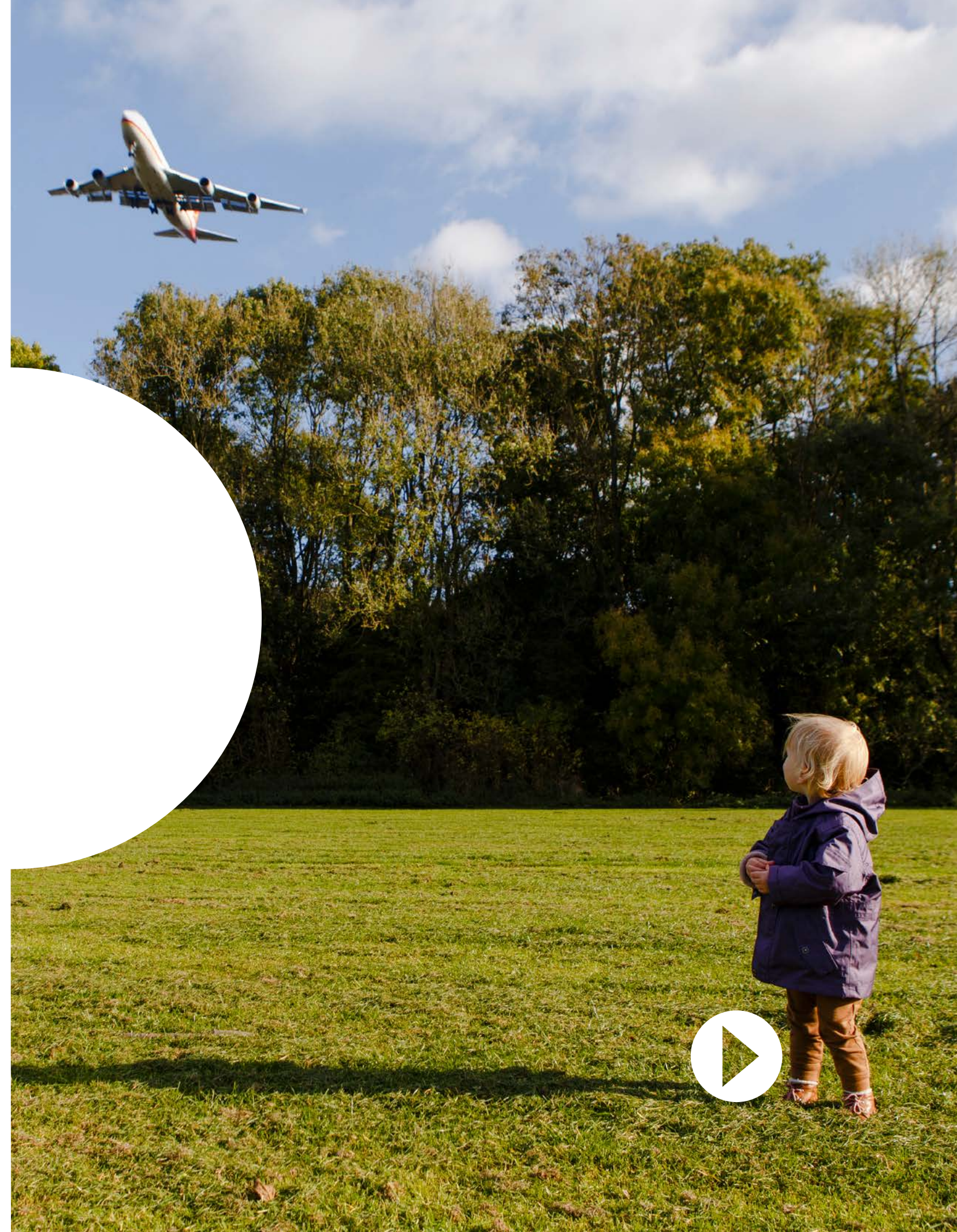


AVIATION POLICY

A NEW APPROACH PATH

APRIL 2019



About the Council for the Environment and Infrastructure

The Council for the Environment and Infrastructure (*Raad voor de leefomgeving en infrastructuur*, Rli) advises the Dutch government and Parliament on strategic issues concerning the sustainable development of the living and working environment. The Council is independent, and offers solicited and unsolicited advice on long-term issues of strategic importance to the Netherlands. Through its integrated approach and strategic advice, the Council strives to provide greater depth and breadth to the political and social debate, and to improve the quality of decision-making processes.

Composition of the Council

Jan Jaap de Graeff, Chair
Marjolein Demmers MBA
Prof. Pieter Hooimeijer
Prof. Niels Koeman
Jeroen Kok
Annemieke Nijhof MBA
Ellen Peper
Krijn Poppe
Prof. Co Verdaas
Em. Prof. André van der Zande

Junior members of the Council

Sybren Bosch MSc
Mart Lubben MSc
Ingrid Odegard MSc

General secretary

Ron Hillebrand PhD

The Council for the Environment and Infrastructure (Rli)

Bezuidenhoutseweg 30
P.O. Box 20906
2500 EX The Hague
The Netherlands
info@rli.nl
www.rli.nl



CONTENTS

SUMMARY	5		
<hr/>			
1	INTRODUCTION	9	
1.1	Aviation-related interests in the Netherlands	9	
1.2	Purpose of this advisory report	10	
1.3	Questions addressed in this report	10	
1.4	Context	10	
1.5	Reader's guide	11	
<hr/>			
2	INSPIRATION FOR A NEW APPROACH: GOVERNMENT POLICY ON AVIATION COMPARED WITH OTHER SECTORS	12	
2.1	Differences in general principles	13	
2.2	Differences in policy approach	15	
2.3	Emotions and impressions associated with Dutch aviation	17	
<hr/>			
3	RECOMMENDATIONS FOR A NEW APPROACH IN AVIATION POLICY	18	
3.1	Recommendation 1. Treat the aviation sector more like an 'ordinary' business sector	19	
3.2	Recommendation 2. Set well-defined limit values for aviation	19	
3.3	Recommendation 3. Apply the ALARA principle	21	
3.4	Recommendation 4. Develop a Dutch climate policy for aviation with reduction targets for carbon dioxide emissions	22	
3.5	Recommendation 5. Gain public trust through strict enforcement and sanctioning	24	
3.6	Recommendation 6. See that the polluter pays	25	
3.7	Recommendation 7. Focus more on passenger behaviour (and on influencing that behaviour)	25	
3.8	Recommendation 8. Concentrate on the international accessibility of the Netherlands and reconsider the concept of network quality within that context	26	
<hr/>			
4	SPECIFIC ACTIONS TO IMPLEMENT THE NEW APPROACH	29	
4.1	Develop a new nuisance standard for perceived aviation noise	29	
4.2	Limit nuisance at night	30	
4.3	Introduce mandatory blending of sustainable fuel	31	
4.4	Make airlines and passengers pay for negative externalities	32	
<hr/>			
5	FINAL REMARKS	35	
<hr/>			
	REFERENCES	38	
<hr/>			



APPENDICES	41
GENERAL PRINCIPLES	41
RESPONSIBILITY AND ACKNOWLEDGEMENT	42
OVERVIEW OF PUBLICATIONS	44





SUMMARY

Air traffic volume has grown significantly around the world, including in the Netherlands. Noise pollution and the emission of particulate matter and carbon dioxide mean, however, that air travel is increasingly at odds with a healthy and pleasant living environment and climate objectives. These conflicting interests, combined with a decline in the public's trust in government and the aviation sector, call for a new approach to aviation policy. In this advisory report, the Council for the Environment and Infrastructure (Rli) puts forward a proposal for such a new approach.

The core of the new approach is that government policy should treat aviation much more like any other business sector. At the moment, aviation still enjoys an exceptional position. Various environmental principles are rarely if ever applied in government aviation policy. That policy tends to focus on boosting the competitiveness of Schiphol Airport in particular. Other sectors receive far less of this sort of government support.

The Council considers that such exceptional treatment can no longer be sustained in policy. Considerations of safety, the quality of the natural and living environment, and the climate objectives all impose limits on air traffic. Like other economic sectors, aviation will have to develop within these limits. The starting point for policy can no longer be 'permit growth first, then mitigate'. The sequence will have to be: enforce the boundary

conditions first, then decide on capacity growth at airports. This means that the number of aircraft movements to and from the Netherlands can only be increased after the boundary conditions have been satisfied.

In this advisory report, the Council elaborates on this new perspective by making the following recommendations:

Focus in aviation policy on the environmental limits for aviation instead of on the number of aircraft movements

The current policy focusing on the number of aircraft movements is inconsistent with government's treatment of other economic sectors. After all, government does not set a ceiling for the number of bulbs that a lightbulb factory is allowed to produce. The authorities should focus first and foremost on setting precise environmental limits for the aviation sector. In addition to the existing limits, they should also develop new nuisance standards for perceived noise.

Apply the ALARA principle and tighten up the limit values for aviation regularly

Airports and airlines should step up their efforts to ensure that the level of environmental nuisance caused by aviation is 'as low as reasonably achievable', otherwise known by its acronym, the ALARA principle. That is why government should tighten up the limit values for aviation regularly. In the same vein, nuisance at night should be reduced as much as possible. The number of night flights can be curtailed by offering a price incentive and/or by prohibiting take-offs.

Develop a national climate policy for aviation

It is important for the Netherlands to set carbon reduction targets for aviation, just as it does for other business sectors. For the time being, sustainable fuel is the most promising method of reducing aircraft carbon emissions. The Council therefore recommends requiring fuel suppliers to Dutch airports to blend sustainable fuel with conventional kerosene. To avoid the adverse effects of refuelling abroad, the government should agree to subsidise the price gap between sustainable fuel and conventional kerosene for a transitional period.

Regain public trust through strict enforcement and sanctioning

The success of the new approach in aviation policy outlined here depends on the level of trust that the public has in government and the aviation sector. The new policy will therefore need to be rigorously enforced, with sanctions being imposed when limit and target values are exceeded.

See that the polluter pays

As is the case in other business sectors, passengers and airlines will have to pay for the negative externalities of air travel. At national level, airport fees should therefore be differentiated according to aircrafts' environmental performance. In addition, the Council recommends introducing a tax on airline tickets that goes further than the existing bill in this respect. The Dutch government must also lobby internationally to have excise duties levied on kerosene.



Focus more on passenger behaviour (and on influencing that behaviour)

While it is common practice in other mobility sectors to focus on passenger behaviour if policy objectives are not achieved or if there are negative externalities, this is not the case in aviation. That needs to change. Any new aviation policy should include a thorough analysis of how to influence passenger behaviour. For example, there is evidence that offering viable alternatives (such as international trains) or raising awareness of the consequences of flying can influence passenger behaviour.

Concentrate on the international accessibility of the Netherlands and reconsider the concept of network quality within that context

A good aviation network is important for the international accessibility of the Netherlands. However, that accessibility is determined by the sum of all available transport modalities: air, rail, road and water. The Council recommends analysing how many and which transport connections are needed to ensure our international accessibility. The size and quality of the Netherlands' requisite aviation network, i.e. the network formed by Schiphol and the regional airports, should be contingent on the outcome of that analysis. At present, not enough is being done to assess the aviation network within the overall transport context.

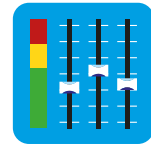
Because Dutch aviation operates in an international arena, the Netherlands will preferably lobby for changes in the above-mentioned aspects at EU and international level. In reality, however, global consensus on this issue is still a long way off. The Council therefore believes that the Netherlands should, where possible, pursue its own policy to tackle the problems in aviation.



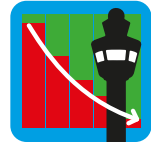
Recommendations



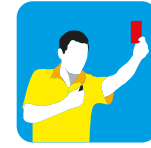
1. The aviation sector as an 'ordinary' business sector



2. Well-defined limit values



3. Apply the ALARA principle



4. Strict enforcement and sanctioning



5. National climate policy



6. Polluter pays



7. Influence passenger behaviour



8. International accessibility

Actions



Develop a new nuisance standard for perceived aviation noise



Limit nuisance at night



Ticket tax for passengers



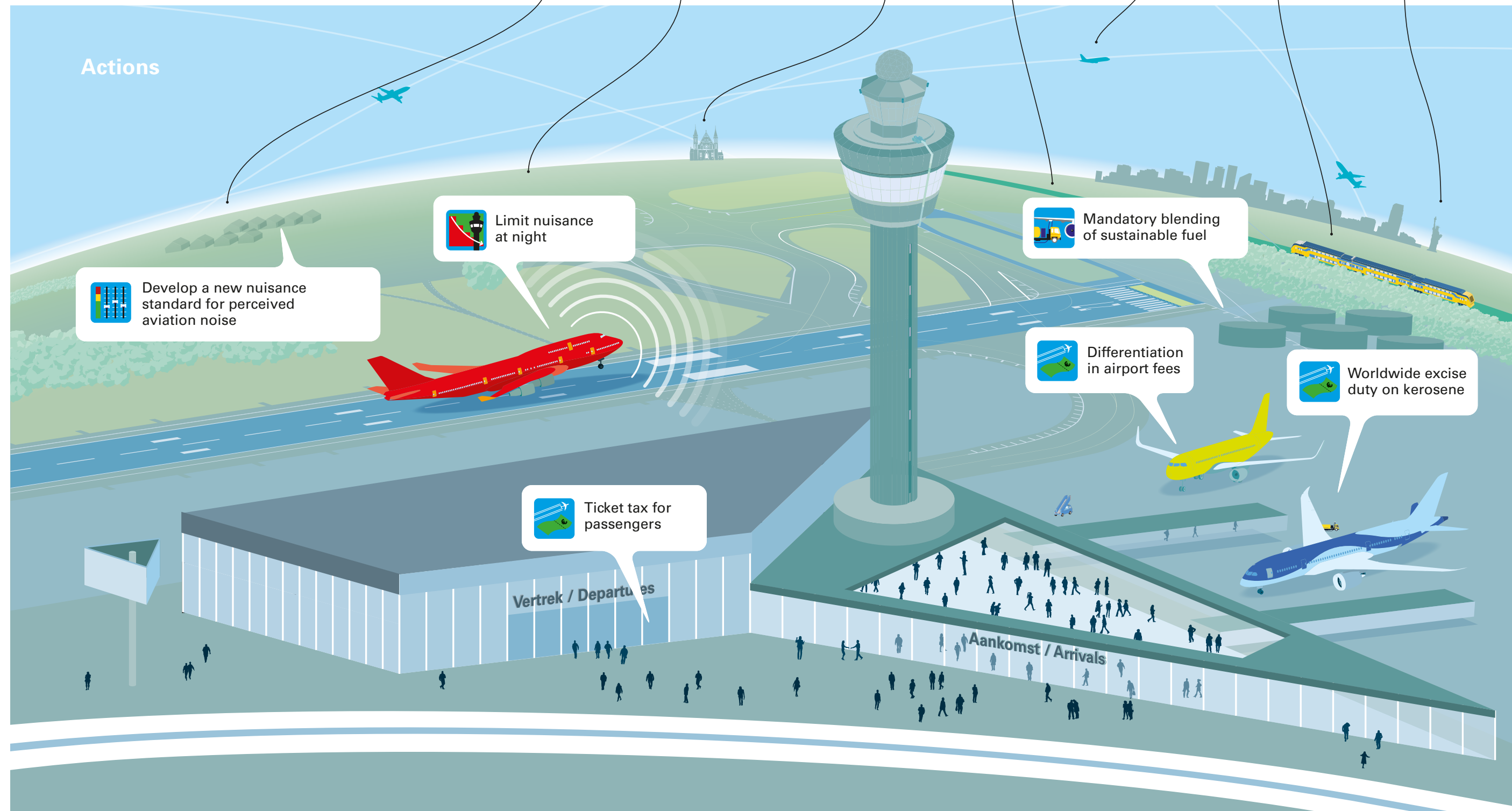
Mandatory blending of sustainable fuel



Differentiation in airport fees



Worldwide excise duty on kerosene





1 INTRODUCTION

It is impossible to imagine modern society without aviation. Air travel has become an important form of mobility, offering people the opportunity to travel long distances, spend leisure time far from home and see much of the world. Aviation also makes a major contribution to the performance of economic centres all over the world and contributes to the quality of the business climate in the Netherlands.

The global aviation industry is growing rapidly and is forecast to continue doing so. Airlines are eager to continue expanding their operations in the Netherlands as well. Growth in aviation entails an increase in greenhouse gas emissions, however, even though the need to reduce such emissions has never been greater. The rising volume of air traffic is also exacerbating adverse impacts on the living environment in the vicinity of airports. There is growing concern about noise pollution and airborne particulate matter and the health problems that they cause. The ongoing expansion of the aviation industry is therefore at odds with both climate change mitigation policy and efforts to protect the quality of people's living environment.

1.1 Aviation-related interests in the Netherlands

Local residents and the aviation industry have increasingly divergent interests. The Council for the Environment and Infrastructure (hereafter

referred to as the Council) is concerned about the level of trust that people have in government (when it comes to protecting the interests of those who live near airports) and in the private sector. Studies investigating this matter indicate that the impenetrable enforcement system for noise pollution is one of the reasons for public mistrust. In recent years, for example, questions have been raised about the independence of the noise calculations performed as part of the environmental impact assessments for Lelystad and Schiphol airports (Wansink, 2017; WesselinkVanZijst, 2018; Meindertsma & Van der Parre, 2018). Public trust has also been eroded by the impression that the aviation industry wields its power to influence government decisions (WesselinkVanZijst, 2018; *Het Financieele Dagblad*, 2017). The dissatisfaction of local residents appears to be exacerbated by a more general trend: the opponents of aviation and airports are speaking up more and are less willing to accept the nuisance caused by air traffic.

1.2 Purpose of this advisory report

In the Council's view, the tension between growth in aviation on the one hand and climate objectives and a pleasant and healthy living environment on the other, combined with a worrisome decline in the public's trust in government and the aviation industry, call for a new approach in aviation policy. Not only is a new approach necessary but it can also generate new opportunities. After all, aviation is changing, for example as a result of innovations in aircraft technology (such as pilotless airplanes and the use of IT), new airline business models, and the development of competing modes of transport for medium-haul travel. Aviation policy will have to

accommodate these ongoing changes. This too calls for a new outlook in aviation policy.

The Council's advisory report provides the foundations for this new outlook. The report focuses on the long term. The Council also examines generally accepted principles in aviation policy and considers the role that the Dutch government can play, given the entirely international arena in which the aviation sector operates.

1.3 Questions addressed in this report

The following questions are central to this advisory report:

- Is a new and different approach possible in the Dutch government's aviation policy?
- If so, what are the basic policy principles that emerge from that approach and what specific policy options can be identified?
- What mechanisms are available to implement these policy options or, if such mechanisms are currently limited, how can they be augmented?

1.4 Context

This advisory report focuses on aviation in the Netherlands and considers issues both 'on the ground' and 'in the air'. Because there is no market for domestic air travel in the Netherlands, Dutch aviation is almost always international. This report focuses on civil aviation, both freight and passenger transport. The report mainly covers the national airport,



Schiphol, and regional airports of national significance, i.e. Eelde, Eindhoven, Maastricht-Aachen, Lelystad and Rotterdam The Hague airports.

1.5 Reader's guide

The remainder of this report is structured as follows. Chapter 2 compares government policy on the aviation sector with government policy on various other mobility and business sectors. Chapter 3 uses the outcomes of this comparison to develop a new approach in aviation policy. The Council makes a number of recommendations in this regard. In Chapter 4, the Council takes these recommendations as a basis for developing a number of specific actions that can serve to implement the new approach in aviation policy. The Council concentrates on measures that break new ground compared with current policy measures. The report ends in Chapter 5 with some final conclusions.





2 INSPIRATION FOR A NEW APPROACH: GOVERNMENT POLICY ON AVIATION COMPARED WITH OTHER SECTORS

To arrive at a new approach in aviation policy, we need to reflect on the national government's current policy regime for the aviation sector. Comparing the principles that underpin government aviation policy with those on which it bases its policy in other sectors may provide inspiration for an alternative approach. To that end, the Council commissioned an analysis comparing government policy on the aviation sector with its policy on a number of other mobility and business sectors, i.e. rail transport, shipping, inland shipping, road transport and heavy industry (KWINK groep, 2019). This comparative study (available in Dutch at www.rli.nl) considered the entire body of legislation, policy measures and the allocation of official responsibilities.

The comparative analysis shows that the policy regime for aviation differs in a number of respects from that in other sectors. There are differences

both in the general principles that apply (e.g. because of EU legislation and environment and planning law)¹ and in government's chosen policy approach.

This section discusses the differences between the sectors most relevant to this advisory report. We first discuss differences in the general principles that apply and then the differences in policy approach. The Council subsequently touches upon two other points that typify the Dutch aviation industry and function as contributing factors in the debate.

2.1 Differences in general principles

EU internal market

One general principle affecting the Dutch aviation industry is the single market of the European Union (EU), the related principle of non-discrimination and the pursuit of a level playing field for all market operators. The founding principles of the internal market are the free movement of people, goods, capital and services, and they apply equally to mobility and business sectors. In aviation, the single market is limited to Europe: passenger and cargo flights to and from countries outside the EU and the European Economic Area (EEA) are governed by bilateral or

¹ Examples of general principles that may underpin government policy are the precautionary principle and the stand still principle. The appendix provides a brief explanation.

multilateral treaties.² For the Dutch aviation sector, the principle of the internal market means that registered airlines may fly to any airport in Europe, unless there is insufficient capacity at a particular airport. In that case, access to the airport is controlled by means of an independent 'slot allocation': the allocation of take-off and landing times ('slots') at the airport, regardless of destination.³ The rules stipulate that most of the time slots must be allocated to parties with 'grandfather rights', i.e. parties that had used these slots in the previous corresponding season. This procedure differs from what is customary in other mobility sectors. For example, on the international railways, concessions are often issued to operate certain services between destinations.

The polluter pays

The Dutch aviation sector also differs from other mobility and business sectors when it comes to charging customers tax and duties. Most sectors do charge their customers, but in aviation that happens only to a limited extent. This disparity has its origins in the Convention on International Civil Aviation, also known as the Chicago Convention (1944) and subsequent bilateral treaties, under which it was agreed not to levy

² Bilateral or multilateral aviation treaties make air travel between countries worldwide possible. EU Member States have delegated some of the authority for concluding such treaties to the EU. The extent to which there is 'freedom of the air' varies from one treaty to the next. For example, the EU and the United States have concluded an Open Skies Agreement in which each side allows the other to operate in certain parts of its market for civil and all-cargo air transport.

³ Access to airports is also subject to safety, security and environmental protection regulations. See Regulation (EC) No 1008/2008 of the European Parliament and of the Council of 24 September 2008 on common rules for the operation of air services in the Community (Recast).



excise duty on fuel.⁴ In addition, in the case of international flights, tickets sold in the Netherlands are not subject to VAT or environmental taxes. The non-imposition of excise duties, VAT⁵ and environmental taxes boosts the demand for air travel (and thus carbon emissions).

There are now international agreements in place to combat aircraft carbon dioxide emissions. For example, intra-European air traffic is included in the EU's Emissions Trading System (ETS) for carbon dioxide emissions. In addition, the 190 member states of the International Civil Aviation Organization (ICAO) have committed to carbon-neutral growth in aviation by 2020. So far, however, this has had only a limited impact on the cost of flying. Aviation is not yet subject to a carbon budget such as those set for other sectors in the Netherlands under the Paris Climate Agreement (see Box 1).

Box 1: Aviation carbon emissions and the Paris Climate Agreement

Under the Paris Climate Agreement, the participating countries have committed to reducing greenhouse gases and limiting temperature rise worldwide. However, the text of the Agreement does not say what the battle against global warming means for the way countries are to handle the aviation sector.⁶ As a result, unlike in other economic sectors such

⁴ During the Second World War, solidarity between nations was considered so important that air traffic between countries was exempted from international taxes. The Chicago Convention prohibits the taxation of fuel on board aircraft. Subsequent bilateral treaties often stipulated that no excise duty was to be levied on fuel on either side.

⁵ The primary purpose of excise duties and VAT is generally not to reduce pollution.

⁶ The exception is domestic flights (of which there are very few in the Netherlands).

as road haulage and heavy industry, there are no agreements in the Netherlands about how aviation will help to attain the country's carbon reduction targets for 2030 and 2050 or about the policy measures that will be necessary to do so.

The 'polluter pays' principle is applied sparingly in the Netherlands when it comes to adverse effects in the immediate vicinity of airports. At the same time, the aviation sector is made to cover part of the cost of airport noise insulation programmes.

All in all, the absence of general taxes such as excise duties and VAT and the largely non-existent 'polluter pays' principle in the Netherlands mean that flying is not subject to the type of financial measures that stimulate sustainability. As a result, sustainable alternative fuels cannot compete with the low price of kerosene and passengers are not discouraged from flying. The Netherlands has fewer opportunities to pursue an independent policy in this sector than in others because it is bound by multilateral treaties and bilateral agreements, some of which have been concluded by the EU. National policy can, however, play a role.

The ALARA principle

The ALARA principle is an important standard in Dutch environment and planning law for assessing the environmental nuisance (emissions, noise and other environmental impacts) that may be associated with an economic activity for which an environmental permit application has been submitted.



ALARA is an abbreviation for As Low As Reasonably Achievable. Emissions of harmful substances, for example, must be as low as reasonably achievable. This principle has been transposed into the Best Available Technology (or Techniques) requirement (BAT). Unlike other businesses, airports in the Netherlands are not required to apply for an environmental permit. In this sector, the protection of the natural and living environment is regulated by an airport traffic decree. The ALARA principle does not necessarily prevail in that context.⁷ An airport's noise and external safety contour lines are based on a 'maximum traffic scenario'. Even if quieter aircraft were to be developed later, an airport's noise contour lines would not be scaled back, as the ALARA principle dictates.

There are elements in the current aviation rules that can be traced back to the ALARA principle, however. For example, Section 8.17(7) of the Dutch Aviation Act [*Wet luchtvaart*] states that any subsequent airport traffic decree must offer the surrounding area protection equal to or better than the first decree (Schiphol Group, 2018). The 50/50 arrangement recommended in the 2008 advisory report by the Alders Committee also incorporates elements of the ALARA principle: after 2020, 50% of the available environmental latitude may be used to accommodate growth in air traffic and the remaining 50% must be used for the benefit of the surrounding area, in the form of nuisance reduction (Tweede Kamer, 2008).

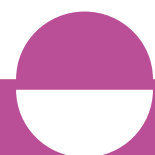
⁷ The ALARA principle generally applies with regard to aviation safety, however.

2.2 Differences in policy approach

Policy on negative externalities other than noise and safety

Further differences between the aviation industry and other sectors are due not so much to principles as to differences in policy practices. Unlike the policy pertaining to other sectors, for example, aviation policy places relatively little emphasis on managing *externalities other than noise and safety*. By contrast, in addition to noise and safety, requirements regarding air quality and greenhouse gas emissions are very common in road haulage, manufacturing and other sectors. Concern about the impact of aviation on the living environment is prominent on the social and political agenda. In the Netherlands, however, the debate on this topic is focused unilaterally on noise-related issues in the vicinity of Schiphol and the other airports. Noise and external safety are therefore the defining environment and planning factors in aviation policy when it comes to the living environment.

Without wishing to underestimate the importance of noise abatement, the Council considers that noise has been given so much emphasis in policy and in public debate that there is insufficient insight into the total environmental impact of Dutch airports. Aviation policy pays too little attention to the assessment of emissions of ultrafine particles, carbon dioxide and other greenhouse gases. It seems as if the Netherlands has outsourced its climate policy for aviation to the ICAO and the EU and is not pursuing its own policy in this regard.



International context

More than other economic and mobility sectors, the Dutch aviation sector is dominated by the international and European arena in which it operates. Almost all air traffic in the Netherlands is international and there is no domestic aviation market, unlike other modes of transport.⁸ In addition, international agreements and treaties have a bigger impact on aviation than on other international transport sectors (rail and maritime transport). The aforementioned International Civil Aviation Convention (or Chicago Convention) was concluded in 1944 and established worldwide agreements about air traffic. The Convention formed the basis for many follow-up agreements. The international nature of aviation means that national policymaking options are limited, a point that must be taken into account when developing a new approach to aviation policy.

Thinking in terms of network quality and connectivity

Government policy on aviation revolves around network quality and connectivity. These factors are virtually non-existent in its policy on other mobility sectors. Network quality is usually defined as the number of connections per airport combined with flight frequency. In the Netherlands, network quality has become a key criterion for measuring airport competitiveness, particularly Schiphol's.⁹

⁸ The Netherlands is fairly unique in this respect. It has a relatively small surface area and airspace, and a relatively large airport.

⁹ SEO Amsterdam Economics issues an annual report on Schiphol's network quality and international competitiveness.

The fact that the Netherlands is connected by air to other economic centres around the world has stimulated economic progress on both ends of the relevant routes. International accessibility also benefits the tourism sector, which accounts for 4.3% of the country's gross domestic product (CBS [Statistics Netherlands], 2018). The large number of international flights also offers residents of the Netherlands the opportunity to travel to far-off destinations with relative ease and to visit friends and family all over the world. However, as the following section clarifies, there are several reasons to rethink the concept of network quality.

Focus on influencing passenger behaviour

In its aviation policy, the Dutch government devotes little attention to passenger behaviour (and how it might be influenced). Instead, policy-makers tend to concentrate on the supply side of aviation, i.e. airports and airlines. Here too, the government's aviation policy differs from its policy on other mobility sectors. For example, it is very common in road traffic policy to encourage drivers to change their behaviour and to challenge them to accept their responsibilities. Examples include peak-hour avoidance projects, tax incentives for environment-friendly vehicles and drink-driving campaigns.

Aviation policy has so far failed to offer air passengers similar incentives. A bill was recently sent to the Council of State proposing the introduction of a tax on airline tickets starting 1 January 2021, but the purpose of this tax is to pad the treasury's coffers and not to influence travel behaviour (CE Delft, 2018).



2.3 Emotions and impressions associated with Dutch aviation

Supplementary to the outcomes of its comparative analysis, the Council would like to touch on another point that typifies the Dutch aviation sector and that plays a role in the debate on aviation in the Netherlands. The public and political debate on aviation is, after all, one that evokes *strong emotions and impressions, both positive and negative*.

During the interviews conducted by the Council, ‘blue pride’ was mentioned several times. ‘Blue pride’ refers to the pride that the Dutch feel about the phenomenon of aviation in general and KLM Airlines and Schiphol Airport in particular. A survey by Motivaction (2018) provides further indication of this: it revealed that 82% of Dutch people have a positive attitude towards aviation in the Netherlands and that they overwhelmingly associate aviation with KLM and Schiphol. The Council has noted that this sentiment plays an important role in the public and political debate on the sector.

Alongside these positive feelings, the public also has a negative one, i.e. the impression of an all too intimate relationship between the national government and the aviation sector. Unlike in other mobility sectors, ‘public’ and ‘private’ interests are closely intertwined in aviation. This is partly because the airports are government property and public authorities therefore have both a public responsibility towards airports and a private stake in them. The Dutch State also recently acquired shares in the Air France-KLM holding company (it already owned shares in the home carrier, KLM). In addition, although it is the national government that is

to some extent competent to enter into aviation treaties, the commercial airlines have a vested interest in such treaties. Government and airlines have therefore traditionally joined forces in international negotiations. As a result, the sector that has evolved over the past hundred years is one in which airlines, airports, public authorities and research institutions are intimately linked. The unique culture that has emerged within the sector reinforces the impression among local residents and environmental organisations that government cares more about corporate interests than about protecting the natural and living environment.





3 RECOMMENDATIONS FOR A NEW APPROACH IN AVIATION POLICY

The Council considers that the outcomes of the comparative analysis discussed in Chapter 2 can be used to develop a new approach in aviation policy. It is the Council's view that this is both inevitable and desirable, given the demands pertaining to safety, the quality of the natural and living environment and carbon dioxide emissions. If aviation is to continue to play an important role in the long-term international accessibility of the Netherlands, these boundary conditions call for a different approach from government. In this chapter, the Council offers the following recommendations:

1. Treat the aviation sector more like an 'ordinary' business sector.
2. Set well-defined limit values for aviation.
3. Apply the ALARA principle.
4. Develop a Dutch climate policy for aviation with reduction targets for carbon dioxide emissions.
5. Gain public trust through strict enforcement and sanctioning.
6. See that the polluter pays.
7. Focus more on passenger behaviour (and on influencing that behaviour).
8. Concentrate on the international accessibility of the Netherlands and reconsider the concept of network quality within that context.

Because Dutch aviation operates in an international arena, the Netherlands will preferably lobby for changes in the above-mentioned aspects at international level, i.e. within the EU and ECAC¹⁰ and with the ICAO. In reality, however, global consensus on this issue is still a long way off. The Council is therefore of the opinion that the Netherlands should, where possible, pursue its own policy on these points.

3.1 Recommendation 1. Treat the aviation sector more like an 'ordinary' business sector

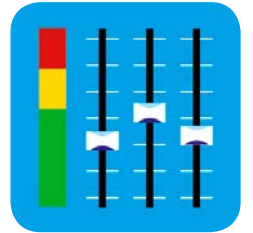
For the Council, the core of a new long-term approach lies in treating aviation more like an 'ordinary' business sector, no different than any other. What distinguishes aviation most from other mobility and business sectors is its exceptional international position. In particular, because aviation is increasingly becoming a standard mode of transport for all, with all the positive and negative implications that that entails, the other differences in underlying principles and policy approaches noted in Chapter 2 will ultimately need to be reconciled. Like other economic sectors, aviation must try to reduce the negative externalities of its operations as much as it reasonably can and will have to accommodate itself to the Netherlands' pursuit of sustainable economic development.



¹⁰ ECAC stands for the European Civil Aviation Conference. It was established in 1955 to promote safe, efficient and sustainable aviation in Europe.

3.2 Recommendation 2. Set well-defined limit values for aviation

Imposing ceilings on the number of aircraft movements is still an important national policy mechanism for limiting the impact of airports on the local living environment. Based on various agreements, there is a cap on the number of aircraft movements (arrival and departures) at Schiphol¹¹ and Eindhoven airports. This is a remarkable policy approach: after all, government does not tell a lightbulb factory how many bulbs it is allowed to produce.



Placing restrictions on the number of aircraft movements is advantageous in that it is easy to track and gives local residents something to go by. It also has a major disadvantage however: there is no incentive to develop innovations leading to quieter and cleaner aircraft. After all, the same number of aircraft movements will be permitted whether the aircraft in question produce high or low levels of carbon dioxide emissions. Innovation, however, should be an important part of a new approach to sustainable aviation. Another disadvantage of capping the number of aircraft movements is that it encourages 'hoarding': airlines claim more slots than they would have done if there had been no ceiling.

Although there were good reasons to opt for a ceiling on aircraft movements in 2008, based on the recommendations of the Alders

¹¹ The maximum number of aircraft movements permitted at Schiphol Airport is also subject to a number of rules governing runway use and nuisance reduction.



Committee referred to above, the Council considers that a different policy approach is called for in 2019.

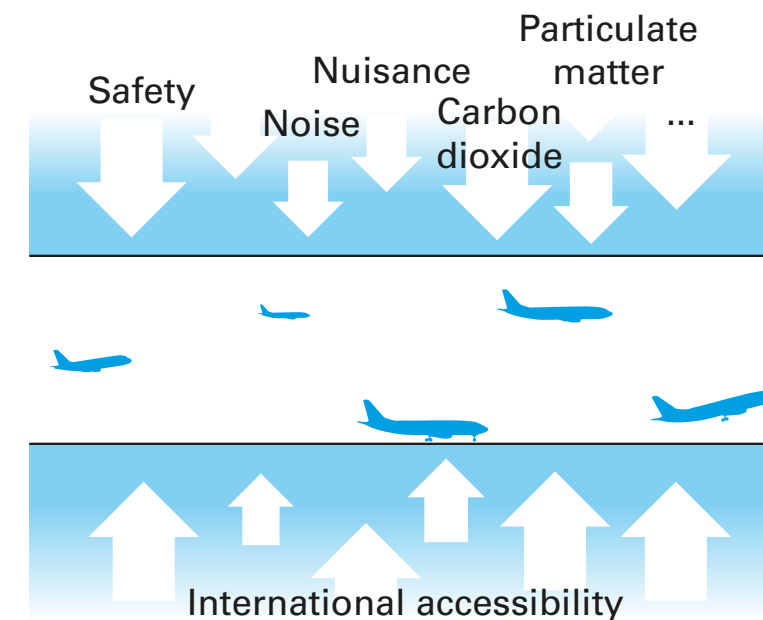
In the case of airports, the focus should not be restricting the number of aircraft movements but on setting *limit values for environmental components and nuisance*, within the boundary conditions for *overall safety*.¹² It is relatively easy to establish evidence-based standards for particulate matter, greenhouse gases and safety. Limit values have already been imposed on Schiphol Airport with regard to external safety, noise, and emissions of particulate matter and various other atmospheric pollutants.¹³ Limit values are also in force for regional airports, although they do not yet cover air pollution. As explained in Section 2.1, an airport's noise and external safety contour lines are based on a 'maximum traffic scenario'. Although there are few doubts about the harmful nature of ultrafine particulates, there are as yet no generally accepted standards.¹⁴ There is furthermore is no reliable measure of perceived noise nuisance from aircraft.

¹² In 2017, the Dutch Safety Board (OvV) concluded that there is no evidence that Schiphol Airport is insufficiently safe at the present time. However, the Board did point out a number of safety risks that need to be addressed to continue guaranteeing its safety in the future (OvV, 2017).

¹³ Participants in one of the expert meetings organised for the purpose of this advisory report pointed out that capping the number of aircraft movements at Schiphol Airport already takes into account certain environmental limits, such as noise and external safety. The political and public debate on the future of aviation, however, focuses on the number of permitted aircraft movements.

¹⁴ The Ministry of Infrastructure and Water Management has asked the Netherlands Institute for Public Health and the Environment (RIVM) to investigate ultrafine particulates around Schiphol Airport and their impact on the health of local residents. The study is expected to be published in 2021.

Figure 1: Air traffic within limit values



The Netherlands can only abandon number of aircraft movements as a standard after it has established clear limit values for every Dutch airport. Such limits are not yet in place for emissions of carbon dioxide and ultrafine particulates and, as mentioned above, a new standard for perceived noise nuisance is also lacking (see also Section 4.1). Another issue is that replacing the ceiling on aircraft movements by limit values for environmental pollution will immediately raise the question of trust touched on earlier. That is why it is important for government to enforce the limit values for air traffic in a way that is transparent to the public, for an independent body to prepare the underlying calculations, and for government to impose sanctions every time an airport exceeds the limits (see also Section 3.4 below).



3.3 Recommendation 3. Apply the ALARA principle

In the Council's view, aviation policy should be based more closely on the ALARA principle. In other words, government should do more to encourage airports' efforts to reduce environmental nuisance in the vicinity to a level that is 'as low as reasonably achievable'. Airports in turn must encourage the airlines that use their facilities to operate aircraft that are as clean and quiet as possible – in other words, to apply the Best Available Techniques principle. Both should take a broader view than noise pollution alone. Their approach should also factor in other environmental aspects, such as emissions of fine and ultrafine particulates, carbon dioxide and other greenhouse gases. Besides promoting cleaner and quieter aircraft, the ALARA principle can also induce airports to adopt other measures, for example limiting night flights, adapting runway use, curtailing test runs, installing noise abatement screens, amending flight procedures, and curbing the number of exemptions from the prescribed rules. The ALARA principle can then be applied towards tightening up standards and rules on all these points at regular intervals.



In practical terms, the ALARA principle implies that the more the sector fails to adhere to the limit values and rules (both locally with regard to environmental nuisance and safety and globally with regard to carbon emissions), the fewer aircraft movements will be possible at airports. If the sector does manage to remain within – and even below – the limit values and to comply with the relevant rules for a certain period of time,

the next question is who will benefit from the 'environmental net gain'. This issue can arise after the successful introduction of improvements in aircraft technology and procedures. In the Council's view, this could mean an increase in the number of aircraft movements within the relevant period (i.e. before the limit values are tightened up once again), provided that the limits and rules have not been transgressed. In other words, it is environmental performance that dictates how many aircraft movements are possible for the duration of the relevant limits and rules.

Applying the ALARA principle can also benefit the environment. In conjunction with such measures as a change in runway use or flight paths, it can result in a gradual contraction of the environmental contour lines around an airport, as long as that contraction is consistent with the other boundary conditions, such as safety. Altered contour lines imply that there are fewer people on the ground experiencing nuisance, but it can also mean that sites that are currently unsuitable for residential use can be rezoned for that purpose. In addition to the measures implemented by the airport operator itself, the national and local authorities can extend the scope for development by working with a package of measures, such as the electrification of cars and buses. This is in fact a programmatic approach, an instrument that can be applied more broadly under the Dutch Environment and Planning Act [*Omgevingswet*].



The package of measures set out in the programmatic approach creates scope for urban development and prevents the area from being put ‘on hold’.¹⁵

It is important to understand that the sequence is critical, even in a programmatic approach: it is only after all sorts of measures have been introduced to reduce nuisance and environmental pollution that there is scope for further development, whether that means more aircraft movements (within a specified period of time) or more physical space for housing construction (over a longer period of time). This sequence is important; the Council considers it unwise to anticipate an improvement going forward before it has actually materialised. Development is only possible after all the boundary conditions have been satisfied.

The new policy approach based on the ALARA principle offers airlines an incentive to make their fleets more sustainable and offers airports an incentive to encourage airlines to do so. This approach calls for coordination between airports and airlines. They share responsibility for operating aircraft that are as clean, quiet and safe as possible. The cooperation of air traffic controllers is also important, as they can optimise procedures and flight paths within the prescribed boundary conditions.

¹⁵ A programmatic approach is appropriate for areas that face urgent local problems relating to a healthy living environment, with many people experiencing environmental nuisance, but where new spatial planning projects are also envisaged. In a programmatic approach, projects or activities that are harmful to the environment (such as aviation) are offset by compensatory measures that improve the quality of the living environment in the area in a way that accommodates not only aviation but also, for example, housing. A programmatic approach attains the required or desired level of environmental quality without the area being put ‘on hold’ for spatial planning.

Finally, this approach calls for coordination with the authorities and local communities near airports, the purpose being to identify priority areas for improvements to the quality of the living environment, for example to make new housing construction possible.

3.4 Recommendation 4. Develop a Dutch climate policy for aviation with reduction targets for dioxide carbon emissions

The reduction of greenhouse gas emissions is one of the most urgent challenges of our time. To meet the Paris climate target, the aviation sector must also do its best to achieve a significant reduction in emissions before 2050.



Aircraft carbon dioxide emissions are caused by kerosene, and this fuel is also one of airlines’ biggest expenses. That is in part why advances in aircraft technology have traditionally been associated with improvements in fuel efficiency. As a result, the amount of carbon dioxide emitted by aircraft has dropped considerably over time. In addition, the market is producing a growing list of innovations aimed at reducing carbon dioxide emissions. For example, EasyJet is committed to developing electric aircraft engines and KLM to using sustainable biofuel. However, it will be several decades before electric passenger jets will be put into service (Peeters & Melkert, 2018) and only a minimal amount of biofuel is being blended with kerosene at this point, partly because of limited availability.



At present, Dutch aviation policy does not set a reduction target for carbon dioxide emissions. As explained in Section 2.1, however, aviation within the European Union falls under the EU Emissions Trading Scheme (ETS) for carbon dioxide. In addition, from 2021 the Carbon Offset and Reduction Scheme for International Aviation (CORSIA) will enter into force for civil aviation worldwide. While both systems encourage the reduction of greenhouse gas emissions, they are primarily geared towards *offsetting* emissions and not towards reductions by the sector itself. Aviation stakeholders in the Netherlands have joined forces to draw up an action plan to reduce carbon dioxide emissions. Their aim is to reduce emissions by 35% in 2030 relative to the expected level of emissions in that year (Luchtvaart Nederland, 2018). In addition to carbon dioxide emissions, aviation is also responsible for climate effects that are not carbon-related.¹⁶ There are no national or international policies whatsoever aimed at reducing these effects.

The Council considers it inevitable that climate policy will be extended to the aviation sector, with a view to lowering emissions by 95% in 2050 (relative to 1990 levels) so as to achieve the climate targets set for that year.¹⁷ Aviation currently accounts for 2% to 3% of carbon emissions

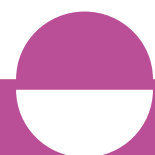
¹⁶ Examples include emissions of nitrogen oxides (NO_x) and sulphur oxides (SO_x). High-altitude non-carbon dioxide emissions along with their chemical reactions and cloud formation also aggravate the greenhouse effect. The exact magnitude of the warming effect is uncertain. Research estimates the total impact as a factor between 1.3 and 2 higher than the impact of carbon dioxide emissions alone, assuming a time horizon of 100 years. With a shorter time horizon of 20 years, the warming effect of total emissions would be a factor between 2.1 to 4.8 higher than that of carbon dioxide emissions alone in 2005 (Schuur et al., 2018, p. 30-31).

¹⁷ This percentage is based on the 95% reduction target set for 2050 that has been incorporated into the bill for the Dutch Climate Act [Klimaatwet].

worldwide. If there is no change in the scenario, at some point between 2070 and 2100 world aviation will account for all the emissions that are still allowed under with the Paris Climate Agreement target (Peeters & Melkert, 2018). Carbon dioxide emissions from aviation in the Netherlands had already reached 12.1 megatonnes in 2017.¹⁸ In a low-growth scenario, the aviation sector expects to release 17.3 megatonnes of carbon dioxide by 2030 if no additional measures are introduced. If the sector achieves all the targets identified in its action plan, emissions will still amount to 11.4 megatonnes by 2030 (Luchtvaart Nederland, 2018). By way of comparison: all the sectors of the Dutch economy combined that are subject to national reduction targets may emit only 10 megatonnes of carbon dioxide equivalents in 2050. To meet the Paris climate target, then, the Netherlands cannot abstain from extending its climate policy to aviation, in the Council's view.

That means that the national government must define precise national carbon dioxide reduction targets for the aviation sector, for both 2030 and 2050. In the Council's view, the fact that agreements have already been made within the ICAO about the pace of carbon offsetting does not in any way diminish the need to define stricter national reduction targets. According to aviation experts, these international agreements are not ambitious or effective enough to prevent aviation emissions worldwide

¹⁸ This refers to carbon dioxide emissions caused by domestic and international flights departing from the Netherlands. It does not include flights arriving in the Netherlands (Uitbeijerse & Hilbers, 2018).



from exceeding the Paris climate target (Peeters & Melkert, 2018, p. 1; Luchtvaart Nederland, 2018, p. 6).¹⁹

The Netherlands must, however, be mindful of the international context so that its efforts to meet the carbon dioxide reduction targets are not confined to the national but also feature on the international stage, where it can join forces with other countries. The Netherlands should also be alert to possible adverse effects on its competitiveness. With regard to measures meant to attain the national carbon dioxide targets, the Council is thinking in particular of requiring fuel suppliers to blend sustainable fuel with the kerosene used for refuelling at Dutch airports (see Section 4.3). To prevent airlines from rerouting their aircraft to neighbouring countries to avoid the higher fuel prices, government could agree to subsidise the price gap between sustainable fuel and conventional kerosene for a transitional period.

¹⁹ According to aviation experts, the level of ambition and the effectiveness of CORSIA are limited by three factors: (1) only emissions that exceed 2020 levels will be offset and only in part because some countries will not be participating in CORSIA. CORSIA applies only to emissions from flights between participating countries; (2) as yet, there has been no further specification of the criteria with which CORSIA offsetting must comply. It remains to be seen whether these criteria in fact guarantee that offsets will occur under CORSIA itself or whether the emission reductions must be attributed to other sectors and would have been attained anyway; (3) CORSIA will only be mandatory for countries with a relatively large aviation sector from 2027 onwards.

3.5 Recommendation 5. Gain public trust through strict enforcement and sanctioning

The new approach advocated here is consistent with an aviation policy that imposes unambiguous limit values and reduction targets regarding safety, the quality of the natural and living environment, nuisance and carbon dioxide emissions. Effective and transparent monitoring and enforcement are critical in this context. Unfortunately, as Section 1.1 explains, some segments of the public no longer trust government to enforce such limits and targets. Government can regain public trust, for example by developing an effective monitoring and enforcement system that is transparent to local residents and stakeholders. This would involve making verifiable exemption agreements and sanctioning airlines if boundary conditions are overrun, with regulatory bodies having the sufficient authority to impose sanctions at all airports. The Dutch Aviation Act [*Wet Luchtvaart*] provides for the levying of administrative fines, which can be imposed from the first infringement onwards. A further option is to cut the maximum number of flights allowed if there have been too many exemptions from the relevant airport traffic decree in the preceding period. Moreover, regulatory bodies must be knowledgeable enough and have sufficient resources to do their job properly. The Dutch Safety Board voiced its concerns about this in 2017 with regard to safety (OvV, 2017).



3.6 Recommendation 6. See that the polluter pays

Compared with other modes of transport and the situation a decade ago, air travel nowadays is inexpensive. This is partly due to the major efficiency improvements that airlines have made over the past ten years. For example, the average seat occupancy rate for aircraft is much higher than for trains. But flying is also cheap because governments do not pass on the external costs (such as the cost of noise pollution, carbon dioxide emissions and land use) to airlines.



In the Council's view, one of the main features of a new approach in aviation policy must be that negative externalities are reflected in the price of flights. It will be several decades before we can expect to see major technological innovations, such as the electric passenger jet mentioned above (Peeters & Melkert, 2018), leading to sustainable aviation with no adverse effects. It is unlikely that such innovations will offset the continued growth in aviation worldwide (Schuur et al., 2018). Until they do, the most promising option for remaining within the boundaries of sustainability and environmental quality is to curb the demand for flying.

It has become clear in recent years that cheap mobility has triggered a sharp demand for air travel. Conversely, increasing the price of airline tickets, with the costs of any adverse effects on the living environment being passed on to passengers, will reduce the demand for air travel. A price hike will cause certain segments of the population to rethink their travel behaviour. They may decide not to travel at all, to choose a different

destination where possible, or to use an alternative mode of transport. The price of alternative modes of transport should, moreover, also reflect their associated negative externalities.

3.7 Recommendation 7. Focus more on passenger behaviour (and on influencing that behaviour)

The Council notes that aviation policy contains few if any measures aimed at influencing passenger behaviour. This is relevant because it is only in the past ten years that the demand for air travel has grown so explosively. Government policy in other sectors customarily includes mechanisms intended to influence behaviour when behaviour has adverse effects or when people do not exhibit a desired behaviour. Examples include campaigns urging drivers to avoid peak-hour traffic or take alternative forms of transport, incentive schemes for sustainable energy, and drink-driving and anti-smoking campaigns. The Rli (2014) has already recommended using the latest insights into human behaviour to make environmental objectives more attainable. At the time, the Council concluded that the disciplines of behavioural economics and psychology had identified a wide range of behavioural factors and that utilising this knowledge would lead to better policy. The Behavioural Insight Team IenW (BIT IenW), part of the Ministry of Infrastructure and Water Management, is working to integrate behavioural insights structurally into policymaking.



The Council has not analysed the behavioural factors associated with people's air travel behaviour. However, there is evidence that offering viable alternatives (e.g. an international train, see Savelberg & De Lange, 2018) or raising awareness of the consequences of flying (*NOS Nieuwsuur*, 2018) can influence passenger behaviour and thus weaken the demand for air travel. Any new aviation policy should therefore include a thorough analysis of passenger behaviour and how to influence it. The work done by BIT IenW can serve as input for that analysis.

3.8 Recommendation 8. Concentrate on the international accessibility of the Netherlands and reconsider the concept of network quality within that context

While the need for measures to counteract the adverse effects of aviation is widely recognised, few steps have been taken in that regard. This is partly due to the international nature of the aviation market: global consensus on effective agreements and measures is difficult to achieve. Even within the Netherlands, however, stringent measures intended to protect the living environment are sorely lacking. It is regularly argued that unilateral measures of this kind would weaken the international competitiveness of both the Netherlands and Dutch aviation enterprises (i.e. Dutch airports and home carrier KLM). National policy measures that restrict the growth of aviation at airports (in particular Schiphol) or increase the price of airline tickets could put Dutch airports at a competitive disadvantage to airports abroad and result in a decline in the number of destinations.

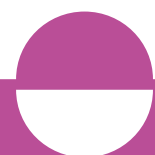


The Council questions this line of reasoning. Over the past few decades, Dutch policy has in fact supported the growth of aviation and allowed the Netherlands to build a position of strength compared with many other countries. It is no coincidence that Schiphol, the Netherlands' national airport, is many times larger than the size of its domestic market would suggest. With regard to airline ticket pricing as a policy instrument, the Council also notes that, far from being at the forefront, the Netherlands lags behind neighbouring countries. The fear that a tax on airline tickets will result in people flying from foreign airports is unfounded, in the Council's view. After all, the taxes charged at these airports are much higher (see Box 2) than the amount proposed by the Dutch government in the bill sent to the Council of State (see also Section 4.4).

Box 2: Tax on tickets in other European countries

The United Kingdom levies an air passenger duty of GBP 26 for flights under 2,000 miles and GBP 172 for flights of more than 2,000 miles (GOV.UK, 2018). Germany charges a differentiated aviation tax in three destination bands (0-2,500 km; 2,500-6,000 km; 6,000 and beyond) of EUR 8, EUR 25 and EUR 45 respectively (Bundesminister für besondere Aufgaben, 2018). France applies a civil aviation tax of EUR 4.48 for flights within the European Economic Area (and Switzerland) and EUR 8.06 to all other destinations (FCC, 2019).

Key concepts in the discussion about competitiveness are 'connectivity' and 'network quality'. The 2009 *White Paper on Dutch Aviation* defines network quality as 'the direct availability of an extensive, global route



network with regularly scheduled services. This line network should include connections which contribute to the regional and national economy and to the competitive strength of the Netherlands' (Ministry of Transport, Public Works and Water Management and Ministry of Housing, Spatial Planning and the Environment, 2009, p. 5). In reality, network quality is often interpreted as 'maximum destination quantity' (see Box 3). The assumption in Dutch aviation policy, politics and the aviation sector is that any national measures that limit allowable capacity or the growth of aviation will inevitably impair the network quality and connectivity of the Netherlands (read: Schiphol), with dramatic implications for the Dutch economy.

The Council acknowledges the importance of a well-developed network for the international accessibility of the Netherlands. However, the way in which the concept of 'network quality' is currently interpreted and the method used to measure it raise such serious questions that it falls short as an argument on which to base decisions about allowed capacity, the growth of aviation and investments in airports (see Box 3). As it is now applied, the concept of network quality emphasises high-frequency services to numerous destinations; absent is any reference to 'connections which contribute to the regional and national economy' that featured so prominently in the original definition in the 2009 *White Paper on Dutch Aviation*. For example, it ignores the type of passenger; there is no indicator

of network quality that considers the importance of OD passengers²⁰ compared with transfer passengers.

On top of that, there has yet to be a proper analysis of how many and which connections are needed – by air (via Schiphol and the regional airports combined), by rail, by road and by water – to ensure that the Netherlands is easily accessible from abroad.²¹ Which connections are the most valuable for the Netherlands? Which contribute most to its prosperity? The Council recommends a comprehensive study of the country's international accessibility and how it can best be guaranteed. In its view, a study of this kind should form the basis for a well-founded analysis of the Netherlands' ideal international accessibility by air.

A third comment is that, while having a large number of transfer passengers is regarded as crucial to maintaining Schiphol Airport's role as a hub, there are various changes afoot in the aviation market that call the importance of this role into question. Worldwide, direct connectivity is showing much stronger growth than hub connectivity (Airports Council International, 2016). In addition, new aircraft technology makes point-to-point flying over long distances possible with smaller aircraft; in due time,

²⁰ OD passenger: Origin-Destination passenger: a passenger who starts or ends their journey at the relevant airport.

²¹ This is in line with an earlier Rli advisory report, *Beyond Mainports* (2016), which advocated examining how much volume is needed to achieve critical mass, in the sense of 'optimal' and 'big enough' (p. 19).



it will also be possible using hypersonic²² and pilotless aircraft. A growing number of online tools now also help travellers plan their own connections with ease across different airlines (known as 'self-hubbing' or 'self-connecting'). This is another factor that must be taken into account in the analysis recommended above.

Box 3: The difference between network quality and 'destination quantity'

The Dutch government defines network quality as 'the direct availability of an extensive, global route network with regularly scheduled services. This line network should include connections which contribute to the regional and national economy and to the competitive strength of the Netherlands' (Ministry of Transport, Public Works and Water Management and Ministry of Housing, Spatial Planning and the Environment, 2009, p. 5). Network quality is assessed regularly. SEO Amsterdam Economics monitors the network quality of Schiphol and its main competitors on behalf of the national government every year. Its reports make use of an indicator based on the number of destinations and the frequency of services but it does not consider the contribution 'to the regional and national economy and to the competitive strength of the Netherlands'. In other words, the indicator does not measure how much the network is worth to the Netherlands. As a result, the government is not measuring network quality, but rather 'destination quantity'.

²² Hypersonic planes are faster aircraft whose environmental performance is better than that of their predecessors, such as the supersonic Concorde.

We can illustrate the difference between the two as follows. If an airport's network is extended to include a new destination, the airport offers potential passengers more options (thus increasing its option value), making it more attractive as a business location than airports that have fewer destinations in their network.

The differences only become measurable when changes arise in the type of passengers who use a connection. If a new destination is added that only attracts transfer passengers, it may have an option value for the Netherlands (because it is possible to fly directly from the Netherlands to that destination), but it makes only a very small contribution to Dutch prosperity because transfer passengers only contribute to the regional and national economy to a limited extent. In that case, network quality does not improve even though destination quantity does.

Another example: if the network remains the same, in terms of number of destinations and frequency of services, but the proportion of OD passengers flying to a certain destination doubles while the number of transfer passengers declines, then destination quantity remains the same but the value of that destination for the Netherlands doubles and the network quality improves as a result because it is contributing more to the national economy and the country's competitiveness. The Council therefore recommends taking the importance of OD passengers into account in the network quality indicator.





4 SPECIFIC ACTIONS TO IMPLEMENT THE NEW APPROACH

Based on the recommendations for a new approach in aviation policy made in the previous chapter, the Council describes a number of specific actions below that can serve to implement this new approach in the real world. The Council does not claim to have produced an exhaustive list of actions; other options are also possible. The actions focus on a few elements that genuinely break new ground compared with current policy measures. After all, government and the aviation sector are already working on a number of innovative proposals. One example is to optimise European airspace; another is to replace air travel by trains on medium-haul routes. The Council calls on all the parties concerned to continue their efforts in these areas.

4.1 Develop a new nuisance standard for perceived aviation noise

As one of the building blocks of the new approach, the Council proposes focusing on precise limit values rather than on number of aircraft movements. In addition to the existing limits, government will need to develop a new nuisance standard that specifically addresses perceived noise.

Noise pollution is currently defined in accordance with EU guidelines. However, the relationship between noise levels and perceived nuisance is a complex one. In reality, the noise standard that is presently applied is not a good indicator of perceived nuisance. That much has become clear in the recent report by the chairman of the Advisory Board [*College van Advies*] for the Schiphol Airport Environment Council [*Omgevingsraad Schiphol*] (Alders, 2019). He notes that people who live in the vicinity of the airport scarcely perceive aircraft as having become quieter, if at all. He also observes that the intervals between passing aircraft during the day are growing shorter all the time. Unlike industrial noise pollution, there is no limit on peak noise levels from passing aircraft, which are extremely disruptive to local residents. Moreover, the noise standard that is applied and the associated limit values do not take into account the perceived nuisance of people living farther away from airports (outside the noise contour lines). The Council is of the opinion that nuisance assessments should look beyond the average noise level and consider peak levels, measured levels, perceived nuisance, and health. Other aspects, for example odour nuisance, could also be taken into account in any new standard.

Recommendation	Action
Set well-defined limit values for aviation	Develop a new nuisance standard

4.2 Limit nuisance at night

Around 32,000 night flights – i.e. between 11 p.m. and 7 a.m. – take off from or land at Schiphol Airport every year. There are a limited number of night flights at regional airports, but they do occur.²³ Sleep disturbance due to aircraft noise at night has an adverse impact on health (Gezondheidsraad, 2004; Schuur et al., 2018) and yet very little mention is made of health in assessments of aviation. In accordance with the ALARA principle, the Council therefore recommends making night flights a more important factor when assessing the boundary conditions for air traffic. It is possible to cut down on noise nuisance at night by reducing the number of night flights and/or by optimising night-time flight procedures. There is a similar problem at regional airports in the late evening and early morning.

A few specific segments of the aviation sector make particular use of Schiphol’s night regime. These are cargo flights (full-freighters), certain intercontinental flights and budget flights to holiday destinations. Incoming full-freight and intercontinental flights generally have no alternative to operating at night. Budget flights often depart in the early hours of the morning because this allows the relevant parties to maximise productivity per aircraft.

The number of night flights can be limited by introducing an additional price incentive on top of the existing one to make flying at night

²³ Regional airports are generally only open at night (11 p.m. - 7 a.m.) in exceptional cases, for example for emergency services or delayed flights. However, some regional airports are open daily before 7 a.m. for regular air traffic (e.g. at 6 or 6.30 a.m.).



considerably more expensive (see also Section 4.4). Another option is to simply ban certain aircraft movements. The EU Slot Regulation allows airport operators to adopt environmental measures restricting air traffic to and from their airports when the local (environmental) situation so requires. A local ruling of this kind can be used to limit night flights. For example, night-time disturbance can be reduced by prohibiting departures between 11 p.m. and 7 a.m. at all airports. This prohibition will mainly affect the budget flights and may put pressure on the business operations of the carriers concerned. The Council therefore proposes a transitional period during which airlines can update their operations in line with the new rules. A ban on further increases in night flights could be introduced at the outset, followed two years later by a prohibition on night-time take-offs only. Only night arrivals would be permitted then.

Recommendation	Action
Apply the ALARA principle	Curtail the number of night flights by introducing a price incentive and/or by prohibiting take-offs

4.3 Introduce mandatory blending of sustainable fuel

The aviation sector is working to develop electric and hybrid-electric aircraft and other innovations. In addition, a small amount of sustainable fuel is already being blended with kerosene to limit carbon emissions. Unfortunately, these efforts will not be sufficient to achieve a 95% reduction in carbon dioxide emissions by 2050 or to attain far-reaching interim targets in the shorter term. The sluggish pace of technological progress makes

blending sustainable synthetic fuel and/or biofuel the most promising option for achieving carbon reduction targets in the aviation sector in 2030 and 2050 (CE Delft, 2017).

At the moment, the EU's Renewable Energy Directive²⁴ does not apply to aviation. Sustainable synthetic fuels and biofuels are still in their infancy, making them much more expensive than fossil kerosene. If government policy stimulates the demand for sustainable fuel, production will increase and the price will drop. Government can stimulate demand by making the blending of sustainable fuel mandatory for fuel suppliers to Dutch airports, with a gradual, incremental increase in the percentage of sustainable fuel over time. This will generate a stable demand for sustainable fuel and create an incentive to scale up production. The rise in demand and improvement in market stability will lead to economies of scale. As a result, the private sector will be more willing to invest in systems and in scaling up the production of sustainable fuel. The Netherlands will be acting in the public interest by pioneering a market for innovative alternative fuels. This is important because the Netherlands produces and supplies a relatively large amount of fuel to the aviation industry (Energieonderzoek Centrum Nederland/ECN, 2017).

In the short term, however, the price of sustainable alternative fuels will exceed the price of conventional kerosene. A side effect of mandatory

²⁴ Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC.



blending may therefore be an increase in the cost of flying, possibly resulting in airlines choosing to refuel their aircraft (fuel tankering) abroad. Aircraft would consequently carry more fuel and that in turn would increase their carbon dioxide emissions. The net effect would therefore be counterproductive.

To prevent the adverse effects of fuel tankering abroad, the Council proposes that government subsidise the price gap between sustainable and conventional kerosene for a transitional period. The Council stresses that the subsidy should not be paid from the public purse but rather charged to the polluting activity. The proceeds of a tax on airline tickets (see Section 4.4) could be used to cover the subsidy, for example. Another alternative is to introduce a tax per flight, with the amount depending on the distance flown and the emissions performance of the aircraft in question. The Netherlands must do what it can to implement this type of policy at EU level but it must also not shy away from being a trailblazer, in the Council’s view.

Recommendation	Action
Develop a Dutch climate policy for aviation with reduction targets for carbon dioxide emissions	<ul style="list-style-type: none"> a. Introduce mandatory blending for kerosene suppliers and increase the percentage of blended sustainable aviation fuel annually. b. Introduce a subsidy to bridge the price gap between sustainable fuel and conventional kerosene.

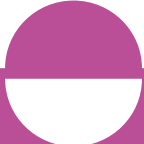
4.4 Make airlines and passengers pay for negative externalities

In line with the ‘polluter pays’ principle, imposing a tax on aviation-induced negative externalities can help to mitigate these effects. Although excise duties are not primarily intended to offset externalities, they are a step in the right direction. The Council is of the opinion that excise duties should be levied on aviation fuel, as they are on fuel in other sectors. International consensus is required for this to happen, however. The national government should therefore push for a kerosene duty within the EU, the ICAO and other international bodies.

At national level, logic dictates two frames of reference for the ‘polluter pays’ principle: charge the airlines and charge the passengers for external costs.

Differentiate airport fees according to aircraft environmental performance

Airports can charge carriers differentiated fees based on the environmental performance of their aircraft and in so doing discourage them from using aircraft that perform poorly. Lower fees will make quieter and otherwise more sustainable aircraft more attractive for airlines and encourage them to replace their fleets. It is legally permissible to differentiate by type of aircraft in this manner provided that airports satisfy the conditions of transparency, non-discrimination, cost-oriented pricing and so forth laid down in international and EU law. In other words, they must be able to justify fee differentiation in terms of measures that they are obliged to undertake to



soundproof housing, for example. Fee differentiation may not take the form of a fine.

The Dutch House of Representatives also advocated airport fee differentiation in May 2018, when it passed a motion calling on Schiphol Airport to differentiate its airport fees based on aircraft climate impact. Here, the Council is proposing a differentiation based on a longer list of criteria. The new fee structure would differentiate not only by carbon dioxide emissions but also by particulate emissions and noise nuisance, perhaps with a special focus on the consequences of night flights (see Section 4.2). Schiphol already has a fee structure in place that differentiates by noise production, but it does not yet cover emissions of harmful substances.

The Council is aware that fee differentiation may have a greater impact on home carrier KLM than on other airlines. Unlike non-home carriers, it will be less easy for KLM to avoid extra expenses by moving its aircraft to another airport. Even so, the Council advises including the home carrier in the fee structure because the problem of aviation-induced negative externalities will otherwise not be resolved. In the longer term, the situation would be untenable. A new fee structure will spur airlines to fast-track their fleet upgrade plans. However, a transitional period is needed to allow the home carrier to revise its business strategy and the pace of fleet replacement

accordingly.²⁵ The length of this transitional period should depend in part on the approach taken in neighbouring countries.

Introduce a ticket tax related to negative externalities

Passengers can be held accountable for their travel behaviour by introducing a tax on airline tickets. While the Dutch government recently sent a bill to the Council of State proposing the introduction of a tax of approximately EUR 7 on airline tickets starting 1 January 2021, the primary purpose of this tax is to pad the treasury's coffers. The revenues will not be used to mitigate negative externalities (noise pollution or carbon dioxide emissions) (CE Delft, 2018).

The Council recommends a tax on airline tickets for both boarding OD passengers and transfer passengers. Our tax differs from the government's proposed flight tax in three respects:

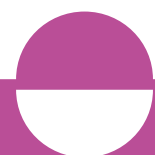
1. Tickets must be made expensive enough to have impact on passenger behaviour.
2. There must be a clear relationship between the size of the tax and the adverse effects of air travel.
3. The tax revenues should be used to pay for mitigation measures, in particular to subsidise sustainable fuel (see above).

²⁵ The environmental impact may be limited in the case of foreign airlines flying to the Netherlands. Under a differentiated fee structure in the Netherlands, they can choose to use the relatively favourable portion of their fleet for flights to and from the Netherlands, and the unfavourable portion for other flights. Total fleet emissions will not change, so there will be no positive effect on total carbon dioxide emissions.



It should be noted that the proper application of the 'polluter pays' principle hinges on airlines actually passing on the ticket tax to their customers.

Recommendation	Action
See that the polluter pays	<ul style="list-style-type: none">a. Work at international level to introduce an excise duty on kerosene.b. Differentiate airport fees based on the environmental performance of aircraft.c. Introduce a ticket tax that goes a step further than the current bill and use the revenues to subsidise the price of sustainable fuel.





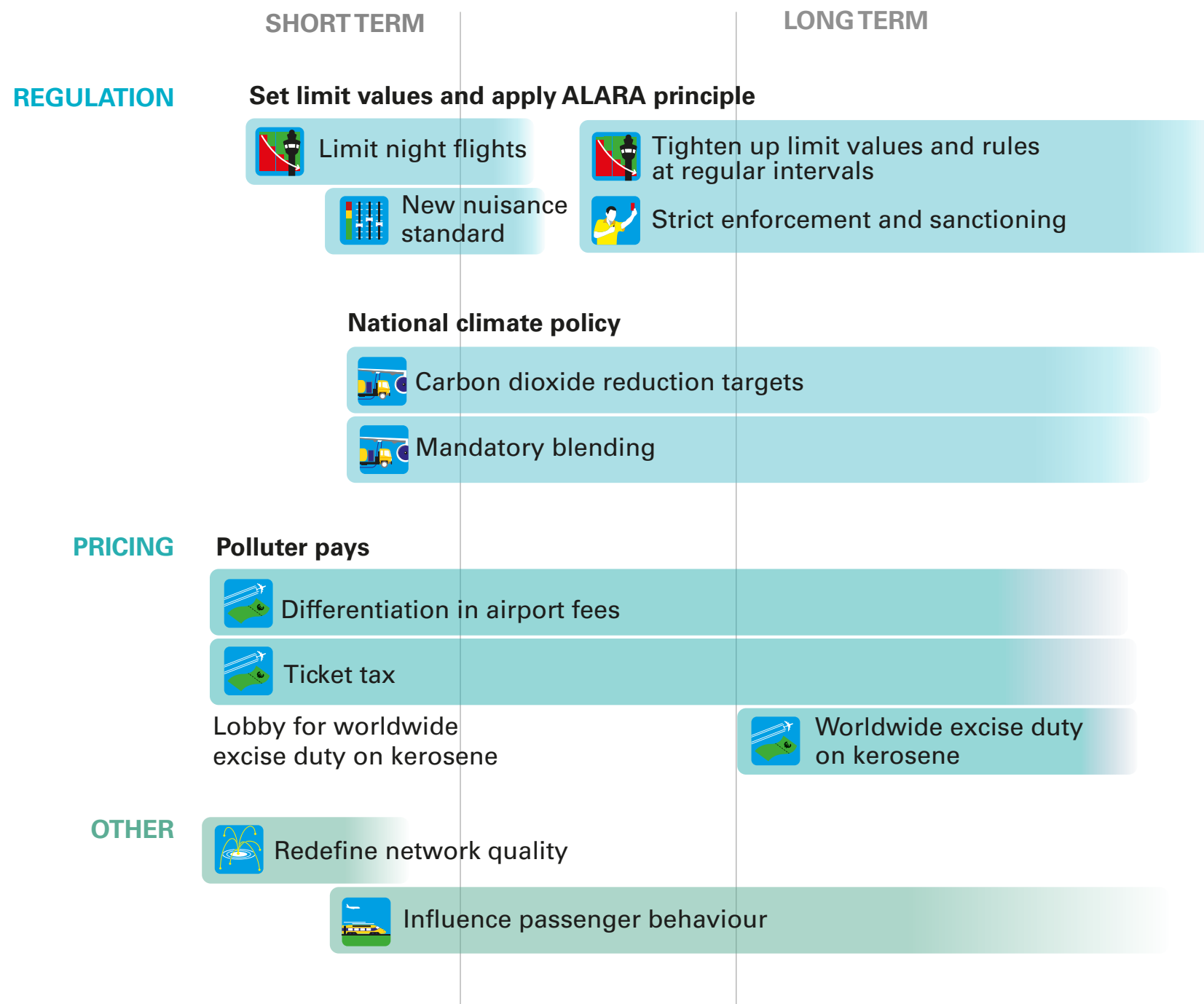
5 FINAL REMARKS

In this advisory report, the Council has aimed to point out the special position of aviation in Dutch national policy compared with other mobility and economic sectors. Awareness of this special position inspires a new outlook on the aviation sector. The advisory report makes a number of recommendations for a new approach to aviation in the Netherlands.

The core of our recommendations for a new approach lies in treating aviation more like an 'ordinary' business sector, no different than any other. Considerations of safety, the quality of the natural and living environment, nuisance and carbon dioxide all impose limits on the volume of air traffic. Like other economic sectors, aviation will have to develop within these limits and aviation enterprises will need to work towards reducing negative externalities as much as reasonably possible.

The forthcoming White Paper on Dutch Aviation addresses the period from 2020 to 2050, and the Council's recommendations do the same. While this may seem a long way off, that does not mean that no action needs to be taken in the short or medium term. On the contrary, it is the Council's view that aviation should be treated like an 'ordinary' business sector from the outset. Efforts must be made to implement the other measures advocated by the Council as quickly as possible, but some will take time to prepare and will only enter into force in the course of time. Potential short-term

Figure 2: Indicative timeframe for prioritising recommendations



measures include limiting night flights, airport fee differentiation and the introduction of a ticket tax. The same is true of arriving at an accurate definition and robust policy on network quality. It may take longer to prepare for the mandatory blending of sustainable synthetic fuel (or biofuel). The transition to a new policy regime that sets precise limit values, including for carbon dioxide and noise nuisance, along with the application of the ALARA principle and the establishment of a vigorous system of enforcement and sanctioning will also take several years. That does not alter the fact that we must start working on these measures now. The current ceiling on the number of aircraft movements should be maintained until the new system becomes operational. Figure 2 indicates the timeframe that the Council deems necessary to implement the recommendations.

From this perspective, the growth or reduction of aviation volume is not an end in itself, but a consequence of the extent to which the sector respects the boundary conditions of sustainability, safety and environmental quality. Contrary to the impression that often arises in public debate, the sequence is not ‘permit growth first, then mitigate’, but the other way around: enforce the boundary conditions first, then decide on capacity growth at airports. The number of aircraft movements to and from the Netherlands can only be permitted to increase *after* the boundary conditions have been satisfied.

The Council is aware that it is making far-reaching recommendations for a new approach in aviation policy and that they will have major implications for the aviation sector and for Dutch passengers. The Council does not expect this to jeopardise the prosperity of the Netherlands. Thanks in part



to government stimulus in recent decades, the Netherlands has a robust aviation sector. As things stand, however, the sector will need to display creativity and entrepreneurship to continue developing within the boundary conditions of sustainability and quality of the living environment. The Council therefore considers it important to build in a transitional period while developing the components of the new regime, so that all the parties involved have time to prepare for the changes.

Although the new approach focuses on the long term, it also suggests the direction government should take with respect to the choices that it is already facing. The arguments on which these choices are based, such as the current interpretation of network quality and the relative importance of transfer passengers vis-à-vis OD passengers, must be updated accordingly. In all these respects, it is vital for government and the aviation sector to regain the trust of the public and civil society organisations, a task that will require all relevant parties to undergo a cultural transformation. The Council recommends continuing along existing lines in that regard, with transparency for all parties.



REFERENCES

- Airports Council International (2016). *Airport Industry Connectivity Report 2016*. Brussels: ACI Europe.
- Alders, H. (2019). *Brief van de voorzitter College van Advies van de Omgevingsraad Schiphol aan de minister van Infrastructuur en Waterstaat van 30 januari 2019*. Groningen.
- Bundesminister für besondere Aufgaben (2018). *Verordnung zur Absenkung der Steuersätze im Jahr 2018 nach § 11 Absatz 2 des Luftverkehrsteuergesetzes (Luftverkehrsteuer-Absenkungsverordnung 2018 - LuftVStAbsenkV 2018)*. Retrieved on 2 February 2019 from <https://www.buzer.de/s1.htm?g=LuftVStAbsenkV&f=1>
- CE Delft (2017). *Overheidsmaatregelen biokerosine: mogelijkheden om de vraag naar biokerosine te stimuleren en de effecten op de luchtvaart en de economie*. Delft.
- CE Delft (2018). *Economische- en duurzaamheidseffecten vliegbelasting*. Delft.
- Centraal Bureau voor de Statistiek (2018). *Groei toerismesector vooral dankzij buitenlandse toeristen: nieuwsbericht 29 oktober 2018*. Retrieved on 19 March 2019 from <https://www.cbs.nl/nl-nl/nieuws/2018/35/groei-toerismesector-vooral-dankzij-buitenlandse-toeristen>
- Energieonderzoek Centrum Nederland (2017). *Nationale energieverkenning 2017*. Petten: ECN.
- FCC Aviation (2019). *French Civil Aviation Tax*. Retrieved on 19 March 2019 from <https://www.fccaviation.com/regulation/france/civil-aviation-tax>
- Gezondheidsraad (2004). *Over de invloed van geluid op de slaap en de gezondheid*. Den Haag.

GOV.UK (2018). *Rates for air passenger Duty*. Retrieved on 20 December 2018 from <https://www.gov.uk/guidance/rates-and-allowances-for-air-passenger-duty#rate-types>

Het Financieele Dagblad (2017). De overheid moet nu echt ophouden met Schiphollen: interview Pieter Winsemius. *Het Financieele Dagblad*, 14 October 2017, p.9.

KWINK groep (2019). *Een andere kijk op luchtvaart: een vergelijking tussen luchtvaart en vijf andere sectoren*. Study commissioned by Rli. Den Haag.

Luchtvaart Nederland (2018). *Slim én duurzaam: actieplan Luchtvaart Nederland: 35% minder CO₂ in 2030*.

Meindertsma, B. & Parre, H. van der (2018). *Deel schipholgemeenten is vertrouwen in luchthaven kwijt*. Retrieved on 19 March 2019 from <https://nos.nl/artikel/2210161-deel-schipholgemeenten-is-vertrouwen-in-luchthaven-kwijt.html>

Ministry of Transport, Public Works and Water Management and Ministry of Housing, Spatial Planning and the Environment (2009). *White Paper on Dutch Aviation. Competitive and sustainable aviation sector for a robust economy* [Official translation of: Ministerie van Verkeer en Waterstaat & Ministerie van Volkshuisvesting, Ruimtelijke Ordening en Milieubeheer (2009). *Luchtvaartnota: concurrerende en duurzame luchtvaart voor een sterke economie.*] The Hague.

Motivaction (2018). *Luchtvaart in Nederland: draagvlakonderzoek onder het Nederlands publiek*. Amsterdam.

NOS Nieuwsuur (2018). *Door 'vliegschaamte' nemen Zweden minder het vliegtuig, wij straks ook?* Retrieved on 19 March 2019 from <https://nos.nl/nieuwsuur/artikel/2262497-door-vliegschaamte-nemen-zweden-minder-het-vliegtuig-wij-straks-ook.html>

Onderzoeksraad voor Veiligheid (2017). *Veiligheid vliegverkeer Schiphol*. Den Haag.

Peeters, P. & Melkert, J. (2018). *Factsheet 'Toekomst verduurzaming luchtvaart' voor de vaste commissie voor Infrastructuur en Waterstaat van de Tweede Kamer*. Breda/Delft: NHTV/TUD.

Rli [Council for the Environment and Infrastructure] (2014). *Influencing behaviour: More effective environmental policy through insight into human behaviour*. The Hague. Translation of *Doen en laten: effectiever milieubeleid door mensenkennis*.

Rli [Council for the Environment and Infrastructure] (2016). *Beyond Mainports*. The Hague. Translation of *Mainports voorbij*.

Savelberg, F., Lange, M. de (2018). *Substitutiemogelijkheden van luchtvaart naar spoor*. Den Haag: Kennisinstituut voor Mobiliteitsbeleid|KiM.

Schiphol Group (2018). *Concept MER 'Nieuwe normen- en handhavingstelsel Schiphol' 2018: deel 5 actualisatie en doorkijk naar de periode na 2020*. Schiphol.

Schuur, J., Blom, W. & Uitbeijerse, G. (2018). *Kennisscan Luchtvaartnota*. Den Haag: PBL.

Tweede Kamer (2008). *Advies van de Alderstafel over de ontwikkeling van Schiphol en de regio voor de middellange termijn (tot en met 2020), bijlage bij Brief van de minister van Verkeer en Waterstaat aan de Tweede Kamer van 1 oktober 2008*. Vergaderjaar 2008-2009, 29 665, nr. 108.



Uitbeijerse, G. & Hilbers, H. (2018). *Ontwikkeling luchtvaart en CO₂-emissies in Nederland: factsheet voor de Omgevingsraad Schiphol*. Den Haag: PBL.

Wansink, H. (2017). Vertrouwen van burgers in de overheid inzake luchtverkeer lijkt verdwenen. *De Volkskrant*, 21 October 2017.

WesselinkVanZijst (2018). *Voorlopige opbrengst van de luchtvaartgesprekken: over de toekomst luchtvaart en herziening luchtruim*. Zeist.



GENERAL PRINCIPLES

1. Principle of an internal market in Europe

The founding principles of the internal market are the free movement of people, goods, capital and services, and they apply equally to mobility and business sectors.

2. ALARA principle and BBT principle

ALARA is an acronym for As Low As Reasonably Achievable. The ALARA principle derives from the EU's environmental policy and is used, among other things, to curb noise pollution caused by economic activities. It is an important standard in the Dutch Environmental Management Act [Wet Milieubeheer] for assessing the environmental nuisance (emissions, noise and other environmental impacts) that may be associated with an economic activity for which an environmental permit application has been submitted. The principle implies that the greatest possible protection should be extended against adverse effects on the environment, unless such protection cannot reasonably be required. 'Reasonably' means that no measures may be required that are prohibitively expensive or difficult to implement in practical terms, for example. In Dutch environment and planning law, this principle has been transposed into the principle of 'Best Available Techniques' or 'Best Available Technology' (BAT).

3. Principle of preventive action

The principle of preventive action comes from EU environmental policy. It means that adverse effects on the physical environment must be avoided as far as possible by the party undertaking the relevant economic activity.

4. Stand-still principle

The stand-still principle is also derived from the EU's environmental policy. It means that economy activity may not lead to a deterioration in the quality of the living environment, which at the very least must remain at the same level.

5. Principle of 'tackle environmental pollution at its source'

According to this principle, environmental pollution should preferably be tackled at its source.

6. 'Polluter pays' principle

This principle makes the party responsible for pollution pay for the damage done to the environment.

RESPONSIBILITY AND ACKNOWLEDGEMENT

Advisory Committee

Prof. N.S.J. (Niels) Koeman, Rli council member and committee chairman
J. (Jasper) Faber, external member PhD, CE Delft
Em. Prof. P.P.C. (Peter) Haanappel, external member, Leiden University
J. (Jeroen) Kok, Rli council member
M.W.B. (Mart) Lubben MSc, Rli junior council member

Project Team

B.N.S.M. (Bart) Swanenvleugel, project coordinator
L.B.J. (Lianne) van Duinen PhD, project officer
A. (Anneke) Koose-Verschoor, project assistant

Persons and organisations consulted

D.A. (Dick) Benschop, Royal Schiphol Group
N. (Nico) de Bruijn, Airport Coordination Netherlands
G. (Guillaume) Burghouwt PhD, Royal Schiphol Group
J.H. (Jan Hendrik) Dronkers, Ministry of Infrastructure and Water Management
P.L.B.A. (Pieter) van Geel, pilot case Eindhoven Airport/ Air Traffic Control the Netherlands (LVNL)
Z. (Zuhal) Gül, pilot case Eindhoven Airport



F. (Floris) de Haan MSc, Erasmus University Rotterdam
J.M.G. (Hans) Heerkens, University of Twente
O.L. (Olga) Huibregtse PhD, KiM Netherlands Institute for Transport Policy
Analysis
R.B.T. (Rogier) Lieshout MSc, SEO Amsterdam Economics
W.J.J. (Walter) Manshanden, Neo Observatory
J.A. (Joris) Melkert, Delft University of Technology
Prof. P.M.J. (Pablo) Mendes De Leon, Leiden University
P. (Paul) Peeters, Breda University of Applied Sciences
J.F. (Jan) Schuur, PBL Netherlands Environmental Assessment Agency
M. (Marieke) Smit, Royal Schiphol Group
W.J.A. (Joery) Strijtveen MA, Royal Schiphol Group
R.J.A.J. (Robbert) Thijssen, Ministry of Infrastructure and Water
Management
G.C.M. (Gabrielle) Uitbeijerse, PBL Netherlands Environmental Assessment
Agency
H.M. (Herman) Vreeburg, Airport Coordination Netherlands
S.E.J. (Eric) de Vries, Ministry of Infrastructure and Water Management
P.T.S. (Petrouschka) Werther, Ministry of Infrastructure and Water
Management
Prof. J.G. (Jaap) de Wit, Pintail Aviation Economics
P.M. (Pauline) Wortelboer-van Donselaar, KiM Netherlands Institute for
Transport Policy Analysis

Round table dinner, 26 November 2018

M.J. (Marja) Eijkman, Royal Netherlands Aerospace Centre (NLR)

F. (Floris) de Haan MSc, Erasmus University Rotterdam
J.M.G. (Hans) Heerkens PhD, University of Twente
W.J.J. (Walter) Manshanden PhD, Neo Observatory
J.A. (Joris) Melkert, Delft University of Technology
J.W. (Hans) Pulles, Obnconsultancy
B. (Bouke) Veldman, HorYzoN
P.T.S. (Petrouschka) Werther (observer), Ministry of Infrastructure and Water
Management
Prof. J.G. (Jaap) de Wit, Pintail Aviation Economics

Stakeholder meeting, 10 January 2019

S.P. (Sijas) Akkerman, Natuur & Milieufederatie Noord-Holland
H. (Hans) Buurma PhD, Werkgroep Toekomst Luchtvaart
P. (Pieter) Cornelisse, KLM Royal Dutch Airlines
Z. (Zuhal) Gül, pilot case Eindhoven Airport
W. (Wouter) Knop, City of Amsterdam
A.M. (Anjo) Reussink, City of Amsterdam
W.J.A. (Joery) Strijtveen MA, Royal Schiphol Group
W. (William) Vet, EasyJet Nederland
P.T.S. (Petrouschka) Werther (observer), Ministry of Infrastructure and Water
Management

External referees

F. (Floris) de Haan MSc, Erasmus University Rotterdam
J.M.G. (Hans) Heerkens PhD, University of Twente



OVERVIEW OF PUBLICATIONS

2019

The Sum of the Parts: Converging National and Regional Challenges. [‘De som der delen: verkenning samenvallende opgaven in de regio’]. March 2019 (Rli 2019/01).

2018

Warmly Recommended: Towards a Low-CO₂ Heat Supply in the Built Environment [‘Warm aanbevolen: CO₂-arme verwarming van de gebouwde omgeving’]. December 2018 (Rli 2018/07)

National Environment and Planning Strategy: Litmus Test for the New Environmental and Planning Policy [‘Nationale omgevingsvisie: lakmoesproef voor de Omgevingswet’]. November 2018 (Rli 2018/06)

Accelerating Housing Production, While Maintaining Quality [‘Versnellen woningbouwproductie, met behoud van kwaliteit’]. June 2018 (Rli 2018/05)

Better and Different Mobility: Investing in Mobility for the Future [‘Van B naar Anders: investeren in mobiliteit voor de toekomst’]. May 2018 (Rli 2018/04)

The Healthy City: Delivering Health Through Environmental and Planning Policy [‘De stad als gezonde habitat: gezondheidswinst door omgevingsbeleid’]. April 2018 (Rli 2018/03)

Sustainable and Healthy: Working Together Towards a Sustainable Food System [‘Duurzaam en gezond: samen naar een houdbaar voedselsysteem’]. March 2018 (Rli 2018/02)

Electricity Provision in the Face of Ongoing Digitalisation [‘Stroomvoorziening onder digitale spanning’]. February 2018 (Rli 2018/01)

2017

A Broad View of Heritage: The Interactions Between Heritage and Transitions in the Physical Environment [‘Brede blik op erfgoed: over de wisselwerking tussen erfgoed en transitie in de leefomgeving’]. December 2017 (Rli 2017/03)

Energietransitie en leefomgeving: kennisnotitie. December 2017 (Rli 2017) [only available in Dutch]

Land for Development: Land Policy Instruments for an Enterprising Society [‘Grond voor gebiedsontwikkeling: instrumenten voor grondbeleid in een energieke samenleving’]. June 2017 (Rli 2017/02)

Assessing the Value of Technology: Guidance Document [‘Technologie op waarde schatten: een handreiking’]. January 2017 (Rli 2017/01)



2016

Faster and Closer: Opportunities for Improving Accessibility in Urban Regions ['Dichterbij en sneller: kansen voor betere bereikbaarheid in stedelijke regio's']. December 2016 (Rli 2016/05)

International Scan 2016: Emerging Issues in an International Context. November 2016 (Rli/EEAC)

The Connecting Landscape ['Verbindend landschap']. November 2016 (Rli 2016/04)

Challenges for Sustainable Development: Main Focus Areas Identified in Advisory Reports Published in the Past Four Years by the Council for the Environment and Infrastructure ['Opgaven voor duurzame ontwikkeling: hoofdlijnen uit vier jaar advisering door de Raad voor de leefomgeving en infrastructuur']. July 2016 (Rli 2016/03)

Beyond Mainports ['Mainports voorbij']. July 2016 (Rli 2016/02)

Notitie Systemverantwoordelijkheid in de fysieke Leefomgeving. May 2016 (Rli 2016/01) [only available in Dutch]

2015

Reform of Environmental Law: Realize your Ambitions ['Vernieuwing omgevingsrecht: maak de ambities waar']. December 2015 (Rli 2015/07)

A Prosperous Nation Without CO₂: Towards a Sustainable Energy Supply by 2050 ['Rijk zonder CO₂: naar een duurzame energievoorziening in 2050']. September 2015 (Rli 2015/06)

Room for the Regions in European Policy ['Ruimte voor de regio in Europees beleid']. September 2015 (Rli 2015/05)

Changing Trends in Housing: Flexibility and Regionalisation Within Housing Policy ['Wonen in verandering: over flexibilisering en regionalisering in het woonbeleid']. June 2015 (Rli 2015/04)

Circular Economy: From Wish to Practice ['Circulaire economie: van wens naar uitvoering']. June 2015 (Rli 2015/03)

Stelselherziening omgevingsrecht. May 2015 (Rli 2015/02) [only available in Dutch]

Survey of Technological Innovations in the Living Environment ['Verkenning technologische innovaties in de leefomgeving']. January 2015 (Rli 2015/01)

2014

Managing Surplus Government Real Estate: Balancing Public Interest Against Financial Gain ['Vrijkomend rijksvastgoed: over maatschappelijke doelen en geld']. December 2014 (Rli 2014/07)



Risks Assessed: Towards a Transparent and Adaptive Risk Policy [‘Risico’s gewaardeerd: naar een transparant en adaptief risicobeleid’]. June 2014 (Rli 2014/06)

Recovering the Costs of Environmental Damage: Financial Indemnity Requirements for High-Risk Companies [‘Milieuschade verhalen: advies financiële zekerheidstelling milieuschade Brzo- en IPPC4-bedrijven’]. June 2014 (Rli 2014/05)

International Scan 2014. Emerging Issues in an International Context [‘Internationale verkenning 2014. Signalen: de opkomende vraagstukken uit het internationale veld’]. May 2014 (Rli 2014)

The Future of the City: The Power of New Connections [‘De toekomst van de stad: de kracht van nieuwe verbindingen’]. April 2014 (Rli 2014/04)

Quality Without Growth: On the Future of the Built Environment [‘Kwaliteit zonder groei: over de toekomst van de leefomgeving’]. April 2014 (Rli 2014/03)

Influencing Behaviour: More Effective Environmental Policy Through Insight Into Human Behaviour [‘Doen en laten: effectiever milieubeleid door mensenkennis’]. March 2014 (Rli 2014/02)

Living Independently for Longer, a Shared Responsibility of the Housing, Health and Welfare Policy Domains [‘Langer zelfstandig, een gedeelde opgave van wonen, zorg en welzijn’]. January 2014 (Rli 2014/01)

2013

Sustainable Choices in the Implementation of the Common Agricultural Policy in the Netherlands [‘Duurzame keuzes bij de toepassing van het Europese landbouwbeleid in Nederland’]. October 2013 (Rli 2013/06)

Pulling Together: Governance in the Schiphol/Amsterdam Metropolitan Region [‘Sturen op samenhang: governance in de metropolitane regio Schiphol/Amsterdam’]. September 2013 (Rli 2013/05)

Safety at Companies Subject to the Major Accidents Risks Decree: Responsibility and Effective Action [‘Veiligheid bij Brzo-bedrijven: verantwoordelijkheid en daadkracht’]. June 2013 (Rli 2013/04)

Dutch Logistics 2040: Designed to Last [‘Nederlandse logistiek 2040: designed to last’]. June 2013 (Rli 2013/03)

Nature’s Imperative: Towards a Robust Nature Policy [‘Onbeperkt houdbaar: naar een robuust natuurbeleid’]. Mei 2013 (Rli 2013/02)

Room for Sustainable Agriculture [‘Ruimte voor duurzame landbouw’]. March 2013 (Rli 2013/01)

2012

Keep Moving: Towards Sustainable Mobility. Edited by Bert van Wee. October 2012 (Rli/EEAC)



Original title

Luchtvaartbeleid: een nieuwe aanvliegeroute

Text editing

Saskia van As, Tekstkantoor Van As, Amsterdam, The Netherlands

Infographics

Vizualism: Frédéric Ruys, Utrecht, The Netherlands
(Pages 8, 19, 20, 21, 22, 24, 25, 26, 36)

Photo credits

Cover: Jordi Huisman/Hollandse Hoogte

Page 5: Peter Hilz / Hollandse Hoogte

Page 9: Herman Wouters / Hollandse Hoogte

Page 12: Marjo Steffen / Nationale Beeldbank

Page 18: Eye Em Mobile GmbH / Hollandse Hoogte

Page 29: Paulien van de Loo / Hollandse Hoogte

Page 35: Bart Eijgenhuijsen / Hollandse Hoogte

Graphic design

Jenneke Drupsteen Grafische vormgeving, The Hague, The Netherlands

Publication Rli 2019/02

April 2019

Translation

Livewords/Balance, Amstelveen-Maastricht, The Netherlands

Preferred citation

Council for the Environment and Infrastructure (2019). *Aviation policy: A new approach path*. The Hague.

ISBN 978-90-77166-80-2

NUR 740

