanced between the adjacent communities and the aviation industry.

PA asked ILT for any guidance they could offer as to how they intended to implement and enforce a curfew at an operational level if it was mandated. While the policies would need to be developed in great detail, they did highlight some initial thoughts on their intended approach:

Early Arrivals - ILT does not believe that a flight that was scheduled to land outside the curfew, but unintentionally arrives early for reasons beyond its control (such as stronger than expected tailwinds), should be subject to penalty. Linked to this, ILT does not believe stacking is desirable due to the additional noise and emissions it creates. For this reason, they believe there should be a buffer, of at least one hour, during which early arriving aircraft can land without sanction, provided the flight was operated with an aircraft with a low noise category (S6 or S7)[1].

Enforcement - ILT also believes that their current powers are adequate, but a curfew will require additional enforcement, that may require additional powers, which could include the ability to ground an aircraft if required.

Ultimately, ILT policies will be one of the key variables for the effectiveness of any of the proposed variants in terms of on the day operations. If it is decided to impose a curfew, in any scenario an enforcement policy will need to be developed as key part of its implementation. This was a point made by several operators, who also remarked on significantly different practices in multiple locations globally, including Sydney, Frankfurt and Lisbon.

There is little point implementing a curfew if there is no consequence for operators who do not respect it. However, this is not as straightforward as it may seem, and a clear set of policies covering what is a breach and what is not will need to be agreed.

The '*Slot Enforcement Code*'[1] was update in May 2024. A complete overhaul is planned for 2025-26 which PA assumes will address any elements relating to a new curfew or other measures.

Note: Noise categories are mentioned in the charges and conditions document issued each year by the Schiphol Group.

[1] *https://slotcoordination.nl/wp-content/uploads/2024/05/2024-May-Slot-Enforcement-Code-v1.1.pdf*

Enforcement options for a night curfew at Schiphol (1)

The section that follows will highlight a range of implementation and enforcement approaches from light to severe. This includes schemes where slots are withdrawn from the operator, though this is rare and usually only for those who have prolonged poor performance, and only after every other effort to improve compliance has failed.

In the case of Schiphol, we are modelling three variants, and it is likely that the most effective enforcement regime for each scenario will vary.

As a starting point, it was highlighted before that today, ACNL monitors slot performance, including breaches of the existing night rules. ILT investigates these breaches, and issues warnings and sanctions as appropriate. Indeed, ILT has recently recruited additional inspectors to undertake this work, and operators have reported an increase in warnings in recent months. This means there is already a process in place on which to build, though by how much the current process will need to be amended, and whether ILT will need additional powers, will depend on which scenario is adopted.

This slot enforcement activity is carried out under the terms of the Dutch Slot Enforcement Code as mentioned before.

In the event of a total closure of the airport, where nothing is allowed to arrive and/or depart, an unambiguous, strict policy could be applied. In simple terms, any operation inside the curfew period is sanctioned. We believe any fine needs to be substantial to be effective.

However, if a scenario is adopted where the airport is open for emergencies, diversions and other unplanned activity (all outside of schedules), then a progressive enforcement scheme may be more effective. The scheme would need to recognise any scope in the curfew rules for late departures and arrivals in the late evening as well as early arrivals in the morning. This would require systemic monitoring focused on any airline who repeatedly operates in these shoulder periods in case, potentially playing the system to their own advantage.

There is also a question as to whether Schiphol should remain open at night to accept diversions. The alternative would be for aircraft to divert to an airport in another country.

Enforcement Challenges

In a scenario where the airport remains open at night and no commercial activity is allowed during the curfew, penalties could start low but increase with each breach, so that over time they become severe. In all variants the enforcement scheme needs to comply with the EU Slot Regulation, and with that come two challenges:

1. **Repeated and Intentional** – under the EU Slot Regulation sanctions can only be applied to repeated and intentional non-compliance. Repeated is easy to demonstrate, but intent is much more difficult to prove.
2. **Force Majeure** – ILT already has a Policy Rule (Article 4) regarding Force Majeure that they believe is adequate, which we tend to agree with. However, operators may seek new justifications for breaches that could add time and complexity to the enforcement process as any new curfew takes effect.

One additional point ILT has made is that currently they have no power to ground or impound an aircraft to ensure fines are paid. This additional power could be considered if it is likely that more severe penalties will be issued in conjunction with the introduction of a night curfew.

As stated before, the effectiveness of any curfew in reducing noise nuisance, will remain dependent on how strictly it is enforced. We have added this explanation in the front of the document as it is important to have some of these issues in mind when considering the options being evaluated.

04
Curfew definition and benchmarks

Key takeaways curfew definition and benchmarks

- There is no single definition of a curfew, in terms of design, implementation and/or enforcement.
- Bespoke curfews are developed to meet local operational and environmental requirements.
- Different types of enforcement have different levels of effectiveness but may also have varying implications and consequences for both operators and passengers, especially if aircraft are forced to divert.
- Slot Monitoring and Enforcement is already in place at Schiphol, under the terms of the Dutch Slot Enforcement code, though it is likely the code would need to be amended as ILT has indicated. They may need additional powers, depending on the type of curfew implemented.
- A total curfew at Schiphol would mean no airports were open for commercial operations at night throughout the Netherlands, and there would be challenges accommodating a significant number of diverted or delayed aircraft in airports near to the Netherlands in exceptional situations.
- Even where a curfew is in place, airports often remain open for non-commercial operations, including diversions and emergencies

There are different approaches to a curfew...

Within aviation, a curfew is a period during which an airport is closed for business, meaning no aircraft can arrive or depart. There are however a number of different types of curfew that have been applied within the aviation sector and, when designing a curfew, it will be important for all parties to clearly delineate their approach.

A complete, or 'hard' curfew is where the airport closes completely, and no aircraft movements are managed or allowed. This is the most basic form, easiest to understand, and to enforce.

There are also soft curfews, where normal operations are not allowed, but certain types of activity are. Examples of this include:

- Emergency landings are allowed (though the aircraft may not be able to depart again until the curfew is lifted)
- Head of state, military, coast guard, air ambulances, postal service and other official flights may be allowed

Some airports such as Frankfurt have a two-stage curfew where there is curfew to schedule and operate within and, recognising that airlines can go off schedule beyond their control, a second shadow ‘hard’ curfew is in place at a later point.

It should also be noted that at some airports, the curfew may be a 'hard curfew' during the night but with 'soft curfew' shoulder periods during the very late evening and very early morning, so that the curfew is applied and lifted progressively. This avoidance of hard borders creates a level of operational flexibility that benefits the airport, operators, and ultimately passengers and freight forwarders, but can make the curfew more difficult to enforce.

Some German airports have different rules for aircraft based in the airport vs. other carriers, recognising the greater challenges a curfew places on the home carrier.

In some airports curfews are only applied based on the noise levels produced by the aircraft, and limited flights operated by designated quieter aircraft are allowed inside the curfew.

In all these cases there can also be a quota for exceptions, either planned or unforeseen, that may be limited in number each night, for an IATA season or for a year. There are numerous details that can be considered in the construction of a quota depending on the objectives that policy makers set out.

It is also important to say that whatever approach to a curfew is taken, success in reducing noise nuisance is dependent on effective compliance by all operators at the airport.

Night Curfew Benchmarking

The benchmarking that follows focuses on two different issues:

1. the different type/hours of curfews at other airports
2. how other airports enforce their night curfews

This is not a consistent list since the airports that best illustrate item 1 may not best illustrate item 2, and vice versa.

Therefore, we have used a different sample of airports for each of the two benchmark exercises.

This sampling of airports is meant to be demonstrative and not exhaustive. It reflects a sampling of the diversity of approaches focused on measures to limit noise pollution and nuisance at night.

As well as the terms of their night regimes, we also looked at their enforcement regimes where public information was available. In our experience, even where rules are clearly published, the rigour and severity of enforcement efforts varies widely.

In some countries, more leniency is given to the home carrier. This can be formalised in the rules, as is the case at some German airports, or is known to simply occur informally elsewhere.

There are a number of key variables airports may impose within their night regime, including:

- Night flight curfews
- Night flight bans
- Approaches surrounding late departures & arrivals as well as early arrivals
- Aircraft type restrictions

We have found it difficult to identify a truly like for like comparator for the situation at Schiphol. The comparable airports we are familiar with who implemented a curfew were either not operating at capacity or were able to open up more capacity adjacent to the curfew period to reaccommodate flights in a commercially viable manner.

Schiphol is unique in that there is no clear plan we are aware of to address the concerns of the impacted parties during any curfew implementation.

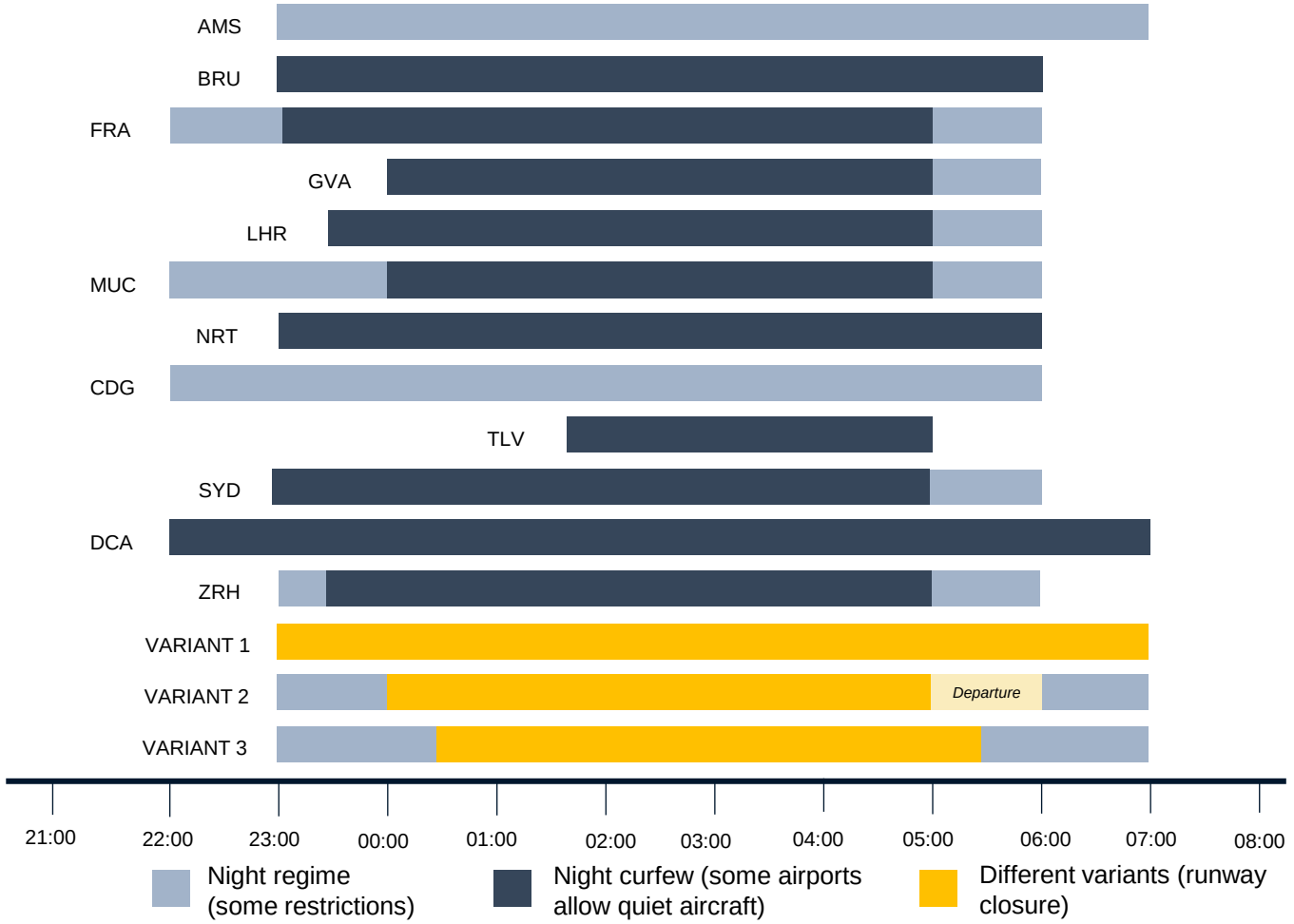
Comparable airports have some type of night regime, but there is no uniform or standardised approach

Key insights from our analysis:

- Variations exist in terms of specific rules/policies depending on an airport's business model and/or local & national environmental policies.
- Curfews vary by airport, but usually start before 00:00 and end in the 05:30-06:30 period.
- Some airports have a scheduling curfew longer than the operations curfew to prevent delayed aircraft from breaching the closure period.
- Most airports are not explicit about their treatment to late & early arrivals that encroach on the night period.
- While it would be helpful to replicate ideas used by other airports, we have found the situation which have evolved tend to be based on different sets of circumstances in each case, as most airports have local procedures that have evolved after their respective night closures were established.

There many curfew and night regime approaches deployed around the world with various nuances. We have highlighted some here and on the following pages to demonstrate the variety of strategies applied.

Figure: Overview of night regime and night curfew hours across airports.



Examples of Night Curfews around the world

Figure: List of airports included in our benchmark

Schiphol (AMS) – *Major hub airport*
- 33,551 annual night planning movements
- 23:00 – 07:00 night period (runway use)

Brussels (BRU) – *Midsize hub airport*
- 23:00 – 05:59 night period/ban for nosier, generally older aircraft types
- Adjusted weekend curfew currently under review and may be adjusted in 2025
- Night slots required in shoulder periods
- Government can grant dispensations

Frankfurt (FRA) – *Major hub airport*
- 0 night movements (48,545 in shoulder period 22-23:00 & 06-07:00)
- 23:00 – 05:00 night period
- Frankfurt Hahn is the diversion airport

Geneva (GVA) – *Destination airport*
- 2,600 total night movements per week
- No Departures 24:00 – 06:00
- No Arrivals 24:00 – 05:00

Hong Kong (HKG) – *Major hub airport*
- 24/7 airport
- Enforcement of noise mitigating measures in the nighttime

London (LHR) – *Major hub airport*
- 5,800 night movements/yr.
- 23:30 – 06:00 night period
- Limited early historical arrival slots in the 05:00 hour

Narita (NRT) – *Major hub airport*
- 23:00 – 06:00 night closure
- Quieter aircraft can operate and other restrictions
- Subject to protests and legal disputes before and since opening in 1978
- Delayed flights diverted to Tokyo Haneda

Munich (MUC) – *Major hub airport*
- 00:00 – 05:00 'core night' with no flights
- Quota limitations 22:00 – 06:00 with preference for home base airlines as in many German airports

Paris (CDG) – *Major hub airport*
- 84,000 night movements/yr
- Open 24/7 but limitations on flights during 22:00 – 06:00 night period

Tel Aviv (TLV) – *Destination airport*
- Last take off at 01:40 with last slot allocated at 01:20. First movement at 05:00 (05:30 in winter). Landings limited 01:00-1:45

Sydney (SYD) – *Major hub airport*
- 23:00 – 06:00 night period
- 'Quiet' aircraft exempted all night
- 8 aircraft arrivals allowed 05:00/05:59
- Punitive enforcement
- Night exceptions rescinded upon the opening of Western Sydney Airport

Washington Reagan National (DCA) – *Destination airport*
- 22:00 – 06:59 night closure
- Quieter aircraft can operate. Non-compliance generates a $5k fine per operation.
- Delayed flights easily diverted to nearby Washington Dulles (24/7)

Zurich (ZRH) – *Midsize hub airport*
- 23:00 – 06:00 night closure
- Delayed flights can take-off and land between 23:00-23:30

Numerous other hubs have unfettered 24-hour operations including Dubai, Singapore, Istanbul, and Washington (IAD)

Airport night regimes are composed of varying elements

Key insights from our analysis:

- Airports with night restrictions have published hours for **prohibited operations** & in some cases **only permitted aircraft types** allowed.
- Airports and Air Navigation Service Providers (NSPS) sometimes distribute (or control) routings to avoid flying over densely populated areas and/or share the pain to avoid disproportionate impact on any one community.
- A number of airports either chose or were compelled to allow airlines with historic slots in the night period to continue to operate them but, at the same time, did not allocate new slots (this is true at both London Heathrow and Sydney).
- In the case of Frankfurt, we understand that collaboratively, agreements were reached that allowed new slots to be offered with additional capacity in the 06:00 hours for night slot holders.
- Many facilities remain open for transit passengers, post/cargo and emergencies even when no aircraft operations are allowed.

Figure: Overview of common night regime characteristics.

General Restrictions	AMS	FRA	MUC	CDG	LHR	ZRH	BRU	NRT	SYD	TLV	HKG
Night flight ban (no aircraft movement allowed unless specified list/emergency)		✓	✓			✓	✓	✓			
Departure & Arrival slots (specified times for late departures & arrivals)	✓	✓		✓	✓	✓	✓	✓		✓	
Night curfew or limited number of movements/ take-offs/landings during the night)	✓			✓					✓	✓	
Flight allowed under certain conditions pertaining to aircraft types (and their noise index)				✓	✓	✓			✓	✓	✓

Examples of Night Curfew Enforcement

Key insights from our analysis:

- The EU Slot Regulation and IATA WASG require slot monitoring and enforcement, but **do not specify** the **enforcement process**.
- Good compliance is driven by the penalties for non-compliance.
- Monitoring and penalties vary, and schemes can quickly become ineffective without rigorous application.
- Sanctions are imposed for repeated and intentional slot non-compliance, but intention can be difficult to prove.
- **Compliance is highest** in countries with **substantial fines** (Australia, Germany) or where **slots have been withdrawn** (Switzerland).
- Low fines are often treated as a cost of doing business so not dissuasive.
- Effective schemes, such as those in Sydney and Frankfurt, are administered by the **airport**, not the slot coordinator.

Schiphol's position in the table reflects existing powers to impose fines and withdraw slots, but until recently these powers are not used as often as at some other airports, though warnings appear to be issued regularly. The implementation of a night curfew at Schiphol may require **new legislation** to create effective enforcement powers.

Figure: A sampling of enforcement regimes to demonstrate the breadth of approaches and measures across airports (airports included about which information was publicly available)

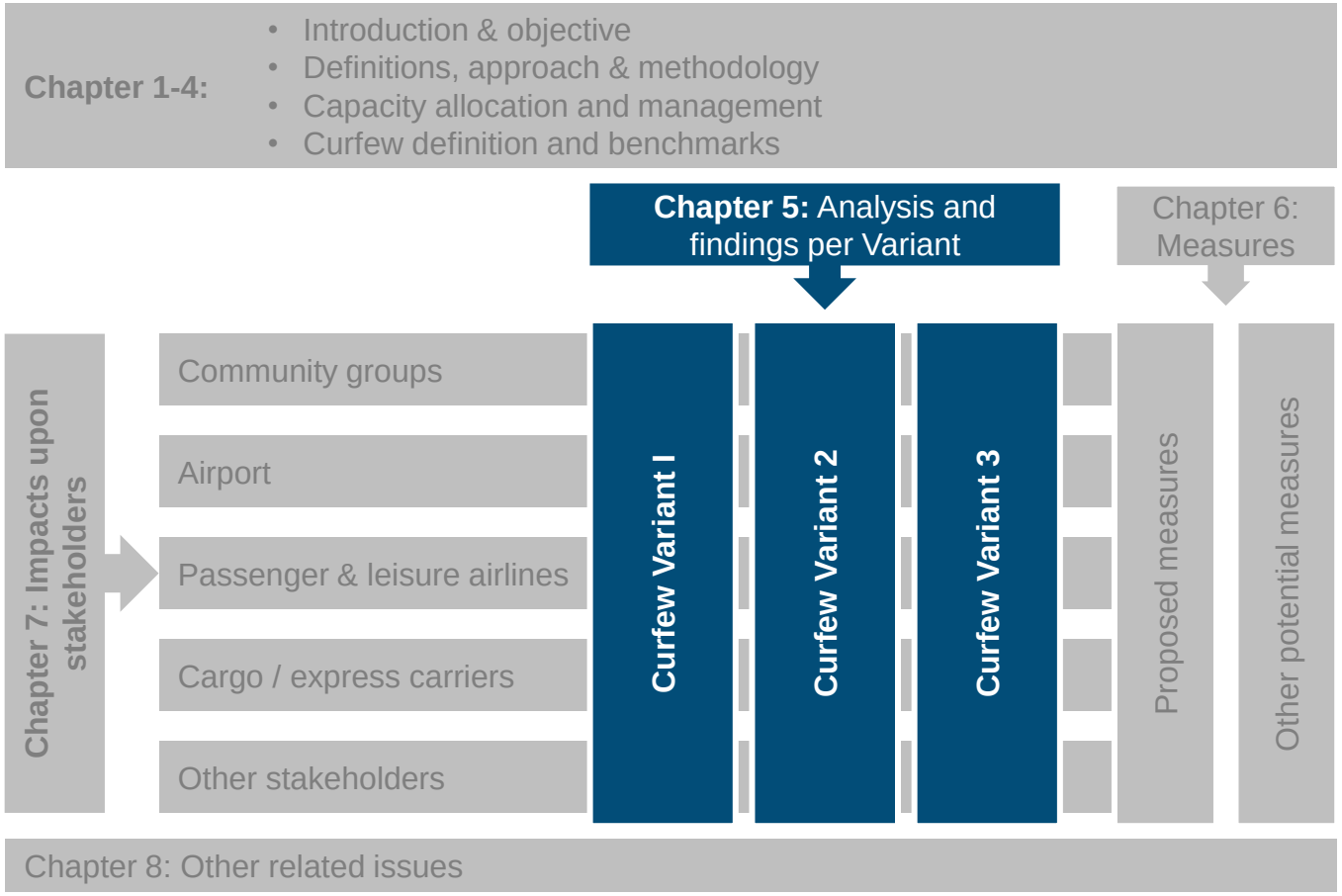
05
Analysis & findings per variant

Chapter 5: Analysis & findings per variant

We have looked at the three proposed Variants independently although there are common elements among them.

A detailed analysis and explanation of our approach has been laid out, but it should be considered indicative based on the given set of assumptions and not absolute.

Figure: Overview of structure of the report



Key Takeaways Analysis & findings per variant

- Variant I is by far the most damaging to the airlines, impacting both KLM hub, several long haul airlines from US and Asia, the Dutch based leisure airlines, the cargo integrators DHL and Federal Express.
- Variant II and III, instead, generate impact mainly on the leisure airlines and the cargo integrators with different severity, where Variant III has the softest impact. No impact on KLM and its partners hub structure.
- The leisure Schiphol based airlines: Transavia, TUI, Corendon, are impacted in all variants, Transavia, in particular in Variant I, needs to modify significantly its business model to protect business continuity
- KLM hub is impacted only in Variant I on its largest wave, both on long haul and medium haul flights with several cancellations of EU destinations and significant rescheduling of long-haul destinations with risks of further cancellations, as well as its US partner Delta.
- The cargo integrators DHL and FedEx cannot maintain their early morning delivery products in all variants, only Variant III may allow practical mitigation options.

The situation as it exists today – Distribution of Night Period activity

The modelling is based on the operators' published IATA Winter 2023/24 and Summer 2024 schedules as of 29th February 2024. This slide shows activity as it exists today.

In addition to these published schedules, we added historical slots held by FedEx and DHL since they do not publish their schedules for public consumption.

The night period is assumed to be 23:00-07:19 for arrivals and 22:40-06:59 for departures, with movements split 62% arrivals and 38% departures. Total slots allocated amount to 33,551.

For arrivals:

- The busiest period is the 23:00 hour with 25% of the total.
- 2nd is the morning shoulder 07:00-07:20, which accounts for a further 20% of the total.
- Arrivals are spread throughout the early morning hours up to as late as 04:00.

For departures:

- The largest concentration is in the early morning with 62% occurring in the 06:00 hour.
- A further 17% fall in the 20 minutes shoulder period for departures (22:40-23:00).

Wherever possible we tried to maintain in our rescheduling exercise original timings in order to keep any slot series consistent wherever possible

Figure: Distribution of Night Period Arrival Slots

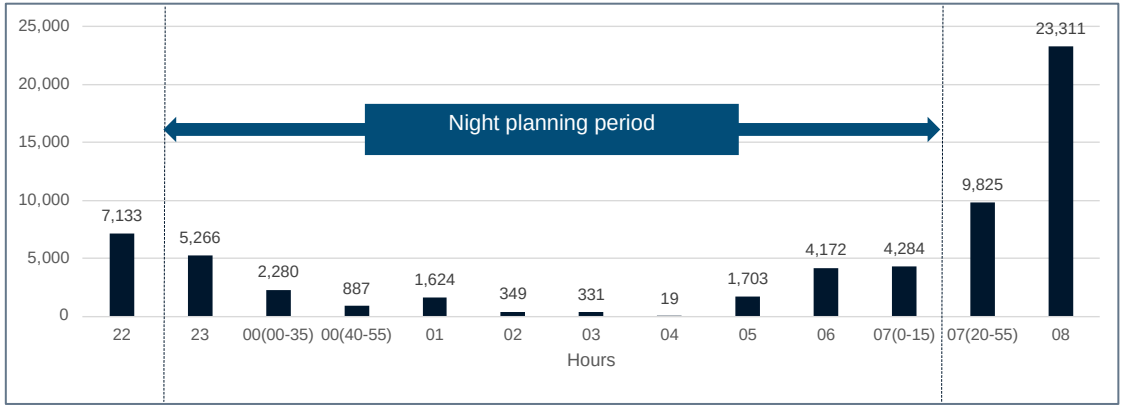
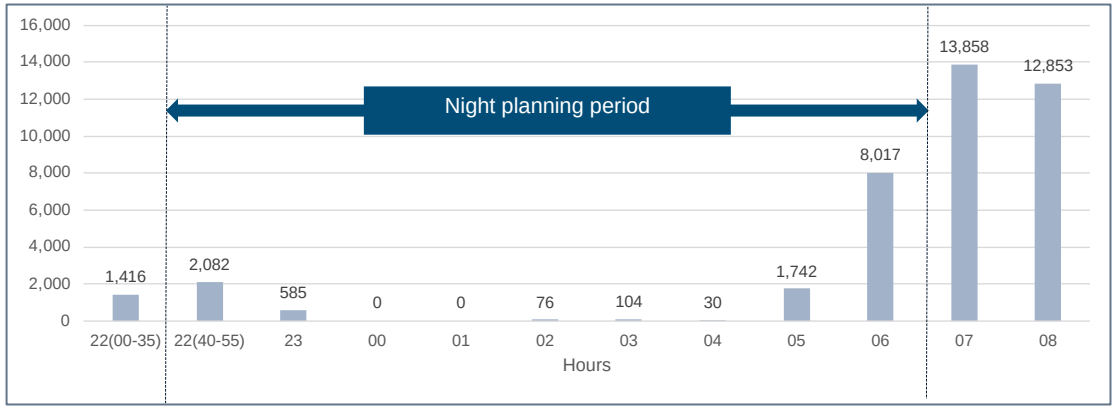


Figure: Distribution of Night Period Departure Slots

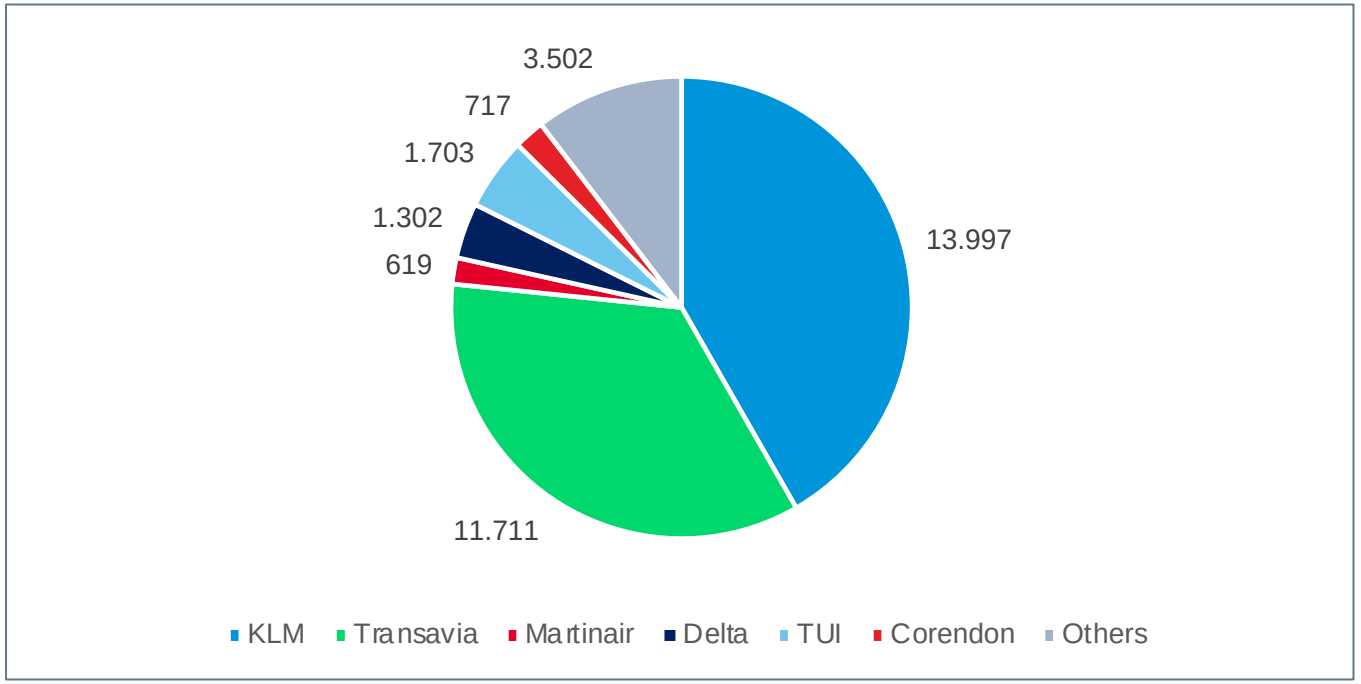


The situation as it exists today – Night Period activity by airline

The following are some key points to consider when we look at Schiphol today:

- As expected, the KLM Group (KLM, Transavia, Martinair) are the major holder of night period slots with 78% of the total.
- KLM contribution is made much more significant when extending the night regime on departures from 7:00 to 7:20 due to the 20-minute shoulder period. This extra period would become an effective curfew and generates more than 1/3 of KLM's potential night regime movements.
- Delta, Joint Venture partner of AF-KLM, holds a further 4%, so the SkyTeam Alliance, which includes an additional 1% of China Southern, reaches a total of 83% of all night period movements.

Figure: Distribution of the 33,551 Night Period slots including the shoulders by airline

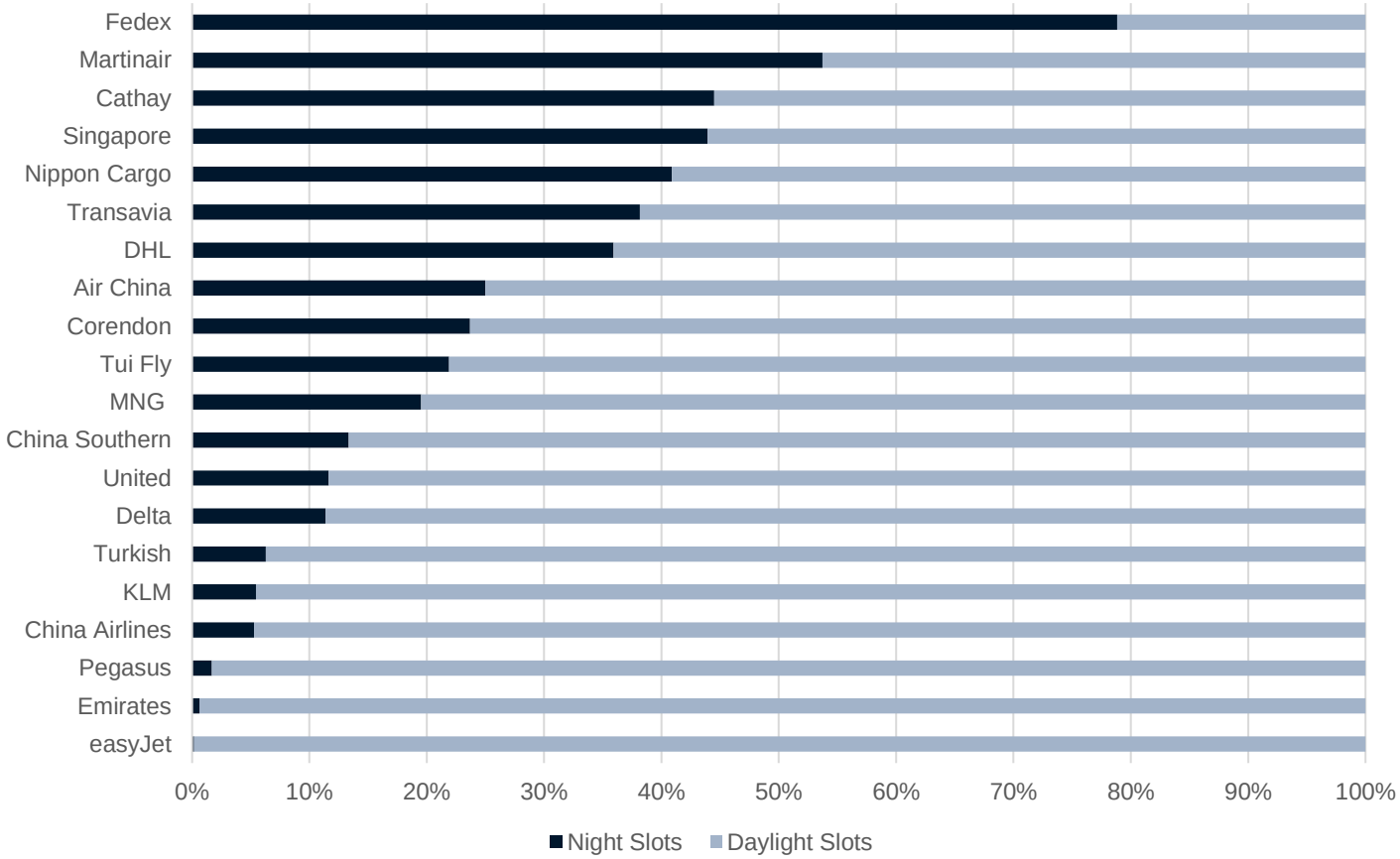


The situation as it exists today – The Importance of night slots for each airline

Night period slots differ in importance for the operations of each airline:

- From this perspective, of the airlines impacted, the Integrators and Cargo airlines are facing the largest impact as a proportion of their total activity.
- For Integrators: FedEx is the highest at 79% and DHL at 36%.
- For Cargo freighters: over 53% of Martinair's slots are in the night period along with 40% of Nippon Cargo's.
- For passenger airlines: the most impacted are Singapore (both passenger and cargo) and Cathay Pacific, both with ~44% of their slots in the night.
- For the leisure carriers, Transavia has 38% of its slots in the night, with TUI and Corendon at 20%.

Figure: Weight of Night Operations vs Total Schiphol Activity by Airline



The situation as it exists today – Current declared capacity

The capacity parameters taken from Schiphol letters are:

1. Total airport operational capacity, which is the major capping instrument for the airport, set at 482,741 annual movements over two IATA seasons.
2. The capacity declaration by 20-minute intervals limits, and a further rolling hour limit imposed by LVNL on several periods during the day. These limits can allow some room to move flights if they already have a movement assigned to them.
3. Wide body stands limitation to maximum 41 arrival slots between 7:20-9:35 during the Summer.
4. List of prohibited aircraft types due to noise levels.
5. Air Traffic Control daily limit of 1,520 movements,
6. Border control capacity of 123,000 daily seats on arrival and departure.

Since all variants trigger a reduction in currently planned flights, parameters 1, 4, 5, 6 are met by default. The only two relevant parameters to verify were 2 and 3 during peak times. A specific slot model was created to account for parameter 2 The requirements for item 3 would demand an insight into the rescheduling of the widebody operators, mainly KLM and its partners which we do not have so could not take into account. If the capacity is insufficient in the morning peak, there will be the ability to reaccommodate more as the day progresses.

For a network- (or hub-) carrier, the peak-hour capacity is crucial. Rescheduling in the peak may be restricted especially by stands / gate capacity. The maximum number of gates is 150 of which 96 are connected. KLM mentioned there is limited connected gate capacity, but a detailed analysis of this issue was not included in this study.

Wide body flights have been retimed to later arrivals after the constrained times indicated in the capacity declaration letters, so our modelling is not impacted by this constraint. However, wide body stands remain a concern going forward. Planned stand renovation activities will further this challenge in Piers C, D, E & F as a ‘temporary’ reduction of wide body stands is expected. Currently, these effects are not yet fully reflected in the capacity declaration letters.

Throughout the stakeholder consultation process, airlines have noted that Schiphol has experienced delivery difficulties in the last year, both for its own activities as well as for the activities carried out by its operational partners (which would include border control, ground handling/baggage and LVNL).

Therefore, it has been suggested by many parties that the passenger experience may worsen if even more activity is squeezed into the daytime hours.

The situation as it exists today – indicative available capacity

Slot availability has not been tested on a continuous seasonal base, but the graph to the right shows some limited slot availability during a typical peak day subject to runway movements being available. KLM suggested it may be very difficult to reschedule flights with consistent daily timings during a season in the morning hours from 7:00 – 10:00. This point was supported by ACNL.

Other carriers with much more limited slot portfolios will find rescheduling even more challenging.

This would indicate that the impact of a night curfew may be greater than the modelling demonstrated from our limited sample.

Note: The graphs to the right correspond to the available slots in 20-minute brackets during a typical peak Friday in August. Other days may be less congested, but airlines' schedules tend to be built around their peaks.

Figure: Departure Slots

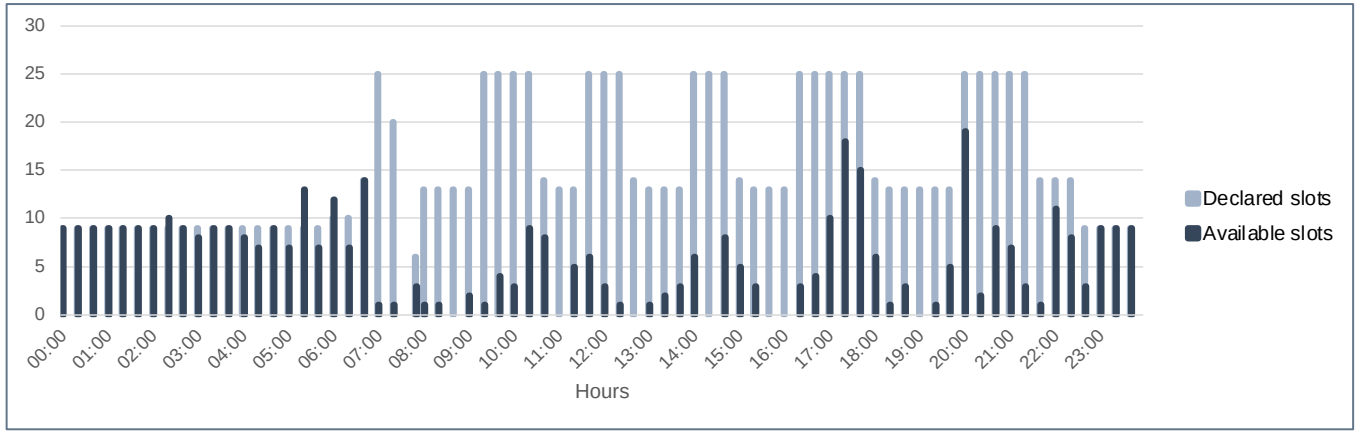
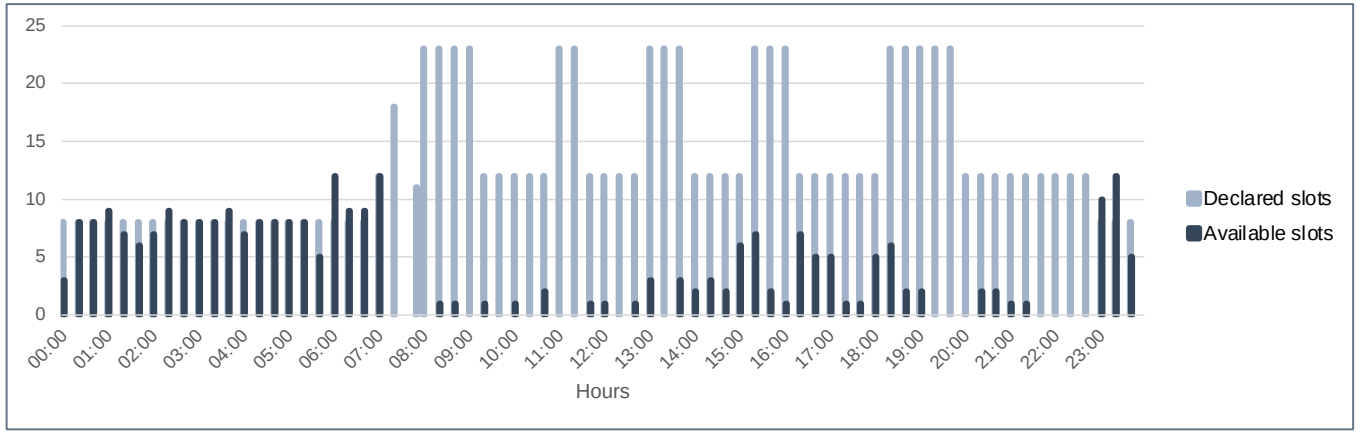


Figure: Arrival Slots



The situation as it exists today for the top 5 impacted airlines

These tables display the top 5 impacted airlines based on the present profile of activities. The carriers are KLM and Delta and the leisure airlines Transavia, TUI & Corendon. The data shows:

- the seasonal variance of operational activity for the leisure airlines between winter and summer months compared to the hub carriers that are more consistent.

- the breadth of destinations the leisure carriers bring to the network quality of the Netherlands, given their relative smaller size.

- the leisure carriers' dependency on night period slots when compared to the hub carriers.

Figure: Total flights and destinations per top 5 impacted airlines

Flights by month (Schiphol base)	Corendon	Transavia	TUI	KLM	Delta
January	134	1,806	411	20,131	868
February	130	1,888	395	19,378	812
March	148	2,156	405	21,178	877
April	213	2,597	438	21,492	1,020
May	332	3,051	745	22,308	1,054
June	320	3,004	727	21,597	1,020
July	414	3,351	1,038	22,611	1,054
August	428	3,375	1,169	22,674	1,054
September	390	3,106	934	22,198	1,020
October	301	2,783	733	21,312	965
November	94	1,697	377	20,668	840
December	122	1,866	405	21,029	868
Total flights	**3,026**	**30,680**	**7,777**	**256,576**	**11,452**
Total destinations	**21**	**61**	**58**	**153**	**10**

Figure: Total flights per hour per top 5 impacted airlines

Flights by hour (Schiphol base)	Corendon	Transavia	TUI	KLM	Delta
00:00	103	2579	362	9	
01:00	38	1142	378		
02:00	40	163	156		
03:00	19	35	60		
04:00	22	17		2	
05:00	23	1479	224	552	364
06:00	427	3804	320	5,785	938
07:00	167	1,289	840	15,715	364
08:00	87	124	466	26,660	2,030
09:00	36	568	190	21,064	1,246
10:00	38	333	549	10,018	2,912
11:00	254	1,339	549	16,403	728
12:00	51	1,971	593	18,185	1,170
13:00	311	2,442	397	16,251	916
14:00	381	2,083	484	14,327	232
15:00	294	1,693	337	17,065	552
16:00	161	2,318	385	20,104	
17:00	53	1,656	207	7,950	
18:00	78	1,556	128	5,405	
19:00	41	932	32	21,065	
20:00	94	315	105	17,400	
21:00	262	230	239	16,480	
22:00	1	120	594	3,702	
23:00	45	2492	182	2,434	
Total flights	**3,026**	**30,680**	**7,777**	**256,576**	**11,452**

Note: The number of flights involved in the rescheduling exercise for the three leisure carriers are higher than the ones operated at Schiphol, since several flights of aircraft based in Amsterdam also fly to Rotterdam, Eindhoven, Groningen

Rescheduling Methodology

In order to define the impact of the different variants, we first determined which airlines were impacted in each variant:

- The operators impacted in all curfew variants are Transavia, TUI fly, Corendon, Nippon Cargo, DHL and FedEx.
- Variant 1 is a much wider curfew than 2 and 3. It impacts KLM's hub structure and affects its connecting partners, most notably Delta. Several Asian carriers are also significantly impacted.

After identifying the operators impacted the most by the various variants, a rescheduling approach was made using assumptions as follows:

- The routes cancelled and/or rescheduled were selected on operational constraints based on our long-term network planning experience.
- For Transavia, TUI and Corendon, rescheduling has been performed on their full Amsterdam network, including the mixed rotations to other bases which start from Schiphol, but not for aircraft based at Rotterdam, Eindhoven, Brussels, or other stations. Spare aircraft capacity present in the base schedules has not been utilised, to maintain similar level of operational resilience.
- For KLM, rescheduling affected only the impacted flights and subsequent associated flight (rotational integrity) and not the entire network. The same approach has been applied for the remaining carriers impacted. Still, for KLM the structure of the hub and its banks restricts the rescheduling exercise.
- Rescheduling has been performed on three typical weeks, reflecting Winter, Summer and Summer Peak, representing the variability of each airline throughout the year.
- Slot availability was only checked at Amsterdam. The outstations chosen were not ones with a curfew. The new timings are theoretical and subject to slot availability. Therefore, we cannot be certain all outcomes can be achieved.
- No new routes or frequencies have been added. However, spare aircraft capacity might emerge from unsuccessful rescheduling due to congestion.
- This would create excess capacity which, in some cases could be utilised to accommodate new, nearer leisure destinations, improving aircraft utilisation for Dutch based carriers. Therefore, a large portion of the cancelled flights would be replaced instead of lost.
- A combined weighted average of the typical weeks for each variant was used to calculate the overall yearly effect on new movements volumes and hourly distribution, by extending the effect on each typical week to the entire period of validity for each airline analysed.
- The way in which we transformed a typical week into an entire seasonal period were specific for each airline.

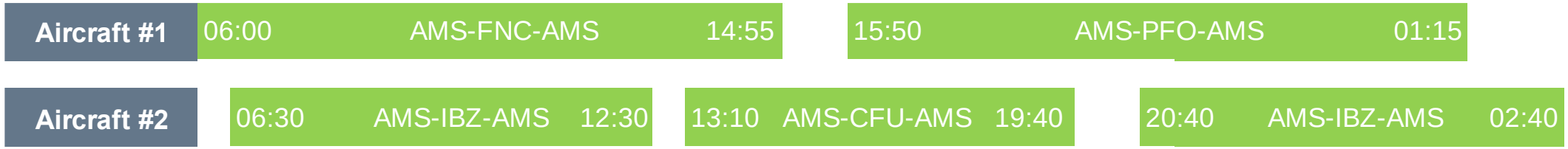
Rescheduling Methodology: an illustrative example

An example of applying a rescheduling solution based on the same aircraft type of a typical holiday schedule (Funchal, Corfu, Ibiza, Paphos). By taking advantage of late night flying opportunities, we have identified a method to recover all night flights that would no longer be possible in case of a curfew.

The flights to Paphos (PFO) from Schiphol (AMS) and the second flight to Ibiza (IBZ) currently return in the curfew period, thus needing to be rescheduled.

By moving the Paphos (PFO) flight into less desirable hours of the night the schedule creates the space for a late evening Ibiza (IBZ) flight prior to the night curfew, maintain the entire network.

Base case (illustrative)



Rescheduled (illustrative)

Please note that we have used this as an example with the grey boxes representing flights that have been realigned to complete the entire program. In this example, Paphos airport is open and we have assumed slot availability..

Rescheduling Methodology - A Caution to the Reader

The three variants are hypothetical versions of what a curfew might look like. The variants should be considered accurate in terms of the optimal use of Schiphol capacity.

Practical issues with the rescheduling
The three variants are dependent on a number of key assumptions and may propose a solution that is not feasible in practice, due to a number of reasons:

- *Non-availability of destination slots*
  As flights are moved it is impossible to say whether the slots at the other end of the route can be secured. Schiphol has long established connections to some of the world's most congested airports where rescheduling may take several years and, in some cases, simply may not be possible because of slot availability which would impact aircraft utilisation.
- *Commercially or operationally non-viable results*
  It is unlikely that all the flights retimed will remain commercially or operationally viable. This heavily impacts several carriers including KLM and its partners in Variant 1. The same impact occurs in Variants 2 & 3 on a smaller subset of carriers.
- *Loss of essential feed traffic and its impact on the hub*
  For the hub carrier, as certain flights are retimed, feed traffic may be lost. This could make these flights less viable if not moved, because they are dependent on a large portion of connecting passengers. An airline hub such as KLM's is built over years to be balanced in its flows in different directions. Like a bicycle, as spokes are removed, the hub's structural integrity weakens.

Additional optimisation opportunity within AF-KLM Group
On the other hand, for the airlines within the AF-KLM Group, additional room for optimisation may exist that we didn't include in our rescheduling. The AF-KLM Group and its partners control over 60% of the airport's capacity, so they can optimise their schedules amongst themselves independent of ACNL, which may lead to some mitigations being available to them. However, this will be a net sum game within the Group for peak time access.

We have treated KLM, Transavia, Martinair (and AF and Delta) as separate entities and didn't simulate any of these possible mitigation opportunities they may have, due to the numerous factors in play which are confidential to the AF-KLM Group.

Determining expected cancellations
Due to the above noted elements, PA has estimated cancellations as the sum of those required to fit the schedules within the 3 curfew variants and estimated consequential cancellations based on risk factors arising within each variant as applied to individual airlines. The risk factor reflected the rigidity of the slot environment at key airports, the severity of the changes applied, and the impact of adjusted stage lengths on the commercial viability of the routes selected. Some mitigation of the high cancellation rate could be gained by introducing new routes that have less familiarity or demonstrated appeal to the Dutch consumer than those presently operated.

Variant 1 summary overview

This is the variant with the highest impact:

- 100% of night flights impacted
- 56% of night flights require cancellation to fit in this scenario
- 76% of flights of Transavia/TUI/Corendon require rescheduling, with 29% of risk of cancellation

Passenger airlines impact

- Transavia needs to relocate around 80% of its fleet to other bases outside Amsterdam excluding Rotterdam and Eindhoven. This was superior to the alternative of grounding much of the fleet for a large portion of the day. But in either scenario, the viability of the Transavia business model that exists today is challenged.
- The KLM first large long haul connecting wave is compromised with 13 cities no longer connecting, along with 4 connecting Delta flights. Moreover, 9 daily feeding flights from Europe are cancelled with secondary impacts on other routes expected due to a loss of feed traffic.
- Most Chinese and other South-East Asian carriers impacted by the curfew with significant delayed rescheduling.

Cargo airlines impact

- Singapore may cancel flights from London, other cargo airlines impacted with significant timing changes
- DHL and Federal Express compelled to reconsider their business model for servicing the Netherlands.

Airport impact

- Greater operating pressure on terminal facilities and stand congestion in the morning at Schiphol due to the overlap of delayed first arrival long haul wave.

	Variant 1: COMPLETE NIGHT CLOSURE
Night Curfew definition	Night closure: • Arrivals 23:00-7:19 • Departures 22:40-6:59
Rescheduling	Reschedule only in daytime

Analysis - Variant 1 – Overview of impacted carriers

This is the variant that creates the most disruption as it impacts all planned night slots between 23:00 – 7:00 plus the 20-minute shoulder periods. This is 20,915 arrivals and 12,636 departures, a total of 33,551 planned slots, of these 56% (18,945) could not be reaccommodated outside the curfew.

KLM, Martinair, Transavia, TUI, Corendon, Delta, FedEx, DHL, Singapore Airlines, Cathay Pacific and Nippon Cargo Airways all suffer significant impact.

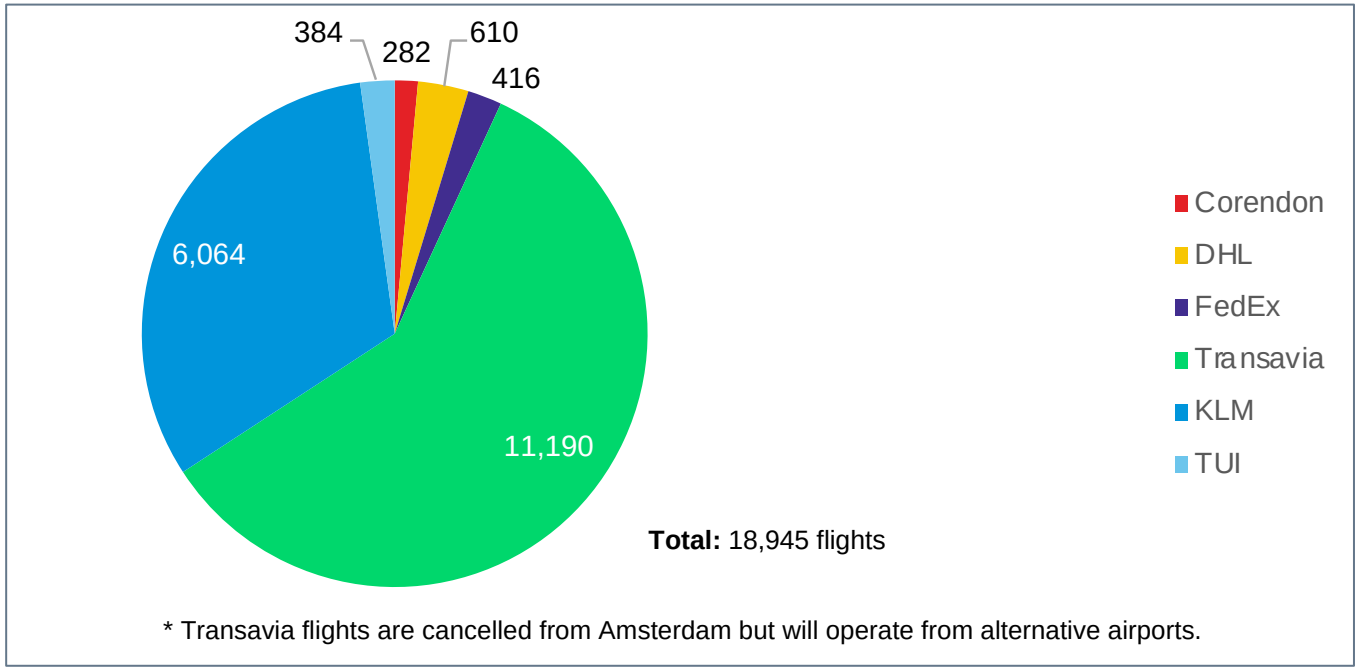
Other operators, including United Airlines, Air China, China Southern, Turkish Airlines, China Airlines and MNG Airlines are also impacted, but to a lesser extent.

There is only a nominal effect upon Pegasus (1.7% of flights impacted), Emirates (0.6%) and easyJet (0.3%)

After the modelling exercise, most of the flights we assumed would be cancelled are operated by KLM, Transavia, TUI, Corendon, DHL and FedEx.

All the other airlines night flights were re-timed into the day, but at very different timings.

Figure: Distribution Cancelled Flights*. All other impacted night flights were rescheduled to the daytime hours.



Total: 18,945 flights

* Transavia flights are cancelled from Amsterdam but will operate from alternative airports.

Analysis – Variant 1 - Transavia

Transavia is the most impacted carrier as it has most of its morning departures (First Wave) inside the curfew period and very limited possibilities for delaying morning departures and still allow two daily return flights with the last one returning before the night curfew begins. During the rescheduling it was necessary in the summer to move 22 Schiphol-based aircraft out of the currently planned 26 to alternative airport bases in order to create a sustainable fleet utilisation parameter, comparable to present activity. A higher number of aircraft could have been maintained in Schiphol, but this would have required a complete restructuring of the portfolio of routes served to shorter destinations. In the winter it was possible to maintain 9 aircraft based in Schiphol. The aircraft moved to an out base will have their first departure from there, serving Amsterdam during the daytime hours.

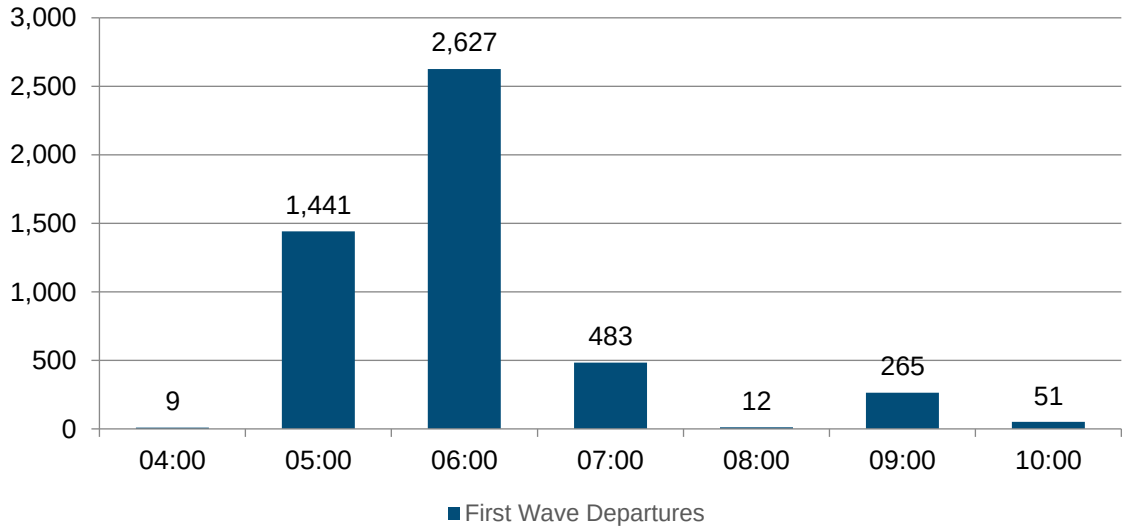
The 'least-worse' theoretical model PA was able to design (aside from dramatically downsizing the company) involved basing most aircraft at a different location than Schiphol. This base change maintained the level of production across the network. However, it resulted in a reduction of 36% of currently planned movements in Amsterdam. Also, ~83% of all flights will require rescheduling.

In practice a significant number of cancellations are to be expected due to capacity limitation at popular Greek island and Spanish destinations and key winter ski destinations on Saturdays.

Since a very large part of the airline's capacity is sold through Dutch Tour Operators, the financial impact is dependent on the commercial appeal of flights that are moved out of Amsterdam, on top of the extra crew and maintenance costs associated to positioning resources outside a central point like Schiphol.

The full impact of Variant 1 upon the future viability of Transavia is discussed in the Transavia stakeholder pages later in this report.

Figure: First Wave Departure slots Transavia – Summer - Total 4.888 flights



Analysis – Variant 1 - Transavia

For rescheduling out of base aircraft two different basing strategies can be employed:

1. Seek to base aircraft as close as possible to the Randstad customer (where the largest percentage of the market resides). This might include Maastricht, Groningen, Niederrhein / Weeze, Liege, Oostende (and Lelystad if opened), which would allow the carrier to maintain a similar flying time to destinations currently served, thus requiring less slot changes abroad. In many of these areas the local population base cannot support the traffic required to fill capacity, so the business would depend on increased road traffic from the Randstad. This would mean a significant drive time for up to 2-3 hours to catch departures between 5-7 am or to return home from arrivals as late as 2 am.

2. Seek to base aircraft at destinations where there is at least a daily service (Barcelona, Malaga, Alicante, Las Palmas, etc.). This raises capacity issues at those airports, but it could be better integrated with the operations of the existing Rotterdam and Eindhoven aircraft. This would, however, generate a less appealing product timing asking passengers to leave their holiday hotel exceptionally early and/or check in after midnight, a situation that is far more challenging in a tourist resort even if one may do that at home.

We developed the schedule simulating the first case without identifying base airports and without doing a full reschedule of each flight. We maintained the remaining flights in/out of Amsterdam in their present schedule to simulate slot coverage.

Transavia could simply move aircraft out of the Netherlands, but since much of its business is dependent on Dutch tour operators, the company would find it more challenging to recover passengers.

The switch in bases adopted in the theoretical model produces no direct cancellations but requires the rescheduling of 86% of flights. After considering the slots at key airports, the severity of the changes applied, and the impact of adjusted stage lengths on the commercial viability of the routes selected, we estimated the final level of cancellations could reach 34% due to the risk of unsuccessful rescheduling. This has been considered in Impact Evaluation slides at the end of this chapter.

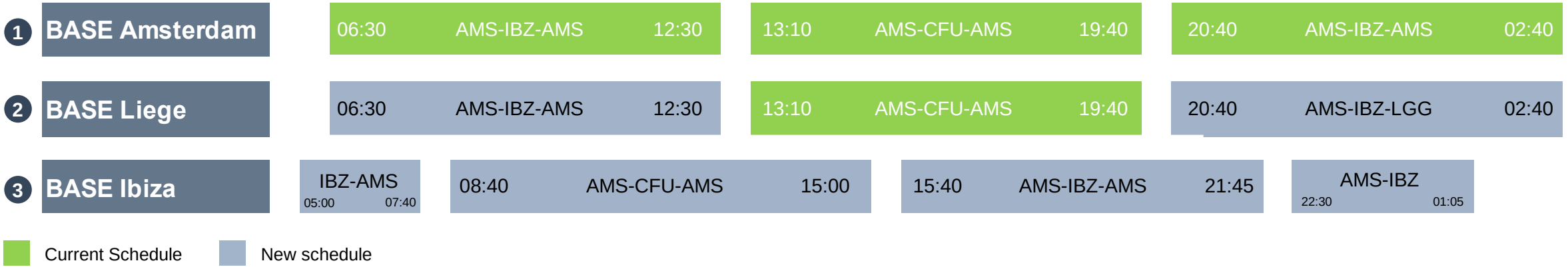
The cancellation rate might be mitigated, but to do so would likely require the airline to fly routes that could be less appealing to the Dutch consumer. For example, many people prefer The Canaries, Turkey and Greece to some nearer Northern Mediterranean or Atlantic Coast destinations.

Analysis – Variant 1 - Transavia

In this case we have shown an illustration of the two options (subject to slot availability):

- Line 1 reflects the service as it is presently scheduled, 2 x Amsterdam-Ibiza returns and 1 x Amsterdam-Corfu return.
- Line 2 shows the opening of a base in a nearby airport (in this case Liege). This allows effectively two services a day to Ibiza (one from Liege and one from Amsterdam and retains the Corfu. But the aircraft base in Liege will be subscale which may cause inefficiencies in crew and maintenance. Furthermore, a Liege employed crew will have to overnight in a Schiphol hotel.
- Line 3 is an Ibiza based aircraft accomplishing the same results as Line 1. Once again, this pattern creates inefficiencies in crew and maintenance, as well as accommodations costs. Although Ibiza can be unique, early departures from many holiday destinations can also be more challenging than an early departure from home due to unfamiliarity and logistics.

Figure: Examples of rescheduling with the two types of bases



Analysis – Variant 1 – TUI and Corendon

These two carriers operate in different bases and have a more concentrated network in terms of destinations served.

This allowed us to preserve most of their respective networks through the creation of two outside bases for TUI (Antalya and Las Palmas) and one for Corendon (Antalya) - similar to what was shown on the previous slide.

These carriers have a very limited number of slots in the 7:00 hour and have a longer stage length within their destination portfolio. This brings rigidity to the schedule, making it more difficult to move flights and limiting activity on some days.

The more segmented fleet for TUI in terms of gauge (from 151 seats to 307 seats) allows the possibility to reschedule the network by compacting flights on larger size aircraft and/or applying a practice they sometimes use having two destinations served by a single flight (tagged flights) instead of by two separate flights. Such an approach may address questions of destination choice and network quality, but it increases costs and is unlikely to be utilised regularly if an airline can fill all the seats to a single destination and there is adequate hotel capacity.

Figure: Reschedule by consolidating two destinations

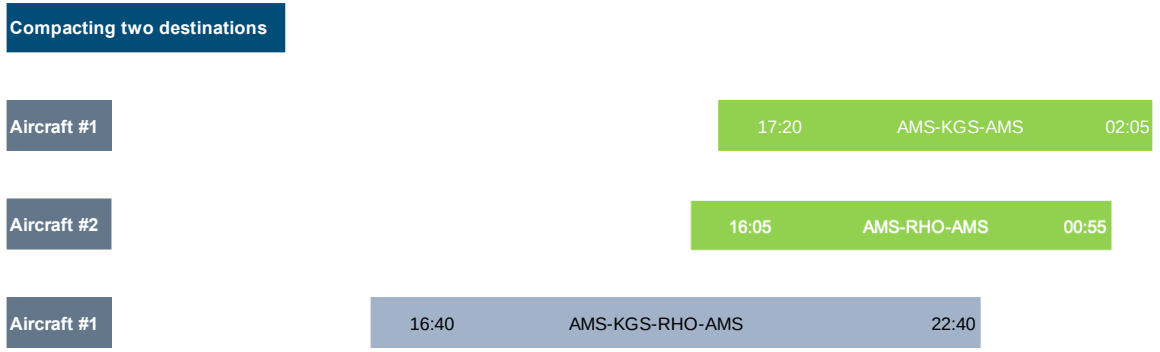
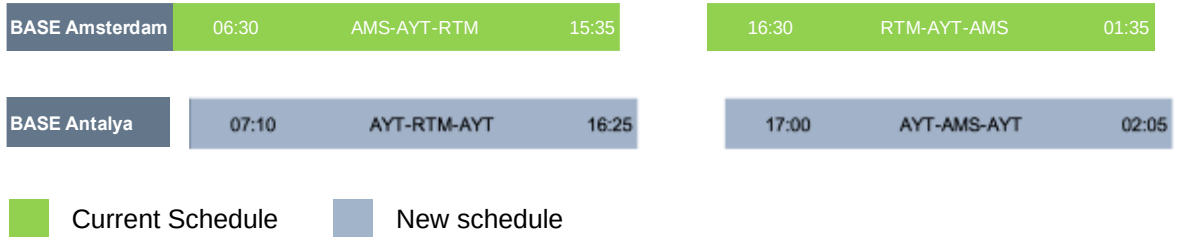


Figure: Reschedule by creating an outstation base



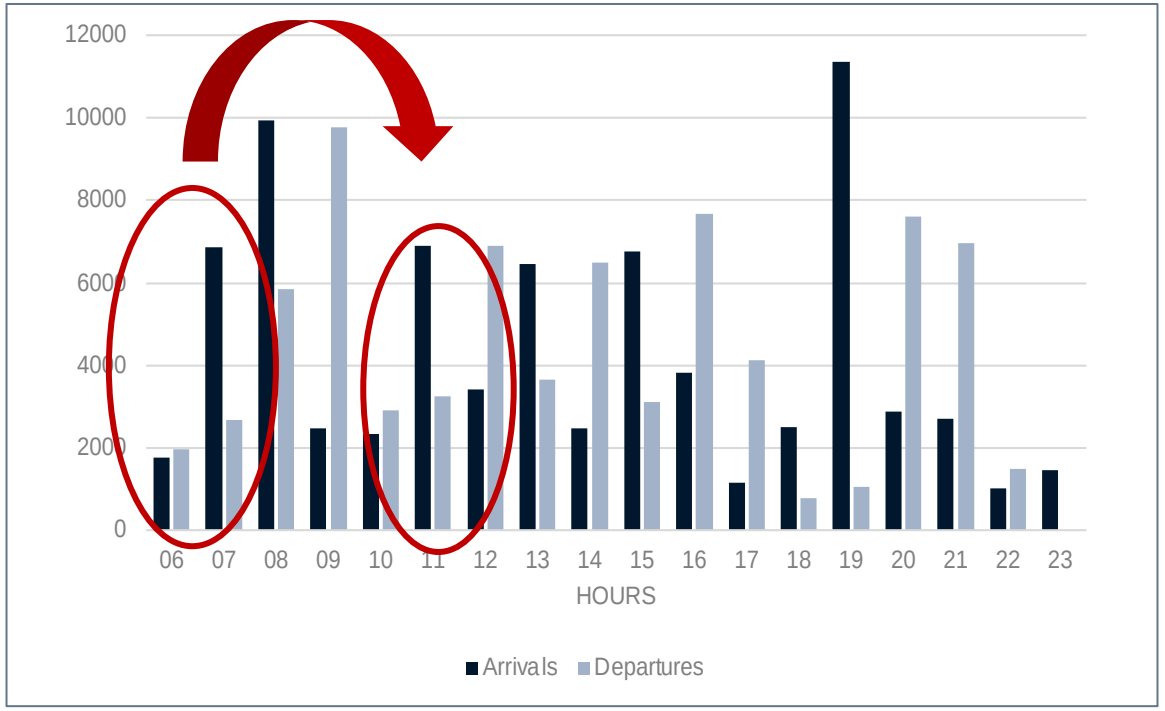
Analysis – Variant 1 – TUI and Corendon

- In some cases (e.g. joint flights Cabo Verde with Dakar or Banjul), it was not possible to maintain the entire triangular circuit due to the total flight time required, which did not fit in the allowed daytime period. Therefore, one of the two destinations needs to be cancelled.
- A few slots in the 7:00 hour have been assigned to both carriers to recover several routes otherwise impossible to reschedule.
- In the Winter, a limited number of ferry flights (flights without passengers or with limited commercial appeal operated to transfer aircraft) are necessary to allow continuous operations on the outstations' bases, leading to further negative financial impact.
- TUI requires 43% of slot changes of their total portfolio on a yearly base and as much as 70% in the Summer peak season.
- Corendon requires 40% of slot changes on a yearly base and 68% for the entire summer season.
- The model produces a base figure of flight losses of 5% for TUI and 9% for Corendon before various externalities are addressed. After considering the rigidity of the slot environment at key airports, the severity of the changes applied, and the impact of adjusted stage lengths on the commercial viability of the routes selected, we estimated the final level of cancellations could reach 18% for TUI and 25% for Corendon due to the risk of unsuccessful rescheduling. This has been considered in Impact Evaluation slides at the end of this chapter. The cancellation rate might be mitigated but, similar to Transavia, to do so would likely require the airline to fly routes that could be less appealing to the Dutch consumer.

Analysis - Variant 1 - KLM

- At present, KLM operates a five waves hub system with two major waves of flights in the early morning and late evening.
- The main impact is on the first and largest wave of the hub in terms of long-haul connectivity due to its strategic timing for flights from North America, Asia and Africa allowing premium yields to be earned by KLM. In particular, the extension of the night curfew to 7:20 for arrivals, exposes the airline to a large number of flights which needed to be rescheduled.
- Due to lack of arrival slots available in the early morning, the impacted long-haul arrivals are moved later in the 10:00 – 13:00 hours while the short haul arrivals are cancelled.
- KLM would effectively lose a large portion of the arrival component of the first wave.
- The delay in the arrival times of the wide body aircraft compounds existing infrastructural challenges in relation to airport capacity which are addressed in the Schiphol section since this will compress the first and second wave of wide body arrivals before any departure takes place.
- Even if the early short-haul flights have slots, their commercial viability may be weakened by reduced long-haul connecting feed.

Figure: KLM Hub Structure Summer 2024 – Variant 1 based on available capacity



Analysis - Variant 1 - KLM

The impacted long-haul destinations highlighted on the following slide require different rescheduling options based on their origin. We have postulated a series of hypothetical outcomes that KLM could consider but they all have challenges and may prove commercially non-viable for KLM. Some routes may ultimately be cancelled, and others might see frequency reduced impacting connecting markets.

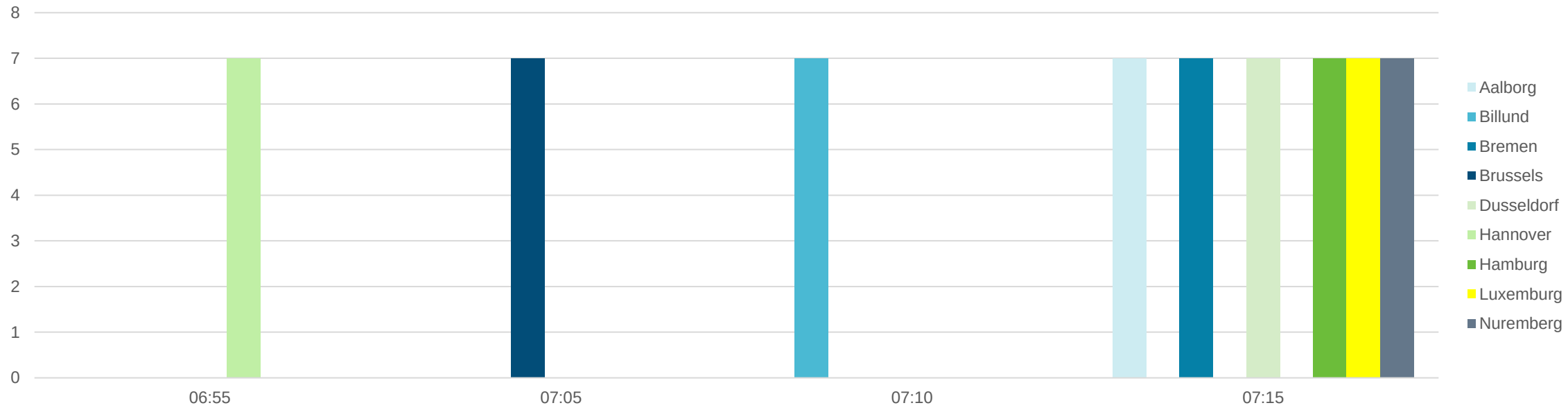
North American arrivals (5 cities with KLM and 4 cities with Delta) are impacted negatively by three effects:

- They are moved 3-5 hours later up to midday, resulting in missed morning connections to Europe. Prime business traffic is lost to other hubs which have an earlier arrival time at the final destination.
- The flights are so delayed that they nearly overlap with the second arrival from the same origin, creating a loss of value due to lack of differentiated frequency from the US when competing with other carriers.
- The later US departure in the US results in longer connecting times from many other North American cities via the KLM-Delta US hubs with a further negative commercial impact.
- Africa arrivals (4 cities) require a significantly delayed timing as they can no longer access reasonable late evening departures from their origins. This resulted in the flights rescheduled morning departures from Africa, arriving at Schiphol in the afternoon (15:00-16:00) with the loss of most US outbound flights which are critical to the revenues of these routes.
- Far East flights are moved to late afternoon arrival timings where they may lose some European connections.
- Another significant impact is on the short haul first wave flights both outbound before 7:00 and inbound before 07:20. While for the latter, the availability of departure slots has allowed a somewhat later departure for most destinations, for the first type there are no remedies and flights

Analysis - Variant 1 – KLM Medium Haul

- A further negative effect would come from the loss of early morning connections to some important business markets, e.g. Hamburg, where the loss of the first flight would have a negative impact on both the business connecting passengers arriving from the US and the local business traffic (further detail in the KLM pages later).
- For routes such as Brussels and perhaps Düsseldorf, surface alternatives may be available, but this is not true for most destinations. The underlying issue remains the alternate proposition if a passenger flies via competing hubs.

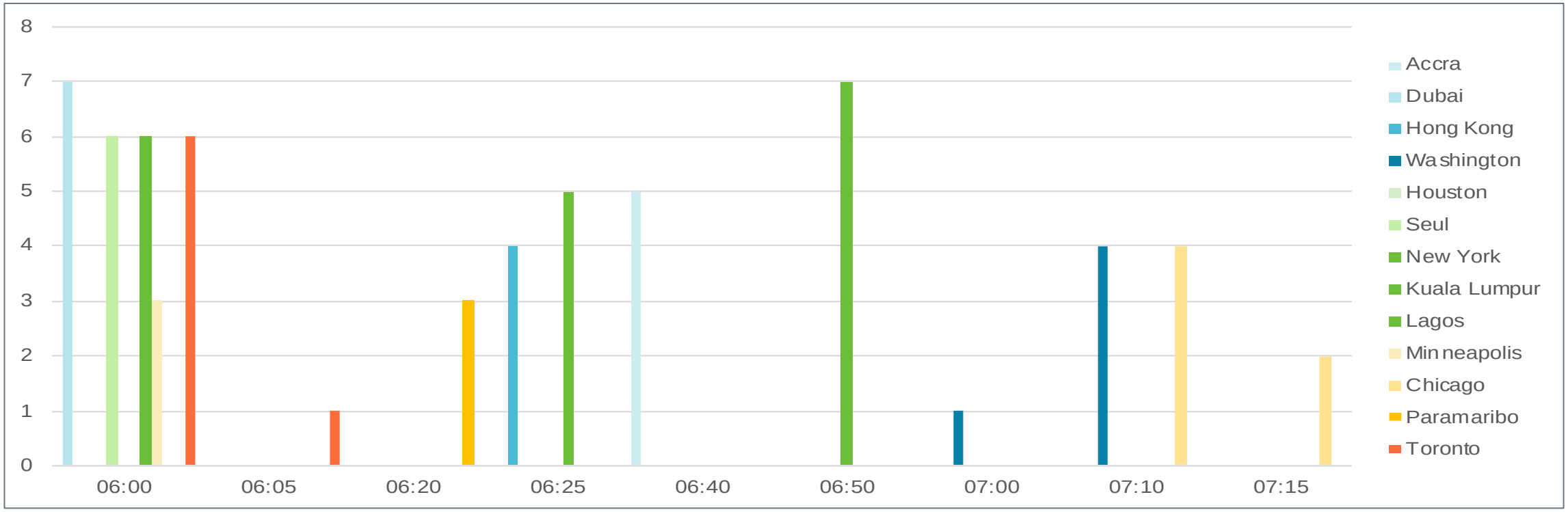
Figure: KLM Short Haul Arrivals Week 33



Analysis - Variant 1 - KLM Long Haul

- Long haul routes impacted would include Bangalore, Bogota, Capet Town, Houston, Johannesburg, Kilimanjaro, Lima, Los Angeles, Minneapolis, Paramaribo, Quito, San Francisco, Sint Maarten & Zanzibar.

Figure: KLM long Haul Arrivals Week 33



Analysis - Variant 1- KLM Summary

KLM

- It was impossible to perform a full reschedule of KLM flights without company internal data. So, we focused only on the flights impacted by the curfew and the associated return flights, (the base scenario evaluated flights) equalling ~10% of total flights, which were rescheduled. We assume this cannot be fully representative of the wider impact without having visibility from within KLM of the knock-on effects upon both the schedule and fleet. The final effect is certain to be greater, (we would estimate perhaps by two or three times).
- When we consider the total cancelled flights emerging from the rescheduling exercise compared to the number of total flights, the number might also not seem strikingly large at 3% of the KLM total but our model demonstrates the ripple effect created.
- Due to slot and capacity issues, this can be considered a ‘best case scenario’. If the schedule cannot be secured, further cancellations may be required.
- What is most important to highlight, is that each flight of the hub carrier carries an average of at least 50% connecting passengers. Therefore, ‘sub optimally’ rescheduled flights that do not allow convenient and competitive connections to destinations with significant demand can impact both yields and passenger loads and ultimately, route viability.

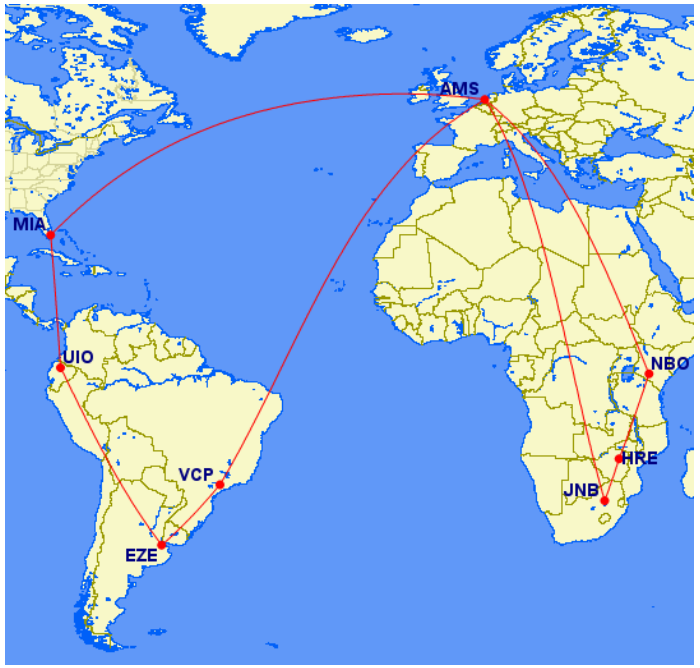
Figure: Impact of rescheduling KLM

	KLM
Impact of Rescheduling	Variant I
Total planned yearly flights	256,576
Total base scenario evaluated flights	23,020
Total flights impacted	22,900
% of flights impacted	99%
Total flights cancelled	6,415
% of cancellations	28%
Suboptimally scheduled flights	7,738

Analysis - Variant 1- Martinair

- The impact is on the late departure bank which falls between 22:40-23:40 and the arrivals at 06:00 from Africa.
- The carrier has been rescheduled for departures at 22:20. However, due to the nature of all cargo flights, there is a high risk of delays on departure. Therefore, the carrier may feel even that this timing is too great a risk and would ideally seek an earlier departure. Such an earlier departure is likely to cause slot issues or curfew infringements at destination airports.
- The flower industry has particular challenges, but the same issues extend to the wider export/import sector. The complex routings with multiple stops generate a high rigidity for the overall operation. The rigidity is the result of opening hour and slot availability at other airports, even if they have some flexibility to accommodate late freighter arrivals.
- The Martinair network has been built over many years in a series of flights from Amsterdam to B to C to D and back to Amsterdam over several days. To move any one flight significantly has a rolling impact on other flights. This has the potential to significantly impact the Schiphol operations of both importers and exporters.

Figure: Complex but regular Routings of Martinair



	Day 1		Day 3
Aircraft #1	22:40	AMS-VCP-EZE-UIO-MIA-AMS	15:20

	Day 1		Day 3
Aircraft #2	22:40	AMS-JNB-HRE-NBO-AMS	06:00

Analysis – Variant 1 – The integrators

DHL and Federal Express

- DHL will need to cancel the through flights connecting hubs in Leipzig to East Midlands via Schiphol. Deliveries will either be executed via surface transport, or they will have to double back via Leipzig, increasing overall emissions and cost.
- FedEx's European hub is in Paris and they may have to consider more surface traffic to compensate.
- The Variant does not allow for any practical recovery of their operations for the early delivery product.
- Both airlines arrive in the 5:00 hour to distribute products which are required at the start of activities, particularly critical care products/pharma for immediate hospital use. Earliest possible arrivals are in the 9:00 – 10:00 hours, so for vital medical and pre- market opening financial institution deliveries, the "just in time" logistic chain would be disrupted.

So, unless a waiver is put in place for integrators, it is very likely the two couriers will move to another airport and truck the products into Amsterdam.

Note: PA believes a waiver could be included in the conditions of use of the airport or the curfew rules that makes allowances for a specialist integrator who delivers a clear public good (such as just in time critical medical supplies to hospital operating theatres) before 08:00 for all Variants.

In some countries, postal flight are classified separately but it would require a review to see if this was possible and applicable to parties such as DHL and FedEx.

Other Carriers Impacted

- The cargo operators like Nippon Cargo, China Southern and Air China should be able to move their operations to times where slots are available, aligning them in some cases to other existing operations. An example in case is Nippon Cargo with arrival at 18:00 hour. We assumed that all operations of these carriers will be maintained.
- China Southern also will need to move its Canton passenger service arrival from morning to late afternoon, losing many connecting opportunities offered by KLM's hub.
- Singapore needs to move its passenger daily flight to another time window to fit a much later arrival at Schiphol. This later time window may be too late to competitively integrate it with its Singapore hub for feeding purposes. Singapore will also need to move its twice-weekly cargo flights from London Heathrow to another airport, possibly reutilising the slots for a growth of the passenger flights.
- Cathay is in a similar position as Singapore passenger flights and a similar solution has been applied.

Slot distribution in Variant 1

In Variant 1, activity is eliminated from the night period, but the preexisting late evening and early morning activity remains.

Figure: Distribution of Night Period Arrival Slots

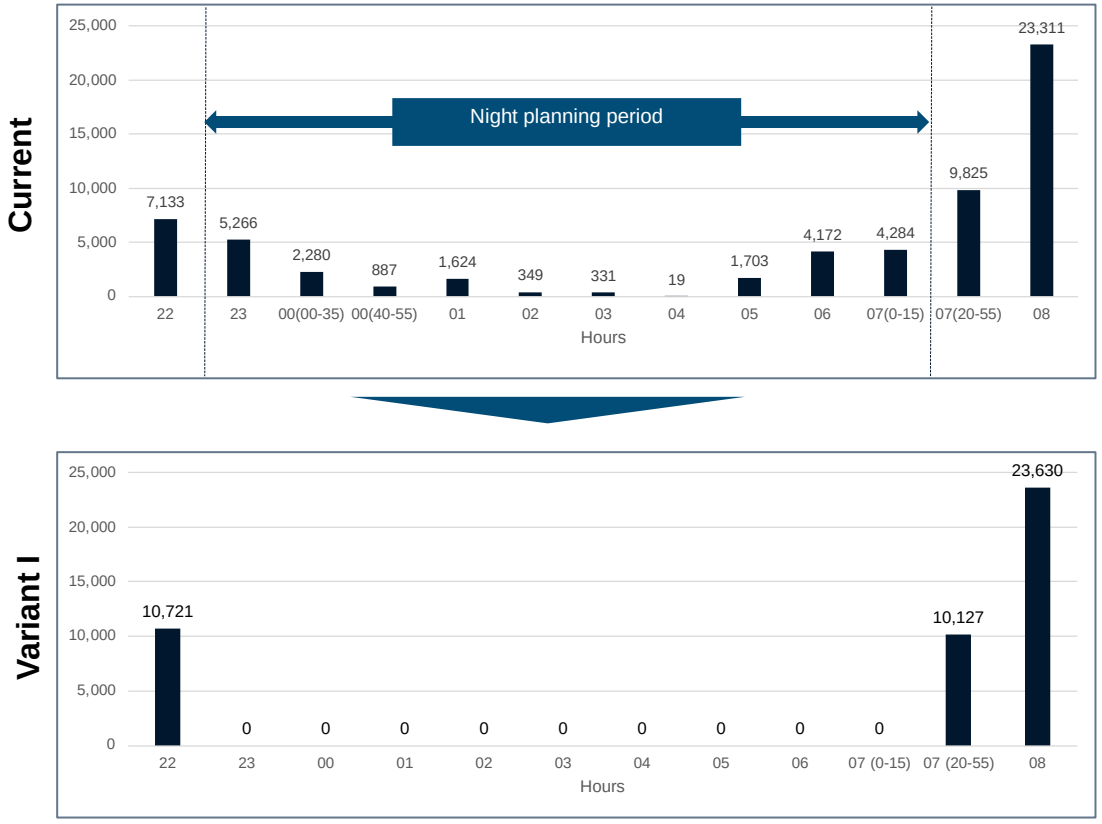
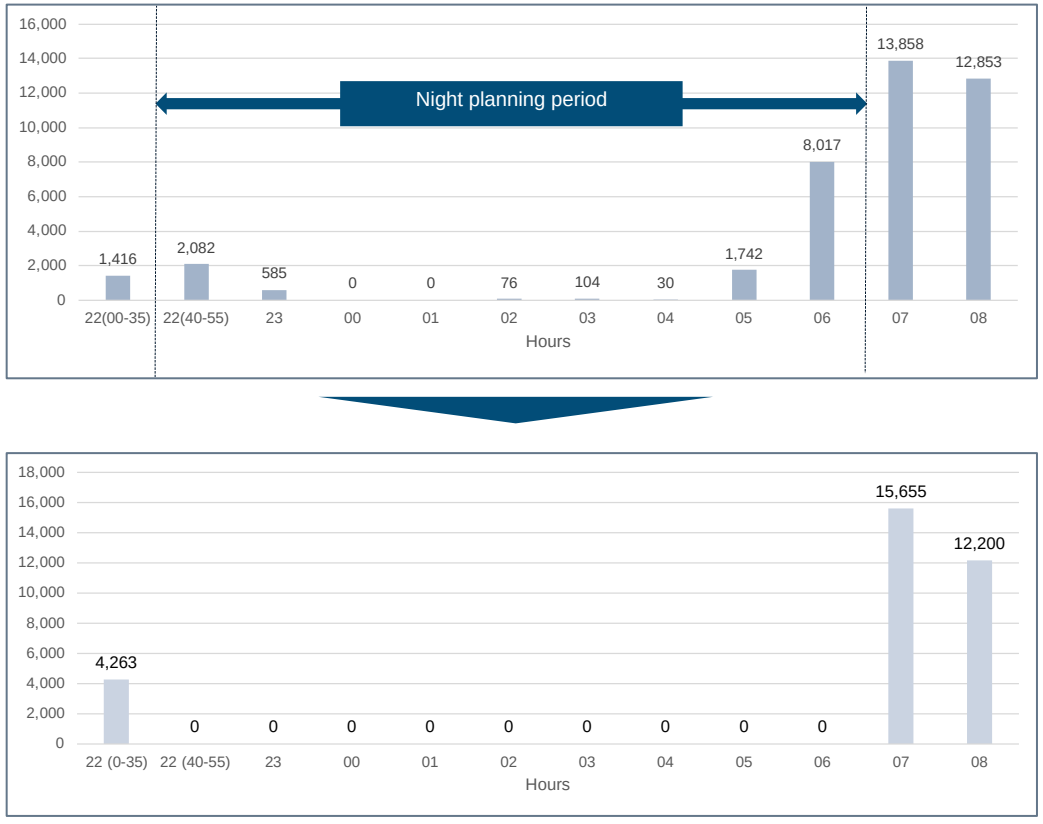


Figure: Distribution of Night Period Departure Slots



Variant 2 summary overview

The impact of this variant is:

- 24% of the night flights impacted
- 21% are rescheduled during the day while 3% are rescheduled in the night period
- 0.4% of cancellations are required to fit in the scenario
- 34% of flights of Transavia/TUI/Corendon require rescheduling, with 12%of flight running a risk of cancellation

Passenger airlines impact

- The KLM hub structure is not impacted in a typical operating day. However, there could be unquantified secondary effects, such as the reduced ability to recover operational disruptions on impacted days.
- Transavia, TUI, Corendon are confronted with limited flight cancellations (-2% to –5%). The required level of rescheduling on an average yearly base is high (15% to 39%) and very high during the summer peak season (21% to 65%).

Cargo airlines impact

- Singapore cargo flights from London Heathrow rerouted to other airports.
- Nippon Cargo has similar retiming as in Variant 1.
- DHL and FedEx are still hit by the curfew: their flights are delayed from early in the 05:00 hour until 07:20, which is likely to compromise the critical early morning services for many of their deliveries throughout the country.

Airport impact

- Increase in activity in the peak morning hours.

	Variant 2: INTERMEDIATE NIGHT CLOSURE
Night Curfew definition	Night closure: • Arrivals 00:00-05:19 • Departures 23:40-05:59
Rescheduling	No reschedule at night period edges only in daytime. Slot swaps allowed between arrivals and departures

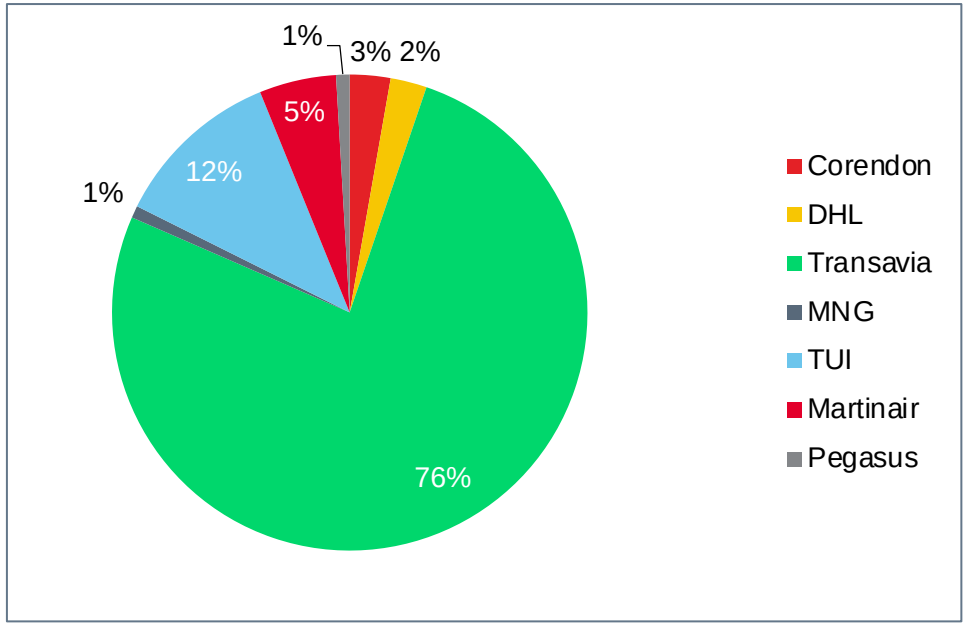
Analysis - Variant 2 – Impacted Carriers

- The overall movements affected by the curfew are 6,021 arrivals and 2,054 departures, which represent 24% of total night period activity.
- The airlines impacted are the three leisure airlines Transavia, TUI, Corendon, the integrators DHL and Federal Express along with Nippon Cargo, Air China Cargo and Singapore Cargo. There is only a nominal impact on Pegasus and easyJet.
- There is no impact on the KLM-Delta hub structure as their arrivals and departure are outside of the curfew. Also in this variant, some carriers mentioned concerns about the operational resilience when operating hours are reduced. This has been mentioned both with regards to the management of airspace as well as ensuring smooth connectivity of passengers, baggage and cargo. Schiphol has indicated they are prepared for such a scenario while LVNL has indicated that a few years may be needed to implement any material change.

Impact on passenger flights

- The impact on departures is mainly on Transavia, which holds 76% of all affected departures and 85% of all 05:00 hour departures at Schiphol. They represent approximately 20% of all Transavia's morning departures and it impacts an average of nine aircraft flying activity in the peak summer period, many to constrained airports.

Figure: Distribution of impacted departures 00:00-05:59



Analysis - Variant 2 – Our approach

In line with the adopted guidelines, no planning in the remaining night period is possible in this Variant. Therefore, several departures that could be moved into the 06:00 hour (based on slot availability) must be moved into the 07:00 hour, where there is less slot availability. In turn, this pushes all subsequent flights to later timings, some of which will cancel, and others will fill the period with increased activity in the hours before the start of the night period.

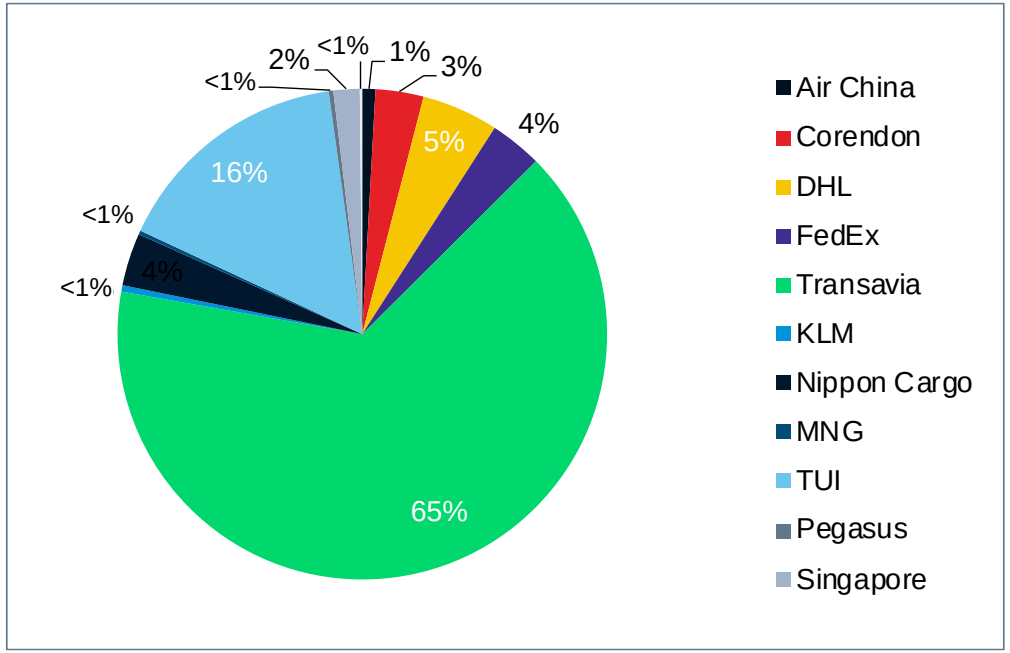
The inability to reschedule flight arrivals in the 23:00-24:00 shoulder, means that rescheduling falls into the 22:00 hour. At present, the majority of evening flights of Corendon, Transavia and TUI arrive after 24:00 (80% of Corendon, 61% of Transavia and 53% of TUI). Therefore, these three carriers will lose a significant portion of their final out and back flight each day to current destinations. The carriers will likely try to fly to nearer destinations with shorter flight times. This could potentially mitigate the financial impact upon the carriers, but it would further increase arrivals in the evening period leading up to the curfew.

One practical mitigation that avoids a reduction in aircraft utilisation and/or cancellations is to delay arrivals from the night into the first available early morning hours; an overnight return from destinations further away.

The 05:00 hour arrival is key since the aircraft need to be ready to start the day with a normal morning departure in or after the 06:00 hour. This is facilitated by the application of allowing arrival slots to be swapped with departure slots.

Transavia has the highest number of departures in the 05:00 hour, so it gets a greater benefit from slot swaps where possible.

Figure: Distribution of impacted arrivals 00:00-05:19



Analysis - Variant 2 – Freighters and integrators

Impact on cargo flights:

The integrators, DHL and FedEx, have a weekday 05:00-05:15 arrival bank which is used to deliver time-sensitive goods to various clients including hospitals and to the financial services sector. Since these airlines do not hold 05:00 departures to swap, under this scenario the earliest reschedule can be done after 07:20 hour arrival, making an early (usually time-critical) delivery virtually impossible.

In the model we have retained the flights at the later arrival, but the parties have indicated that this will have a severely damaging impact on their product and quality of service to their clients. If this issue is to be considered in greater detail, it would require an analysis of the impact on the entire door-to-door process and not just the flight considerations noted herein which we understand their representative body, the European Express Association has considered further.

From a long-haul freight perspective, Nippon Cargo and Singapore Airlines are both affected. We believe it should be possible for Nippon Cargo to re-time their night arrivals to the evening (as it already does so on one day of the week) to allow a subsequent departure before the curfew. However, the Singapore Airlines flight originates from London Heathrow, where a schedule adjustment is uncertain. Therefore, it is quite possible the Singapore may move the operation to an open airport (such as Liege), possibly operating extra services to protect movements for future passenger services in case of a potential capacity reduction at Schiphol.

In the evening, the application of the 20-minute rule to the 00:00 runway closure solely impacts Martinair. Martinair has twice-weekly departures at the threshold point of 23:40, which will be rescheduled into the 22:00 hour. The combination of the challenges of freighter operators and their clients to maintain punctuality along with the introduction of a curfew is likely to impact late evening operations by Martinair.

Analysis - Variant 2

After completing the rescheduling exercise, 26,353 slots remain in the night planning period of the original 33,551. They remain allocated in the periods 22:40-00:00 and 06:00 to 06:59 for departures and 23:00-00:00 and 05:20 to 07:19 for arrivals. This represents a reduction of 21% of slots, nearly all of which have been rescheduled in other times of the day.

In terms of cancellations, the overall reduction resulting from the new theoretical schedule is only a rather small amount. However, this low amount is misleading, as the really damaging factor is the required intensive level of schedule change for the impacted leisure airlines.

The more significant factor is the impact of rescheduling:

- For Transavia this will be 33% of the total flights, and 52% in the Summer peak as previously highlighted
- For TUI 25% of all flights require rescheduling, 37% in the Summer peak
- For Corendon 13% of total flights need rescheduling, with 19% in the Summer peak season

The model produces a base figure of flight losses of 4% for TUI, 5% for Corendon and 6% for Transavia before various externalities are addressed. After considering the rigidity of the slot environment at key airports, the severity of the changes applied, and the impact of adjusted stage lengths on the commercial viability of the routes selected, we judged that a portion of rescheduled flights would be non-viable and needed to be cancelled. The final level of cancellations was 13% for TUI, 11% for Corendon and 19% for Transavia. The cancellation rate might be mitigated, but to do so would likely require the airlines to fly routes to holiday destinations closer to the Netherlands that may not have the same level of consumer appeal.

Therefore, this will be damaging to the package holiday operators. TUI and Corendon are better positioned than Transavia to mitigate the situation due to their other existing bases outside the Netherlands. For Transavia, their profitability will be severely dented, and they will need to restructure their network and other aspects of their operations.

In the 02:00 hour there is an issue with DHL flights from Germany to the UK via Schiphol, which will most likely be cancelled and re-routed to other airports.

Slot distribution in Variant 2

In Variant 2, activity is eliminated for much of the night period, but the preexisting late evening and early morning activity remains.

Figure: Distribution of Night Period Arrival Slots

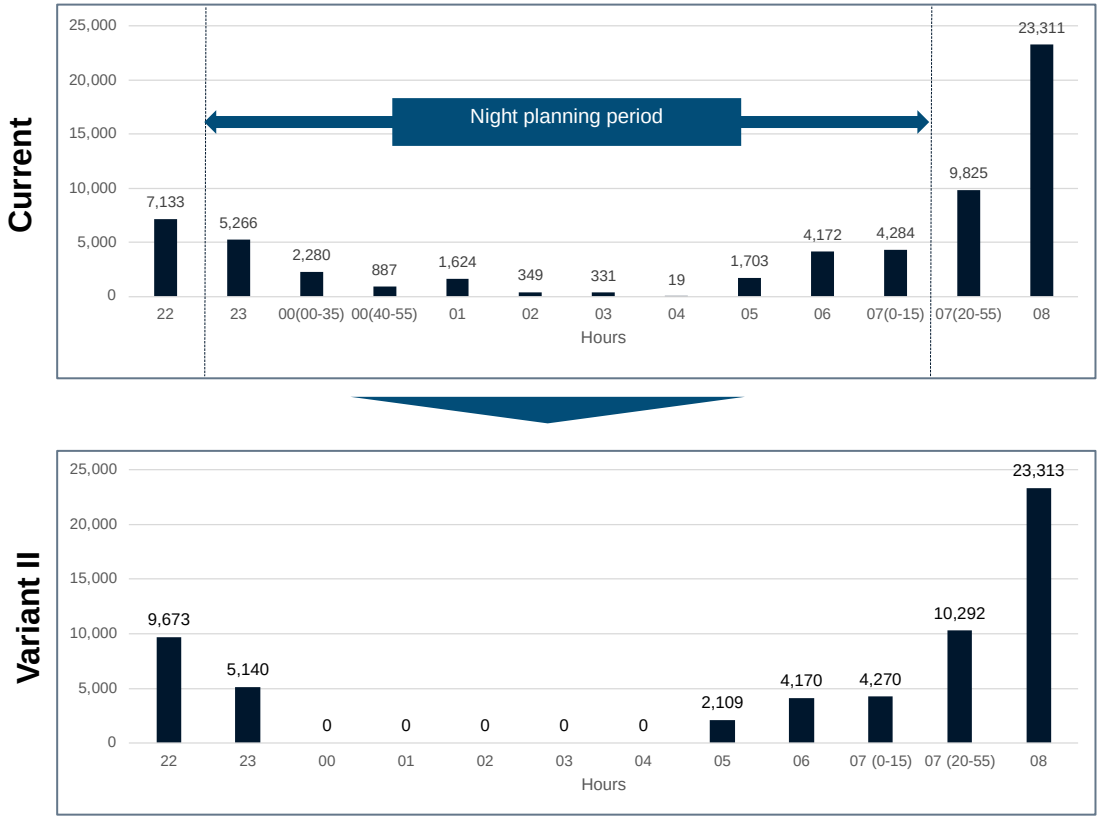
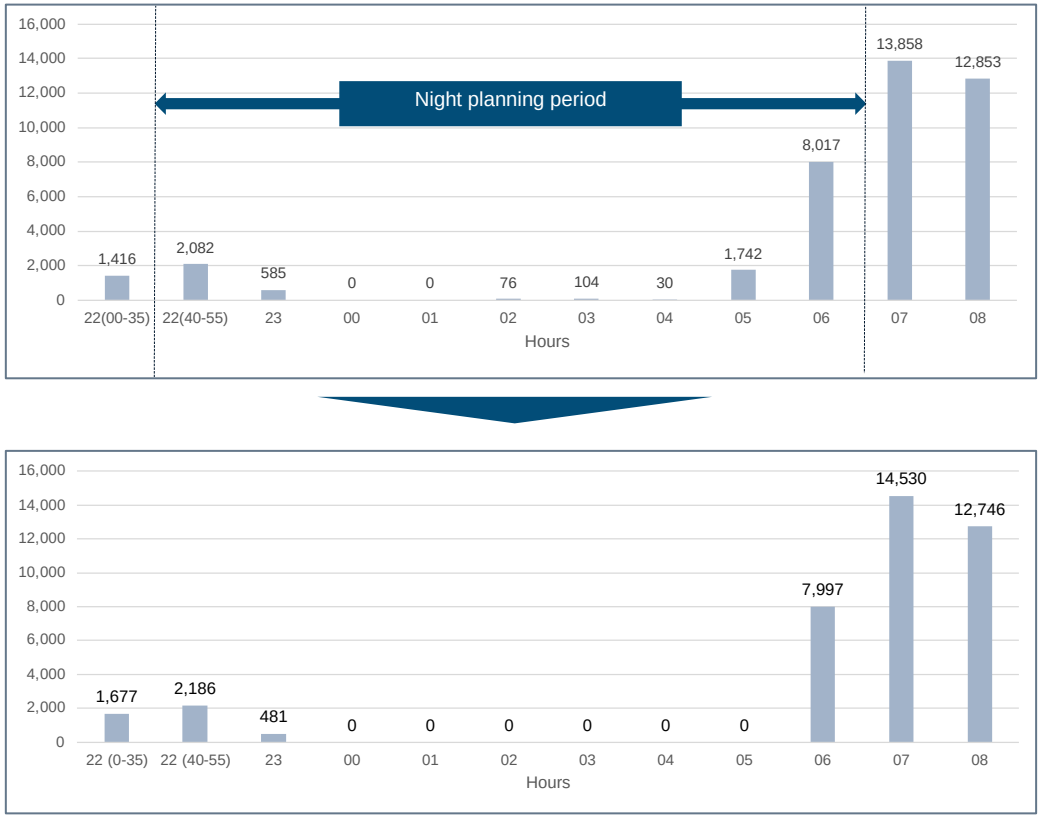


Figure: Distribution of Night Period Departure Slots



Variant 3 summary overview

This Variant had the lowest impact upon the airlines

- 13% of the night flights impacted, impacted flights are mainly arrivals
- 2% are rescheduled during the day while 98% are rescheduled in the night period
- 0.1% of cancellations are required to fit in the scenario
- 13% of flights of Transavia/TUI/Corendon require rescheduling, with 4% with a risk of cancellation

Passenger airlines impact

- There was no impact on the KLM hub
- The three leisure airlines are still the ones most impacted. The impact is primarily on the last out and back flights in the evening, as they generally should be able to get most of their morning flights away in this scenario
- Rescheduling is required within a range of 7%-16% of all flights for the three leisure airlines on a full year average, reaching a higher value in the Summer peak in the range of 24%-30% for Transavia and TUI

Cargo airlines impact

- There is also some impact upon the integrators, though less severe than in the other variants due to the possibility to reschedule early morning arrivals in the shoulder period starting from 5:40 with the slots available .
- No major issues arise for Singapore Cargo and Martinair. Only Nippon Cargo and China Southern remain impacted and rescheduling solutions were found for both carriers. For Nippon Cargo Airlines the same approach was used as in Variant 1 and 2.

Airport impact

- No significant impact on Schiphol

	Variant 3: BALANCED CURFEW WITH SHOULDERS APPLIED ON BOTH SIDES	
Night Curfew definition	Night closure: • Arrivals 00:20 - 05:19 (Runway) *00:40 - 05:39 (Planning)*	• Departures 00:20 - 05:19 (Runway) *00:00 - 04:59 (Planning)*
Rescheduling	Reschedule at night period edges and daytime allowed Slot swaps allowed between arrivals and departures	

Analysis - Variant 3

The overall movements affected by the curfew are 4,076 arrivals, and 210 departures, which represent 13% of total night period activity.

Impact on passenger flights

- No impact on KLM or the US carriers' flights.
- There are no significant departure issues for any airlines. The possibility to reschedule in the remaining night period allows the limited number of 4:00 hour departures to be shifted into the 05:00 and 06:00 hours. Moreover, it also allows the airline a reasonable chance to reschedule so that the last return flight to Schiphol can be accommodated before the curfew begins.
- In this scenario, it is possible to maintain the first rotation on historical slots, which consequently also allows the second rotation to be operated at historical timings, and in some rare cases, even the third rotation.
- The application of the 20-minute rule to both sides of the curfew, while allowing a five-hour runway closure as per requirement, creates enhanced planning flexibility for specific periods which have a high concentration of departures (05:00-05:20) and arrivals (00:20-00:40).
- In the evening, the planning curfew starts later than in Variant 2, and this impacts positively on Turkish departures planned at 23:10.
- Again, the theoretical level of cancellations is quite low. More significant is the level of schedule changes which amount to 14% for Transavia, 17% for TUI and 10% for Corendon. Destination capacity and slot issues will likely lead to a larger cancellation figure beyond those calculated. The final level of effective cancellations after all externalities was 5% for TUI, 3% for Corendon and 6% for Transavia.

Analysis - Variant 3

For arrivals, this variants has a smaller window in the 05:00 hour as flights can only be planned from 05:40 onwards. This means there is only a 20-minute time bracket to add flights from the night period to the early morning, which is needed to avoid aircraft rotation issues. However, the availability of arrival slots in the 06:00 hour partly mitigates this critical point, as KLM has already proved by moving its 05:00 hour arrivals into the 06:00 hour Summer 2024.

The extension of arrival planning to 00:35 allows for many operators to maintain more of their current historical slot-times except the 4,076 noted before.

Impact on cargo flights:

- The impact on integrator airlines is like Variant 2, but the ability to reschedule in the shoulder would allow DHL and FedEx to arrive at 05:40. This would result in arrivals only 25-40 minutes later than at present, potentially allowing them to maintain some early delivery services. No doubt this would negatively impact their businesses as they indicated but we assume not to an irrecoverable level. That said, as the aircraft arrive even slightly later, they get close to the early morning congestion period for delivery vehicles, which may not be able to deliver before peak hour. However, there would be an issue with priority for these services slots vs the leisure airlines that would also want to secure them.
- The arrival planning limit placed at 00:40 resolves the Singapore Cargo issue, as the 00:25 arrival would be outside the curfew, and the 00:40 arrival can be rescheduled to 00:35. This option can be achieved by very slightly shortening the block time or requesting a five-minute re-time at London Heathrow, which may be granted at such a quiet period.
- For Nippon Cargo, the considerations made for Variant 1 and 2 are also applicable here.
- China Southern is impacted by the curfew, though it may be possible to replan arrivals into the 06:00 hour, as they are likely to have more flexibility at their Shanghai base.

New distribution of planned slots Variant 3

In Variant 3, activity is still eliminated for much of the night period, but the remaining night period activity is increased

Figure: Distribution of Night Period Arrival Slots

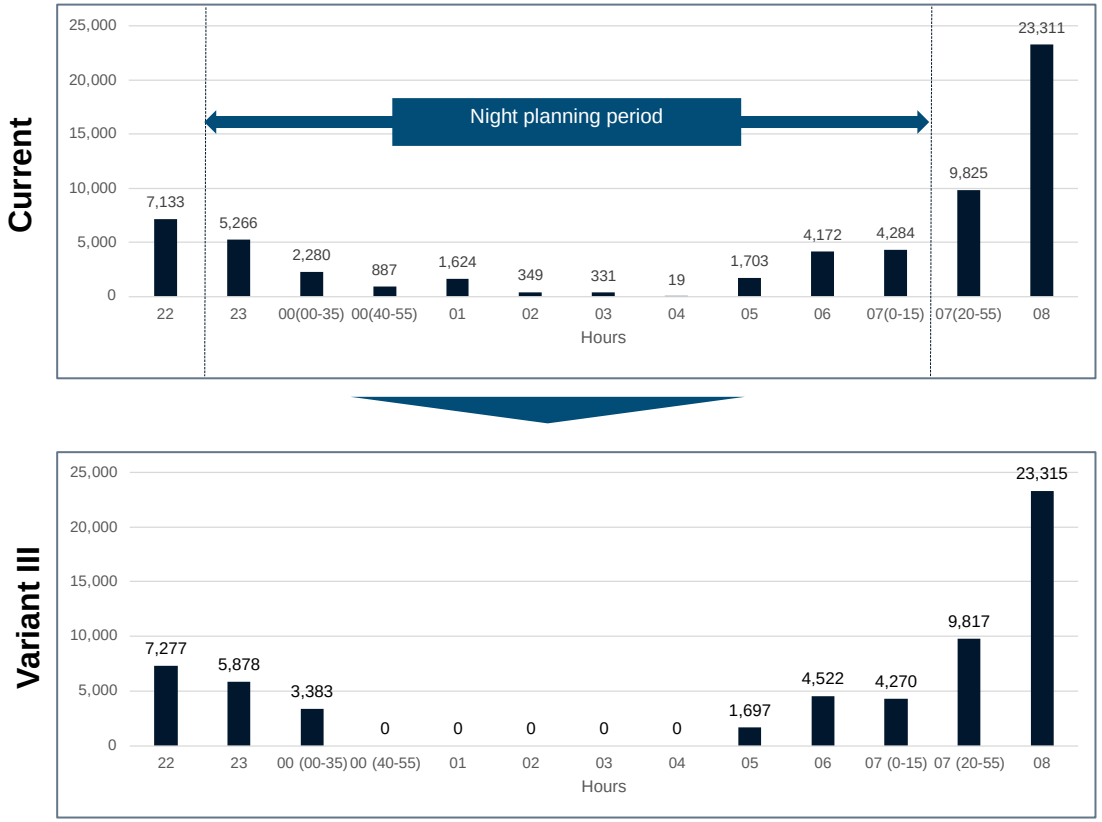
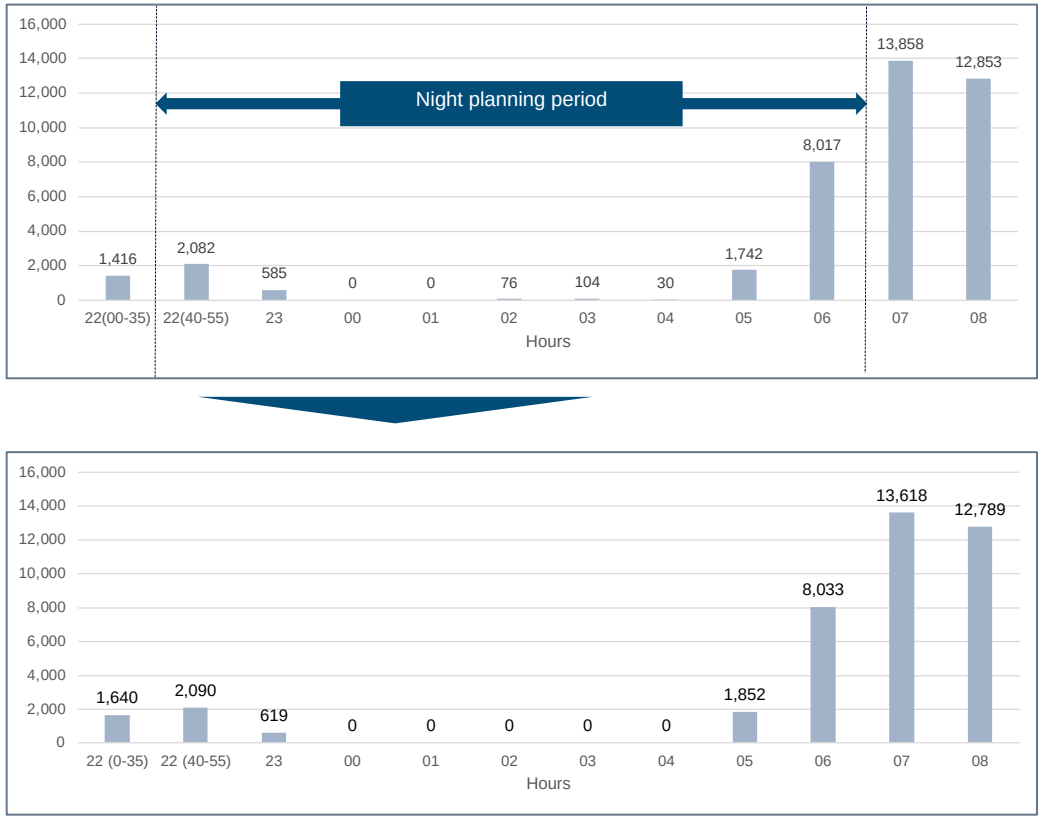


Figure: Distribution of Night Period Departure Slots



Impact Evaluations

Without access to commercial and financial data, we opted to comment on the financial impact by evaluating the loss in passengers which have a direct impact on revenues for each airline.

Our analysis has been carried out for the three typical weeks and then the results were transformed into a yearly evaluation. In this way we were able to consider the seasonality of traffic demand, which for the leisure airlines is particularly important, and avoid just applying year-round averages.

We considered four areas of impact in calculating the expected loss of passengers:

- **Flights cancelled directly** when developing the reschedule exercise for each Variant. These cancellations were necessary to fit the schedule in the new rules for a night curfew.
- **Flights at risk of cancellation** due to unsuccessful rescheduling. This will only impact a portion of flights since there will be others that might find alternate destination opportunities but in absence of commercial data, it would be highly speculative to estimate the clawback of revenues or passengers.
- **Flights rescheduled to a different origin airport** 2 to 3 hours drive away (for example Maastricht or Groningen), therefore being less attractive for the wider Amsterdam market.
- **Flights rescheduled to originate from a destination airport** at a very early time of departure or late time of arrival, which are less appealing to the traveller (for example a departure from Ibiza at 05:30 am).

With these definitions the sum of all cancelled or retimed flights are considered disruptions to the base scenario.

It was previously highlighted that even after multiple seasons, some slot changes are impossible to secure. Therefore, in order to establish a criterion for deciding the portion of rescheduled flights which would not be able to find a real possibility to be changed and thus be transformed into cancelled flights, we set a timeline for the start of the curfew of three years. In this way we believe we could give an equitable evaluation of the impact.

There is potential for some further recovery of cancelled activity on different routes. However, this requires commercial information not available from the carriers and depends also on the individual airline's restructuring flexibility.

Transavia is the carrier with the greatest impact in all Variants

Variant 1 disrupts 87% of its flights, it requires to move 85% of its based aircraft away from Amsterdam, and to cancel 34% of its flights, with a significant social impact on its workforce. Only 56% of its original flights maintain a commercially viable timing.

The loss in passengers is forecasted at 2.0 mil, about 37% of the actual base volume of its Amsterdam operation.

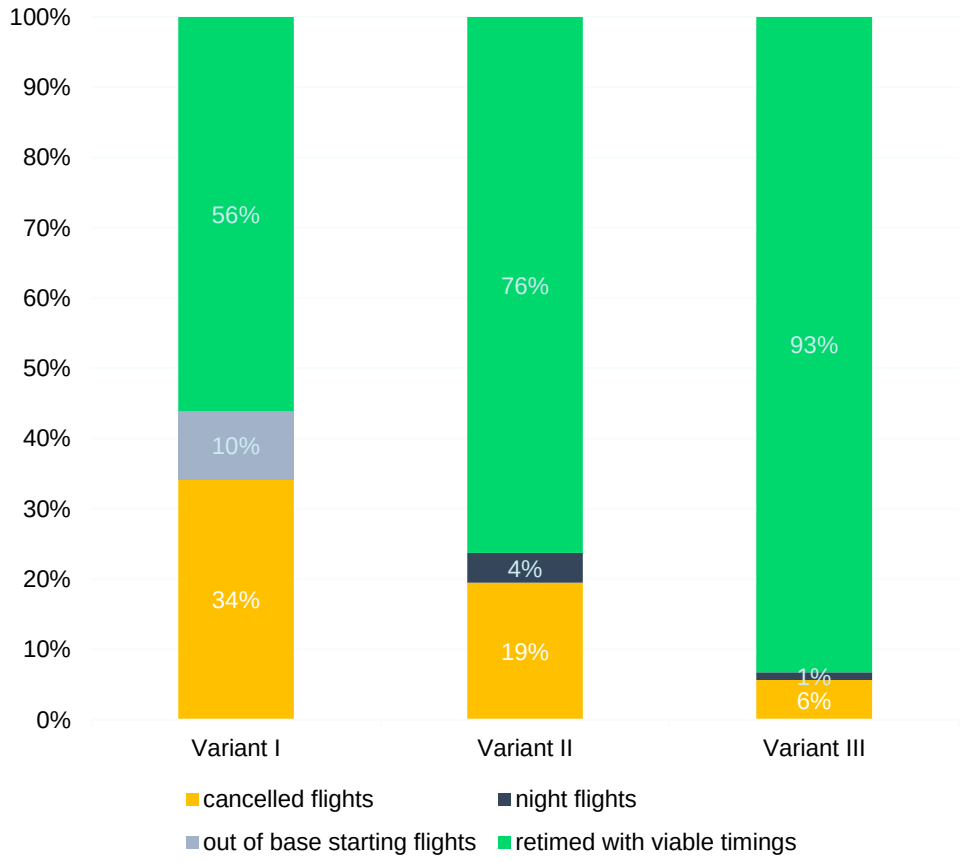
There is a radical change to its current business model and a severe downsizing. It is our view that under Variant 1, it would be reasonable for the AF-KLM Group Board to want to reassess the size and sustainability of their investment in the Transavia Netherlands business model as it exists today.

Variant 2 is less invasive but still quite significant with 43% of its flights impacted. This scenario allows to potentially maintain the fleet based in Amsterdam, but it is estimated the need to cancel 19% of its total flights, with the loss of 1.1 mil passengers.

Variant 3 has a more limited impact with 14% of flights impacted, which leads to a 6% cancellation level and a subsequent loss of 6% of passengers valued at 0.3 mil.

The cancellation rate might be mitigated, but to do so would likely require the airline to fly routes that could be less appealing to the Dutch consumer.

Figure: Transavia – Flight segmentation after rescheduling
Total of 32,954 flights



TUI is the carrier with the greatest flexibility to react to the impact

Variant 1 disrupts severely its operations with 52% of its flights being impacted. It requires TUI to position 1 aircraft out of Amsterdam in the summer season and a further second for the peak period to enhance its rescheduling potential. This leads to a cancellation of 18% of its total flights.

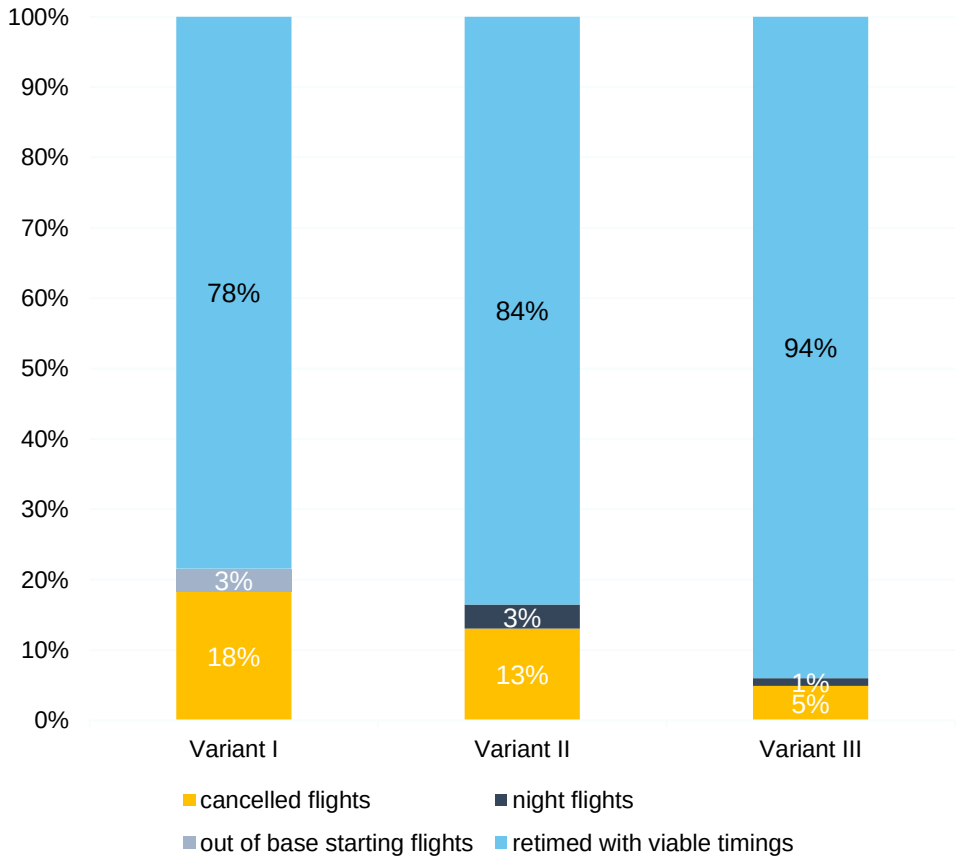
The loss in passengers is forecasted at 300,000, about 18% of the actual base volume of its Amsterdam operation.

Thanks to its established multi-base business model, TUI will recover flights in/out of Schiphol using aircraft based outside the Netherlands more easily than Transavia.

Variant 2 is still quite invasive with 35% of its flights impacted. This scenario allows to maintain all aircraft based in Amsterdam, but it is estimated the need to cancel 13% of its total flights, with the loss of 200,000 passengers.

Variant 3 has a more limited impact with only 19% of flights impacted. This impact is higher than the impact of Variant 3 on Transavia or Corendon due to the different mix in early departures and arrivals within the start of the curfew. Variant 3 leads to a 5% cancellation level and a subsequent loss of 5% of passengers valued at 80,000 passengers.

Figure: TUI – Flight segmentation after rescheduling
Total of 8,090 flights



Impact Evaluations - Corendon

Corendon is the carrier with the smallest operation of the three leisure carriers. Flexibility is achieved through its sister companies to react to the impact which occurs only in the summer season.

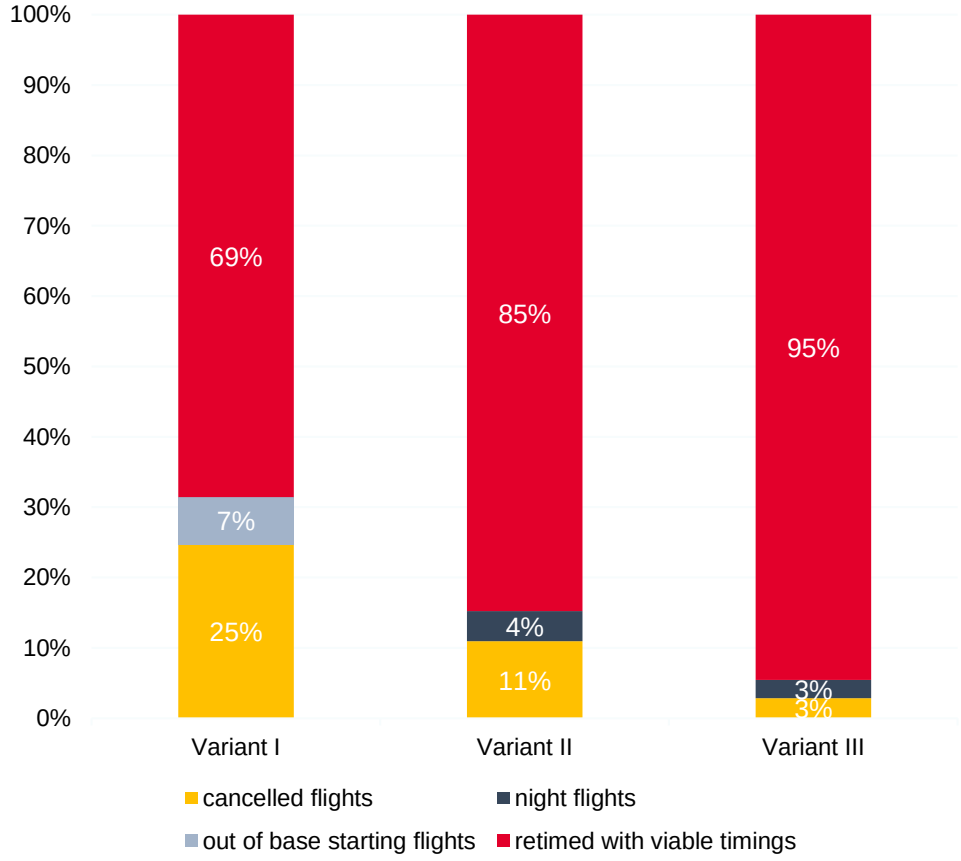
Variant 1 disrupts severely its operations with 57% of its flights being impacted. It requires Corendon to position 1 aircraft out of Amsterdam in the entire summer season to enhance its rescheduling potential. This leads to a cancellation of 25% of its flights.

The loss in passengers is forecasted at 120,000, about 25% of the actual base volume of its Amsterdam operation.

Variant 2 impacts Corendon the least compared to the other leisure airlines, with 25% of its flights impacted. This scenario allows to maintain all aircraft based in Amsterdam. It is estimated that Corendon needs to cancel 11% of its flights, with the loss of 65,000 passengers.

Variant 3 has a smaller impact with 10% of flights impacted, which leads to a 3% cancellation level and a subsequent loss of 3% / 16,500 passengers.

Figure: Corendon – Flight segmentation after rescheduling
Total of 3,169 flights



Impact Evaluations – KLM and Delta

KLM and Delta are only directly impacted in Variant 1.

The evaluation of the impact of the three Variants on KLM's network cannot be constructed in the same manner and level of detail as for the leisure airlines. We are lacking the insights to understand all the knock-on effects of rescheduling the flights directly hit by the night curfew and to quantify and display them graphically in the same way as the leisure carriers.

We can only try to evaluate the impact on this portion of flights, which represent only 9% of the full operation of KLM at Schiphol. We have added Delta side by side in this evaluation since the two carriers effectively act as one. Variant 1 directly impacts those synergies in the early hours of the day.

As previously indicated, KLM suffers a cancellation of flights on its short haul activity and a rescheduling of its long-haul early morning arrivals, which are moved from its first connecting wave.

For the short-haul, the impacted cancellations lead to a loss of about 650,000 passengers.

For the long haul, about 2.5 million seats are impacted, with a potential loss of passengers in the range of 250-500,000 passengers along with the unquantifiable but certain impact of lower yields. For KLM and partners this can lead to downgauging, redirection over partner hubs (Paris, Copenhagen etc) or outright route termination.

On top of this, it is important to consider the loss of passengers flowing on to the short haul fleet of KLM via the reduction of passengers generated by the reschedule of the inbound connecting Delta flights. This additional passenger loss could be estimated in a range of 70-140,000 passengers.

If passenger losses were greater than the numbers suggested, then more flights would likely be deemed non-viable triggering further cancellations.

Delta

In addition to these figures, we have calculated that for KLM’s partner Delta, a further 70-140,000 passengers are likely to be potentially lost. Despite the integration of their operations with KLM, we believed it was reasonable to allocate the likely impact between the two join venture partners. In practice, one carrier could carry greater losses than the other in passenger numbers but within the joint venture, both revenue and financial losses are typically shared.

06 Measures

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Measures

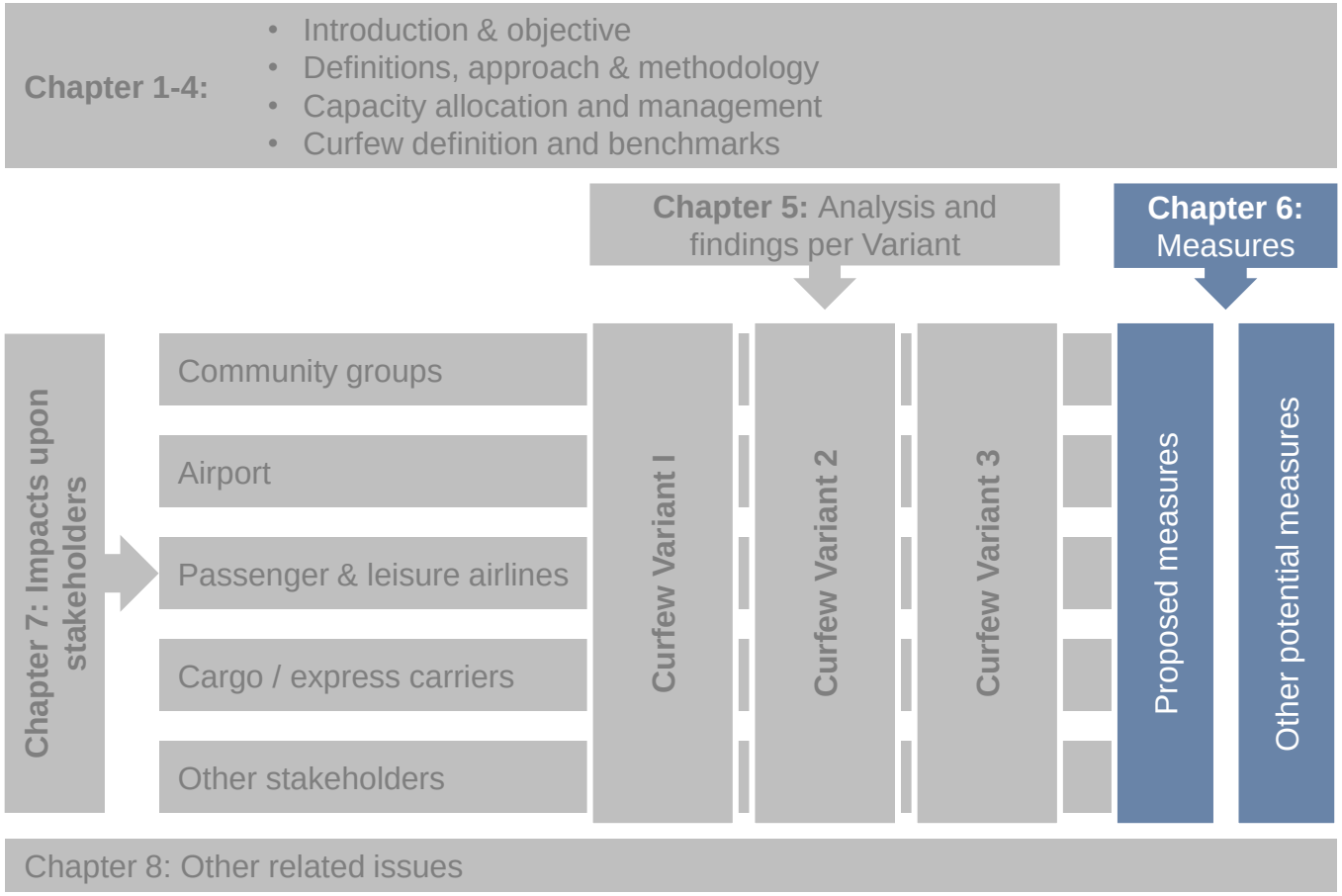
A number of Measures were set out by the Ministry for consideration.

We have assessed them independently of the curfew to determine whether or not they deliver value in their own right.

PA has also set out ideas for other Measures that could further help mitigate noise or hindrance.

These Measures are set out in the following slide and our analysis of the potential efficacy of each one follows thereafter

Figure: Overview of structure of the report



Proposed Measures that were considered

On top of the three Variants previously described, PA was also assigned to consider and seek input on certain other potential measures that could be considered and deployed independently to limit the impact of aviation in the night period.

This may include measures at the source, in spatial planning, operational, or (operational) restrictions in other ways, such as:

1. Prohibition of certain types or noise classes of aircraft at night*
2. Reducing the use of noisy appliances in other ways, for example by differentiating tariffs
3. Night quotas for specific aircraft types*
4. Penalty system for latecomers
5. *Alternative runway and/or route use***
6. *Alternative procedures***

The evaluation of Measures 1 to 4 is described in this report. PA considered Measure 1 and 3 (*) to be intrinsically related and therefore they will be considered together. Measures 5 and 6 (**) were deemed to be closer to the work of the parallel study – Part B.

PA was asked to canvass stakeholders for proposed measures as well as to propose any potential alternative measures beyond those set out (we have articulated three: proposed alternate measures 7, Allowing slot trading for compensation to reduce night activity, 8 Commercial/Financial incentivisation to convert Night Slots into day ones and 9, Discontinuing the allocation of ad hoc slots in the night period

With regards to measure 3, the application of a night quota to aircraft types is practically the same measure as prohibiting certain types (measure 1) since this measure could be considered as measure 3 with the quota being zero. So, PA has treated these two measure in a combined context and the following slide address measures 1 and 3 in tandem.

All proposed measures are likely to be subject to regulatory scrutiny and a Balanced Approach assessment.

Key Takeaways Measures

- The measures proposed reflect issues that can take years to address. If the goal is to insist that all carriers use an aircraft meeting certain criteria, then policies need to be set with a minimum 5-year timeline for gradual implementation.
- Noise measures can only be met in the short term by those airlines with fleets with a high mix of aircraft although it may require suboptimal allocation of that fleet, others like KLM, Martinair or Transavia, who make up the bulk of the activity and have older aircraft types within their Schiphol based fleets can only adjust once the fleet replacement plans are completed between now and 2030.
- Night tariff increases, even if very significant, have a limited impact on route profitability since they are diluted within the totality of routes' costs, so this measure does not appear to become effective in changing airlines planning behaviour.
- Penalties for late comers beyond the start of the curfew to be effective require to be set at a punitive level to influence airline schedule planning, otherwise they will become as part of the cost of doing business since it normally costs more to an airline to divert instead of landing at the destination airport.
- Severe penalties often have unintended consequences that do not always deliver results in the consumer’s best interest.

Newer aircraft typically become more efficient and less noisy; measures aimed at older aircraft can therefore impact noise outcomes

The environment as it exists today

As aviation technology has advanced, jet engine performance has improved significantly, reducing noise experienced by communities surrounding airports globally – a process that is ongoing today. New technologies, such as the Geared Turbofan used by some Airbus and Embraer jets are still bedding down but there is no doubt they burn less fuel and produce less noise – outcomes that benefit all.

That said, in the present environment, new aircraft are extremely challenging to secure. Airbus, Boeing and Embraer have all faced delivery challenges in recent years, and consequently, many airlines placing orders today are being offered delivery slots from 2030 onwards, with existing delivery dates also subject to delay. Therefore, the imposition of any aircraft type restrictions related to noise needs to consider the existing fleets of Schiphol operators, as well as their order books and likely delivery timelines.

In this environment, the prohibition or limitation of existing aircraft types, prior to a reasonable period and implemented in a way that does not recognise the operators' inability to promptly upgrade their fleets, would potentially create a burden that will be challenging to resolve regardless of will or intention of the airlines. They can try to adjust their schedule to minimise impact and incentives can be created to that effect, but the actual options may be limited.

Freighters bring additional complexity in this area. Historically and globally, freighter aircraft tend to be older, and, in many cases, are retrofitted former passenger aircraft. The clearest example of this is the B747, which is no longer seen in passenger service but is still quite common as a freighter.

These older aircraft types include B777s, B767s and others that may not meet new noise thresholds, so any restrictions or increased penalty enforcement may encourage operators to simply move their operations to airports in Belgium, Germany or Luxembourg. This would likely result in the freight starting/completing its journey to/from the Netherlands by road with the associated impacts that would cause. In other words, depending on when the prohibition is implemented, and/or where noise limits are set, some freighter operators may simply be unable to adapt and therefore choose to re-locate.

Freighter operations are also especially challenged in terms of maintaining punctuality. Older aircraft can be less reliable, and in parallel, delays are often attributable to the shipper and forwarder who have had challenges delivering freight to the airport, with associated knock-on effects. This has been a long-term issue confronting the global freighter industry and is not unique to Schiphol. We note that if an airline is missing one passenger, it can depart anyway and leave a person behind, but if a freighter is waiting for cargo such as a key shipment of machinery (e.g. from ASML), it is likely to give the customer as much forbearance as possible.

Prohibition of certain types or noise classes of aircraft at night and night quotas for specific aircraft types are more nuanced than a full curfew

Measure 1 - Prohibition of certain types or noise classes of aircraft at night
Looking specifically at narrowbody freighters such as those used by integrators such as FedEx, we have received clear information that, while Boeing will continue to produce new-build wide-body freighters, they will not be producing any new narrow-body freighters. (Note: Boeing is FedEx's existing global fleet provider of narrowbody aircraft – mainly 757-200SFs). This will limit fleet replacement in the integrator sector so some accommodation may be required based on cargo fleet availability may be needed to allow their offerings to continue. The fleets of both DHL and FedEx are older on average than typical passenger aircraft. This is an issue seen in many parts of the world and integrators have often set up their operations at secondary airports since the underlying fleet issue is difficult to address. But such a solution is not available in the Netherlands.

The sector raised issues surrounding the banning of older aircraft that are associated with EASA policy. We suggested they articulate this in more detail in part B of the study.

It should be noted that many airlines have mixed fleets and on a given day, the aircraft the airline planned to operate may not be available and the operator may be compelled to use a different aircraft or cancel the flight. Extra charges, a quota allocation or even escalating penalties could be levied upon the airline who encountered this situation repeatedly. For long-haul airlines there is already significant impact of taking this step as it can leave crews and aircraft out of position for future planned operations. Therefore, there is no incentive to switch aircraft types, but, if the alternative is a cancelled flight, the operator will use different aircraft types.

Measure 3 - Night quotas for specific aircraft types
A night quota exists at both Sydney and London Heathrow for a limited number of flights that arrive before the 06:00 official opening. These flights had longstanding early historical slots for key routes. There is no clear legal mechanism to withdraw these slots and so they are tolerated. If a carrier does not fulfil its 80/20 commitment, it forfeits the slot to the pool and could only be reissued after 06:00.

Other airports do offer a limited number of exceptions for curfews – we see this for example in Germany – and the rules there at airports such as Munich are biased to favour the based carrier, a recognition of the unique challenges the home carrier may face returning to base.

Specific quotas based on noise also exist. FedEx noted the one in Hong Kong as an example of good practice.

Quotas can be considered for Schiphol but our conclusion, based on what evidence we have seen, is that it is unlikely to have a material impact on airline behaviours in short to medium term.

Measures 1 & 3 summary: Restrictions based on the noise levels could be challenging to fully implement, at least prior to 2030

At an overview level, the limitation imposed on the night period flights could be considered as the primary night quota in effect already.

However, if a specific night quota was to be imposed on the flights operated by aircraft with a noise level above the defined threshold of -14 ΔEPNdB, it could be considered, in effect, as a secondary night quota.

- KLM Group (KLM, Transavia and Martinair) will inherently account for a large share of noise in the night period as they have the majority of activity and key parts of their fleet are transitioning between now and 2030, subject to aircraft manufacturing delay.
- While the passenger fleet has some flexibility in flight planning, the cargo fleet is schedule constrained and their fleet replacement programme will likely be completed during 2027.
- For the other airlines, Singapore Airlines may also find it challenging to switch aircraft type, because the B747 is the optimal aircraft for their Schiphol - London Heathrow cargo service.
- Other Cargo and Integrator fleets may be challenged to meet any nighttime noise restriction and, depending on the nature of the restriction, these carrier may still face challenges after 2030.
- Most other passenger airlines will likely have the ability to operate aircraft that will meet a reasonable noise restriction by assigning specific types to their Amsterdam route. Of course, there could be exceptional circumstances on occasion (such as a maintenance issue grounding the intended aircraft, thus requiring an older aircraft to fly the rotation).

A more detailed analysis of noise related issues is addressed in the adjacent Part B of the study commissioned by the Ministry

Tariff Differentiation by time of day is already established; in order to impact fleet decisions the quantum must be meaningful

Schiphol already has differentiated tariffs between daytime and night-time landings and take-offs.

Night fees apply to movements between 23:00 and 06:00. Currently, 3.2% of scheduled movements (14,996) fall within the night tariff, with 74% held by KLM Group.

The tariff scheme has a base value for a noise category S3 aircraft connected to a pier gate landing or taking off during daytime period.

The tariff then has a night surcharge which is added to the daytime tariff and is differentiated between landing and take-offs.

For aircraft that have a worse noise category the daytime tariff is increased and clearly this also increases the night applicable tariffs.

For the night tariffs to have any meaningful effect upon the carriers that are impacted, it must make a material difference to its full costing of the route. Therefore, the increment of a night tariff needs to be evaluated within the change in the total level of airport charges paid by each carrier and then, furthermore, it needs to be considered within the entire cost chain of the route.

Lastly, the carrier has to have a reasonable alternative available within its fleet mix to allow a calculated choice, otherwise it will just absorb and pass on the cost.

Figure: Airport Charges (*Source: Schiphol - Charges and Conditions April 1, 2024)*

The charge in relation to the base charge as per April 1, 2024:

Landing and take-off charges (%)	Category Category S1			Category S2			Category S3		
	Day	Night		Day	Night		Day	Night	
	Landing / take-off	Landing	Take-off	Landing / take-off	Landing	Take-off	Landing / take-off	Landing	Take-off
Connected	200%	500%	600%	145%	225%	250%	100%	140%	165%
Disconnected	160%	400%	480%	116%	180%	200%	80%	112%	132%
Cargo	104%	260%	312%	75%	117%	130%	52%	73%	86%

Category S4			Category S5			Category S6			Category S7		
Day	Night		Day	Night		Day	Night		Day	Night	
Landing / take-off	Landing	Take-off	Landing / take-off	Landing	Take-off	Landing / take-off	Landing	Take-off	Landing / take-off	Landing	Take-off
80%	120%	145%	65%	100%	120%	50%	80%	95%	40%	65%	75%
64%	96%	116%	52%	80%	96%	40%	64%	76%	32%	52%	60%
42%	62%	75%	34%	52%	62%	26%	42%	49%	21%	34%	39%

Nox charge	
per kg Nox emission	€ 4,00

Passenger charges		
Passenger Service Charge	**Schiphol Centre**	**Schiphol East**
per departing local passenger	€ 22,30	€ 17,84
per departing transfer/transit passenger	€ 9,36	€ 7,48
Security Service Charge		
per departing local passenger	€ 17,08	€ 17,08
per departing transfer/transit passenger	€ 9,54	€ 9,54

Parking charge	
per 1.000 kg per full day	€ 2,52

Section 3 In the event of a flight which is handled at a connected stand, the basic compensation per 1.000 kg (or part thereof) for a landing or take-off is calculated according to aircraft weight:

	As per April 1, 2024
a. for aircraft not weighing more than 20.000 kg MTOW (in total)	€ 118.80
b. for aircraft weighing more than 20.000 kg MTOW	€ 5.94

A manifold increase would be required in the aircraft landing fees to have a discernible impact on overall route economics

This is best shown with an example, where we compare the situation as-is today with what would happen if the night surcharge was doubled. The tariffs are applied at full level, without any incentive scheme the airport may have in place.

We took a B737-800, the base aircraft for Transavia, and we calculated the total airport costs paid by an airline for a turn at Schiphol today, and then we compared the effect of doubling the night surcharge. Our example considers an aircraft arriving during the daytime tariff regime and departing during the nighttime tariff regime, as the mixed situation day/night or vice versa for a turnaround is the most common case.

The final impact is a 7% increase of the total airport costs. Considering that this cost element in general weighs between 20-30% for a medium haul route, the final impact on the full route cost is reduced to 1.5-2%.

So, to achieve an impact that would change airlines' planning behaviour, the night surcharge should be increased many folds to make a material impact.

Besides, the eventual increase in night tariff would have to be reviewed within the broader tariff setting EU and Dutch procedure.

Figure: Example of the turnaround airport costs for a B737-800 based on *Schiphol - Charges and Conditions April 1, 2024*

Landing and take-off charges (%)	Category S2		
	Day	Night	
	Landing / take-off	Landing	Take-off
Connected	145%	225%	250%

Airport night fees for a mixed turnaround		As is			Double Night surcharge	
B737-800	MTOW (tonn)	78			78	
	Pax	151			151	
	Nox (Kg/movement)	10.5			10.5	
	Category	S2			S2	
	Base daytime S2 fee (connected) per ton	5.94 €			5.94 €	
	Daytime landing fee for S2	**145%**		672 €	145%	672 €
	Night take-off surcharge for S2	+105%		1,158 €	+210%	1.645 €
	Night take-off charge for S2	**250%**			355%	
	NOx fee per ton	4.00 €		84 €	4.00 €	84 €
	Pax fee	22.30		3,367 €	22.30	3,367 €
	Security fee	17.08		2,579 €	17.08	2,579 €
	Total airport costs			7,189 €		7,675 €

+7%

As a result, the measures aimed at noisier aircraft would disproportionately impact home based carriers

Looking more closely at present fleets, carriers facing a challenge today include:

Martinair – Its business model operates in the period adjacent to any curfew period. It presently has a fleet of 747s and has ordered A350s. KLM indicated that these aircraft will be in service in 2027-28. Therefore, reconfiguring their network in any meaningful way to act sooner would be challenging.

KLM – KLM fleet impacted are B737-900s, for which the replacement plan will be completed by 2029 and the A330-200s that are being replaced presently. From 2026, KLM will start replacing older B777s with new A350s. KLM may have some flexibility in assigning the less noisy aircraft for flights that are inside the night period without sub-optimising capacity, but it should be considered on a case-by-case basis. In general, the KLM fleet may not be fully compliant with the proposed levels before 2029-2030 subject to the manufacturers.

Transavia – Transavia has also started a transition from the noisier B737-800s to the quieter A320/321neos.

We assume KLM's fleet modernisation is driven by many factors including efficiency, customer expectations as well as a recognition of their likely future obligations to address sustainability issues.

Most other carriers are based elsewhere and thus have options to swap aircraft within their fleet, to ensure that Schiphol is not subject to aircraft outside of any proposed limit. This would include carriers as diverse as Turkish, DHL and Singapore.

In the present environment, new aircraft are extremely challenging to secure. Airbus and Boeing have faced multiple manufacturing challenges and consequently many aircraft orders today are being offered delivery slots in 2030 and beyond, so the possibility to anticipate deliveries and meet this measure in the near term appears highly unlikely.

Conclusion

In summary, on measures 1-3: Flying with quieter aircraft depends on the time it takes for fleet renewal in which airlines are dependent on delivery of new aircraft. As aircraft lifecycles can run over two decades (plus ordering time) they tend not to be well equipped to react quickly to changes in fees or regulations.

Any mitigations opportunities may be limited though they will likely seek them wherever available. As these will be limited, measures surrounding older fleet tend to be punitive and will not accelerate the limitation of nuisance but will have a negative impact especially on the operation of home carriers and the product they deliver.

A penalty system for latecomers could help to discourage incursions into the night period

We have analysed the punctuality of the last flights arriving at Schiphol in calendar year 2023.

Generally, almost all flights arriving from 22:00 till 4:00 do not depart until the morning, so they are the final flight operated by an aircraft based in Schiphol from the first morning departure.

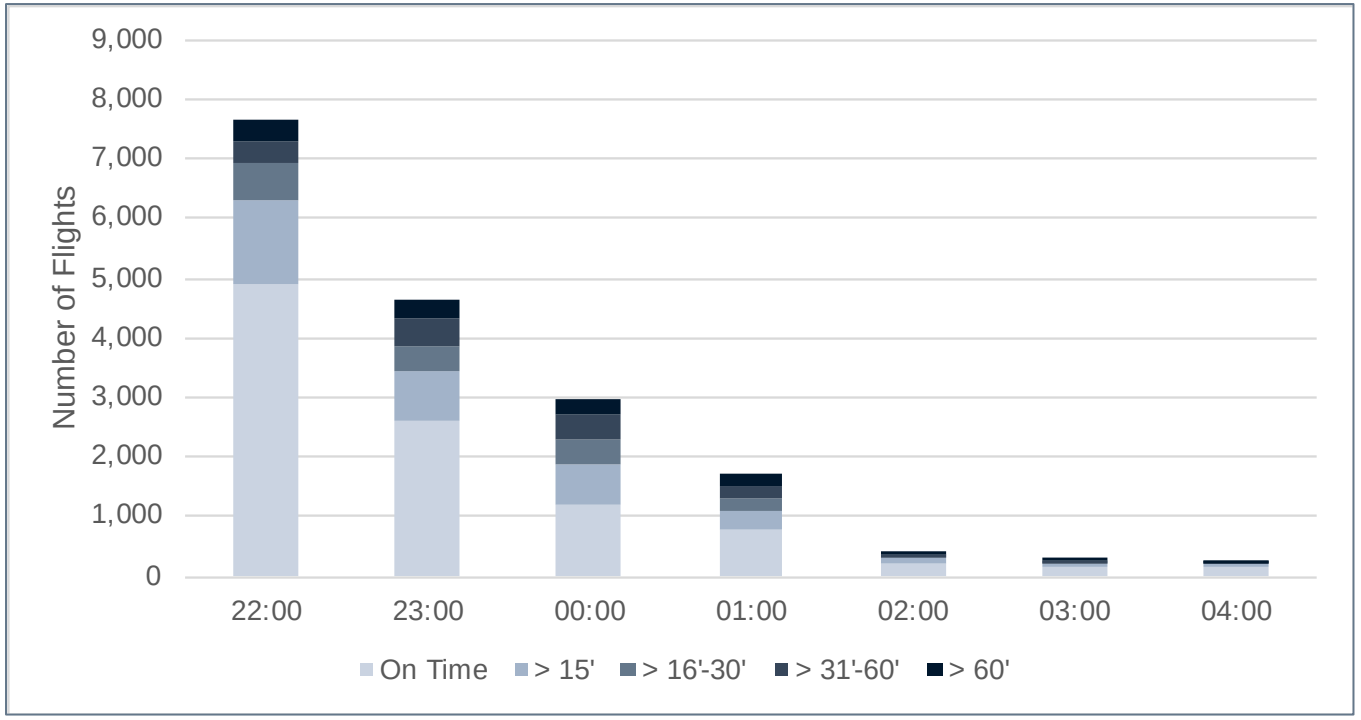
Depending on when each Variant has the start of the curfew, based on the number of flights that are scheduled in the previous 60 minutes, an estimate of the number of flights that will likely fall inside the curfew can be calculated.

As shown in the graph, punctuality deteriorates as we move from earlier to later arrival time.

Based on last year's performance, we estimated the below numbers of flights that would have incurred a warning/penalty if the proposed curfew was in place:

	Variant 1	Variant 2	Variant 3
Flights arriving <60' before the curfew	9,722	5,159	5,348
Estimated number of curfew infractions	972	722	1,230

Figure: Distribution of on time performance by scheduled arrival hour - 2023



The impact of a penalty for latecomers will depend on the magnitude of the fine and the severity of enforcement

Penalties for latecomers is a key issue that will ultimately have to be decided by policymakers and enforced by ILT. Airlines tend to consider flying outside of their designated slot in the same way they might consider a curfew: The enforcement regime and consequences will ultimately steer behaviour as much as the policy itself. Airlines will often claim Force majeure so it becomes the role of the ILT to determine if they concur and if the rules will make exceptions for given sets of circumstances.

A curfew with very light enforcement penalties will result in carriers accepting that delay related costs and penalties need to be considered as a cost of doing business. We assume ACNL and ILT will follow processes in line with the EU slot regulation (article 14.4) but it is more likely to minimise questionable practices if the risks are deemed consequential by the carrier.

On the other hand, if the penalty is more severe, it effectively extends the curfew since an airline may feel it has to squeeze flights in earlier to minimise risk and/or it will build contingency minutes into block times, resulting in increased off-slot operations. This may sound desirable to the neighbouring communities, but this report demonstrates that as the variations of the curfew become more restrictive, it changes the commercial impacts upon the carriers and ultimately upon Dutch travellers. Anticipatory cancellations of flights is a common occurrence in the US and occasionally in Australia since more severe penalties have been put in place for when the airlines attempt to operate and then misjudge.

Flights that will not be able to land because of delays will need to divert to other airports outside the Netherlands, with a high level of inconvenience for the passengers and higher reaccommodating costs suffered by the airlines (EU261 directive). Looking at 2023 data, about 56% of all last arrivals have been on time, while almost 8,000 flights arrived late, with 1.1 mil passengers impacted by the delays. There is a 20-minute buffer built into the slot time vs the movement (runway occupancy) time, but the airline will always assess cost and risk. Take for example a holiday charter caught pushing up against a curfew due to a variety of reasons including weather, ATC, ground handler challenges, a baggage offload or a Captain being cautious when carrying out checks or requiring a minor repair. If the penalty for a late departure is punitive, the airline may feel it has to cancel the flight and accept the consequences, including significant disruption for travellers.

Latecomers in the night period will inherently tend to lean towards the based carriers who have the vast majority of the night slots and the need to return to base. Therefore, it is inevitable that this measure would disproportionately impact the home carriers whose choices may be limited. And the cost of the reduction in nuisance may be higher for these operators. It may be for this reason that the German curfew rules give more latitude to base carriers.

The PA team has considered and proposed te additional measures which may present viable, pragmatic alternatives

The Ministry indicated that PA was welcome to propose further measures that might help mitigate the situation.

PA considered this carefully since it seems likely that a curfew, no matter how it may be implemented, is likely to be subject to legal challenges from several parties in both camps (aviation and noise/environment) using laws and regulations that conflict with each other at many levels. We are not lawyers and therefore cannot give formal legal advice, but based on extensive experience, we do not see this situation resolving itself quickly. With that in mind, PA would like to propose additional measures that we believe are within the gift of the Dutch government and are much less likely to be subject to legal challenge.

A key area to focus on is slot mobility. In the UK slot trading and mobility has been common practice since 1999, but we are aware of numerous slot trades that have occurred in other EU Member States, many of which involved cash compensation. This grey market exists, and even in the Netherlands, a carrier is permitted to loan/lease its slots to a friendly carrier within an alliance if it so chooses, even if there are no sales.

It is based on this experience that we are proposing two of our three measures, that create commercial incentivisation for returning evening slots. Previously, we have seen agreements reached between airlines, government and airports where all parties are able to declare victory for their own interests. It is with all of this in mind that we believe the following measure are worth considering. They do not resolve the nighttime issue and may, in fact, only offer a limited mitigation, but they could be put in place promptly and even if they only reduce a handful of night movements, there would be a public benefit. They would also support the Balanced Approach requirement that all alternatives are explored before exceptional measures are implemented. The alternate proposed measures are:

7. Allow slot trading (in this case movements) on the proviso that it is only allowed to facilitate the movement of flights out of the night period (and perhaps even the morning peak) to other parts of the day where capacity is more readily available.

8. Compensate/incentivise airlines for the forfeiture of a night slot/movement in exchange for a daytime slot/movement.

Unrelated to slot mobility, we note the final proposed measure:

9. Discontinuing the allocation of ad hoc slots during the night period.

Slot trading or incentives could provide a more dynamic solution to reducing night movements while banning ad hoc flights offers some immediate relief

7. Allow slot trading (in this case movements) on the proviso that it is only allowed to exchange the movement of flights out of the night period (and perhaps even the morning peak) to other parts of the day where capacity is more readily available.

Trading is not an unknown process in the European Union. In the UK (prior to Brexit and presently) the coordinator issues dummy slots, a practice that EU accepted even after a 2004 review of Slot Regulation (which DG MOVE later did not contradict in 2008). While there would need to be proper consultation and review of any proposed approach, we believe ACNL would be able to adopt comparable procedures if the Government so instructs.

To be clear: the EU Slot Regulation is silent on slot trading, and the Commission has clarified that there is nothing in the Regulation that prevents slot trading. Therefore, PA is of the view based on our experience, that it should be possible to implement a form of trading as an alternate 'Measure' that may reduce hindrance in line with community goals. This could be on an ongoing basis, or as an ad hoc but targeted process to help facilitate the reduction of movements in the night by incentivising parties to effectively sell their rights.

If an operator controls a night slot that is problematic or even unprofitable for them to operate, they may be reluctant to not utilise it for fear of loss under the 80/20 slot rule. However, if the airline can secure a fair value for that slot/movement by being allowed to sell it to another carrier who is wishing to acquire a daytime opportunity, we believe that would be a 'win' for all involved.

8. ACNL and Schiphol create incentives for the forfeiture of a night slot/movement in exchange for a daytime slot/movement.

This is similar to Measure 7 but instead of selling to a third party, the night slot/movement can be exchanged for a daytime movement for a commercial incentive meeting regulatory requirements. While it may seem unusual to offer compensation for reducing noise in the night, it is not unheard of for governments to carry out compulsory acquisitions of land (or other assets) for a public good. While this may not be compulsory, there is likely to be a clearing price for at least some parties to be willing to forfeit a night slot.

Please note that **the proposed Measures 7 and 8,** would only work if financial compensation to exchange a night slot was allowed, otherwise there is no incentive to forfeit a night slot. This would likely require a policy change to be set forth by the government. The EU stated in 2008 that they would not take any action against member states that allow slot trading.

9. Discontinuing the allocation of any ad hoc slots during the night period.

While some will oppose this, including charter, freighter and courier operators, no one would lose any slot that currently has historic rights attached to it. This would apply to commercial services only, so would not have any impact on government, medical or other emergency flights that could continue to operate as required. While this is not in slot guidelines, we believe it could likely be addressed with a Local Rule.

07
Impacts upon stakeholders

Impact upon stakeholders

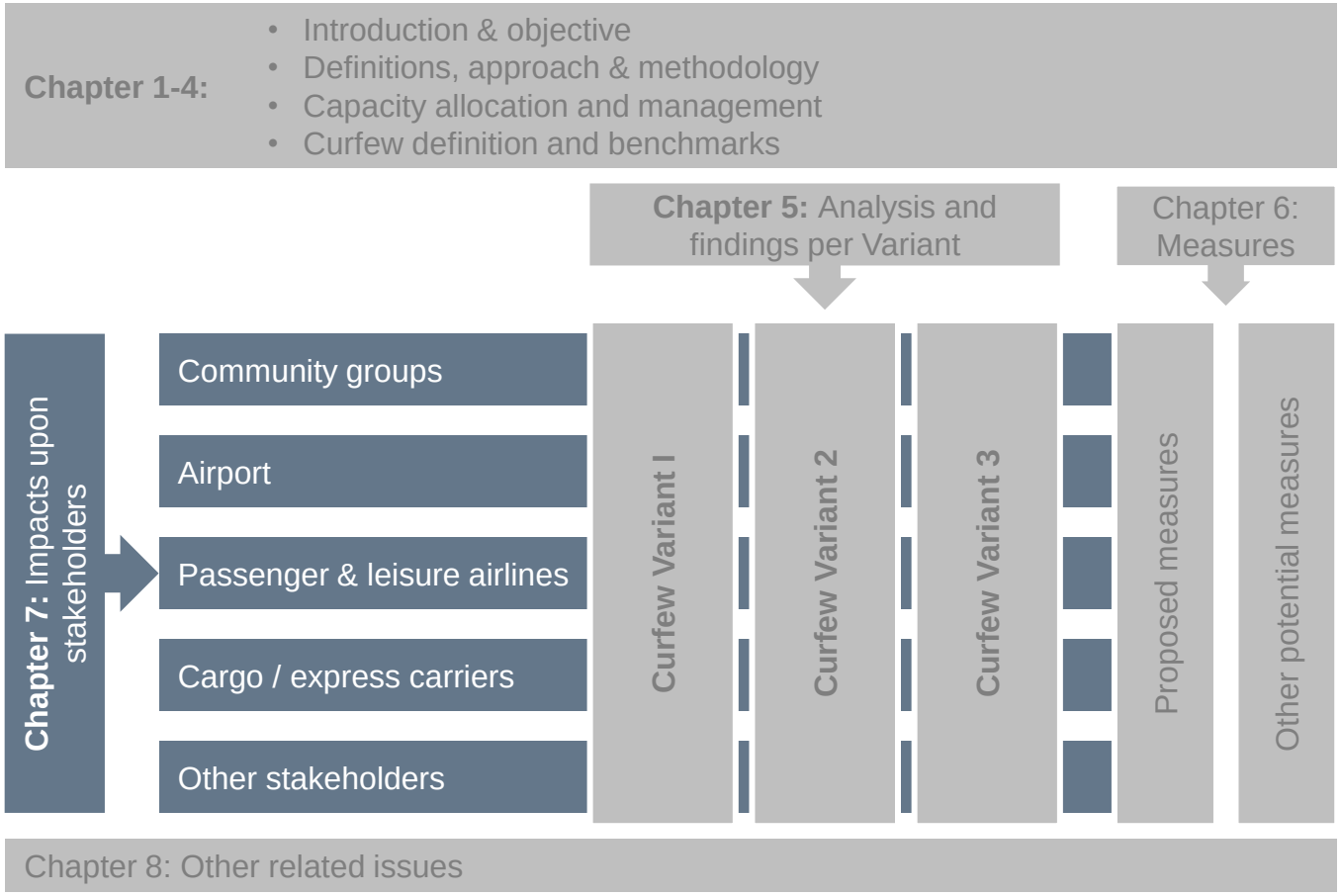
The stakeholders tended to fall under three major groupings

- the aviation industry parties who are concerned about the potential changes (most of the aviation sector)
- the parties that are advocating for change (BRS, MRS and Schiphol)
- the parties that will need to facilitate the future scenario that is decided upon (ACNL, ILT, LVNL)

Common ground between their views was limited so in this section we have tried to articulate details that were not fully covered in the assessments of the Variants, Measures and the Impact Analysis

The impacts are based on the study team's analysis and professional judgements. Both direct (interviews) and indirect (published views) with stakeholder inputs taken into account.

Figure: Overview of structure of the report



Key Takeaways Impact upon stakeholders

- There are very mixed views on the value of a night curfew, and it may not be possible to find a compromise approach that is acceptable to all stakeholders
- Different options affect different groups differently, but the industry generally only sees downside (in a context where it is already spending €m's on fleet replacement that will reduce noise and emissions)
- Some stakeholders see the need to find a compromise position, while others have more polarised views
- Many question whether the Balanced Approach Methodology is being properly adhered to
- Nearly all stakeholders would welcome (a return to) more collaborative way of working with the Ministry
- It is not on our remit to determine policy, nor to judge which sets of laws and regulations will prevail, but it is seems likely from our consultation process that whichever path is chosen, there will almost certainly be at least one major stakeholder grouping dissatisfied and likely to litigate.

MRS takes the strongest stance in favour of a night curfew, citing negative community impacts

Maatschappelijke Raad Schiphol

During the stakeholder consultation MRS raised that a night curfew would result in more daytime flying. This is a reasonable assumption since the airlines will try to make maximum use of all remaining available capacity/of movements across the new airport opening hours. This would likely continue into the 22:00-23:00 period, and potentially even earlier depending on the variant chosen and the strategies followed by the airlines, which is a concern of MRS.

As for the noise and hindrance that is generated, either in the day or night period, this will be focused on in Part B of the night curfew study.

MRS also proposed further restrictions around the edges of the night. These have not been added as further variants on the model.

They do have a concern that the noise, especially in the early morning and late evening should be more concentrated in the shoulders next to the night period. Variant 3 produces outputs to be provided to the consultants advising on which reflect an increased concentration in this period.

The modelling of the effects will come from the To70 study separately, but we see the variants put forward on a spectrum when viewed from the MRS position

- Variant 1 is closest to what the MRS seeks (and is most feared by the aviation community)
- Variant 2 is similar to the Schiphol proposal that was assessed last year but the 20 min taxiing buffer was added
- Variant 3 may be closer to what the airlines would want, but the impact as seem from the MRS viewpoint may be seen as unacceptable given the retiming in the parts of the night period that remain operational. It is possible some may consider it not much better than what exists today due to the late evening and early morning buildups before and after a curfew.

MRS could request even further restrictions going forward, while the aviation community is adamant that a curfew is altogether the wrong mechanism to address noise and sustainability issues so should not be implemented. In constructing this report, we saw this as a rather binary situation with little common ground between the two groups.

BRS took a balanced view, but its priorities are still at odds with the airline community

Views expressed by the BRS diverge slightly from the MRS in seeking a balance between health and sustainability issues and the financial/economic impacts of the proposed measures.

That said, their desire to not see more traffic during the day if the night is reduced is unlikely to occur as airlines will inherently seek to maximise the total remaining capacity available to them. In the event of a curfew, night movements will likely be reallocated to the day.

Many of the points noted regarding noise and related issue are matters that are best addressed in the To70 report.

Still, BRS did call for an understanding of the impact of the proposed Measures and Variants upon the airline networks and upon the freight sector.

One proposal BRS put forward is a prioritisation of flights based on economic value to the Netherlands. While we can see the merits in such an approach, we are not sure how it can be implemented in practice since airlines choose routes based on potential profitability and not the wider national economic interest. In the past the EU has given clear guidance to not have any public intervention in route section or business model preference.

BRS also proposed helpful guidelines for grace periods, both for evening outbound flights and for late arrivals which are considered under the ILT enforcement section of this document. They specifically cited Frankfurt which has a soft curfew allowing exceptions under defined circumstances followed by a hard curfew at midnight. This is an interesting approach, but a distinct difference between the Frankfurt situation and the Dutch situation is that there are alternate airports in the Frankfurt region where aircraft can land in the event of further delays.

While it is positive that BRS has approached the matter constructively, and with a willingness to accommodate certain situations, we would reaffirm the binary and opposing nature of the goals and desires of the organisation and the airlines. The open nature of the discussion is positive, but it did not draw out any significant common ground.

Schiphol supports a night curfew but considers Variant 1 unfeasible

In keeping with its position taken in the 8-point plan (achtpuntenplan) of 2023, Schiphol remains in favour of a curfew. They highlighted that a reduction of night flights and a quiet period at night addresses one of the major concerns of neighbouring communities and is a highly cost-effective means to reduce noise hindrance. Variant 2 is similar (though not exactly the same) as the initiative the airport proposed.

Despite their support for a curfew, Schiphol was concerned about the possibility of an initiative along the lines of Variant 1. They believe that the length of the closure would have both operational and capacity impacts due to a compression of morning activity. Furthermore, the loss of connections when compared to other European airports would likely be disadvantageous and would have a significant impact upon the airport's leading hub status. In short, Schiphol considered Variant 1 as unfeasible.

Schiphol believes a curfew can be implemented with only a limited impact upon cargo though they acknowledged some flights will need to be rescheduled.

The airport indicated other measures are worth considering including a quota for late arrivals with a penalty system for exceedances. They also mentioned that the night noise threshold could be -13 ΔEPNdB (vs -14) and that higher night tariffs be considered.

Specific airport challenges

While many parties raised the issue of the various bottlenecks the airport has had post the Covid-19 pandemic, Schiphol has been experiencing the pressure of the peaks increasing, resulting in challenges in some areas (e.g. baggage delivery and transfer, immigration etc.). These are currently being addressed in the Mid-Term Plan through investments. The airline community was consulted in this process and Schiphol does not concur with the concerns of others regarding enhanced infrastructure constraints due to a curfew.

There was an acknowledgement that some bottlenecks remain with cargo as well as with access to widebody stands, especially in the morning hours while the airport goes through a maintenance refurbishment plan that will last until the mid 2030s requiring significant investment.

The airport acknowledges that a night curfew causes major challenges for certain airlines and requires network adjustments. Lelystad could be an option to relieve some of the challenges.

The airport summarised in noting that Schiphol considers its situation as different from other European airports, since it operates in a (more) densely populated area and therefore has a responsibility to the neighbouring communities to find a solution that takes in their concerns as well as those of the aviation sector.

Carriers raised consistent concerns about the legitimacy and objectives of the study process

There was a reluctance by a number of stakeholders to fully engage in the consultation process as they felt the overall process has not followed the EU Balanced Approach, since Stages 1-3 had been skipped, with the Ministry jumping straight to Stage 4.

It was also felt that no clear target or objective, against which to measure success or assess alternative measures, has been set. Many of the issues raised were adjacent to, but still outside of the scope of, our assignment, but it would be remiss of us not to highlight them as they intertwine with the wider views of the curfew itself.

There is a strongly held view that previous efforts to address noise and emissions issues have not been acknowledged (e.g. KLM Group's Stiller, Schoner, Zuiniger viewpoint) while new initiatives were created. Furthermore, it was suggested that change is not being initiated in a collaborative manner, which the airlines suggest happens in other nations and leads to more effective outcomes.

"*What is the problem that needs to be addressed?"* was stated more than once, with the carriers repeatedly questioning the legitimacy of this exercise as not being in the Balanced Approach. PA did explain that this was not a Balanced Approach consultation, but we still valued the carriers' input. Reactions were mixed but it was suggested more than once that jumping straight to a solution was premature, or simply illegal and the concepts proposed were in breach of EU regulations and/or other international law/treaty obligations.

Challenges were also made that PA's scenario modelling should be based on the full 500K Annual ATMs as that is currently the official cap at Schiphol, even though the airport declared capacity has been below that level in recent years. We noted this concern but highlighted that the Ministry preferred to use the most recent data and an actual reference situation by basing calculations on the present declared capacity. Still, we also highlighted that this nuance should create no material difference in the comparative levels of impact based on the modelling methodology being used.

Overall level of carrier engagement was constructive, but often with caveats and reservations

Other issues raised by multiple parties

A curfew at Schiphol leaves the Netherlands as the only major European economy closed to all air transport in the night.

Several parties suggested the Government needs to put forward evidence led objectives if it seeks partnership and wants to rebuild trust with the industry. It was also suggested that pronouncements related to the curfew have raised public expectations beyond what may be achievable.

Many noted that the industry requires long-term stability for planning purposes (fleet / infrastructure etc.) yet the approach by government is perceived as sporadic (not the reliable partner needed for the industry to run effectively).

We took notice of all the issues raised, and passed them on to the Ministry, while doing our utmost to obtain articulated views and constructive feedback on the options under discussion. We believe valuable feedback was received after initial protestations were made, though it tended to be in discussion and did not often follow the order of questions or the refinement of Variants and Measures we had hoped for in the interviews.

The overall level of engagement was strong, and after stating certain disagreements mentioned, the aviation sector stakeholder discussions brought new and unique insights to the discussion.

PA reflections on general carrier concerns

The study team has not seen any document from ACNL or the Ministry which identified a legal basis on which historic slots would not be reallocated (effectively, withdrawn) or involuntarily exchanged. We are aware of the ACNL Policy Rule covering slot allocation when the number of historic slots exceeds declared capacity, but the likelihood of operators affected by any loss of slots to legally challenge the issue seems high.

PA accepts that technically slots are not being ‘withdrawn’ so much as ‘not being reallocated’, but the net effect to the airlines remains the same. Therefore, it would be reasonable to assume they may consider the outcome as an appropriation of a valuable asset that may not be consistent with the EU Slot Regulation. We would also note that the Balanced Approach methodology does not appear to be aligned with the EU Slot Regulation, though we could not say which legislation would prevail where they conflict.

KLM strongly opposes Variant 1, highlighting significant business model damage

Variant 1 will cause significant damage to KLM's business model and will weaken the airline's competitive position vs other major network carriers with European hubs. We do not have sufficient information to make a quantification of the damage, but we believe it to be substantial based on the impact we can see to their network and the carefully constructed connections from which half of their traffic is derived, especially during the morning banks.

KLM indicated it may pose an existential threat to their viability. While we cannot validate such a claim, we can reasonably assume it will require a significant restructuring of their business model and network in a way that likely move them out of what could best be described as the 'Premier League' of European Hub Carriers and by association, the same would become true for Schiphol vs its major airport competitors.

KLM will be challenged to maintain their full slot portfolio in Variant 1 and if slots/movements are returned to the coordinator, they will likely be picked up by foreign competitors who may put more pressure on KLM's yields.

It will also create many other effects that will fall straight to the bottom line, for example:

- Lower aircraft utilisation which in turn increases average costs
- A loss of significant portions of the highest yielding business traffic to competing hubs offering a preferable schedule
- Crew inefficiency that will increase costs as more crews have to night-stop in other European cities so that connecting flows can continue
- Cargo limitations, especially on time sensitive/perishable cargo
- It is unlikely that KLM will be able to reduce overhead proportional to activity reduction, impacting margin accordingly

In Variant 1, KLM will likely need help from its many partners to maintain its slots and market position at Schiphol, but these partners may find the connections offered will be more limited and less attractive vs CDG/other hubs.

Variant 2 and 3 would not create a material impact upon the KLM schedule.

Variant 1 has the potential to significantly damage KLM's hub, which depends on the morning connections for most of its long-haul flows

At present, KLM operates up to five waves of flights throughout the day with the morning ones being among the most valuable.

KLM would effectively have to restructure its two morning waves, possibly consolidating them into one.

This raises infrastructural and other concerns in relation to airport capacity which are addressed in the Schiphol section, but it will also likely impact long haul connections and flows.

A few examples highlighted earlier are articulated in more detail below:

- We understand USA to Africa flows to be important for KLM and without them, many of the destinations in Africa cannot be sustained on Dutch and other European traffic alone. Many of these connections are lost as they can only be accommodated much later in the day, and possibly would be flown Southbound in the evening vs the morning, in part due to challenges at the destination airport. Then the aircraft would fly Northbound in the daytime, missing a large portion of North American connectivity. Therefore, KLM will likely have to assess whether it can compete effectively in these markets. Please note that this is one example of the network impact but there will be others.
- Closer to home, consider the traffic from North America to the nearby destination of Hamburg in Germany. At present, KLM offers one of the earliest Hamburg arrivals from North America via Schiphol, which is very attractive to the high-yield, time-sensitive, business market. If this fight was lost, a large portion of this traffic would simply seek alternative connections (Frankfurt, London or Paris etc) so while KLM would still offer a later flight, this would inherently carry many more low-yield, price-sensitive passengers. In other words, KLM would not only lose share, but they would also lose on yield by offering a less competitive product. Their parent group and alliance partners would have no choice but to try and re-route at least a portion of that traffic via Paris to minimise losses to Lufthansa, BA and others. This reduction in feed and preference for CDG will inevitably impact the viability of a number of the spokes on the KLM network
- As these effects occur, this will inherently impact the overall connectivity of the Netherlands. In the example mentioned, Hamburg like Rotterdam is a center of shipping activity. Yet the first flight for business to this and many other key destinations will be too late in the day for the business community and the same will be the case for many business travellers to the Netherlands.

Delta is a JV/SkyTeam partner who faces significant impacts from Variant 1 schedule changes for arrivals and connections

We have separated Delta from most of the other foreign carriers as Delta, along with some other (primarily SkyTeam) partners, are inherently impacted by changes to KLM as well as to their own schedules in Variant 1.

Delta has several flights in the night, and they have indicated that moving some of them ~30 mins later would have a significant impact on connections at Schiphol. This is because Delta's schedule is set to optimise connections for passengers transferring to KLM so if overnight services from the USA must arrive later, they will start to miss the first outbound wave of connections to Europe. As would be expected, this is consistent with KLM's view.

In our interview with Delta, they highlighted flights from Boston (0545), Atlanta (0600), New York- JFK (0600) and Detroit (0600), mainly based on the summer schedules that would all be impacted under various curfew variants.

While Delta may reroute some traffic over Paris that hub also has its own constraints, meaning a portion may be lost to competitors. PA could also speculate Copenhagen may offer a limited amount of relief at some point if/when the SAS investment is approved in the future although this was not mentioned). Other flows might be offered later in the day where possible.

They did highlight that as there is a greater concentration of flights later in the day which will have less excess inventory, limiting to customer access for connecting traffic.

Delta also highlighted its investment in fleet transition to A330-900 and A350-900/1000 in the coming years. At present, newer aircraft operate about 25% of their flights at Schiphol and while this is increasing, there are varying pressures to deploy the new aircraft in the most environmentally effective manner globally as they arrive.

Night curfews at Amsterdam could pose an existential threat to Transavia's business model, especially with Variant 1

In all variants, Transavia is the most severely impacted and their public calls of concern are credible and should not be considered as simply scaremongering.

The PA Team includes 3 former senior aviation executives with years of experience in Network Planning and slots. We were unable to model a scenario that is implementable in our opinion without severe impact upon the business. Even a five-hour pause will have a notable impact on their operation.

Transavia operates 27 aircraft at Schiphol and the majority both depart and /arrive in the Night period, the operations are intertwined with the fleet of 7 aircraft at Rotterdam and of 9 aircraft at Eindhoven, allowing aircraft to be swapped as all maintenance activities are in Amsterdam.

Their network structure is based on a mix of aircraft flying up to 6 flights/day on shorter routes and 4 flights/day on longer routes. This combination has generated a high fleet utilisation that is one of the key elements of their cost base and consequently any reductions in production will flow directly through to their bottom line.

Transavia has stated that to operate a viable business model, the aircraft needs to operate up to 3 roundtrips a day, especially during holidays (only some of their aircraft do so, mainly in the peaks). With the new aircraft (A321neo) the turnaround times are higher and with a shorter working day this could be reduced to 2 or even 1, which is not economically sustainable.

They have suggested they may move much of their operations out of the Netherlands if a curfew was introduced and indeed, this is one possibility. That said, Transavia is not like easyJet or Ryanair as its product and the business relationships are specifically designed to serve the Dutch outbound market. It is also worth noting that much of the capacity on their aircraft has been bought by other Dutch tour operators and so this leisure sector would also be adversely impacted. They are not well equipped to move their crews and business offshore and only fly in during midday hours.

Another alternative would be to funnel Dutch traffic to regional airports far from the majority of the population and without the same quality of rail connections. Two turns a day might be reallocated to airports including Maastricht, Groningen and the German and Belgian border zones (plus Lelystad if it opens).

It should be noted that while Transavia France does operate a network that starts later, they historically hold a post 6am slot portfolio that is impossible to replicate today at Amsterdam. They also have a sizeable operation of shorter domestic flights specific to France. Therefore, the Transavia France is not an easily replicable.

Transavia's aircraft utilisation is impacted in all Variants, undermining the airline's economics

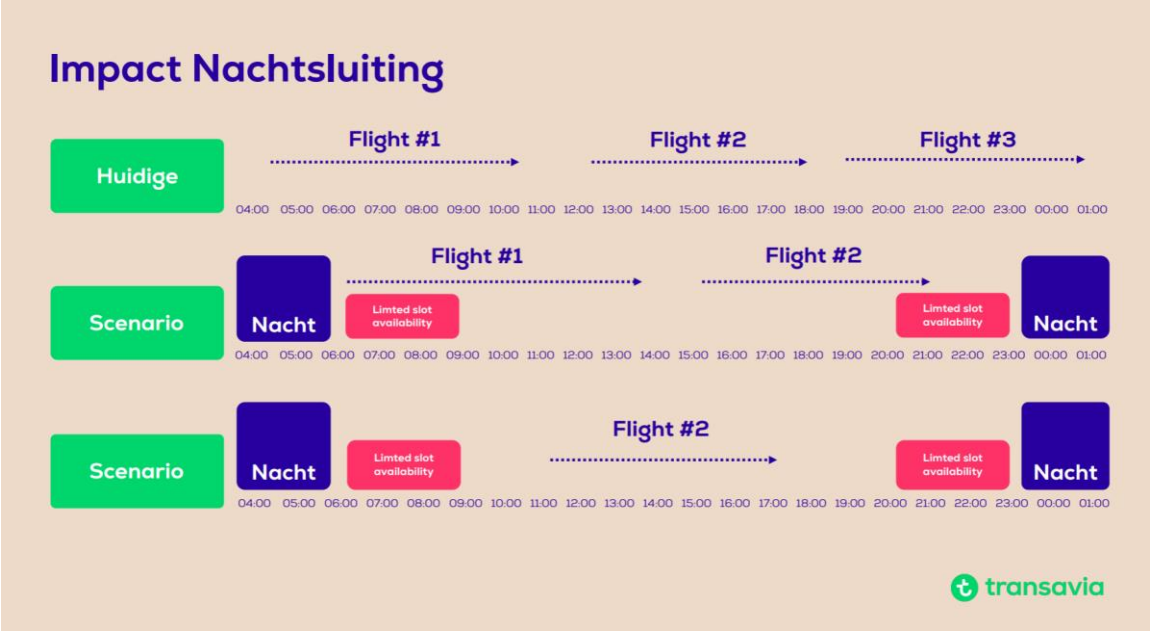
Transavia will replace the current B737 fleet with a mix of A320 and A321neos. The replacement has started with 6 Airbuses being phased in this summer and completion by 2030 if they take up their options. Approximately 50% of the existing fleet at Schiphol will be replaced by 2025. This will create a further public benefit in terms of noise reduction, but their current fleet is compliant with proposed limitations. Charging differentials well not modify the noise levels in any case as improvements are limited by the delivery schedule Airbus is able to provide.

When making a business case for new aircraft, as Transavia has done, a core assumption is that the aircraft are more fuel efficient and dependable, but the ownership costs are higher. To make that equation work, airlines seek to fly the aircraft a greater level of block hours. Where possible Transavia seeks 3 returns/day out of their aircraft during the peak though many of the aircraft achieve only two.

Amsterdam is also very important for supporting operations at night, since irregular operations at restricted Eindhoven and Rotterdam, are managed using Amsterdam as diversion airport. Losing this possibility will increase cancellations of flights and result in a multiplier effect of the night curfew impact for Transavia which will clearly have negative impact for customers in other regions. It also needs to be clarified by the ILT if the first flight is delayed to unforeseeable circumstances, will a late flight still be allowed to operate knowing that it will arrive after the curfew.

An example of a 3 flight day was provided by Transavia below. Many of their aircraft only operate two flights, but if they cannot reschedule their first AM flight until after the curfew, they remain impacted.

Figure: Operational impact night curfew on Transavia *(source: Transavia)*



Corendon is primarily impacted by Variant 1 as it has relatively limited early morning departures

Corendon has a very limited number of historical night slots, primarily in the summer.

The airline tends to operate patterns of two rotations a day. Many departures are later than 5:00 o'clock hour, so the airline is mainly exposed to a Variant 1 scenario.

Therefore, the impact upon their schedule will be there but it should be considered relatively smaller compared to TUI and Transavia as most of what they fly today could continue. Therefore, despite the impact, the much greater adverse impact on Corendon's competitors could create a nominal benefit of improving their own competitive position, relatively speaking.

If they are unable to protect all their Schiphol slots/ movement, they could potentially transfer excess capacity to their sister companies abroad, as an alternative to acquiring more aircraft that would be underutilised for much of the year.

The tour operator side of their organisation would be impacted as they depend on other carriers for part of their capacity.

The airline is operating a fleet of new B737 Max 9 aircraft, so they have already transitioned to quieter planes.

It should be noted that the Corendon schedule is better situated for Variant 2 and 3, but it would be difficult for either Transavia or TUI to reschedule and replicate it in the presently constrained Schiphol morning due to the slot availability issues noted.

TUI has significant operations in the early morning hours and would face negative impacts in each Variant

TUI (aka TUI fly Netherlands incorporated as TUI Airlines Netherlands, part of the German headquartered TUI Group) operates a heavily optimised schedule built up over many years, that includes a significant slot-holding in the early morning peak with 13% percent of their first wave departures in the 0500, 18% in the 0600 and 46% in the 7:00 hours.

It is finely tuned and tightly integrated with slots held at key resort destinations meaning that even very small movements may be difficult, if not impossible, to accommodate. All of the slots it holds have historic rights, and they do not depend on ad hoc operations.

Beyond their own airline operations, they are also a tour operator and so buy space on other carriers.

They claim to run very high load factors making the most of their capacity.

Older aircraft are currently exiting the fleet, with the 767 out this year, Their own fleet will all be 737 Max 8 and 787 within a couple of years.

TUI leases in a substantial number of A320s and B737s during the Summer season. They intend to upgrade to more environmentally friendly types of aircraft as third-party leasing partners renew their fleet portfolio.

They did not explore any of the scenarios in detail but made it clear that the approach, especially variant 1, would be highly damaging to their business in the Netherlands given their early morning starts.

While they did not have any intention of operating into the early morning on returns, they did raise the question of where were they supposed to divert to with lots of Dutch holiday makers onboard in the event of unforeseen delays. Outstation bases are potentially feasible but operationally complex with various slot and maintenance issues, and there was a question as to why the government would want to pursue a policy that would export jobs from a longstanding Dutch carrier.

The Tour Operator community is highly exposed to changes to Transavia, TUI and Corendon's schedules

The tour operator association, ANVR indicated they have 250 members that expect to generate ~EUR 9B of revenue this year. Much of the business of the big three Transavia, TUI and Corendon is B to B with smaller parties taking seat allotments to sell their products. This reduces the risk for the 3 holiday airlines as well as other traditional airlines who sell seat blocks to these parties.

If the supply of Dutch operated holiday seats contracts significantly, as is likely to be the case, the holiday aircraft operators will have both more overhead per seat, raising prices but also a reduced amount of capacity in a market that shows no signs of shrinking. In effect, they should have pricing power to mitigate some of their losses, but this will infer a price rise both to the public in direct sales as well as the specialist tour operator market.

To offset this, the tour operators will likely seek more capacity on the foreign carriers that are expected increase services to the Netherlands if the Dutch Carriers return movements and slots to the coordinator. While many of these are focused on the leisure market such as Ryanair, Vueling and Wizz, they are less likely to operate the traditional allotment system used by tour operators in the Netherlands today.

Another issue raised was that if the airport is closed and a delayed aircraft cannot return, it may result in situation of a planeload of Dutch passengers find themselves stuck in island destination airports where bed stock is limited.

This issue will impact passengers from Rotterdam and Eindhoven as well since they will no longer have access to an alternate diversion airport when their flights are delayed.

ANVR expressed concerns that groups such as the MRS are not a proxy for the general population of the Netherlands and the views expressed probably do not reflect the opinion of the vast majority of Dutch travellers who are seeking a holiday at a price within their means.

ANVR also indicated that their base does not see Lelystad as a viable option.

ANVR did suggest a more restrictive departure closure but allowing arrival up until 0200.

easyJet is concerned but has little direct impact

easyJet has a number of unique features that distinguish it from other carriers. It carries a mix of leisure, package holiday and business traffic. It holds a significant position at Schiphol with a 9 aircraft base and associated employment in the Netherlands. 6 of these aircraft are the quieter Airbus neo aircraft. When one adds inbound flights from various bases, Schiphol sees the equivalent of 16-17 aircraft.

The airline has practically no flights (0.3%, only arrivals) which are impacted by any of the scenarios under review, therefore small changes will allow it to place all arrivals outside the curfew. They also have no interest in Lelystad as their strategy is based on primary airports.

However, the risk highlighted in the meeting is real life operations, where the need to operate an equivalent number of flights within a restricted period due to the curfew, will prove challenging resulting in a high degree of delays across the airport and with the ANSP, the results of which will impact all carriers throughout the day. The likely increased flights delays such that the last flight in may struggle to meet the planned arrival time on a consistent basis and therefore exceed the curfew limit of 23:00. Delays such as these are not shown in our model but will likely occur regularly and could count depending on delay rules. There is a concern that limited resourcing at LVNL could compound the risk of flights that are scheduled on time but could be perennially delayed and since there are no alternate airports in the night, the EU 261 costs of passenger accommodation and compensation that airlines are required to cover may become prohibitive.

So, if this was to happen and the carrier might want to scale down its based aircraft to avoid too many planes ending the day in Amsterdam, it will have the capability to protect its Schiphol movements while reallocating newer, quieter Airbus neo aircraft at Schiphol to other bases where they are also in demand. In such a scenario, easyJet would not truly pull back from Schiphol but it could:

Take away jobs from the Dutch economy as the number of aircraft based at Schiphol could be reduced making Schiphol more of a destination market than an origin one;

Cause prices to rise on business routes at peak hours if easyJet reallocates aircraft to other bases, for example Amsterdam – London could be cut back where easyJet has a competitive effect of dampening KLM and BA pricing on the routes for business travellers.

Foreign carriers suffer a ripple effect from Variant 1

We discussed the collective concerns of nearly all the carriers, both foreign and domestic via BARIN, the airline industry association.

The Dutch carriers are members of BARIN but we focused on the representations of other carriers as we had spoken to home carriers directly.

BARIN reflected many of the concerns about the present initiative that others have stated and have been noted before.

Most foreign passenger carriers beyond the ones highlighted are not directly impacted by the curfew, with the exception of Variant 1 which would be a concern to certain Asian and North American carriers previously mentioned.

It was highlighted that:

- Hubbing activities do not just occur within KLM, or even SkyTeam, as many carriers such as Air Baltic use Schiphol as an excellent single terminal connecting hub through interline processes - schedule disruptions would therefore ripple beyond KLM;
- The airlines are concerned about traffic bleeding off to Belgium, Dusseldorf/Weeze/Niederrhein and elsewhere;
- Schiphol's morning terminal related capacity issues are already a challenge to carriers not operating in the night period and carriers are concerned that this initiative will only worsen the experience.

There is a generally held view amongst foreign carriers that being allowed at least 3-5 years to prepare and adjust for any new regime is critical for schedule adjustments. While many of them may be able to adjust their Schiphol timings, a few hub carriers may have the same issues with re-timings and connections flows at their base airport.

Martinair should be able to schedule in the curfew, but delay risks are high

Martinair operates freighters only. It is a brand within the AF-KLM Cargo business unit that acts as single point of entry for all the freight they carry, both belly (the majority) and freighters. Cargo transhipped between the two businesses is limited and the synergies arise from the complete types of lift the wider group offers. It is widely held view in the cargo community that operators need to offer heavy lift (i.e. freighters) to be placed on freight-forwarder preferred supplier lists. However, freighters have all but disappeared from Heathrow and the belly proposition remains strong.

Martinair flies complex routings (e.g. from A-B-C-D-A) that connect multiple slot-constrained (Level 3) airports, many of which have restricted operating hours. As a result of this, schedules are difficult to retime and operational disruption is more common than for passenger operations as many aircraft operate 2-3 day circuits.

Martinair indicated they would likely have issues in Johannesburg, Sao Paulo-Viracopos, and explained that 7 of their 11 weekly departures are in the night period. It also departs half of its flights in the first part of the night to ensure to best align with the shippers' working practices. However, departures at 2240-2340 are at high risk of delays for either technical reasons or late delivery of freight to the airport by the shippers, which is why departures in the night are common practice. If an airline is missing one passenger, it can depart anyway, but if a freighter is waiting for e.g. a delayed shipment of ASML machinery, it is likely to try to accommodate.

Flower auctions take place close to the airport and everything needs to be on site by noon. If Martinair cannot land in the night and cannot re-time into the early morning peak due to lack of capacity, a day's worth of freshness may be lost to supply the auctions. Cargo operators require freight in both directions to operate profitably, so from an economic perspective you cannot support ASML and Pharma Exports without the perishable backhaul.

If measures (night curfew or banning of their aircraft types) are implemented too soon, Martinair feels it would be discriminated against compared to other operators. This is because they have invested in new Airbus A350 freighters (that produce 50% less noise and 40% less CO2 and other emissions) they will not receive them until the second half of 2026 into 2028 due to manufacturer timescales. Martinair is making long term sustainability focused investments, but they are concerned the goal posts are being moved in the meantime.

Some other freighter operators will also be effected, potentially eroding Schiphol's leadership in this sector

PA's review identified certain freighter operators who could find schedule recovery hard to achieve.

We also assumed carriers operating both passenger and freight services will do whatever they could to protect all slots until the 440/460K movement reduction issue plays out since cargo slots could be a tool to recover lost passenger services by sacrificing future cargo operations if a reduction came to pass.

Our assumptions on both points were validated during our discussion with ACN, the industry body for a large number of parties in the air cargo shipping community including forwarders, traditional airlines with belly cargo and freighter operators (both traditional and courier). They were contacted as the representatives of this wider swathe of the market.

The leadership of ACN reaffirmed the position of its cargo shipping membership that the Netherlands should not close for business at night. They also highlighted many of the points already noted that do not require further repetition, but they did reaffirm the key point that a quick implementation vs a measured approach over a number of years will at least allow cargo shippers to try and transition to any new regime.

This will eventually lead to a large piece of economic activity being transferred to neighbouring countries.

ACN also highlighted that:

- The ecosystem of exceptionally fast customs processing vs competitors (an example mentioned was one might expect 10 hours at Frankfurt vs 4 hours at processing at Schiphol), as well-established local industry expertise and a strong distribution network all have provided Schiphol a competitive advantage, but they felt this will be severely damaged or lost in the event that a curfew is imposed.
- The idea of ring-fencing slots for a certain sector of aviation or purpose was mentioned. Though this is an interesting idea and others have pursued it as well, we do not believe it is likely to be compatible with EU Slot Regulation
- That the situation has become more challenging in recent years with ACNL and the ILT. This is not surprising as the airport becomes more constrained. The slot system was designed many years ago for passenger airlines and PA can reaffirm that is not well accommodated toward freighters whose schedules are often challenged by shipper related issues

The express courier industry is highly sensitive to a night curfew, since it relies on early and late slots

Aside from the holiday focused airlines, the other segment within the aviation sector that is likely to be severely damaged by a potential curfew would be the integrator (express delivery) community.

While often included within the cargo sector, it is important to establish that this is a highly time sensitive and unique business model serving a wide-ranging customer base. Their parcels can often smaller but often tend to be high value imports and exports.

The community is represented by the EEA who made several submissions to the Dutch Government last year, but the two largest players are FedEx and DHL who operate early arrivals and late departures most weekdays. Other operators such as UPS are still impacted since they depend on scheduled airlines in their logistics. Various representations were made indicating that the process being followed was illegal and was subject to challenge in terms of both the balanced approach, and the rights of historical slots.

The FedEx flights connect to their European hub in Paris while DHL has a hub in Leipzig and also operates some ad hoc flights direct to the UK (avoiding the expense and impact of having products double back via Leipzig).

The carriers have considered other airports in the region but due to location, capacity and curfews there are no others that would allow their most time sensitive products (delivered to sectors including the medical and banking community). DHL noted, for example, that their Brussels operation could only practically serve the southern regions of the country. Airports such as Lelystad, Groningen or Maastricht would not have suitable facilities, proximity to much of the customer base nor the necessary road infrastructure. As integrators with national networks, these operators offer a viable product that is meant to serve the entire country and not just the regions near the airports

These operators employ thousands of individuals both around the airport and through their logistics teams throughout the Netherlands. They are important businesses that would be notably impacted by the imposition of a curfew.

Variant 1 and 2 would fundamentally change the courier business model in the Netherlands

All three variants would have an impact upon DHL and FedEx

- Variant 1 and 2 would fundamentally change the courier business model in the Netherlands as it exists since deliveries could not occur until well into the day.
- Even in the case of Variant 3 where there would only be a nominal delay to the morning arrivals, it could still significantly impact key delivery times. It also may be extremely challenging to line any change up with downline slots at other airports.
- It would be possible to assume that all shipments to and /from most Dutch destinations (except certain border regions) would likely suffer a one day transit penalty.
- This would in part be due to the need to reach the furthest customer points (Zwolle was mentioned) in a timely manner
- It is also due to the fact that, at present, the delivery vehicles depart Schiphol before the morning traffic congestion period, but a small delay will likely lead straight into the blockages on the motorways, significantly impacting delivery times.

Regarding the noise profiles of certain aircraft types, FedEx indicated that the definitions taken were not compliant with the EASA defined noise profiles and they do not feel that the noise categories put forward are aligned with outputs, nor should the age of the aircraft should not be a defining criteria in this process.

It was also noted that Boeing has declined to produce a newer Max version of the 737 Freighter which serves the Paris – Amsterdam route. Therefore, any freighter operated is likely to be an older model Boeing narrowbody consistent with the FedEx fleet.

Lastly, a view was expressed that the airport and ANSP were both challenged on many levels and this initiative would only exacerbate the negative effect of any constraints.

LVNL raised operational and timeline challenges if new policies require a change in procedures, staffing and/or operations

In the case of all three variants, LVNL sees a common series of points that need to be considered. LVNL also suggested there are numerous unknowns that would need to be resolved in advance.

From a practical perspective, they noted that a gate slot of 06:55 is likely to take-off after 07:00 and so is not actually a movement in the night period, and this could have implications for how capacity is declared, planned and managed on the day in terms when aircraft noise is actually causing disturbance.

In terms of resources, which are already stretched, a short closure (that would include five hours) would not reduce the number of people required to be on duty especially if the airport remains open for diversions and emergencies.

LVNL current policy is to land aircraft as they present, to avoid stacking of approaching aircraft into a holding pattern. If stacking were to become a requirement to avoid early arrival because of strong tailwinds it would add additional challenges. Early arriving aircraft would not be given permission to land, burning extra fuel which would worsen the environmental impact, but this would also demand additional resources to manage the additional aircraft in the air.

It is currently taking 2-3 years to recruit new controllers and train them to be operationally ready - this is a key point for consideration when looking at the implementation timeframe for any curfew.

Policy decisions and planning assumptions would also be needed for the transition periods between night and day, specifically in terms of when exactly to switch between night and day operating procedures.

LVNL does not make a distinction between arriving aircraft with night slots and arriving aircraft with day slots when they are sequencing landings. If priority is to be given to one over the other, a policy decision will need to be made by the Ministry.

LVNL also highlighted the likely decline in punctuality that could follow moving more flights into already busy periods of the day, and that this in turn could put at risk the Netherlands ability to meet EU Single European Sky Airspace Performance Targets.

LVNL added that any change of use of airspace can only be implemented after a rigorous Safety Case has been approved which, again, may be a factor when looking at implementation timeframes.

One potential mitigation over time would be 2+2 runway operations vs. today's 1-2 or 2-1, allowing a few years for implementation with safety and training in mind, but we recognise that this may be difficult to consider politically and would be subject to permit.

ACNL has observed some changes in anticipation of a potential curfew

In terms of passenger airlines, ACNL believe a total closure would have a significant impact on KLM's first morning bank, and that any type of curfew would reduce the number of daily rotations for leisure carriers, most likely from three to two.

ACNL also said that retimes for freighter operators would be difficult due to a lack of suitable slots.

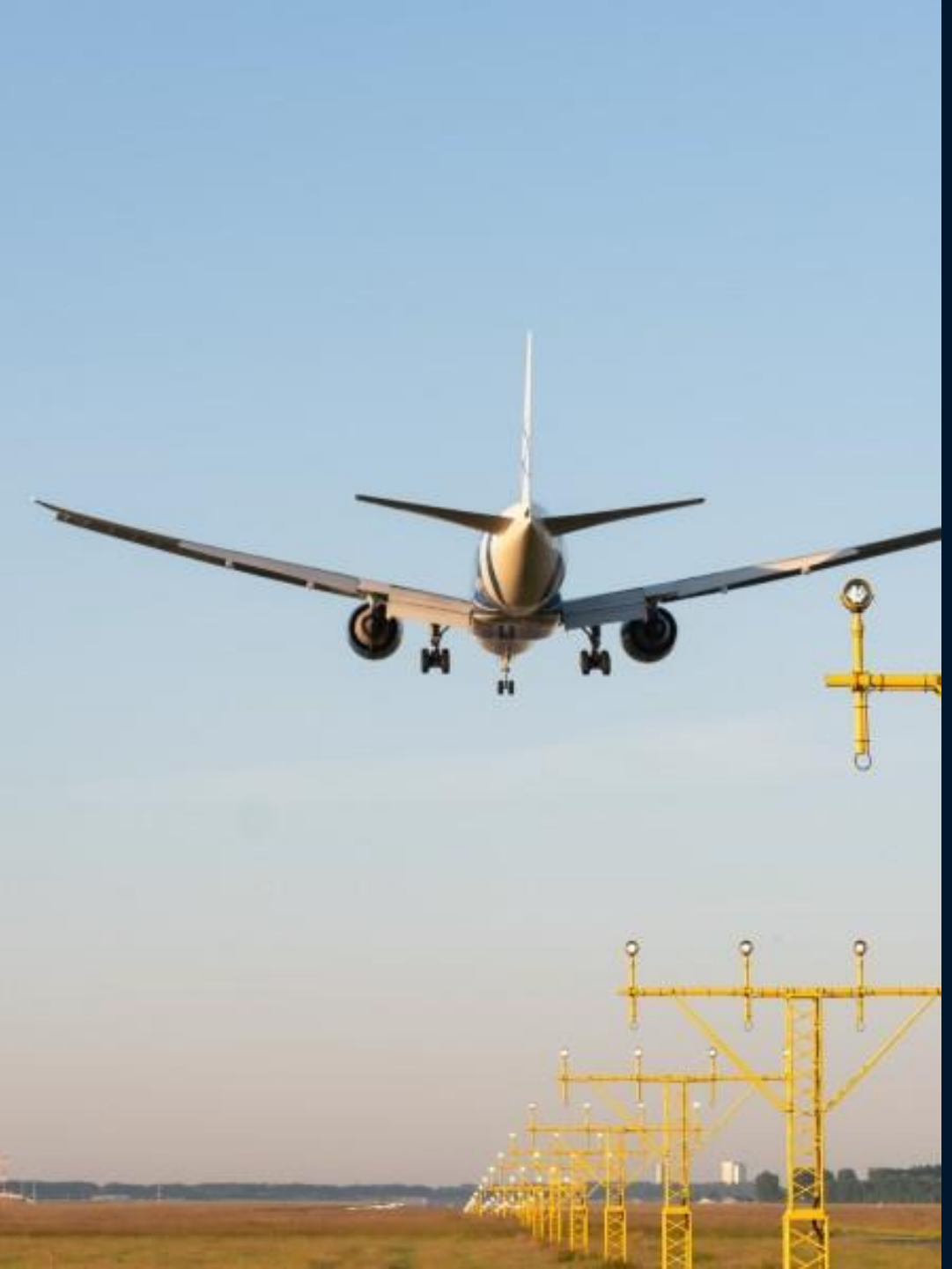
Looking to the future, they said Lelystad may become a limited solution, but only for leisure operators, though this in a context where it is not clear if the airport will ever become operational. All of this is consistent with the feedback from the airlines and freighter operators we spoke to.

They also explained that they are currently not seeing many early arrivals that breach the current night restrictions, which is thought to be a consequence of KLM briefing pilots on the importance of early morning slot compliance.

ACNL also believe, that in the absence of regulatory powers, incentives are the only option to encourage airlines to voluntarily re-time.

ACNL also reported that KLM appears to be pre-empting the introduction of a curfew by re-timing some flights out of the night into the early morning, and in the process has already secured many of the best slots available.

ACNL did reaffirm, like many other, that planning and implementation could require a few years.



08
Other related issues

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Key takeaways other related issues

This sections covers certain points that did not naturally fit in any particular part of the report but are worthy of consideration when evaluating future policy as a whole.

- The key slides focus on the wider financial impact upon the sector and how this flows down to different stakeholders
- As illustrated earlier in the paper:
  - The financial impact of Variant 1 is the highest with severely damaging impacts upon the entire sector.
  - Variant 2 is less damaging as it mainly impacts the holiday operators and the cargo integrators/freighters.
  - Variant 3 has limited damage, primarily to the Dutch based holiday carriers and the integrators. We do not consider this option as optimal, but it is the least impactful of the three proposed.
  - The impact of the proposed Measures mainly related to timing of implementation.
- Other areas considered are the effects on the airports and passengers in the regions further from Amsterdam including Lelystad of policy was ever implemented to open it
- Lastly, we touched on potential challenges the Netherlands may face from the outside world when it seeks to implement some of the proposed initiatives
- We accept that some of these items are outside of the strict mandate of the Ministry's requirements, but we felt them still relevant and worth mentioning.

A high level overview and ranking of the financial impact

PA was asked to consider the operational and business economic effects on individual airlines and segments that currently operate at night at Schiphol? Much of the focus was directed to major airlines that operate at night and have bases of operations at Schiphol. At a wider level, we tried to consider the key market segments including network airlines, holiday airlines, air freight and express services.

We have focused our attention on issues that arise in a curfew and the items that follow are based on Variant 1. Some of the items highlighted will partially or completely fall away in Variants 2 and 3 but all variants will be subject to some of these impacts. We have distinguished the differences where possible.

As mentioned before, credibly quantifying the financial impacts has proven impossible to achieve without privy data for the airlines such as route profitability and connecting passenger flows.

We considered simpler measure such as tying losses to reduced production in block hours flown per airline but we deployed methods for the airlines to keep much of their flying production in place but to do so it may come at a greater cost for a variety of reasons including but not limited to increase crew costs based on late night ground handling, fuelling and handling costs downline airport, out station hotel costs or other employment impacts for crew positioned at other bases, loss of yields due the less competitive timings, airport accessibility or other quality of service elements that will impact consumer willingness to pay.

Operating with less access to the base airport will likely increase costs through limited or more expensive maintenance from other providers outside of Schiphol, crewing issues and the likelihood of EU-261 compensation costs to consumer increasing as recovery options are more limited with a scattered fleet.

Furthermore, the holiday airlines often make their profit less on the flight and vs. services delivered to the customer at their destination including hotels an experience, the impacts of which would not be apparent without a full and detailed look into individual businesses.

PA had many further items we could add to this list, but we hope this illustrates where the challenges lies in determining the impact.

Further financial impact issues and the effect on home based carriers

Any airline's management when considering all the previously noted factors will have to make an assessment not just of which activity can be sustained, but where it can be done so profitably.

To appreciate the impact at an EBIT level it should be determined if the routes are cancelled (resulting in a reduction in revenues and variable costs) or are flown at suboptimal timings (loss of revenues), if the new expected return on a flight should be deteriorated to the point of falling under a profitability at variable costs level with no likelihood of improvement, it would be reasonable to assume it would be cancelled.

In absence of detailed financial data, options are limited. Using proxies from other carriers may be too arbitrary, because there could be relevant differences in the business models. Transavia's holiday and wholesale programme make it quite different from easyJet or Ryanair (publicly traded companies where a reasonable amount of proxy data is available).

One last element is **the impact of competition. As the costs of Dutch based carriers could be relatively uncompetitive due to the curfew or other measure, they may find themselves less able to compete with foreign based carriers.**

For carriers such as easyJet and TUI, the situation is more easily resolved as they can redeploy their aircraft to other bases around Europe and still fly into Amsterdam to utilise their movements, but for KLM they will be faced with other carriers operating into the Netherlands at a lower relative cost and if more of their slots are returned to the pool, more Schiphol flights will be deployed by non-Dutch carriers increasing the competitive pressure on KLM's bottom line.

All these factors will also have a jobs impact as carriers move based aircraft out of the Netherlands and the amount of activity in and around the airport recedes.

To help the reader quantify the impact of the measures, the scheduling outputs have allowed us to make high level indicative estimations of the loss of passengers in the 'Impact Evaluation' by the 5 most impacted airlines. While this does not translate into a straight-line financial result, it can provide an indication of the level of impact upon airlines and consumers.

Impacts on the wider Dutch economy – Passengers and Employment

A number of stakeholder groups will be impacted financially:

Airline Passengers

In the event the curfew is implemented in line with any of the variants mentioned, we would expect the supply of seat offered for holiday packages to contract by the home based carriers to contract, most notably in Variant 1 but this will occur to a lesser extent in Variant 2 and 3 as well. The airlines that presently run closer to three turns per day in the peak season will be unable to carry out these patterns. In some cases, even two turns per day may be challenging.

Supply constraint will be highest during holiday May and Summer holiday peaks with greatest impact upon individuals and families who have limited flexibility in their holiday timing.

But if the based carriers are unable to operate all their slots and they are forfeited, the other airlines that take them up may not focus all of that capacity on traditional holiday destinations. Some may be redirected to competing hubs and more business focused markets. Still, a large portion will likely be deployed to leisure markets with the product simply being offered by foreign carriers with a lower cost base. Those carriers will therefor gain a growing segment of the Dutch holiday market.

Price rises may exceed inflation and there will be some supply constraint making the products less affordable than they are today, though not to the extremes some have indicated.

Still, the home based carriers will be subject to:

- An increase in EU 261 claims relating to a greater cancelled flights due to base carrier curfew compliance
- Lower utilisation of the fleet with fixed cost spread over fewer passengers.
- Higher crew related costs
- Lower utilization of airport infrastructure could also increase unit costs, these will be passed on to travellers via the airlines.

Jobs in the Netherlands

As airlines including Corendon, TUI, and Transavia base aircraft outside of the Netherlands, this inevitably leads to less jobs in country including, crew and overnight maintenance support. Other parties in the cargo and integrator sectors may also see a reduction in activity leading to lower employment in the future as well.

Impacts on the wider Dutch economy and population – Business Traffic, Tourism, Cargo and the Regional Airports

Business Travellers

Business travellers are less price elastic than leisure passengers, but they are highly schedule sensitive. Reduced flights and connections, especially in the morning hours may make the Netherlands a less attractive business location and (an issue previously highlighted by the Netherlands Foreign Investment Agency to attract foreign direct investment).

We would also highlight one potential side issue, as more slots might be forfeited to foreign carriers, the price pressure on tickets could increase. This would pose a further challenge for the home carriers as a scenario could occur on some routes where yields do not increase in line with costs.

Inbound Tourism

As some of the night flights might be taken over by carriers based outside of the Netherlands operating in the day, we do not see a material impact on short haul leisure travellers.

If the hub is weakened as highlighted in Variant 1, it is possible that price sensitive inbound leisure travellers to Europe may choose other airports as their 'Schengen gateway' with some consequent impact upon the hotel and tourism sector. This effect is typically seen with foreign package holiday groups (often from Asia and North America) who are focused on a multi stop itinerary in a limited time frame.

Cargo and Integrators

Higher shipping costs of goods into the NL could increases prices to consumer and industry. More restrictive schedules could hold back the timely flow of deliveries and products. Ultimately, the Variants and Measures potentially accelerate the erosion of Schiphol's strong position in the freighter cargo market as has happened at other constricted airports such as Heathrow and Frankfurt, but unlike those markets, the Netherlands has no other alternative cargo airports.

Eindhoven, Rotterdam and other regional airports and their travellers

Airlines may reschedule certain operations at these airports since their delay recovery options become more limited is Schiphol is no longer an alternate. Flexibility of scheduling may be limited but airlines will do their utmost to retain scarce slots at these airports. This could impact passengers destined to the secondary airports who will be included in those stuck if a flight is delayed.

Related to that, if passenger (and cargo/integrator) traffic shifts to secondary airports (or even nearby airports in neighbouring countries), it will increase emissions and road traffic in the regions since most do not have effective rail links.

Network Quality – Impacted by Variant 1; less so by Variant 2 & 3

What is the effect on connectivity for the Netherlands (network quality)?

"Network quality is the availability of direct connections to preferred destinations. Preferred destinations are cities that represent a significant economic importance for the Netherlands or that have a special political/historical relationship with the Netherlands." Source: Notitie Beleidskader Netwerkkwaliteit, Ministry of Infrastructure & Water Management (https://open.overheid.nl/documenten/ronl-4b014aaf3c6b6a2173076eb42a25b8706669d4c4/pdf)

PA noted before that we cannot foresee the plans of the major carriers, most notably KLM. However, it is clear in Variant 1, that certain points on the Network will likely be eliminated as KLM is forced to restructure its schedule.

Some Asian carriers may also find it challenging to serve Amsterdam with morning arrivals in Variant 1.

This means there could be reduction in Network quality in Variant 1 as KLM will attempt to restructure their schedule, especially their morning banks. We cannot say how many destination will be lost as it depends on the nature of network restructuring KLM can achieve.

It also depends on where the AF-KLM Group feels they can better feed connection through their less constrained Paris hub, or possibly via Copenhagen once SAS is integrated into SkyTeam.

Still, most of the destinations impacted have other frequencies which will still connect the Netherlands to those cities, mitigating the deterioration but a reduced number of frequencies could impact the quality of service between Schiphol and some destinations.

Network Quality will also be impacted by the potential loss of some freighter/integrator activity depending on the Variant implemented.

Lastly, while the above Network Quality definition does not include leisure destinations it is fair to say that Dutch holiday makers may find it harder to find seats to some established destinations. New holiday routes will likely replace those lost but they may need to be closer to the Netherlands in flight time and thus more temperate. In general, it is hard to say how popular the new destinations will become to the public and we accept that tourist destinations are often deemed interchangeable. Still, these challenges might occur with key destination on the Croatian Coast, in the Greek Islands or with secondary airports in Italy. While this may not fit in a network quality assessment nor have a clear value loss, it remains likely be an impact on options to the consumer.

Regional airports offer limited mitigation due to similar curfews

Maastricht and Groningen both have capacity, but their own curfews means that while they may see an increase in traffic, they offer no substantive mitigation to the issue at hand.

Schiphol is currently the only airport in the Netherlands that does not have a night curfew. Therefore, the introduction of a total closure would mean that any aircraft wishing to land at night would have to do so in another country – this has a series of implications:

- For planned, but non-commercial operations such as medical, coast guard, police military or government flights, this may simply be so impractical that a total closure is not in the national interest. This may also be the case if the airport will stay open for emergency landings. These subsets are not a focus of this study.
- For commercial flights suffering delays but no emergency issues this may mean landing in another country. This will add cost and complexity for airlines, and significantly increase inconvenience for travellers, and under EU261 create additional costs for the airlines, which in some form will ultimately be funded through higher air fares.
- It is not clear where that location would be and how returning holiday makers or other passengers would be repatriated but we see no easy or practical options for impacted travellers.
- As mentioned before, the closure will also affect Eindhoven and Rotterdam customers since Schiphol was their alternate landing airport in case of delay. Now they are likely to be forced to land abroad as well in the event of delays into the night.
- It should also be noted that many airports outside the Netherlands, but within a reasonable distance of Schiphol, already have their own night restrictions so again this may not be a practical alternative.
- We are cognisant that there could also be resistance to a diversion policy dependent on airports out the Netherlands as their respective governments may question why they are resolving a Dutch issue.

PA's view is that imposition of a full night curfew should include a full assessment of the points above, with workable alternatives identified to not using Schiphol at night.

If Lelystad was to open, it would not have a material impact

As part of the wider brief, PA was asked to consider whether Lelystad could play a future mitigation role in accommodating flights moved out of Schiphol's night period. We recognise that Lelystad was not under government consideration at the time the research was conducted, but it was asked that PA explore any potential impacts of this possibility if the situation ever was to change..

In summary, if it were to open, we do not believe that Lelystad is likely to have a material impact upon the Variants noted. Lelystad has 10,000 movements and the profile of the airport is likely to primarily attract LCCs and charter operators. Based on 0600-2300 opening hours it would be challenging to have 3 turns per day to any but the nearest Mediterranean holiday destinations. Alternatively, an airline could build a schedule on 2 turns per day.

Assuming the above, we can target at most an average 2.5 return flights per day for a based aircraft reflecting a mix of routes. Let's also assume that Transavia is the only carrier based at Schiphol who may move capacity voluntarily with the right incentives due to their ability to transfer capacity to KLM. Therefore, we would expect they could take up to 5000 of the 10,000 available Lelystad movements as there is no meaningful incentive for any other airline to move. This equals about 2.75 based aircraft. For the sake of the example, we could suggest 3 summer-based aircraft and 2 winter ones. We understand that the airport only has the ability to base up to four Code C aircraft overnight so it is possible Transavia will only secure two positions year-round. While this is a helpful mitigation, it does not even resolve half of the Transavia flights impacted so there is still a 'Transavia issue', though a reduced one.

The remaining 5000 movements and overnight parking positions are likely to end up with 'new entrant carriers' to the greater Amsterdam airports system. This could include the major LCCs of course but it could also include flights from a company like Corendon or TUI using their other (non-Dutch) AOCs. On a positive note, since those carriers are unlikely to base aircraft at Lelystad, their movements will probably be concentrated away from the extreme ends of the day (before 0700 or after 2200). For much of the day the airport will be empty and the airport, handler and LVNL staff idle, making it potentially difficult to secure a lower cost base.

Opening Lelystad, could compel Transavia to make a decision to occupy Lelystad for strategic reasons. But even if that occurs, KLM will have a claim for the historic rights of the portion of night slots of Transavia that are transferred to Lelystad. The present timings of those slots are not consistent with the KLM network strategy so KLM might be open to a reasonable adjustment but views on this may differ and there will still be other early Transavia slots to address in any discussions with the KLM Group.

Rules, Regulations and Retaliation – Geopolitical Issues

The Netherlands is a signatory to several international aviation agreements and treaties, some of which are decades old, and that places certain obligations on it. While there is no legal and/or formal link between these treaties and slots, slots (and other matters like over-flying rights) can be (and on occasion have been) used to retaliate to actual, or perceived, breaches of these treaties. In other words, if the Netherlands was seen by others to be failing to meet its obligations, there could be a risk of retaliation against Dutch carriers at overseas airports. There may also be a risk of legal challenge, and/or intervention by the EU Commission where those treaties are signed at Community level (e.g., the EU/US Open Skies Agreement).

We are aware that the Ministry is well-versed in these treaties, so it is worth highlighting that several stakeholders (who are based outside the Netherlands) frequently referred to them and made clear that any perceived breach would be challenged at either national or EU level

We are also aware that the Ministry is knowledgeable of the EU Slot Regulation. As we have referenced elsewhere, the Regulation is very clear under what circumstances slots with historic rights can be withdrawn from operators, and none of those circumstances would apply during the implementation of a curfew. We therefore see a high risk of the recent policy on exceedance of historic precedence being challenged via ACNL, either by an operator (often acting with their government's blessing), an industry association or by DG MOVE, if it did not allocate a slot for a future season that had historic rights attached to it.

We have yet to see a workable methodology for ACNL to withdraw, or not reallocate, slots that have historic rights attached to them that would keep the Netherlands compliant with the Slot Regulation, though even if one could be found, it is unlikely to mitigate the risk of retaliations. This would be especially true for countries outside the EU as they would not be exposing themselves to any risk of sanction as, apart from the UK, they do not have formal slot regulations in place. Most follow, to a greater or lesser extent, the IATA Worldwide Airport Slot Guidelines, but these are not legally enforceable in any jurisdiction.

As always, we would encourage the government to take specialist legal advice on these issues as part of any next steps. The Ministry might also explore whether any other EU Directives and Regulations may conflict with the Slot Regulation, and if so, whether there is any historical precedent for how the courts would treat such a conflict.

Rules, Regulations and Retaliation – Geopolitical Issues (2)

As well as operators based outside the Netherlands, KLM also stated that restrictions on foreign carriers are likely to lead to (multiple forms of) retaliations by their respective governments (e.g. US and Canada, Middle-East, India, China) governments often focus on looking after their carriers. The recent reaction to the 'experimenteerregeling' has shown this.

Any restrictions that lead to commercial loss, or drive unwanted restructuring costs, are likely to provoke a reaction and changes to the night period are no exception.

Examples of previous retaliations we have witnessed include:

- systemic placement at remote stands away from the terminal
- denial of overflight rights
- threat of withdrawal of slots and regulatory approvals
- suspension of rights under bilateral air service agreements
- forced relocation to secondary airports
- inaccessibility to slot adjustments, additional capacity
- delayed regulatory approvals and cargo clearance

This list does not include any other issue raised in wider trade and tariff discussions

While some government are more overt about this approach than other, several governments are unlikely to be sympathetic to the introduction of a night curfew if is perceived to damage commercial interests, especially if no practical and equivalent recompense is offered. In considering this we would note that Variant 1 impacts major carriers from Japan, the PRC (both mainland and Hong Kong), Singapore, Taiwan and the USA.

To summarise all of this, any significant changes at Schiphol have potential downstream consequences all around the world. KLM operates into numerous congested Level 3 airports, and it will be almost impossible to reschedule flights at most of them. This is especially true at key airports in Asia such as Shanghai. Beijing, Seoul, Singapore and Dubai amongst others. Other countries may choose to retaliate through other trade or diplomatic mechanisms that are not directly tied to aviation.

A number of the carriers impacted hail from countries that signalled their concern about process that was followed recently in regards to potential ATM reductions, and it would be reasonable assume they could respond in a similar manner concerning the introduction of a night curfew that they believe impacts their commercial interests or otherwise sets a precedent thy may not agree with.

How things change if the Russia-Ukraine War comes to an end

While there is no end to the situation in sight, when that does hopefully occur it would be reasonable to expect that over time Russian and Ukrainian airspace will reopen to many carriers

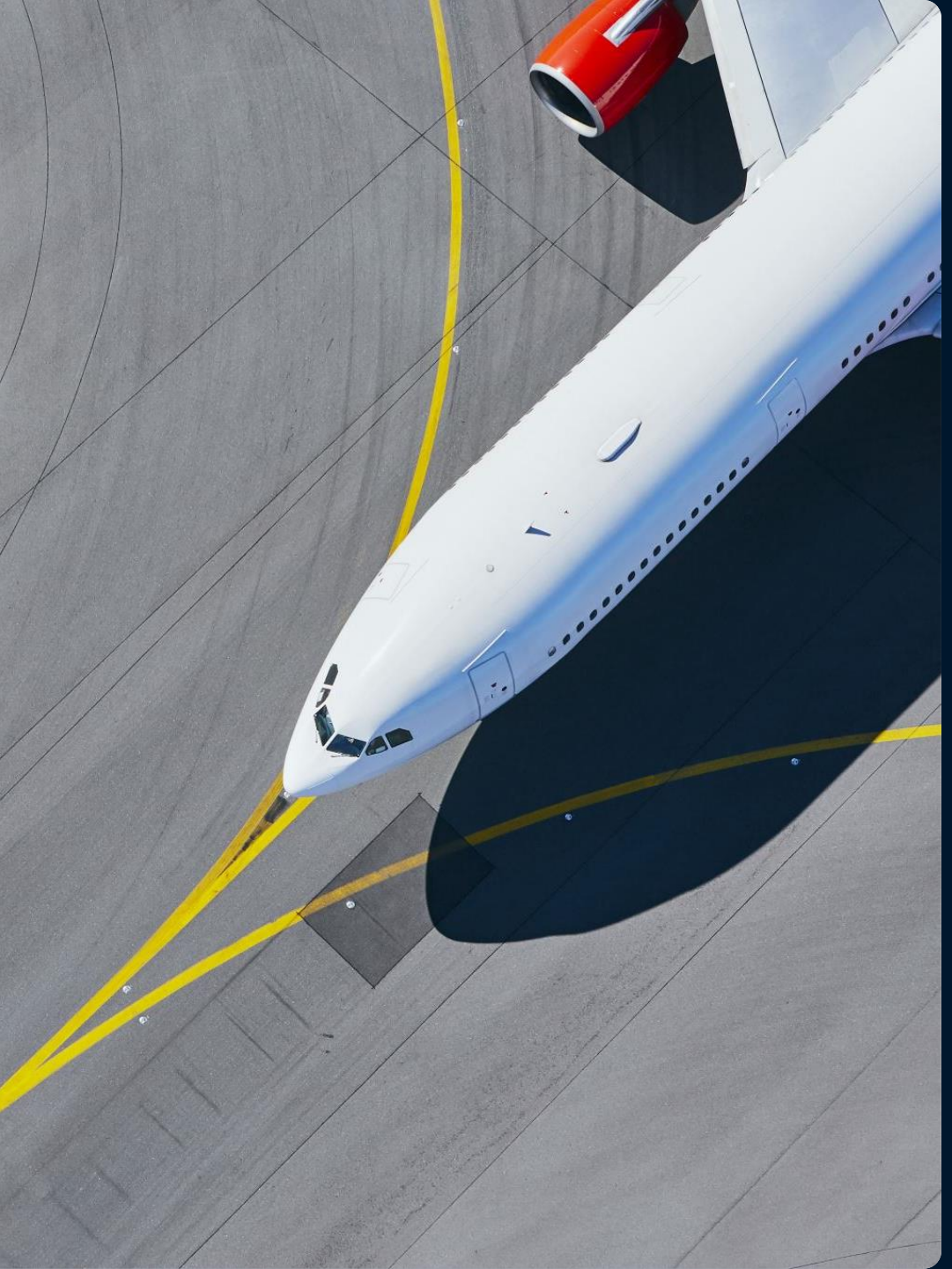
Presently, only a few countries such as China take the most direct routing, overflying Russian air space.

In the event of a reopening after cessation of hostilities, there will likely be flights that will start to arrive earlier in the morning, and it may prove difficult or impossible to retime their departures at the other end at a number of heavily slot constrained airports

We highlight this issue as we believe it is important to consider when planning for the longer term. This may not be an issue for a number of years but in designing future policy it may be helpful to consider how this would be addressed if (and hopefully when) peace and direct overflights are reestablished which has benefits for both the airlines and sustainability.

Still, for clarity, our assessment only looks at the schedules as they presently exist, but we simply felt it important to highlight that any future plan should provision for what might occur if Russian, Belarussian and Ukrainian air space do reopen to KLM and other carriers.

This is, unfortunately, more likely to be a matter to consider in the longer term



09 Appendix

Overview of the authors

David Huttner

David Huttner leads the Commercial side of the airline practice and the slot and capacity practice at PA Consulting

David worked with Virgin Group at Brussels-Zaventem Airport and later became the founding Head of Commercial for Virgin Blue Australia where he managed the growth strategy domestically and throughout the South Pacific. As one of three launch members of the airline's top leadership, he helped guide the company to become the most successful IPO in Virgin Group history with responsibility for key areas including aero-political issues, slots and network strategy. Later David joined the Board of Vueling and SAVC (now Matarat).

His global career spans more than 30 years and covers all areas of the aviation industry from sales and distribution through to product delivery and airline restructuring.

Chris Bosworth

Chris Bosworth is one of the world's leading authorities on slots and is consulted regularly by parties developing both commercial, operational, investment, legal and regulatory strategies.

Chris has developed an extensive understanding of aviation economics in a career spanning almost 35 years in the aviation industry. Having begun his career at British Airways (BA), where he stayed for 18 years holding a number of senior roles in several departments including Network Planning and Heathrow Operations. Chris then became Managing Director of Airport Coordination Ltd (ACL) which is the world's biggest slot coordinator. At ACL Chris oversaw slot allocation at 38 airports spread across Europe, the Middle East, North America, and New Zealand. He worked closely with national government and international regulators on policy development

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Luca Ciarlini

Luca has worked for 20 years in Alitalia where he reached SVP positions in Network Planning and Operations. He managed network profitability worth 4 bn€ in revenues and managed network operations for a fleet of 130 aircraft.

Luca was responsible for re-designing the airline network on a complementary two hubs system of FCO and MXP, later integrated with the KLM network, to boost connecting flows and expand long haul network. Luca has also helped to reoptimised and seeking efficiency gains at major hub airports including Dubai, Dublin London Heathrow and Paris (CDG).

Luca was deputy head of Network and Scheduling within the Joint Venture of Alitalia & KLM.

About PA Consulting

About PA Consulting

- PA Consulting is a management consulting firm of over 4,000 experts working from offices across the UK, Ireland, US, Netherlands and Nordics.
- We help organisations harness the power of innovation and break-through technologies. We define success as achieving exceptional results that have a lasting impact.
- This principle has remained the cornerstone of our ethos since 1943 – and it continues to underpin everything we do. Our clients choose us because we challenge convention to find new and imaginative answers to their questions.

About our Aviation capability

- As a global business advisory organisation focused on providing solutions to the aviation and related travel services industries.
- PA's aviation practice has blended its the deep aviation experience with the organisational design, digital and systems and other capabilities which PA Consulting offers
- We specialise in designing and implementing strategic and operational change, restructuring businesses for better performance.
- Our slots and Capacity Team have years of experience and are industry leaders in this niche of aviation having supported numerous assignments that looked at airports globally.

About our Aviation Team
We have deep industry connection and insight, whilst understanding the mutual dependencies and synergies between the different parts of the aviation value chain.

We are experts in airline, airport, air navigation services and aviation technology
We understand the mutual dependencies and synergies between different parts of the aviation value chain. We always take a holistic view of the industry and the client's situation in solving the issues at hand.

We are experts in strategy and execution
We are trusted advisors for owners, boards and management teams. Across the whole organisation we help our clients achieve exceptional results and lasting impact. From developing vision and strategy right through to execution, we provide the support they need to stay competitive and be successful.

We are experts in innovation and digitalisation
We are the advisors that best understand the business implications of ground-breaking technology and innovation. We support our clients to capitalise on new innovation and support them in the necessary business transformation.