



15 ways

to reduce the Carbon footprint
in airport regions

Conclusions and recommendations



from the second ARC study on
Surface Access and Climate Change

ARC



AIRPORT REGIONS CONFERENCE

CONTENTS

Preface	3
Location of the studied airports	4
The carbon footprint varies between airport regions.....	5
Cities and regions should play an active role	6
Encourage joint actions among stakeholders to reduce CO2 emissions.....	6
Identify the quick wins to start with	7
Reduce Kiss & Fly trips to and from the airport	8
Modal split for passengers and employees are different	8
Reduce emissions faster than the growth of air traffic.	9
The importance of greening all modes of transport	9
Trade off between gaseous emissions and noise	10
Difficulties in collecting information.....	10

Preface

The Airport Regions Conference (ARC) Surface Access and Climate Change project (SACC) deals with questions of intermodality, improving the surface access in airport regions and reducing the CO2 emissions it creates.

In January 2008 a first special report was published – Climate Change and Surface Access in airport regions. The report indicates that how the transport to and from an airport is planned can be of great significance to the amount of emissions related to an airport region. The study intrigued the ARC members when it indicated that up to 50% of CO2 emissions related to the airport region can be assigned to surface access.

The report posed a number of questions. Were these indicators reflecting a general pattern for all airport regions? Would the indicators look different for different types of airports and/or in relation to the number of passengers? How could the challenges be met when the stakeholders like the airports, airlines and public transport providers have different objectives and business models and a limited influence on each others competences? What role could cities and regions play to address the carbon footprint in this environment?

In order to address the questions above and validate the findings from the first report, Climate Change and Surface Access, a second study was launched called 15 ways to reduce the carbon footprint in airport regions.

The number of airport regions in the study was expanded into airports of different size and passenger volume as well as location in Europe. It investigates in depth the impact of a change in the different factors and sources causing the CO2 emissions.

The aim of this second study is also to explore a practical approach for airport regions by a method to calculate the carbon footprint using the same manner in all regions. A separate technical appendix has been developed

so other airport regions can conduct similar studies in their regions. The technical appendix include a template where to fill in facts and figures. This will encourage an exchange of best practices and a wider sample to provide new insights on how to address the carbon footprint in airport regions.

The emphasis in this study lies on the surface accessibility of the airport region. It is clear that the competencies of local and regional authorities are mostly limited to 'landside mobility' and almost none in the field of aviation and/or airport operations. Furthermore the surface transport concerns passengers and staff and not the landside transport of freight. This might be subject of future studies.

This report from the ARC SACC project gives an overview of the findings and conclusions from the project group who guided both studies over the last two years.

The study was conducted by Christian Nilsson, WSP, Sweden, in collaboration with Emma Strömblad, Paul Fenton and Göran Tegnér.

We hope this report will stimulate ARC members in policy discussions on intermodality and on airport capacity. It will hopefully serve as a practical guideline to assess the carbon footprint in airport regions.

With this report the first step in the ARC Surface Access and Climate Change project plan is concluded. [n](#)



Bengt Christensson
Secretary General
Airport Regions



Pieter Deschamps
Chairman
Surface Access
Climate Change project

Location of the studied airports



The carbon footprint varies between airport regions

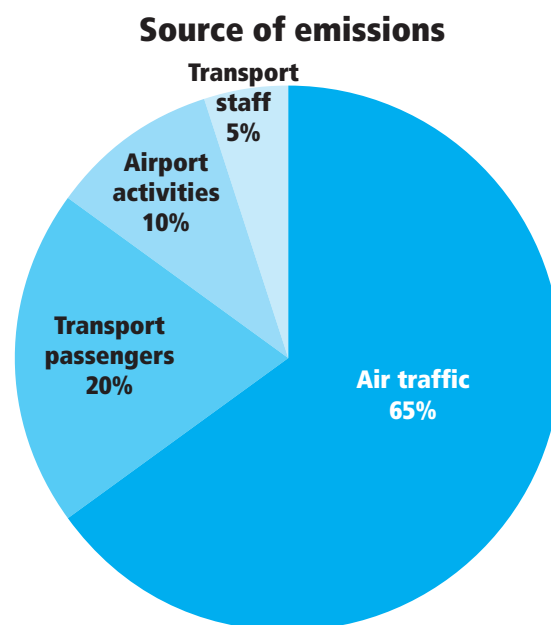
The 9 different airport regions in this report are all of different size and with various geographical characteristics. The findings show as expected a wider variation in magnitude for the CO₂ sources compared to the previous Climate Change and Surface Access study. Every airport has its specific situation in terms of geographical conditions, distance to the city centre, combination of air traffic and passenger volume etc. Each airport has its own profile and its own carbon footprint.

In this new more detailed study it is clearly described that both the total emitted CO₂ per passenger and the share from different sources varies significantly between airports. Nevertheless the main source of CO₂ emissions at all airports, regional or major hubs, relates to air traffic and ranges between 49%–76% of total emissions. Airport activities are responsible for 5%–17%.

Surface transport never exceeds 50% in any type of airport region, varying from 7%–45% of the total emissions. This study could not establish any systematic differences between airports of different size.

Looking at the overall picture for the 9 airport regions, the average share of emissions

related to surface transport for these airports is 25%. Two-thirds of the total CO₂ emissions originate from air traffic itself. We conclude that surface access is in almost all airport regions the second largest source of the overall CO₂ emissions.



Given the variation between the 9 airports, in this study we use an average of the 9 airport regions to investigate the cause and effects by different measures to address the carbon footprint.

Cities and regions should play an active role

Public authorities in most cities and regions have the competences to address surface access and public transport development. Major progress may be achieved with an active approach from the cities and regions to involve the different stakeholders in a joint process to reduce the carbon footprint.

We conclude that a case by case approach is appropriate within a shared vision on intermodality at airports where the challenge is to provide persons travelling to and from airports with attractive alternatives to the private car and thus support more sustainable transport modes via intermodality.

We recommend airport regions to follow a similar integrated approach to create reliable and sustainable surface access transport systems attractive to the passengers in the airport regions. [n](#)

Encourage joint actions among stakeholders to reduce CO2 emissions

The Special report Climate Change and Surface Access identified for each source of CO2 different factors influencing the emissions. These factors are illustrated below and who is most likely to be able to initiate a reduction. This report takes this a step further by analyzing the impact of a 10% change improvement of each factor. The 10%

reduction is made as example just to showcase the approach. The relevant percentage level for reduction and easiness to implement differs most likely from region to region.

This approach shows that a reduction of 10% change in each factor may lead to an overall effect of reducing the total CO2 emissions (on a yearly basis) with 15%.

	Length of taxiways	Increased parking charges	Size of aircraft	Age of aircraft fleet	Continuous descent approach	Load factor	Increased share of PT	Increased share of rail	Reduction of staff travelling by car	Kiss and fly share reduction	Occupancy rates in car and taxi	Public Transport fare reduction	Environmental friendly taxis	Biofuel buses	Toll for cars and taxis
Airport operator															
Airlines															
Manufactures															
Air Navigation providers															
Public Transport companies															
National/regional governments															

We conclude that for each single stakeholder the reduction of 10% may be of limited value but the overall effect can be substantial. By bringing the stakeholders together and by influencing various different actions it is possible to significantly reduce the CO2 emissions. We believe the cities and regions have an important role to initiate a dialogue in their regions.

We recommend that ARC on the European level, together with the stakeholders in the airport and aviation industry, strengthen and support this dialogue in order to coordinate actions when possible and inform each other about recent and planned initiatives. This would complement the ongoing initiatives already taken by many airports and airlines. **n**

Identify the quick wins to start with

The examples of measure discussed in this study have short, medium or long term effect. In a short term perspective it is difficult to change a runway or taxiway configuration unless expansion plans are considered. Some measures include administrative decisions, like only allowing bio fuel buses at airports, may have a medium term effect in changing the fleet, whereas toll and charges may be introduced in a short time frame to promote changes.

Programs to promote employees to commute with sustainable transport modes, parking policy, green taxi's, easy access to information to the passengers and staff are all examples of quick wins fairly easy to introduce in most airport regions.

What could be achieved in short medium or long term will be specific in each region depending on the current development in each region.

It is however equally important for all airport regions to start identifying what measures

to be taken and in what time frame different measure may be introduced. This would be an important step to streamline and initiate a constructive and creative dialogue and actions with relevant stakeholders, like taxi car companies operating at the airport, the major airlines or the employers at the airport.

We conclude that applying the methodology described in this study and the proposed guidelines all airport regions should be able to consider what sources to address first and what reduction of sources may be possible to achieve.

We recommend further investigation of the feasibility of the different factors in this study in a short, medium and long term perspective. This may serve as an important element in bringing the stakeholders together and be a starting point for active involvement across the sector. **n**



Reduce Kiss & Fly trips to and from the airport



A Kiss & Fly trip is when a passenger is brought to and/or is picked up at the airport in a private car. The specificity of these trips is that they count for twice as many trips and thus double the CO2 emissions

compared to parking at the airport. Kiss & Fly trips also put an extra pressure on the capacity of the roads in the airport regions especially during peak-hours.

We conclude that the parking (and stopping) policy at the airport is of great importance regarding the number of Kiss & Fly trips.

We recommend that further studies are being carried out in order to gain a better insight in the dynamics of Kiss & Fly trips related to the parking policy of an airport and to provide better passenger drop-off possibilities close to public transport nodes for airport access. [n](#)

Modal split for passengers and employees are different

The study shows that 84% of staff working trips to airports are made by car. Working trips with public transport does not exceed 14%. In comparison 46% of the passengers use public transport to and from the airport.

An important reason is that the airport is a working area operating 24 hours a day seven days a week all year round. Staff at airports have flexible work hours often starting and/or ending at hours when there are no or limited public transport services available.

We conclude that ordinary public transport by itself is not a viable option for staff ending or beginning a work shift during the night.

We recommend that alternative travel programs to promote climate friendly travel to work are investigated and implemented. [n](#)

Reduce emissions faster than the growth of air traffic

The European political objective, to reduce the carbon footprint, launched by the European Commission, calls for a series of ambitious initiatives in research and regulations at all levels. Initiatives are taken to develop technologies and procedures to reduce the carbon footprint in aviation. Clean Skies and the Single European Sky are two examples in this field. At the same time the demand for air travel is forecasted to grow in all parts of Europe and in the global market.

We conclude that it is a risk that the reduction of CO₂ emission from improved technology and regulations is not enough to balance the growth of the demand for air travel. More has to be done to make real reductions.

We recommend that steps should be taken to look at emission from a door-to-door perspective to reduce the overall carbon footprint related to air transport. [n](#)

- Research indicates aircrafts will be 50% quieter by 2020. And the move towards more fuel-efficient aircraft continues.
- The implementation of the Single European Sky would bring major enhancements in air traffic management leading to efficiency gains of 6–12%. A 1% efficiency gain saves up to 500,000 tonnes of fuel per year in Europe.
- Future improvements in airline operations (through single engine taxiing, reduction of weight in cabin services, etc.), can further reduce fuel-burn by between 2 and 6%.
- Airports and airlines are committed to using more environmentally efficient ground service equipment and vehicles.

The importance of greening all modes of transport

This new study illustrates that reducing CO₂ emissions in surface transport is not just a matter of increasing the use of public transport modes. Because of the higher occupancy rates in public transport it is indeed a sustainable way of transport, but progress can still be made in terms of alternative power sources.

We conclude that it is important that public transport providers as well as the taxi sector increase their investments in greening their rolling stock.

We recommend that the stakeholders together promote and intensify the investments in green technology.

- ethanol and biogas buses are more environmental-friendly than diesel buses do.
- trains propelled by electrical engines have the potential to decrease emissions significantly, if it is generated by hydro, nuclear or wind. It's obvious that diesel trains are less environmental friendly. [n](#)



Trade off between gaseous emissions and noise

Airports located further away from city centres and housing areas increase the carbon footprint. Airports with location close to city centre have a smaller carbon footprint. In terms of reducing the CO2 emissions from surface transport to the airport one could advocate to have airports close to the city centres.

This argument does not take into account the noise footprint of airports. Many airports have a remote location from city centres in order to limit or reduce the number of citizens exposed to aircraft noise. In most airports regions we believe this is an artificial argument, unless a major airport expansion or new location is under debate.

It is important to avoid unnecessary conflicts

of interest between the reduction of CO2 emissions and noise exposure. The carbon footprint must not be reduced at the cost of noise exposure in the communities.

We conclude that it makes more sense to improve and integrate the airport into the public transport system as an intermodal hub rather than having an airport close to the city centre.

We recommend that the airport becomes an integrated node in the public transport system. Knowing that mainly tourists and business travellers have the city centre as their final destination airports should be especially well connected to the city centre by public transport. [n](#)

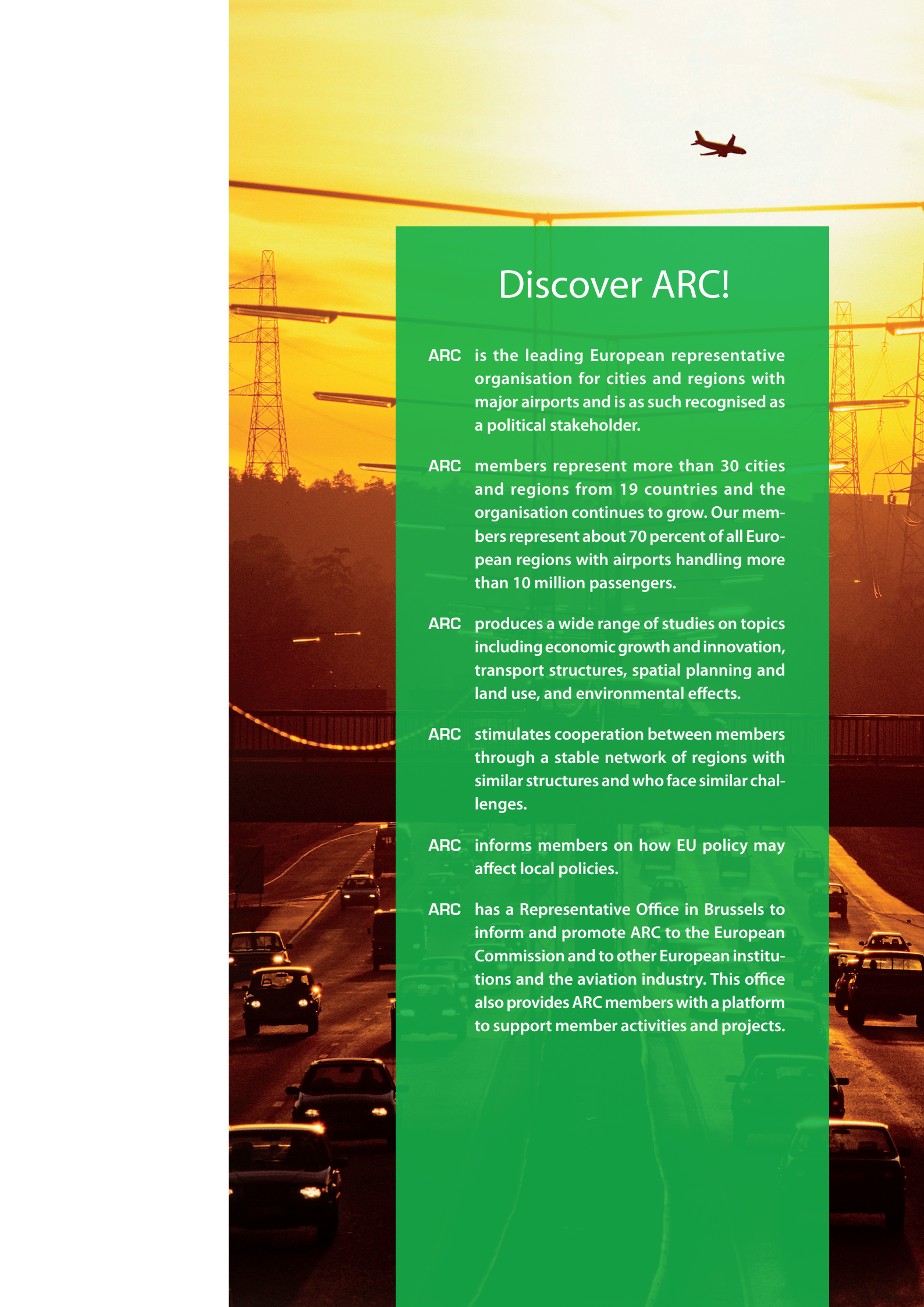
Difficulties in collecting information

The 9 airport regions worked closely together in this new study to provide all the relevant data. Even with this joint effort we encountered difficulties when calculating emissions. For air traffic, the data is generally readily available as the airports keep track of the aircraft using the airport. Unfortunately, this is not the case when calculating emissions from surface access. Most airports and/or regions have some kind of data from travel surveys. The quality of the data and the amount of data available varies significantly from region to region. This means that assumptions had to be made when calculating

the emissions. This is of course a challenge when comparing and benchmarking activities are made between regions.

We conclude that the development of a common template for airport regions to calculate the carbon footprint would be a big step forward to have reliable and comparable facts and figures. The model used in this study is a first attempt towards a common approach.

We recommend that airport regions use a standardised follow up system to monitor the surface access to and from the airports. [n](#)



Discover ARC!

ARC is the leading European representative organisation for cities and regions with major airports and is as such recognised as a political stakeholder.

ARC members represent more than 30 cities and regions from 19 countries and the organisation continues to grow. Our members represent about 70 percent of all European regions with airports handling more than 10 million passengers.

ARC produces a wide range of studies on topics including economic growth and innovation, transport structures, spatial planning and land use, and environmental effects.

ARC stimulates cooperation between members through a stable network of regions with similar structures and who face similar challenges.

ARC informs members on how EU policy may affect local policies.

ARC has a Representative Office in Brussels to inform and promote ARC to the European Commission and to other European institutions and the aviation industry. This office also provides ARC members with a platform to support member activities and projects.



"Making the best of your airport!"

ARC Brussels Office
Rue du Luxembourg 3, B-1000 Brussels, Belgium
Tel: +32 2 501 0835, Fax: +32 2 501 0842
info@airportregions.org • www.airportregions.org