European Cities Tourism Report
For the World Tourism Cities Federation

August 2016

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Acknowledgements

This report has been prepared for the World Tourism Cities Federation (WTCF) by Dr Roger Carter and colleagues at TEAM Tourism Consulting, Professor Karl Wöber and colleagues at MODUL University, Vienna, and Nancy Cockerell of The Travel Business Partnership.

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Foreword

To be added by WTCF.

Summary and Conclusions

European city tourism trends

- In the 30 or so years since travel demand was first tracked on a global scale, city tourism has been one of the fastest growth segments of the market worldwide, but especially in Europe, where annual increases in trip volume have frequently been in double-digit figures.
- Demand for city trips – primarily short weekend breaks – really took off after the formal establishment of the single European market in 1993. This was enabled by and a stimulus to the development of new airline routes by the new, low-cost airlines that were starting to grow rapidly at that time; and by existing scheduled carriers looking to expand their European networks.
- The growth not only benefited Europe's capitals and major cities, but also a whole host of regional, secondary destinations that suddenly opened up to tourism, primarily by the low cost carriers. This of course served to stimulate further demand, in turn generating more intense competition from the airlines, which added yet more routes and increased frequencies. As leisure travel became more affordable, the number and variety of domestic and international city destinations for tourists grew exponentially.
- Demand in Europe, the world's most mature outbound travel market, was further driven by the fact that, while the percentage of the population travelling abroad was fast approaching a ceiling in some countries, travel frequency – notably for secondary short breaks – was continuing to surge.
- The number of trips per traveller has admittedly suffered in times of economic downturn or financial crisis, but many Europeans still prefer to take several short breaks a year than to concentrate all their disposable leisure time into one main holiday.
- Clearly, staggering advances in technology have also been a key driver in the growth in demand for city travel. For the past 20 years, they have improved productivity and services, as well as distribution, and have allowed passengers to book online and, just as importantly, to research and compare all the different travel options and prices. More recently, smart phone technology has extended greatly both the scale and the nature of the impact.
- Urbanisation has also been a key factor in the growth of city tourism. Yet, as well as benefiting from the trend, tourism has also contributed enormously to its rise in importance, resulting in a huge economic impact on many major and smaller regional European cities.
- Tourism in Europe has helped stimulate local government investment in infrastructure to cater to, and stimulate, demand, facilitating the movement of goods, people and capital. It has contributed to

creating a skilled labour force, encouraging local business entrepreneurship and public-private partnerships, and attracting other industries and services.

- This regeneration process has not only helped to build a quality visitor experience, but it has also helped to safeguard and improve the quality of life for local residents, who have benefited from improved local transport, amenities and recreation facilities.

The role of air transport in European tourism development

- Air transport liberalisation in Europe has resulted in unprecedented growth in trade and tourism links, thanks in large part to low-cost airlines services, which have enhanced direct links to and from major hubs, but also to/from secondary cities.
- Europeans and non-European visitors to the continent have been able to access an ever-expanding network of safe, efficient and affordable air services. This in turn has given a huge boost to tourism, not least for Europe's cities.
- According to Airports Council International (ACI) Europe, the number of air routes within the European Union member states alone has increased by 170% since the creation of the single aviation market in 1993, and more than a thousand new 'city pairs' were added to European airline schedules between 2003 and 2007.
- Regional airports play a vital role in connecting the regions of Europe, as well as largely defining the economy of their communities and bolstering social cohesion. Proximity to an airport is still in the top five considerations of any international company considering investing in a region. And business and leisure tourists increasingly choose the convenience of direct airline services rather than transiting at major hubs to reach their destinations.
- Despite the uncertain political and economic environment – not to mention the fear of continued terrorist attacks and natural disasters – the growth in demand for air transport in Europe is expected to continue, with a doubling of passenger traffic forecast by 2030.
- Admittedly, the outlook is not all rosy. Eurocontrol sees a looming capacity crunch at Europe's major airports that will slow growth and have a negative impact on the European economy. But this may of course benefit smaller, regional airports and also secondary cities.
- There are also uncertainties linked to Brexit – the decision by the British people to leave the European Union. UK airlines will in theory no longer enjoy automatic access to the European single market market, although there are ways in which they can continue to negotiate continued access –

e.g. by participating in the European Common Aviation Area (ECAA) Agreement in the same way as countries such as Norway currently does.

- UK-based low-cost carriers (LCCs) like easyJet are fairly confident that they will not have to alter their low-cost model. But they are making contingency plans. If easyJet obtains an air operator's certificate (AOC) in Ireland, France, Germany, or any EU country, it could continue flying intra-European routes, even if the UK makes a clean break with the continent.

The impact of low-cost carriers on European cities' tourism

- The good news for European cities is that much of the air traffic growth in the region this year is being driven by low-cost services, which have been much less affected. Airline seat growth from, to and within Europe in summer 2016 (April through September) is expected to accelerate by 8%, up from 6% in summer 2015, according to the summer 2016 OAG schedules. This would be the highest summer growth rate in six years.
- The importance of LCCs to European city tourism is clearly reflected in the number of seats available in the market and the vast network of destinations served point to point by LCCs. European LCCs operated a total of 378 million seats on Europe-to-Europe routes in 2015, according to CAPA. Almost half of these (181 million, or 48% of the total) were deployed by the two largest European LCC carriers, Ryanair and easyJet. But, in total, there were as many as 20 LCCs on intra-European routes in 2015.
- Seats on routes within Europe represent 86% of the total number of seats operated from Europe in the current (2016) summer schedule. And airlines that are classified as low-cost carriers in the CAPA LCC database account for 40% of the scheduled seats recorded by OAG on intra-Europe routes for summer 2016 (April through September), up from 38% in summer 2015. Growth is expected be 13% year on year, while growth for all other airlines combined will be just 5%.
- The majority of smaller, regional cities served by LCCs have been obliged to provide subsidies in one form or another to the respective airline/s if they want to attract them, at least in the early route development phase. These can be in the form of discounted airport charges – such as for landing and ground handling – marketing agreements with local and/or regional tourist offices, route development promotions, local tour operator support or, in many cases, direct state aid from regional and/or municipal authorities.
- Although the subsidies have been controversial and have resulted in a number of high-profile court cases, the general consensus is that state aid and other subsidies have proved beneficial in helping

to re-energise local economies. The different case studies cited are good example of this, and many other small cities have benefited to an even greater degree.

- In addition to having a significant impact on tourism demand for cities, the entrance and growth of LCCs has considerably changed the tourism landscape. Guests are often willing and eager to spend the money saved from air transport on comfortable, sometimes luxury, hotel accommodation, in addition to shopping, sightseeing and eating out in good restaurants. So the local economy can benefit significantly, not least from new investment in hotels and attractions.

Smart cities lead the way to smart tourism

- Although it is early days, smart cities in Europe are showing that they can create and sustain smart tourism – to the benefit of visitors, the local community and the city itself.
- The Smart Cities Council defines a smart city as a city that has digital technology embedded across all city functions to collect and measure data on everything from water and traffic to energy usage, and much more. The data is then communicated through wired and wireless connections through the Internet of Everything (IoE) and finally crunched or analysed to help decision-makers in government and business to make better decisions.
- All the new communications and services can potentially benefit visitors and stimulate tourism development, as Amsterdam and other successful cities have shown. All three cities analysed as case studies in this report have highlighted the importance for a city to stimulate, encourage, and foster smart initiatives; to share real-time data to inform better decision-making; to involve its citizens in contributing to building a better city; and to work collectively in distributing and spreading best practice nationally and internationally.
- Smart tourism is essentially a new concept for European cities. It is not yet applied comprehensively in any city, but the three case study cities together demonstrate a range of initiatives that will be applied more extensively and comprehensively in European cities.

Embracing the sharing economy

- Another increasingly important phenomenon, the net benefits of which are still open to question – but which has certainly enabled cities to satisfy demand in terms of accommodation at peak tourism periods – is the sharing economy.

- Although the different case studies and other examples cited illustrate the conflicting impact of accommodation and transport (car) sharing on city centres, there is evidence to suggest that local neighbourhoods benefit financially from increased visitor spending, especially as a result of growth in the short-term rental market.
- The local government responses to the growth in the sharing economy vary significantly from city to city. Barcelona and Berlin have both taken steps to limit the number of rentals possible, for example. Barcelona has introduced an outright ban, given the tourism pressures it is facing, while Berlin has restricted the letting of any property without a permit (thus reducing the financial viability of such lettings). In contrast, Amsterdam has changed its laws to facilitate short-term lettings within the sharing economy.
- Amsterdam's agreement with Airbnb facilitates the collection of tourism taxes. However, Airbnb is under no obligation to provide the authorities with data on its hosts/landlords. Conversely, Berlin's latest ruling requires Airbnb to disclose data so that compliance can be checked, while Barcelona has fined the sharing platforms directly for advertising non-compliant properties.
- It is clear that the sharing economy is growing and will challenge cities to adapt to new forms of tourist behaviour in future. The co-existence with traditional forms is possible, as illustrated by Amsterdam, but the relationship needs to be managed carefully, taking into account the available evidence of the different impacts on the economy and environment of the city, and on existing tourism businesses.
- The big question for city management organisations, to quote Ignasi de Delàs, President of European Cities Marketing and Vice President of WTCF, is not whether to be pro- or con- the sharing economy. It is how destinations can actively interact with it, simply because this phenomenon is here to stay.
- "Destination Marketing Organisations (DMOs) in general are the connectors between industry players and authorities, they are the stage managers of their city. And for our member DMOs, it is a crucial need to balance the interest of their established partners with the popularity of the new collaborative platforms."
- Tax evasion, the violation of labour/social rights and consumer protection laws clearly need to be addressed to ensure a strong, strategic operating framework across the region, ensuring a level playing field. But the opportunities offered by the sharing economy to growth the tourism economy through innovation and entrepreneurship – and not least to extend the benefits of tourism to more communities – would seem to far outweigh the detrimental effects and challenges.

In conclusion

- In summary, it can be seen that a number of different factors have contributed – and will continue to contribute – to making Europe's most popular cities successful as tourism destinations; other factors represent substantial, long term challenges or constraints that need to be addressed within city development strategies.
- Low-cost air transport has clearly been a prime factor in stimulating demand and generating success for tourism in many European cities. But continuing growth poses many challenges and it is clear that creativity, innovation and substantial infrastructure investment will be key to ensure continuing success for the long term. The growing impact of smart cities on tourism and the new sharing economy business models would suggest that cities and the tourism industry at large in Europe and elsewhere need to constantly adapt and evolve, embracing new technology and new business models. The case studies presented in this report provide an opportunity to learn about the experiences and practices relating to these major influences in many of Europe's most successful cities.

Introduction

Objectives and scope of the report

In May 2016, the World Tourism Cities Federation (WTCF) commissioned TEAM Tourism Consulting to work with other WTCF Experts to research and write a report providing an analysis of the scale, nature and patterns of tourism in European cities, as well as some of the most important issues related to it.

City tourism has been one of the fastest growth sectors of European tourism over the past two to three decades. Demand for intra-European city trips – primarily short weekend breaks – grew rapidly after the formal establishment of the single European market in 1993. This stimulated the launch of new air routes by the traditional air carriers looking to expand their networks, as well as from new low-cost entrants.

The growth not only benefited Europe's capitals and major cities, but also a whole host of regional, secondary destinations that suddenly opened up to tourism. This of course served to stimulate further demand, in turn generating more intense competition from the airlines, which added even more routes to their networks and increased flight frequencies.

Hoteliers in primarily business travel-driven markets, eager to fill their often empty rooms over weekends, introduced low-priced package programmes to entice guests - sometimes in co-operation with traditional or legacy airlines trying to compete with the no-frills, low-cost carriers (LCCs). As leisure travel became more affordable, the number and variety of domestic and international city destinations from which to choose grew exponentially.

Demand in Europe was further driven by the fact that, while the propensity of the population to travel abroad was fast approaching a ceiling in some countries - it was already at 80-90% in the 1990s in Scandinavia and Switzerland, for example - travel frequency was continuing to surge. Despite the economic and financial crises of recent years, it is not at all uncommon for some Europeans to take several holidays and secondary breaks every year.

Clearly, staggering advances in technology, which improved productivity and services, as well as distribution - allowing passengers to book online but, just as importantly, to research and compare all

the different travel options and prices - were also a key driver in the growth in demand for city travel. And smart phone technology has since had an equally significant impact.

The purpose of this report commissioned by WTCF was to assess the state of tourism in European cities and to identify key trends and opportunities impacting on growth prospects, for the benefit of WTCF Member cities in Europe and elsewhere in the world.

This report was designed to be in three parts: a statistical analysis of tourism-related data and indices; an overview of European air transport; and case studies of selected cities highlighting major factors influencing the respective cities' tourism growth – a combination of quantitative and qualitative analyses. The themes of the case studies selected are:

- **Low-cost Airline Services**: with a primary focus on Barcelona, Berlin and Prague
- **Smart Tourism in Smart Cities**: Amsterdam, Copenhagen and Paris
- **The Sharing Economy**: Amsterdam, Barcelona and Berlin.

Experience in other cities is also presented and discussed at relevant points in the report.

The main aim was for the report to provide some useful indicators to guide WTCF Members in their strategic development and marketing, helping them to plan ahead with greater foresight, providing guidance on both the short-term opportunities and the longer-term potential to ensure optimum return on investment.

Data sources and methodology

A range of different statistical sources was used for the compilation of this report, all of which are cited and discussed where relevant, as well as being detailed in the Appendices.

The primary source of tourism performance data was TourMIS, which is the leading platform for exchanging and analysing city tourism statistics in Europe and is the source of data for European Cities Marketing's (ECM's) Annual Benchmarking Report. The data on city tourism used by TourMIS is provided by the cities themselves and harmonised to ensure consistency. It is core performance data relating to volume (arrivals and bednights) and value.

In order to maximise the value of the data, it was subjected to Data Envelopment Analysis (DEA), which is able to benchmark city tourism destinations in terms of multiple success measures, an increasing

requirement. Analysis was undertaken for 27 European cities, providing 'inefficiency scores' that require both managerial and political attention.

The report also provides performance indicators from a number of other sources available in the public domain, including:

- Global Blue Globe Shopper Index - Europe
- Guardian Cities Global Brand Index (2013)
- PwC Cities of Opportunity Index (2014)
- Mori MF Global Power City Index (2014)
- The Economist Intelligence Unit 2025 City Competitiveness Index
- AT Kearney - Global Cities Index 2015.

Each of these indices is distinct, addressing different aspects of city capacity, competitiveness or attractiveness – not necessarily directly related to tourism. With the exception of the first, they analyse a limited number of European cities alongside cities in other world regions.

In addition, the report includes published data and tourism-related analyses from existing third party sources, including:

- International Air Transport Association (IATA)
- Airports Council International (ACI) Europe
- Centre for Aviation (CAPA)
- FlightGlobal's Innovata
- 2thinknow® 'Global Airport Connections'
- Anna.aero airline network analysis
- PwC City Hotel Performance Study
- ICCA Conventions and Meetings Annual Report
- MasterCard 2015 Global Destination Cities Index.

We are pleased to acknowledge with thanks all of the sources noted above for agreement to reproduce their analyses in this report.

The Appendix provides a detailed account of the methodology of city tourism metrics. This recognises that the development of indicators and metrics systems has been identified as being of paramount importance by many city tourism boards and international tourism organisations like WTCF, the World Tourism Organization (UNWTO) and ECM. It assesses and synthesises various frameworks for sustainable tourism indicators for sub-national regions and cities, including the European Commission's

(EC's) European Tourism Indicator System (ETIS) and the proposals in the recent UNWTO report, *Global Benchmarking for City Tourism Measurement*, drawing conclusions about the relative cost-effectiveness of analysing existing systems and indicators compared with introducing new measures.

Care must nevertheless be taken in interpreting and comparing the statistics from different sources, which are compiled using different definitions and methodologies. Tourism statistics in particular are particularly prone to these variations and discrepancies.

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Section 1 - European City Tourism Trends & Competitiveness

1.1 The metrics of European city tourism

As already indicated, the most important source of statistics on European city tourism, in terms of both relevance and usefulness, is the data marketing information system TourMIS (www.tourmis.info), an online information and decision support system for tourism that compiles statistics from European countries and cities, and which is open to all interested users. TourMIS, which was conceived and is managed by MODUL University, Vienna, Austria's leading international private university owned by the Vienna Chamber of Commerce and Industry, gathers bednights, arrivals and bed capacity data, as well as providing a vast number of tools which support managers, not only for monitoring competitiveness, but also for strategic tourism planning.

Users are able to compare the performance of different cities, identify seasonal trends, analyse the diversity of the guest mix at individual destinations, and calculate and monitor market volumes and shares for benchmarking purposes – all of which helps to determine and support strategic tourism decision-making, planning and the forecasting of demand.

TourMIS is a tool for exchanging data, information and knowledge, not just for tourism associations like European Cities Marketing and the European Travel Commission, but also for students, researchers, journalists and anyone else interested in the development of tourism at national or sub-national level. As with other social media applications, the data in TourMIS is not entered by a single authority or organisation, but collaboratively by qualified tourism experts from different destinations. Similarly to Wikipedia, the quality of the data presented in TourMIS is maintained by the feedback and responses of all users visiting the system, but is also closely monitored by the tourism faculty at MODUL University Vienna.

According to the self-reported statistics available on TourMIS, the system has more than 20,000 registered users, of whom approximately 60% work in the tourism industry. Thanks to the easy access to data and the integration of tools and automatic reports, users are able to apply and understand scientific concepts, methods and models, which would normally be much more difficult to achieve.

The *ECM Benchmarking Report*, published annually by European Cities Marketing (ECM), and produced in collaboration with MODUL University, is based on the data collected on TourMIS and represents the most comprehensive and regularly maintained source of information on urban tourism in Europe. The 2016 edition compares the tourism performance of 121 European cities, with a prime focus on nine key source markets, and provides insights into market trends during the last five years. It includes information on the growth of city tourism in Europe as measured by market volumes of official accommodation data collected by national and regional statistical offices. By providing the latest performance statistics, the report enables policy-makers to benchmark the performance of their particular city and to make more objective evaluations of the development of tourism demand for their city.

1.1.1 Summary of key results

The following analysis relates to the June 2016 ECM Benchmarking Report, or the 12th annual edition, which tracks the performance of 121 cities across Europe over the years 2011-2015. As in previous editions, the focus of the analysis is on the development of bednights from nine key source markets, as well as on bed capacity and tourism density, with a comparison of trends in city tourism against those of national tourism generally. A selection of charts from the current ECM study is included in this report – all of which highlight key findings for the period under review. These reflect the most up-to-date status of, and trends in, European city tourism.

European Cities Marketing reported a healthy 4.2% growth in city tourism in 2015 (in terms of volume of bednights). The performance of 121 cities representing a total of 561.1 million bednights, showed that bednights by international tourists grew at an even faster rate (+5.8%) than those for domestic visitors (+4.8%).

London and Paris were the top city tourism performers, recording close to 125 million bednights between them. Paris retained its second rank despite suffering a 2.1% decline in bednights, attributable in large part to the devastating terrorist attacks at different times during the year. Berlin followed in third place in the ranking ahead of Rome.

Among the top ten European cities in terms of international bednights, above-average growth was achieved by Madrid (+12.8%), Berlin (+9.1%), Budapest (+6.9%), Prague (+7.0%), Vienna (+6.1%) and Rome (+4.7%).

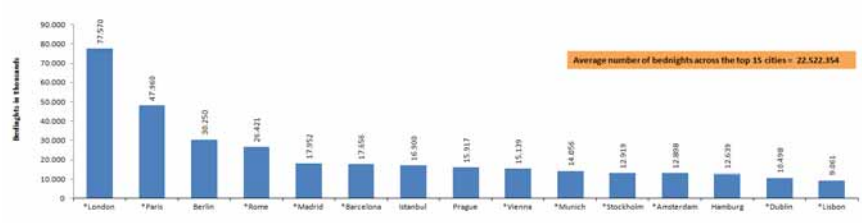
The main source markets for European city tourism were Germany, the USA and the UK, accounting together for 28% of total bednights in European cities. Nevertheless, China continued to record the strongest growth (+32%), doubling its 2014 growth rate. After a promising recovery the previous year, bednights from Italy fell by 5.3% in 2015, and Russia again showed a sharp decline of 31%, although these negative performances were compensated for by positive growth in bednights from the UK (+8.1%) and the USA (+7.1%).

According to European Cities Marketing, the results overall provide compelling evidence of the economic significance of urban tourism. Cities have been the fastest growth sector of European tourism – and, in particular, of the lucrative short break, congress and convention segments.

Although European city volumes are expected to be impacted by the threat of renewed terrorist attacks and the migrant crisis in 2016, forecasts for the current year remain generally positive, with 4.3% growth recorded in bednights across Europe in the first four months of the year. Further increases in demand are forecast over the coming six months.

1.1.2 Detailed findings

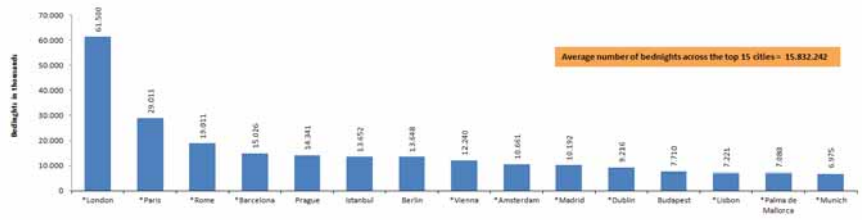
Total bednights in 2015 for top 15 European cities tracked in the ECM report



The above chart highlights the best performers among the 121 sample cities analysed for the ECM report in 2015. In terms of total bednight volume (domestic + international), the top 15 included several European capital cities, regardless of their size. London was the best performing city by a wide margin, with the number of bednights separating London and second-ranked Paris exceeding 29.6 million. There was also a very big gap separating Paris and third-ranked Berlin, whereas the remaining cities in the top 15 ranking were much more closely grouped together. This largely explains why the second-tier cities, such as Lisbon and Dublin, are very competitive one with the other. They are clearly not in a position to compete with Paris and London!

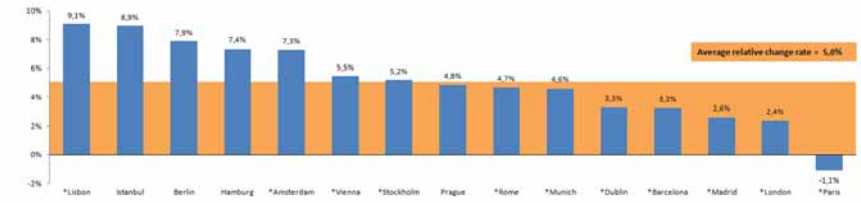
The average number of bednights for these 15 cities was about 22.5 million, which indicates that only four cities performed above average by this measure: London, Paris, Berlin and Rome. As a side note, it should be stressed that some cities are repeatedly shown with * in the charts and tables. This implies the use of different definitions and data rectifications that are detailed in the Annex of the ECM report.

Total international bednights in 2015 for top 15 European cities tracked in the ECM report



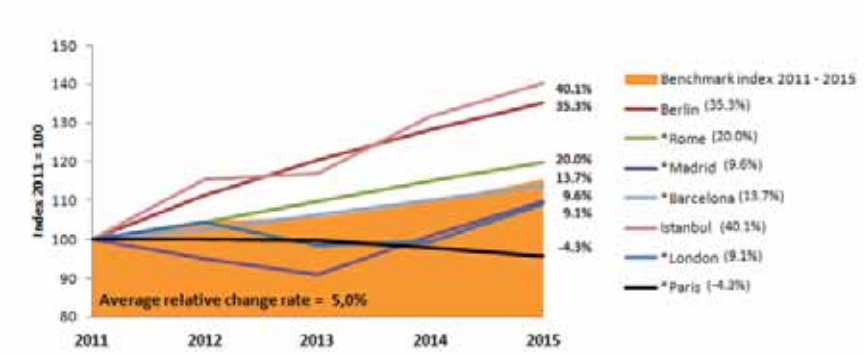
The top 15 city ranking in terms of volume of international bednights shows a similar trend. The average number of international bednights between them was about 15.8 million, and only three cities (London, Paris and Rome) performed above average. The main difference between the two rankings is that Budapest and Palma de Mallorca made it into the top 15 in terms of the international bednights, while Stockholm and Hamburg replaced them in the top 15 total bednight ranking. This suggests that the domestic market was particularly important for both Stockholm and Hamburg, while Budapest and Palma de Mallorca relied more heavily on international visitors.

Top 15 European cities – average annual growth in total bednights, 2011-2015

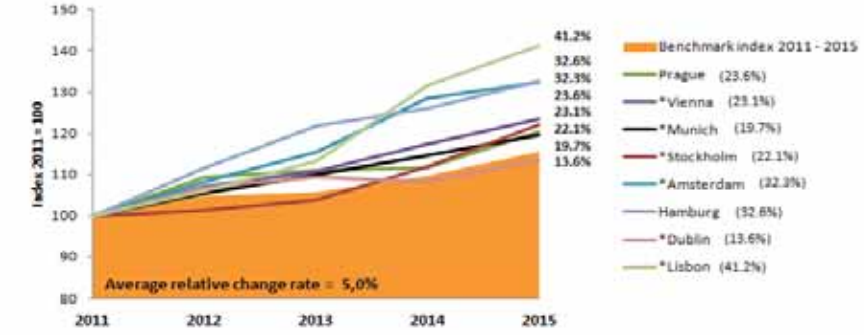


The growth in total bednights for the top 15 European cities over the past five years averaged 5% annually. Some seven cities performed above average, with Lisbon the leader achieving an impressive annual average growth rate of 9.1%. Paris was the only city in the top 15 to record negative growth, of -1.1%.

Average annual growth in total bednights for top seven European conurbations, 2011-2015

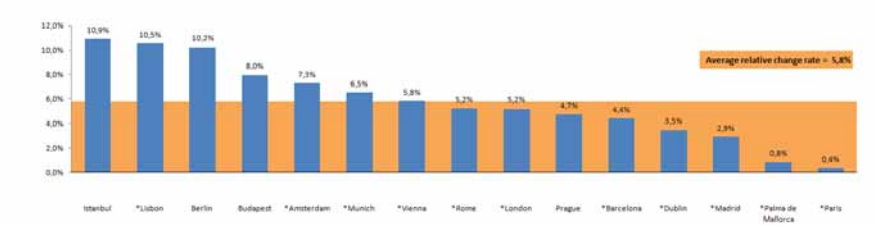


Average annual growth in total bednights for second-tier European cities, 2011-2015



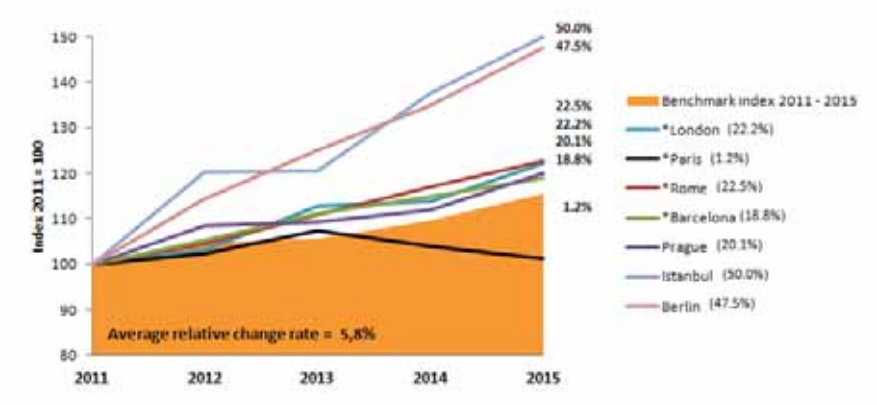
The two figures above show the growth of the top 15 city performers in terms of total bednight volume. Average annual growth across the top 15 was 5%. Over the period 2011-2015, the strongest growth in total bednights was achieved by Istanbul (40.1%) and Lisbon (41.2%). The only city recording an annual decline since 2011 was Paris (-4.3%).

Top 15 European cities: average annual growth in international bednights, 2011-2015

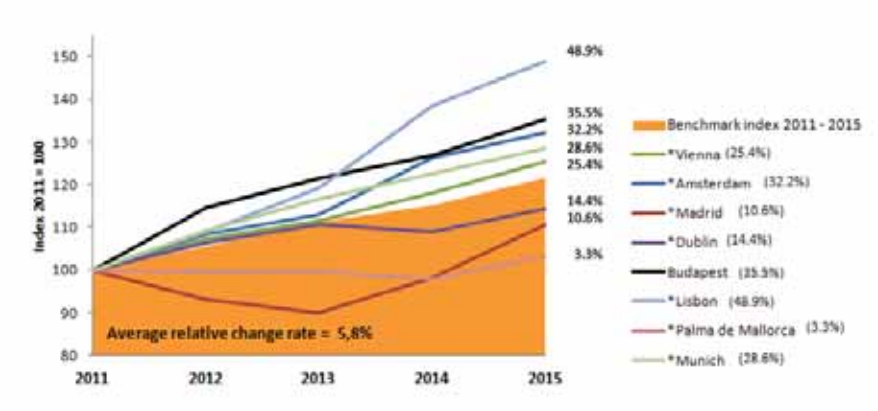


The average annual growth in international bednights across the top 15 European cities in 2011-2015 was 5.8% (as against 5% for total bednights). In other words, international bednights grew on average by 5.8% a year for the top 15 cities, and at a faster rate than for total bednights. Six cities performed average, led by Istanbul with an average annual growth of 10.9%. Vienna was the only city to record the average annual of 5.8%, while Paris once again recorded the lowest growth rate over the period of 0.4%.

Average annual growth in international bednights for top seven European conurbations, 2011-2015

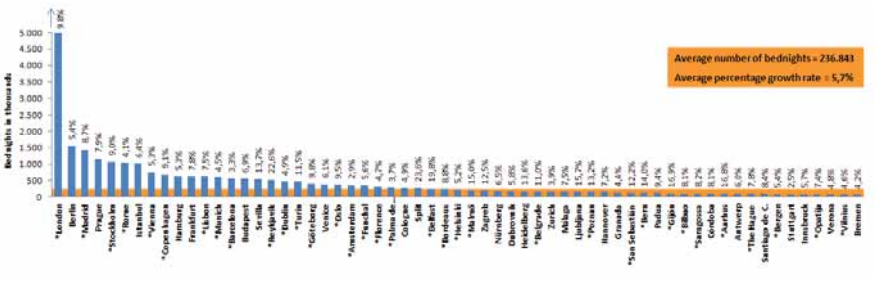


Average annual growth in total bednights for second-tier European cities, 2011-2015

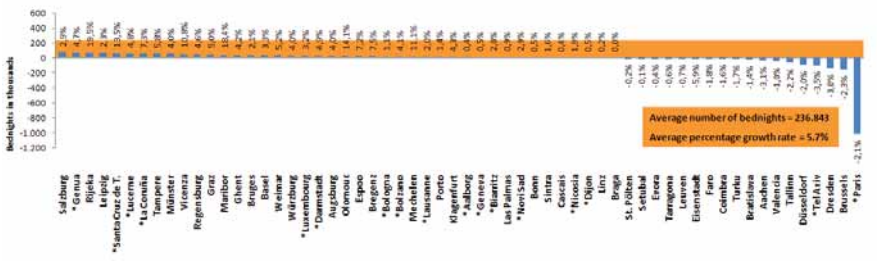


The two figures above show the annual growth rates of top 15 performers with regard to international bednight volume. The average growth across the top 15 cities was 5.8%. Since 2011, the biggest growth in international bednights was recorded by the same two cities as for total bednights, namely Istanbul (50%) and Lisbon (48.9%), while Paris once again recorded the lowest annual growth from 2011-2015 (1.2%).

Average nominal growth in total bednight volume for ECM report cities, 2014-2015



Average % growth in total bednight volume for ECM report cities, 2014-2015

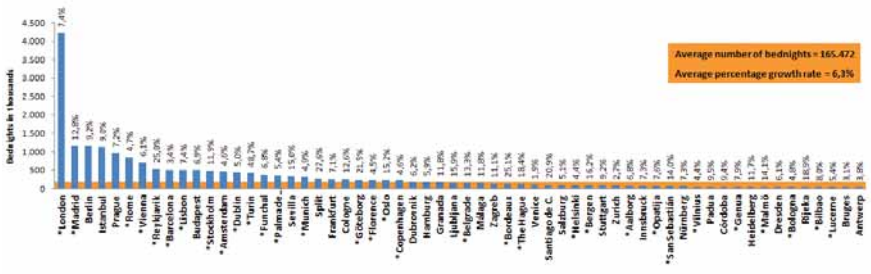


The two figures above compared the growth performance in total bednights of all the cities tracked in the ECM report – both in terms of the benchmark nominal average and the average percentage growth rate. It is interesting to note that in 2015, ECM report cities achieved an average growth rate of 5.7% in terms of total bednights – a pretty impressive performance given the different challenges that European cities faced throughout 2015 (e.g. the immigrant crisis, terrorist attacks, etc.).

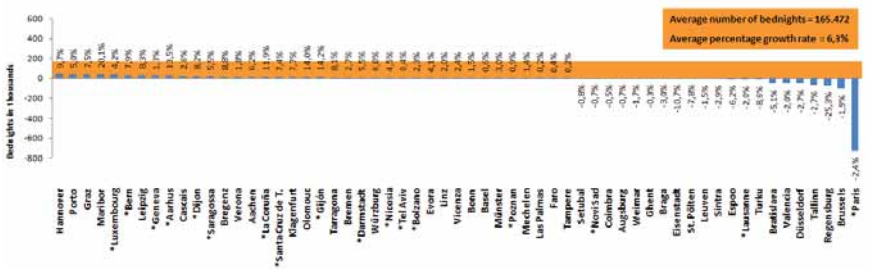
Not surprisingly, London had the highest growth rate among the top 15 cities in terms of bednight volume (+9.8%). However, in terms of percentage growth, cities such as Reykjavik, Split, Rijeka and Belfast were even more impressive, achieving outstanding growth of around 20%. More than 20 cities recorded growth rates of over 10%. In contrast, Paris, the second highest ranked city among the top 15 performers, suffered a decline of 2.1%, which can largely be attributed to terrorist attacks during the course of 2015. Some 17 other cities experienced the same negative trend as Paris – of between -0.1% (Setubal) and -5.9% (Eisenstadt).

Similar patterns are evident in Figures 1.8a and 1.8b below, which highlight 2015's growth performance in terms of international bednights – again showing both the benchmark nominal average and the average percentage growth rate. In 2015, international bednights increased at a faster rate than bednights overall (+6.3% vs.+5.7%). London's growth was not surprising at +7.4%, but a number of other cities recorded even stronger growth in international bednights – in particular, Turin (+48.7%). Other cities that should also be singled out as a result of their outstanding growth in international bednight volume in 2015 were Reykjavik (+25%), Split (+27.6%), Göteborg (+21.5%), Bordeaux (+25.1%), Santiago de Compostela (+20.9%), and Maribor (+20.1%), to name just a few. More than 20 cities achieved growth of over 10%. At the other end of the scale, 21 cities suffered negative growth of between -0.3% (Ghent) and -25.3% (Regensburg). And Paris (-2.4%) showed a similar decline in international bednights as it did in total bednight volume. All the results are shown in Figures 8a and 8b.

Average nominal growth in international bednight volume for ECM report cities, 2015/2014



Average % growth in international bednight volume for ECM report cities, 2015/2014



The results are also presented in the table below, ranking the 121 cities in order of bednight volume, highlighting the annual growth rate of each city in 2015. Table 2 presents the ranking for international bednight volume (for 119 of the 121 cities).

Ranking of ECM report cities based on total bednight volume, 2015

ECM Report Cities' Rankings Total Bednights

	Destination	Bednights 2015	2014-15 % change
1	*London	77.570.000	9,8%
2	*Paris	47.959.516	-2,1%
3	Berlin	30.250.064	3,4%
4	*Rome	26.420.620	4,1%
5	*Madrid	17.951.742	8,7%
6	*Barcelona	17.656.329	1,3%
7	Istanbul	16.899.509	6,4%
8	Prague	15.917.265	7,9%
9	*Vienna	15.138.670	5,3%
10	*Munich	14.055.968	4,5%
11	*Stockholm	12.918.890	9,0%
12	*Amsterdam	12.898.000	2,9%
13	Hamburg	12.639.295	5,3%
14	*Dublin	10.498.360	4,9%
15	*Lisbon	9.061.077	7,5%
16	Budapest	8.712.571	6,9%
17	Frankfurt	8.676.721	7,8%
18	*Copenhagen	8.159.252	9,1%
19	*Palma de Mallorca	8.046.237	3,7%
20	*Florence	7.102.706	4,7%
21	Venice	6.814.317	6,1%
22	*Funchal	6.630.809	5,6%
23	Brussels	6.458.325	-2,3%
24	Cologne	6.017.398	4,9%
25	*Helsinki	4.684.436	5,2%

ECM Report Cities' Rankings Total Bednights (Top 50)

	Destination	Bednights 2015	2014-15 % change
26	Sevilla	4.608.510	13,7%
27	*Turin	4.512.296	11,5%
28	*Göteborg	4.479.988	9,8%
29	*Aalborg	4.455.514	0,4%
30	Düsseldorf	4.403.960	-2,0%
31	*Oslo	4.388.700	9,5%
32	Dresden	4.308.631	-1,0%
33	Zurich	4.244.317	3,9%
34	Valencia	4.106.358	-1,0%
35	Stuttgart	3.961.490	2,5%
36	Dubrovnik	3.902.521	5,8%
37	Granada	3.150.676	4,4%
38	Nürnberg	3.011.065	6,1%
39	*Bordeaux	2.978.882	8,8%
40	*Geneva	2.952.659	0,5%
41	*Reykjavik	2.843.436	22,6%
42	Leipzig	2.829.824	2,3%
43	Tallinn	2.790.993	-2,2%
44	Salzburg	2.710.471	2,9%
45	*Tel Aviv	2.710.360	-1,5%
46	Málaga	2.295.983	7,5%
47	Hannover	2.232.282	7,2%
48	*Bologna	2.204.879	1,1%
49	Bremen	1.993.791	4,2%
50	Bruges	1.986.040	2,1%

ECM Report Cities' Rankings Total Bednights

	Destination	Bednights 2015	2014-15 % change
51	Antwerp	1.911.611	6,0%
52	*Vilnius	1.837.894	4,6%
53	*Bergen	1.771.782	5,4%
54	Bratislava	1.767.356	-1,4%
55	Verona	1.762.837	4,8%
56	Zagreb	1.754.920	12,5%
57	*Belgrade	1.660.955	11,0%
58	*Genua	1.659.372	4,7%
59	*Malmö	1.618.362	15,0%
60	Innsbruck	1.574.973	5,7%
61	*Belfast	1.561.470	19,8%
62	*Bilbao	1.560.185	8,1%
63	*Saragossa	1.535.379	8,2%
64	Córdoba	1.529.043	8,1%
65	Bonn	1.495.546	0,5%
66	*The Hague	1.485.000	7,8%
67	Padua	1.438.825	9,4%
68	Münster	1.418.658	4,0%
69	Heidelberg	1.389.495	11,6%
70	Split	1.373.757	23,6%
71	Cascais	1.316.287	0,4%
72	Porto	1.312.237	1,4%
73	*Poznan	1.300.768	13,2%
74	Santiago de C.	1.279.186	6,4%
75	*Lucerne	1.276.444	4,8%

ECM Report Cities' Rankings Total Bednights

	Destination	Bednights 2015	2014-15 % change
76	*Opatija	1.219.538	7,4%
77	Regensburg	1.202.896	4,6%
78	Basel	1.201.796	3,3%
79	Ljubljana	1.168.178	15,7%
80	*San Sebastián	1.165.489	12,2%
81	Las Palmas	1.154.758	0,9%
82	*Lausanne	1.133.031	2,0%
83	Graz	1.080.409	5,0%
84	*Luxembourg	1.074.211	3,2%
85	Ghent	1.040.469	4,2%
86	Tampere	1.013.324	5,8%
87	*Bern	1.004.707	14,0%
88	Aachen	979.520	-3,1%
89	Würzburg	891.801	4,0%
90	*La Coruña	840.744	7,3%
91	*Gijón	829.904	16,9%
92	*Dijon	802.705	0,5%
93	Linz	777.292	0,2%
94	Augsburg	775.704	4,0%
95	*Aarhus	774.521	16,8%
96	Turku	729.612	-1,7%
97	Weimar	697.695	5,2%
98	*Darmstadt	670.882	4,9%
99	*Biarritz	646.581	2,0%
100	*Bolzano	586.551	4,1%

ECM Report Cities' Rankings Total Bednights

	Destination	Bednights 2015	2014-15 % change
101	*Santa Cruz de T.	523.249	13,5%
102	Vicenza	500.734	10,8%
103	Coimbra	472.451	-1,6%
104	Leuven	431.065	-0,7%
105	Klagenfurt	419.061	4,3%
106	Rijeka	407.770	19,5%
107	Espoo	382.124	7,2%
108	Evora	374.302	-0,4%
109	Sintra	367.211	1,6%
110	Bregenz	356.759	7,5%
111	Tarragona	339.804	-0,6%
112	Faro	289.118	-1,8%
113	Maribor	282.734	18,4%
114	*Novi Sad	274.380	2,9%
115	Setubal	267.943	-0,1%
116	*Nicosia	262.949	1,9%
117	Olomouc	233.105	14,1%
118	Mechelen	226.810	11,1%
119	Braga	225.730	0,0%
120	St. Pölten	140.715	-0,2%
121	Eisenstadt	55.681	-5,9%

Ranking of ECM report cities based on international bednight volume, 2015

ECM Report Cities' Rankings International Bednights			
	Destination	Bednights 2015	2014-15 % change
1	*London	61.500.000	7,4%
2	*Paris	29.011.173	-2,4%
3	*Rome	19.011.407	4,7%
4	*Barcelona	15.025.854	3,4%
5	Prague	14.341.089	7,2%
6	Istanbul	13.652.461	9,0%
7	Berlin	13.648.135	9,2%
8	*Vienna	12.239.526	6,1%
9	*Amsterdam	10.661.000	4,6%
10	*Madrid	10.191.609	12,8%
11	*Dublin	9.216.040	5,0%
12	Budapest	7.709.602	6,9%
13	*Lisbon	7.221.095	7,4%
14	*Palma de Mallorca	7.080.017	5,4%
15	*Munich	6.974.615	4,9%
16	*Funchal	5.989.315	6,8%
17	Venice	5.789.713	1,9%
18	*Florence	5.427.130	4,5%
19	Brussels	5.213.615	-1,9%
20	*Copenhagen	5.118.468	4,6%
21	*Stockholm	4.485.270	11,9%
22	Frankfurt	3.891.729	7,1%
23	Zurich	3.235.963	2,7%
24	Dubrovnik	3.149.057	6,2%
25	Hamburg	3.108.279	5,9%

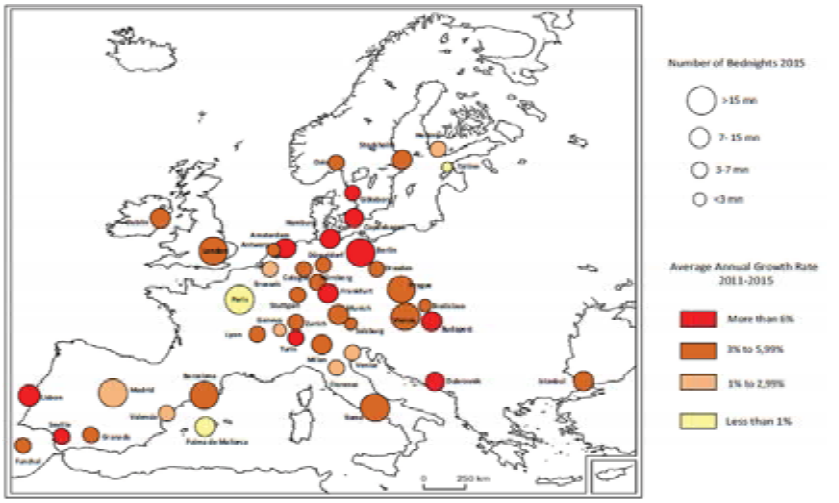
ECM Report Cities' Rankings International Bednights			
	Destination	Bednights 2015	2014-15 % change
26	Sevilla	2.642.503	15,0%
27	*Reykjavik	2.564.988	25,0%
28	Tallinn	2.470.426	-2,7%
29	*Geneva	2.386.805	1,3%
30	Valencia	2.375.083	-2,0%
31	*Helsinki	2.304.873	4,4%
32	Cologne	2.198.448	12,6%
33	*Tel Aviv	2.173.633	0,4%
34	Salzburg	2.047.644	5,1%
35	Düsseldorf	1.800.747	-2,7%
36	*Oslo	1.730.155	15,2%
37	Granada	1.616.547	11,8%
38	Bruges	1.594.072	3,1%
39	*Vilnius	1.419.006	4,4%
40	Málaga	1.406.754	11,8%
41	Zagreb	1.396.432	11,1%
42	*Göteborg	1.348.059	21,5%
43	*Aalborg	1.300.537	6,8%
44	Split	1.285.712	27,6%
45	*Belgrade	1.282.020	13,3%
46	Antwerp	1.275.030	3,8%
47	*Turin	1.253.110	48,7%
48	Innsbruck	1.162.747	7,3%
49	Ljubljana	1.119.559	15,9%
50	Stuttgart	1.115.582	9,2%

ECM Report Cities' Rankings International Bednights			
	Destination	Bednights 2015	2014-15 % change
51	*Bologna	1.100.324	4,8%
52	Cascais	1.085.084	2,6%
53	*Opatija	1.075.916	7,6%
54	Verona	1.015.434	1,8%
55	*Luxembourg	1.001.059	4,2%
56	Nürnberg	979.028	7,3%
57	*Lucerne	945.287	5,4%
58	Porto	918.160	5,0%
59	Bratislava	912.550	-5,1%
60	Dresden	879.397	6,1%
61	*The Hague	817.000	18,4%
62	*Genua	805.615	7,9%
63	Basel	803.617	0,6%
64	Córdoba	693.576	9,4%
65	Ghent	688.598	-0,3%
66	Padua	687.673	9,5%
67	*Bergen	678.081	16,2%
68	*Bordeaux	661.500	25,1%
69	*Bilbao	659.726	8,0%
70	Las Palmas	658.584	0,2%
71	*Lausanne	638.444	-2,0%
72	*San Sebastián	608.429	14,0%
73	Santiago de C.	596.012	20,9%
74	Graz	595.910	7,5%
75	Heidelberg	550.829	11,7%

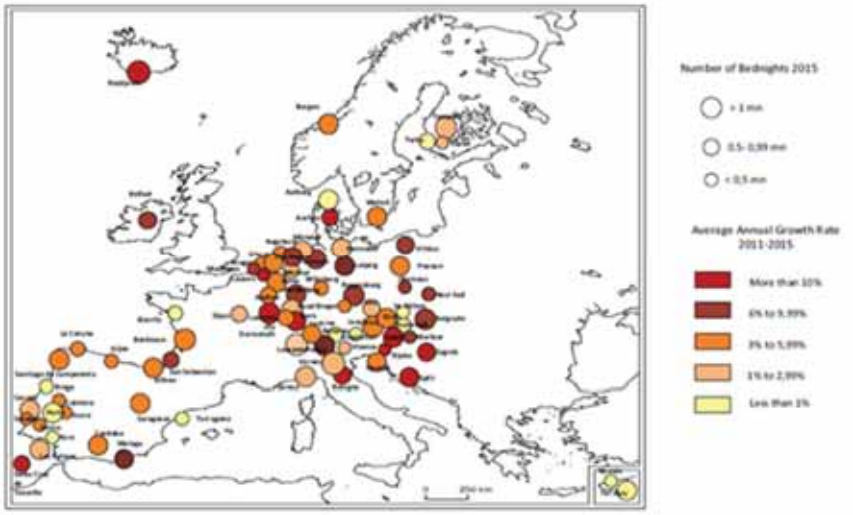
ECM Report Cities' Rankings International Bednights			
	Destination	Bednights 2015	2014-15 % change
76	Hannover	499.893	9,7%
77	*Bern	486.265	7,9%
78	Bremen	449.465	2,7%
79	*Malmö	431.310	14,1%
80	Leipzig	424.975	8,3%
81	*Saragossa	406.941	5,5%
82	Linz	406.290	2,0%
83	*Bolzano	376.062	2,3%
84	Bonn	356.057	1,5%
85	*Poznan	343.670	0,9%
86	Rijeka	315.098	18,9%
87	*Dijon	314.153	8,2%
88	Aachen	306.465	6,2%
89	Leuven	251.168	-1,5%
90	Coimbra	249.404	-0,5%
91	Vicenza	248.172	2,4%
92	*Aarhus	244.251	13,5%
93	Bregenz	244.079	8,8%
94	Maribor	241.265	20,1%
95	*Santa Cruz de T.	229.266	7,4%
96	*Nicosia	224.967	4,5%
97	Regensburg	224.528	-25,3%
98	Sintra	210.300	-2,9%
99	Faro	208.300	0,4%
100	Klagenfurt	206.035	7,7%

ECM Report Cities' Rankings International Bednights			
	Destination	Bednights 2015	2014-15 % change
101	*Darmstadt	202.943	5,5%
102	Evora	200.741	4,1%
103	Augsburg	181.613	-0,7%
104	Würzburg	178.942	6,0%
105	*Novi Sad	177.825	-0,7%
106	Tarragona	168.162	8,1%
107	Tampere	167.611	0,2%
108	*La Coruña	165.732	11,5%
109	Espoo	146.230	-6,2%
110	Turku	143.258	-8,6%
111	Münster	140.048	3,0%
112	Mechelen	123.450	1,4%
113	Olomouc	116.885	14,0%
114	Setubal	114.828	-0,8%
115	*Gijón	112.156	14,2%
116	Weimar	81.781	-1,7%
117	Braga	66.119	-3,0%
118	St. Pölten	40.872	-7,8%
119	Eisenstadt	22.509	-10,7%

Premier league cities: average annual growth in total bednights, 2011-2015

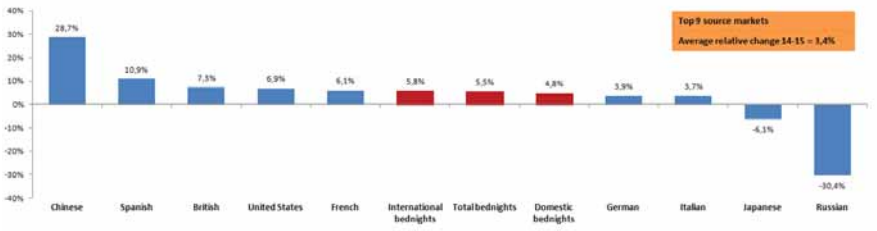


Second division cities: average annual growth in total bednights, 2011-2015



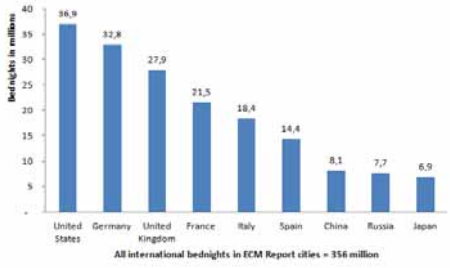
The two figures above provide a graphic display of the average annual growth rates in total bednights in 2011-2015. Premier league cities (>1.5 million bednights annually) and those in the second division (< 1.5 million bednights annually) are analysed separately. In both cases, circles in red denote the cities that recorded the highest growth rates over the past five years (more than 6% for the premier league and 10% for the second division, respectively) – cities such as Lisbon, Berlin, and Reykjavik) – while yellow circles mark the cities with less than 1% growth (Paris, Palma de Mallorca, Turku and Bolzano, to name a few).

Europe's leading source markets, 2015

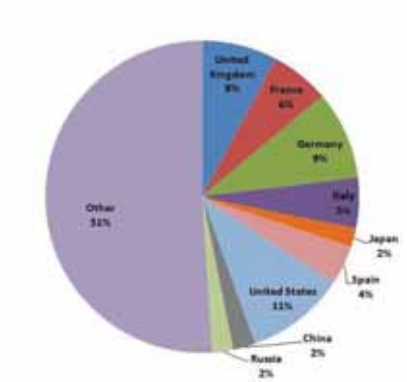


International bednight volumes for leading source markets, 2015

	Source Market	Bednights 2015	2014-15 % change
1	United States	36.874.400	6,9%
2	Germany	32.841.377	3,9%
3	United Kingdom	27.857.663	7,3%
4	France	21.519.029	6,1%
5	Italy	18.390.057	3,7%
6	Spain	14.387.916	10,9%
7	China	8.113.831	28,7%
8	Russia	7.692.278	-30,4%
9	Japan	6.879.590	-6,1%

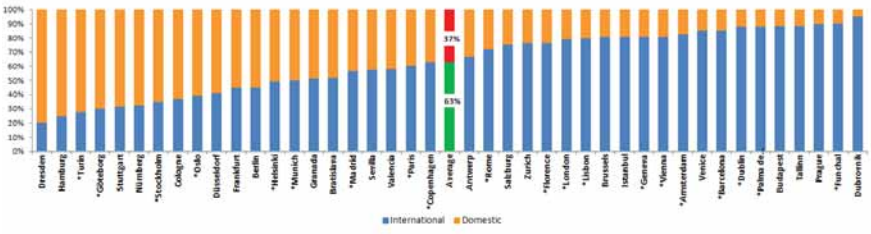


The relative size of leading international source markets, 2015

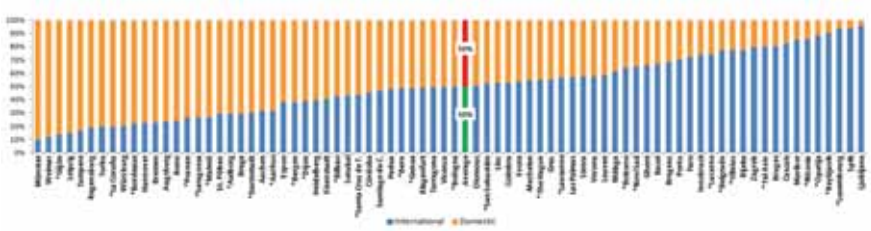


The three figures above shift the focus of analysis from bednights overall (total and international) to bednight volume generated by the leading nine source markets. The average growth for the nine markets overall was 3.4%, despite sharp declines from Russia (-30.4%) – due to the country's economic situation – and Japan (-6.1%). All other leading markets showed positive growth. The Chinese market recorded the highest increase (+28.7%), followed by Spain (+10.9%), with the remainder falling between +3.7% (Italy) and +7.3% (UK). Negative trend in Russian market could probably be attributed to the economic situation in the country. The leading markets in terms of volume were the USA, Germany and the UK.

Premier league cities: international versus domestic bednights, 2015



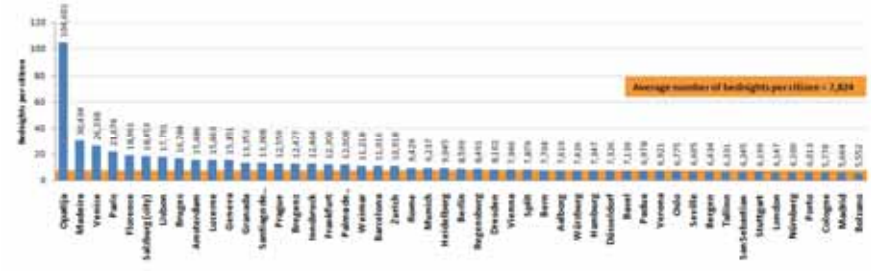
Second division cities: international versus domestic bednights, 2015



The two figures above present the relative shares of international versus domestic bednights in 2015, both for premiere league and second division cities. On average, however, premier league cities showed a much higher share of international bednights than domestic nights (63% vs. 37%), demonstrating the importance of their foreign source markets. If this trend continues over the next few years, city tourism and other destination management organisations (CTOs and DMOs) should carefully monitor trends from these rapidly growing markets.

The pattern was rather different for second division cities, for which international and domestic shares were roughly equal.

ECM report cities' tourism density (total bednights), 2015



ECM report cities' tourism density (total bednights) 2015 cont.

The two figures above show the tourism density for the different cities covered by the ECM report – i.e. total bednights as a percentage of the urban population. As might be expected due to patterns of seasonality, tourism density values for individual cities can and do fluctuate throughout the year. In terms of annual values, however, Opatija recorded the highest tourism density in the sample (close to 105 bednights per citizen), whereas the average for the entire sample was about 7.8. Most cities were below the average. Care should be taken in interpreting the overall average, however, since it would look very different if Opatija (an extreme case) were excluded from the count.

1.2 Measuring city tourism competitiveness: a case study of 27 European cities

Following a synthesis of various frameworks of sustainable tourism indicators proposed by the World Travel & Tourism Council (WTTC), the World Tourism Organization (UNWTO) and Eurostat, this report proposes the application of data envelopment analysis (DEA) to measure city tourism competitiveness (Önder et al. 2016).

Until now, the most comprehensive research on destination competitiveness has been undertaken by Ritchie and Crouch, with their work on indicators and performance measurement appearing in multiple publications over a period of more than ten years[1]. By way of example, Ritchie and Crouch developed a comprehensive list of indicators combining 'subjective consumer measures' and 'objective industry measures' for each of 32 destination competitiveness 'components'.

The Competitiveness Monitor initiated by WTTC, and which later became the World Economic Forum's (WEF's) *Travel and Tourism Competitiveness Report*, was the first practical initiative to transform the gargantuan compilation of competitiveness components by Ritchie and Crouch into a composite destination competitiveness index.

During the search for a composite destination competitiveness index, little attention has been paid by researchers to the aggregation method. Computing (unweighted or weighted) sums of the observed indicators is the simplest way of building compound 'indices' used in several approaches[2]. This is far from satisfactory as long as the weights lack theoretical justification. As such, the majority of destination competitiveness models appear to be systems of definitional rather than cause-effect relationships. Enright and Newton (2005) at least aim to determine the relative importance of tourism indicators by incorporating direct expert judgements of the importance of 15 attractors and 37 business factors determining the relative tourism competitiveness of Hong Kong, Singapore and Bangkok. A more advanced model was introduced by Crouch and Ritchie in 2005 and Crouch (2011), applying the 'Eigenvector' method for indirectly judging destination competitiveness criteria.

In 2007, Mazanec et al. raised a number of criticisms regarding the epistemological nature of definitional models of destination competitiveness and, consequently, propose a moderately revised latent variable model for transforming the WTTC Competitiveness Monitor into an explanatory model. The authors find that neither the tourism related factors 'tourism price competitiveness' and 'tourism related

[1] Ritchie and Crouch, 1993, 2005; Crouch and Ritchie, 1994, 1995, 1999, 2005; Ritchie et al., 2001).
[2] Gooroochurn and Sugiyarto, 2005; Blanke and Chiesa, 2014.

infrastructure', nor the more loosely associated dimensions of 'environmental preservation' and 'openness', were confirmed as factors contributing to overall destination competitiveness, as defined by market share and market growth indicators. From the eight dimensions originally proposed under the WTTC framework, only two sub-fields remained: the education ('human resources') and the economic wealth ('social') index. Without adding the 'heritage and culture' component (represented by the number of UNESCO heritage sites per country) the entire model performed poorly. This study led to a number of questions, such as: Should external criteria for destination competitiveness be characterised as indicators, or considered to be effects within the overall causal chain? And how should tourism destination policy-makers decide which destinations to consider as tough competitors?

Previous research has also identified a variety of sustainability indicators. However, although these indicators are scientifically relevant, they are too complex to be operational due to the lack of data or human resources to collect the data. The following case study is not concerned with identifying new indicators, but rather with using the commonly accepted indicators for measuring sustainability efforts of city destinations by applying the well-known data envelopment analysis (DEA) methodology. Thus, it is a means of achieving a partial model of urban destination competitiveness based on the previously accepted indicators.

DEA is a non-parametric technique that measures the relative efficiency of Decision Making Units (DMUs), which are assumed to have the same objectives. A few examples of DMUs include banks, hotels, travel agencies, hospitals and destinations[3] DEA is primarily described as "…a method for performance evaluation and benchmarking against best practice"[4]. What makes this method particularly interesting is the fact that multiple input and output variables can be processed, irrespective of the units of their measurement, without having any a priori information about the importance of the individual variables[5].

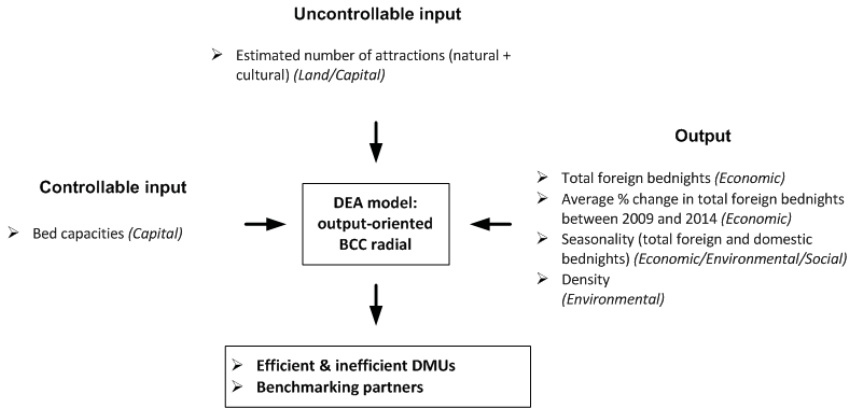
Within the tourism and hospitality domain, DEA has been applied widely in studies concerning hotels[6], destinations[7] and travel agencies[8].

[3] Bauernfeind and Mitsche, 2008; Wöber, 2002.
[4] Cook et al., 2014, p.1.
[5] Herrero and Salmeron, as cited in Bauernfeind and Mitsche, 2008; Wöber and Fesenmaier, 2004.
[6] Evaluation of hotel general managers' performance by Morey and Dittman, 1995; hotel productivity by Johns et al., 1997; Internet marketing strategies in the Greek hotel sector by Sigala, 2003); corporate travel management (Bell and Morey, 1994).
[7] Competitiveness of 103 Italian regions by Cracolici et al., 2008; sustainable tourism management of 20 Italian regions by Bosetti et al., 2006; tourism advertising programmes in the USA by Wöber and Fesenmaier, 2004; marketing strategies of European museums by Remich, 2002); tourism website evaluations (Bauernfeind and Mitsche, 2008.
[8] Köksal and Aksu, 2007.

Taking the above information into account, the purpose of applying DEA to benchmarking urban tourism destinations is twofold: (1) the identification of efficient and inefficient cities (DMUs); and (2) the proposal of benchmarking partners and virtual reference, or the inefficient ones.

The aim of the following DEA case study is not to present and test a complete model that captures all possible indicators as listed in the Appendix 1 (see two tables). Instead, the aim is to provide a partial model that includes already existing and readily available indicators for the number of cities that can be used for destination benchmarking. In addition to the previously mentioned features of TourMIS, there are unfortunately still only a few more indicators that can be used for measuring the sustainability of city tourism in Europe. Specifically, six indicators were modelled in the DEA framework of the current study, as shown in the figure below.

DEA framework of current study



Source: Authors' own elaboration from Bauernfeind and Mitsche (2008, p. 250)

The decision on choice of destination-oriented indicators was made with respect to data availability and comparability and in order to have all dimensions of sustainability (economic, environmental, and social) represented in the analysis. In more detail, two input variables were used: bed capacity (controllable variable) and estimated number of attractions (natural + cultural, uncontrollable variable). Input variables are classified as either controllable or uncontrollable depending on whether they are under the control of the decision-makers or not. On the output side, four indicators were used: (1) total foreign

bednights; (2) average percentage change in total foreign bednights between 2009 and 2014; (3) seasonality based on total foreign and domestic bednights; and finally, (4) tourism density.

The number of variables (2 inputs and 4 outputs) used in the current model is far from exhaustive, hence it is a partial rather than a holistic model. What is important, though, is that the proposed model tries to embrace as many dimensions of the sustainability paradigm as data that is available and comparable, and it can easily be extended in the future. All the data used in the current analysis is from the period 2009-2014 and comes from TourMIS, with the exception of the estimated number of natural and cultural attractions (statistics assembled through direct contact with CTOs).

The final sample for the case study included 27 European cities – the selection of which was made solely on the data availability for all six indicators (thus, no missing values in the dataset). A list of the cities that formed part of the study is shown in the second column of Table 4. The number of DMUs in the study sample (27) also meets the 'rule of thumb' principle that the number of DMUs should be twice (or even three times) the sum of inputs and outputs used in the study[9] .

The process of DEA modelling used an output-oriented Banker, Charnes and Cooper (BCC) radial model as the aim was ultimately to improve the outputs, whereas input values remain constant (Banker et al., 1984). Hence, as DEA maximises all output measures in the output-oriented model, reciprocal values were used for seasonality and density in the current model, as these are the variables that should ideally be minimised, while opposite holds true for the remaining two output variables. Furthermore, Efficiency Measurement System (EMS) software version 1.3 was used for all DEA computations due to the number of advantages this non-commercial software affords: i.e. it is free for academic users, it uses various models and features, it includes uncontrollable variables, and it provides single summary table of results, etc.[10]

[9] Cook et al., 2014.
[10] Scheel, 2000; Scheel, n.d.; Barr, 2004.

1.3 Results of the DEA analysis

A brief look at the descriptive statistics reveals heterogeneity among the cities on all six indicators used in the current study, which is not surprising given the varying sizes of the cities that were represented in the sample. With regard to seasonality and density indicators, actual numbers are shown, while reciprocal values were used in the computations of efficiency scores, for the reasons mentioned previously. Descriptive results are detailed in the table below.

Descriptive statistics of the indicators used in the DEA model

Inputs	Maximum	Minimum	Mean	Standard deviation
Bed capacities	152618	4114	28060,26	34821,31
Estimated number of attractions (natural + cultural)	9155	20	562,56	1860,40
Outputs				
Seasonality (total foreign and domestic bednights)	0,24	0,07	0,14	0,05
Density	15,16	1,84	6,42	3,88
Total foreign bednights	21693993	69872	2835253,70	4560233,39
Average % change in total foreign bednights between 2009 and 2014	16,60	-4,29	4,71	4,27

The table below summarises the DEA results. This table is sorted by the efficiency score for each city (column 3). The fourth column provides suggestions for benchmarking partners and their associated weights for every inefficient city, whereas for each efficient city the column indicates the number of other cities for which that unit is proposed as a benchmarking partner.

The results show that 10 cities were inefficient, while the remaining 17 were efficient based on the given input/output combination. More specifically, the most inefficient city was Bratislava (37.22% inefficient), followed by Dresden (34.79% inefficient) and Helsinki (30.42%). As this is an output-oriented model, the aforementioned percentages represent the extent to which each of the three cities has the potential to improve at least one of its output values with their given resources. In case of Bratislava, five benchmarking partners have been proposed as the best practice examples. However, when looking into the corresponding allocation of weights, this city should look primarily at the performance of Vilnius, as it has the highest weight allocated (0.39). Furthermore, four benchmarking partners have been proposed for Dresden, the most important being Turin (weight of 0.54), whereas Ljubljana (0.36) was identified as the most important point of comparison for Helsinki. The best performer among the inefficient cities, based on the given input/output combination, was Copenhagen (6.19%) and one could argue that this is a case of only marginal inefficiency. Nevertheless, four benchmarking partners have been identified for this city, the most relevant again being Ljubljana (weight of 0.43).

Main findings of the DEA

	City	Score	Benchmarks & Weights (Ineff.) / Benchmark Appearance (Eff.)
Inefficient DMUs			
4	Bratislava	137,22%	1 (0,18) 2 (0,04) 9 (0,37) 23 (0,02) 26 (0,39)
7	Dresden	134,79%	2 (0,02) 15 (0,31) 23 (0,54) 26 (0,13)
13	Helsinki	130,42%	1 (0,12) 2 (0,08) 15 (0,36) 21 (0,10) 27 (0,34)
18	Munich	125,11%	2 (0,49) 19 (0,03) 21 (0,30) 23 (0,18)
20	Salzburg	115,25%	2 (0,13) 8 (0,62) 17 (0,25)
5	Bruges	114,54%	1 (0,00) 15 (0,34) 16 (0,34) 27 (0,32)
3	Berlin	111,48%	19 (0,37) 23 (0,63)
22	Tallinn	108,24%	15 (0,64) 23 (0,08) 25 (0,16) 26 (0,11) 27 (0,00)
14	Lisbon	107,90%	2 (0,24) 15 (0,26) 23 (0,17) 25 (0,22) 26 (0,10)
6	Copenhagen	106,19%	2 (0,29) 15 (0,43) 23 (0,17) 26 (0,12)
Efficient DMUs			
10	Graz	94,96%	0
25	Vienna	94,38%	2
11	Hamburg	93,97%	0
16	Lucerne	92,11%	1
8	Ghent	87,76%	1
12	Heidelberg	86,08%	0
27	Zurich	78,07%	3
26	Vilnius	75,61%	5
9	Gijon	72,75%	1
1	Antwerp	67,65%	3
21	Stuttgart	59,78%	2
23	Turin	54,72%	7
19	Paris	44,36%	2
2	Barcelona	37,29%	7
15	Ljubljana	big	6
17	Malmö	big	1
24	Turku	big	0

One strategy adopted in the DEA to address problems of incomparability of individual units is to merge potential benchmark units into a composite unit (frequently referred to as a 'virtual unit') according to their allocated weights. In the calculation of the virtual references it is understood that such a virtual or composite unit is the result of merging individual potential partners based on the assumption that the resulting composite represents a feasible solution for the unit under evaluation (Wöber and Fesenmaier, 2004). In this particular case study, such a reference city was defined for Bratislava (the most inefficient city) through the linear combination of its five referenced peers: Antwerp, Barcelona, Gijon, Turin, and

Vilnius, according to the corresponding weights of 0.18, 0.04, 0.37, 0.02, and 0.39 respectively. This result is shown in the table below.

Virtual reference for Bratislava

Inputs	Bratislava	Virtual reference	Difference
Bed capacities	12086	11384	702
Estimated number of attractions (natural + cultural)	150	150	0
Outputs			
Seasonality (total foreign and domestic bednights)	0,20	0,14	0,06
Density	3,11	2,27	0,84
Total foreign bednights	707272	970503	-263231
Average % change in total foreign bednights between 2009 and 2014	2,60	3,57	-0,97

It is evident that one of Bratislava´s input values (bed capacity) is higher than that of its virtual reference, whereas when it comes to the uncontrollable variable, attractions, the values of Bratislava and its virtual reference are equal. However, differences were apparent when looking at all four output values. First, the seasonality and density figures of both Bratislava and its virtual benchmark were converted back to the original scale after computations. It is apparent that, in both cases, Bratislava had higher figures compared to its virtual reference. Lower seasonality figures imply that visitor arrivals to the city are spread throughout the year – a goal that many destinations aim to achieve. In addition, lower density values indicate a lower visitor to resident ratio. On the one hand, higher density translates into more visitors (more arrivals, more bednights, more money spent at the destination, etc.), which yields economic benefits for the destination. However, from an environmental and social point of view, any increase in density may not be considered as optimal since it can cause crowding in specific areas and lower resident satisfaction.

Furthermore, the performance of Bratislava is striking with respect to the remaining two output metrics. In 2009, the city was underperforming in terms of total foreign bednights (72.88% of its virtual reference) and average % change in total foreign bednights between 2009 and 2014 (72.83% of its virtual reference). This suggests that Bratislava is not using its resources efficiently, and that with the given inputs it has the potential to improve its outputs up to the values suggested by its virtual reference, as shown in the table above.

With regard to the efficient cities, the DEA reported ´big´ under their efficiency scores for three cities (Ljubljana, Malmö and Turku), which indicates infeasible solutions arguably due to their extremely high efficiency results (Boljuncic, as cited in Wöber and Fesenmaier, 2004). Of the efficient cities with

numerical scores, it is evident that Barcelona is the most efficient, closely followed by Paris and Turin. What is also interesting to observe is that while both Barcelona and Graz are considered to be efficient cities, Barcelona outperforms Graz by 57.67% based on the six sustainability indicators used in this study. In terms of benchmark appearances, Barcelona and Turin are the leaders as they are each identified as reference cities for seven other cities in the sample, followed by Ljubljana (reference for six cities) and Vilnius (reference for five cities). Four cities did not appear as benchmarks at all. Hence, these cities were not considered to be examples of best practice, despite being efficient themselves.

1.4 Conclusions of the DEA case study

In the previous DEA case study, an attempt was made to measure city tourism competitiveness by using data from TourMIS relating to the three dimensions of sustainability. The DEA case study includes only two input and four output indicators and when interpreting the results, reader should bear in mind that this is only a partial model to demonstrate the power of DEA analysis for multi-objective performance benchmarking of city tourism destinations. A more realistic, full model would also need to consider indicators that describe market chances, tourism-generated income effects, tourism policy, tourist satisfaction, marketing investments by the industry, etc. However, these indicators are either not available or not comparable for European cities.

Despite the fact that the performance evaluation of the cities was made using only a small number of indicators and, the results still point to a number of managerial and political implications for city tourism policy-makers. A number of best-practice examples can be proposed for each of the inefficient cities in order to inform and improve their performance. In other words, policy-makers may investigate how these cities use their resources in order to reach their objectives and thus learn how to optimise their own performance. Another strength of applying DEA for measuring city tourism competitiveness is the identification of benchmarking partners. Each of the proposed benchmarks has a weight allocated, which reveals the importance of that benchmarking partner for the inefficient unit. By following up on benchmark cities with a high weighting, a city policy-maker is able to learn from these individual best-practice examples. Although there is no such thing as a universal best practice for all cities based on a given input/output combination, it is very much apparent which of the efficient cities were absolute winners when it came to their number of appearances as benchmarks, so one could argue that they come as close as possible to being labelled as *the* examples of best practice.

Furthermore, the concept of virtual reference that was calculated for the most inefficient unit in the sample, Bratislava, can be of help to CTOs in order to analyse the strengths and weaknesses of their

destinations. As an example, it is apparent that Bratislava must deploy its given input variables more efficiently if it is to boost its output values – and also that it has the potential to do so. Again, a word of caution is in order, as the analysis for this case study was made with a very limited number of indicators and only for one period (2009-2014), and results as such may not be easy to generalise for the individual destinations.

In order to overcome this limitation, future research should include more indicators for potential resources and city tourism policy objectives that stem from alternate sources (see two tables in Appendix 1). However, this remains very much subject to data availability and comparability. DEA results may change entirely if there are any alterations either in the sample or in the variables (or in both), which happens to be one of the major limitations of DEA that must be taken into account[11].

Given recent trends, it appears reasonable to assume that city tourism will continue to grow in terms of market share. In this context, CTOs and DMOs need to take environmental and social objectives in tourism policy and research more seriously. Professional networks in tourism at all regional levels must go beyond marketing and branding, in order to emphasise responsible tourism and strengthen the link between the various stakeholders in their destinations. By raising awareness of the economic, environmental and social impacts of city tourism, cities will lead the way in supranational tourism policy.

The methodology of city tourism metrics is detailed in Appendix 1 of this report.

[11] Bauernfeind and Mitsche, 2008.

1.5 Other tourism indicators

The figure below summarises some of the main tourism-related indicators, excluding all those related to air transport, which are included in Section 2. They comprise hotel operating performance from PwC, the International Congress and Convention Association's (ICCA's) global city ranking based on number of international association meetings organised annually, and MasterCard International's tourism economic impact rankings – rating cities by overnight visitor spending.

In addition to Paris and London, which continue to rank strongly, other leading cities in one or more categories include Geneva, Zurich, Barcelona, Dublin, Edinburgh, Barcelona, Amsterdam, Lisbon, Milan and Prague. The different indicators/indices are self-explanatory.

N.B. The analysis shown in this section is all from sources that are available in the public domain. Additional city tourism data is available from companies such as Euromonitor, Oxford Economics, Jones Lang Lasalle, Horwath International and STR on a subscription basis.

Summary matrix of tourism-related indicators

Blank - indicates that the destination was not included in the ranking or data is not available.

Indices Ranking	Between 1-3	Between 4-10	Between 11-25	Between 25-50	Over 50	Not included

	Amsterdam	Athens	Barcelona	Belgrade	Berlin	Brussels	Budapest	Cardiff	Copenhagen	Dublin	Edinburgh	Geneva	Hamburg	Helsinki	Lisbon	London	Madrid	Marigot	Milan	Minsk
ICCA international events 2015 - ranking	12	24	3	52	1	13	19	276	10	18	35	57	69	33	9	5	5		21	
PwC Occupancy Rankings 2015	4		7		6	13				2	3	18			9	1	16		15	
PwC Occupancy Rankings 2017 (F)	4		8		6	13				3	2	16			9	1	14		19	
PwC ADR Rankings 2015	7		9		14	12				11	10	1			16	4	15		5	
PwC ADR Rankings 2017 (F)	6		7		16	12				10	11	2			15	4	14		9	
PwC RevPAR Rankings 2015	6		9		14	12				10	8	2			15	4	16		5	
PwC RevPAR Rankings 2017 (F)	6		8		13	12				5	9	3			14	2	16		11	
MasterCard international overnight visitor spend 2015 - ranking			6		20											1	15			

Indices Ranking	Between 1-3	Between 4-10	Between 11-25	Between 25-50	Over 50	Not included

	Moscow	Nice	Nicosia	Paris	Plovdiv	Pomorie	Prague	Riga	Rome	Sevilla	Sofia	Thessalonki	Torino	Valletta	Varna	Veliko Tarnovo	Vienna	Zurich
ICCA international events 2015 - ranking	89	70		2			11	52	17	100	132	163	117	230	335		4	44
PwC Occupancy Rankings 2015	19			5			8		17								11	10
PwC Occupancy Rankings 2017 (F)	18			5			7		17								10	11
PwC ADR Rankings 2015	19			2			17		6								13	3
PwC ADR Rankings 2017 (F)	19			1			17		5								13	3
PwC RevPAR Rankings 2015	19			1			17		7								13	3
PwC RevPAR Rankings 2017 (F)	19			1			17		7								15	4
MasterCard international overnight visitor spend 2015 - ranking				3					19									

1.5.1 Hotel Performance Indicators

Source: PwC, Staying power – European cities hotel forecast for 2016 and 2017 (5th Edition, March 2016) at http://www.pwc.com/hospitality.

Commented [GC1]: Awaiting permission.

Key findings from the PwC 5th European cities hotel forecast:

- 'Despite global economic worries, 2015 (…) saw record hotel trading and double digit Revenue per available room (RevPAR) growth across eight of the cities'
- 'All the cities, except two, are expected to achieve some growth in both 2016 and 2017'
- 'Most cities will see a continued increase in Average Daily Rate (ADR) particularly Dublin, Lisbon, Porto, Barcelona and Madrid.'

'European cities **hotel forecast 2016 and 2017** analyses trading trends and provides econometric forecasts **for 19 cities, all national or regional capitals of finance, commerce and culture**.'

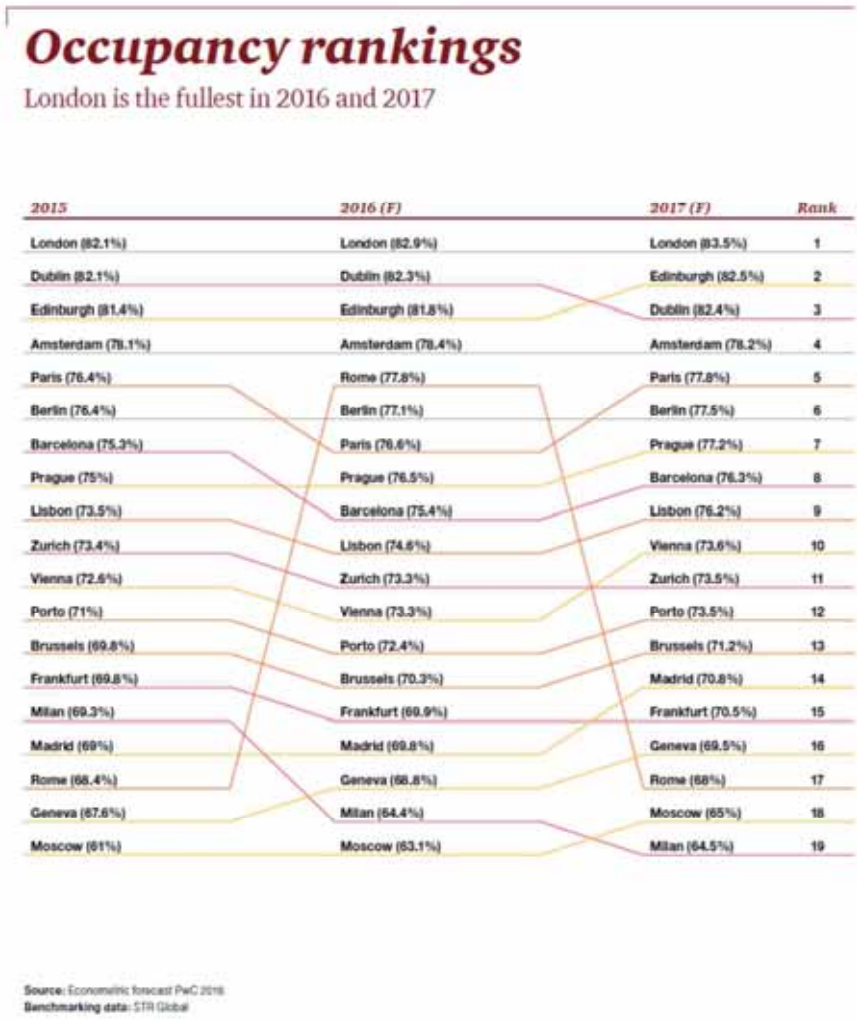
17 out of the 19 cities covered in the survey are WTCF European Cities Members.

- In terms of occupancy rankings, London is expected to be the fullest in 2016 (82.9%) and 2017 (83.5%)
- In terms of ADR, Paris is expected to lead with EUR 252.5 in 2016 and EUR255.3 in 2017
- In terms of RevPAR rankings, Paris is expected to keep its first place.

PwC, Staying power – European cities hotel forecast for 2016 and 2017 (WTCF European City Members only) 2015 ranking in red

Occupancy rankings 2017(F)		ADR Rankings 2017 (F)		RevPAR Rankings 20017 (F)	
1	London (1)	1	Paris (2)	1	Paris (1)
2	Edinburgh (3)	2	Geneva (1)	2	London (4)
3	Dublin (2)	3	Zurich (3)	3	Geneva (2)
4	Amsterdam (4)	4	London (4)	4	Zurich (3)
5	Paris (5)	5	Rome (6)	5	Dublin (10)
6	Berlin (6)	6	Amsterdam (7)	6	Amsterdam (6)
7	Prague (8)	7	Barcelona (9)	7	Rome (7)
8	Barcelona (7)	9	Milan (5)	8	Barcelona (9)
9	Lisbon (9)	10	Dublin (11)	9	Edinburgh (8)
10	Vienna (11)	11	Edinburgh (10)	11	Milan (5)
11	Zurich (10)	12	Brussels (12)	12	Brussels (12)
13	Brussels (13)	13	Vienna (13)	13	Berlin (14)
14	Madrid (16)	14	Madrid (15)	14	Lisbon (15)
16	Geneva (18)	15	Lisbon (16)	15	Vienna (13)
17	Rome (17)	16	Berlin (14)	16	Madrid (16)
18	Moscow (19)	17	Prague (17)	17	Prague (17)
19	Milan (15)	19	Moscow (19)	19	Moscow (19)

Occupancy rankings



ADR (Euros) rankings

ADR (Euros) rankings

Paris tops the chart as Geneva slips a notch

2015	2016 (F)	2017 (F)	Rank
Geneva (€252.5)	Paris (€252.5)	Paris (€255.3)	1
Paris (€252.1)	Geneva (€246.8)	Geneva (€234.2)	2
Zurich (€218)	Zurich (€219.2)	Zurich (€211.4)	3
London (€194.4)	London (€202.2)	London (€202.2)	4
Milan (€151.9)	Rome (€156.5)	Rome (€153)	5
Rome (€148.5)	Amsterdam (€133.9)	Amsterdam (€137.1)	6
Amsterdam (€131.2)	Barcelona (€129.1)	Barcelona (€134.7)	7
Frankfurt (€125.9)	Frankfurt (€128.4)	Frankfurt (€131.1)	8
Barcelona (€125.1)	Milan (€125.9)	Milan (€130.9)	9
Edinburgh (€116.6)	Edinburgh (€122.5)	Dublin (€130.6)	10
Dublin (€111.1)	Dublin (€120.9)	Edinburgh (€123)	11
Brussels (€106.8)	Brussels (€107.2)	Brussels (€108.2)	12
Vienna (€99.6)	Vienna (€100.4)	Vienna (€101.4)	13
Berlin (€93.3)	Madrid (€97.4)	Madrid (€99.7)	14
Madrid (€93)	Berlin (€95.4)	Lisbon (€99)	15
Lisbon (€90.7)	Lisbon (€94.6)	Berlin (€97.4)	16
Prague (€78.2)	Prague (€81.8)	Prague (€85)	17
Porto (€71.4)	Porto (€73.2)	Porto (€76.3)	18
Moscow (€68)	Moscow (€70.1)	Moscow (€70.4)	19

Source: Econometric forecast PwC 2016
Benchmarking data: STR Global

RevPAR (Euros) rankings

RevPAR (Euros) rankings

Paris keeps its crown as London heads upwards

2015	2016 (F)	2017 (F)	Rank
Paris (€192.6)	Paris (€193.4)	Paris (€198.6)	1
Geneva (€170.8)	Geneva (€169.6)	London (€168.7)	2
Zurich (€160)	London (€167.5)	Geneva (€162.8)	3
London (€159.6)	Zurich (€160.8)	Zurich (€155.4)	4
Milan (€105.3)	Rome (€121)	Dublin (€107.6)	5
Amsterdam (€102.5)	Amsterdam (€105)	Amsterdam (€107.2)	6
Rome (€101.6)	Edinburgh (€100.2)	Rome (€103.1)	7
Edinburgh (€95)	Dublin (€99.5)	Barcelona (€102.7)	8
Barcelona (€94.3)	Barcelona (€97.4)	Edinburgh (€101.5)	9
Dublin (€91.2)	Frankfurt (€89.8)	Frankfurt (€92.4)	10
Frankfurt (€87.8)	Milan (€79.8)	Milan (€83.1)	11
Brussels (€76)	Brussels (€75.4)	Brussels (€77)	12
Vienna (€72.3)	Vienna (€73.5)	Berlin (€75.4)	13
Berlin (€71.2)	Berlin (€73.5)	Lisbon (€75.3)	14
Lisbon (€66.7)	Lisbon (€70.5)	Vienna (€74.6)	15
Madrid (€64.2)	Madrid (€67.9)	Madrid (€70.5)	16
Prague (€58.7)	Prague (€62.5)	Prague (€65.6)	17
Porto (€50.6)	Porto (€52.9)	Porto (€56)	18
Moscow (€41.5)	Moscow (€44.2)	Moscow (€45.8)	19

Source: Econometric forecast PwC 2016
Benchmarking data: STR Global

1.5.2 Convention and Congress Business Indicators

Source: ICCA 2015 Statistics Report (Public Abstract) at http://www.iccaworld.com/npps/story.cfm?nppage=5756 and ICCA Statistics Report 2014 (Public Abstract).

The primary source of data relating to conventions, congresses and other international meetings is the International Convention and Congress Association. The ICCA annual statistics refer to the **number of rotating international association meetings hosted by cities.**

'The meetings are more equally spread out amongst destinations, and relatively smaller, second tier destinations are becoming more and more successful at attracting association meetings'.

In its Association Meetings Market 2015 report, ICCA reported a record number of 12,076 rotating international association meetings taking place in 2015. It represented 571 additional meetings compared to 2004. It confirmed the consistent growth pattern in the association meetings market identified in ICCA's 50-year report.

- Over half (54.4% 6,565 meetings) took place in Europe.
- 14 WTCF European City Members are in the top 20 city ranking by number of meeting organised in 2015. The top 6 are actually all WTCF European City Members.
- Berlin climbed 3 places and is the new number one city with 195 meetings in 2015. Berlin is followed by Paris (186) and Barcelona (180).
- Although the order is different, the top seven is made up of the same cities than in 2014 ranking.
- Lisbon and Copenhagen are newcomers in the top 10, both climbing 3 places to 9th and 10th respectively.

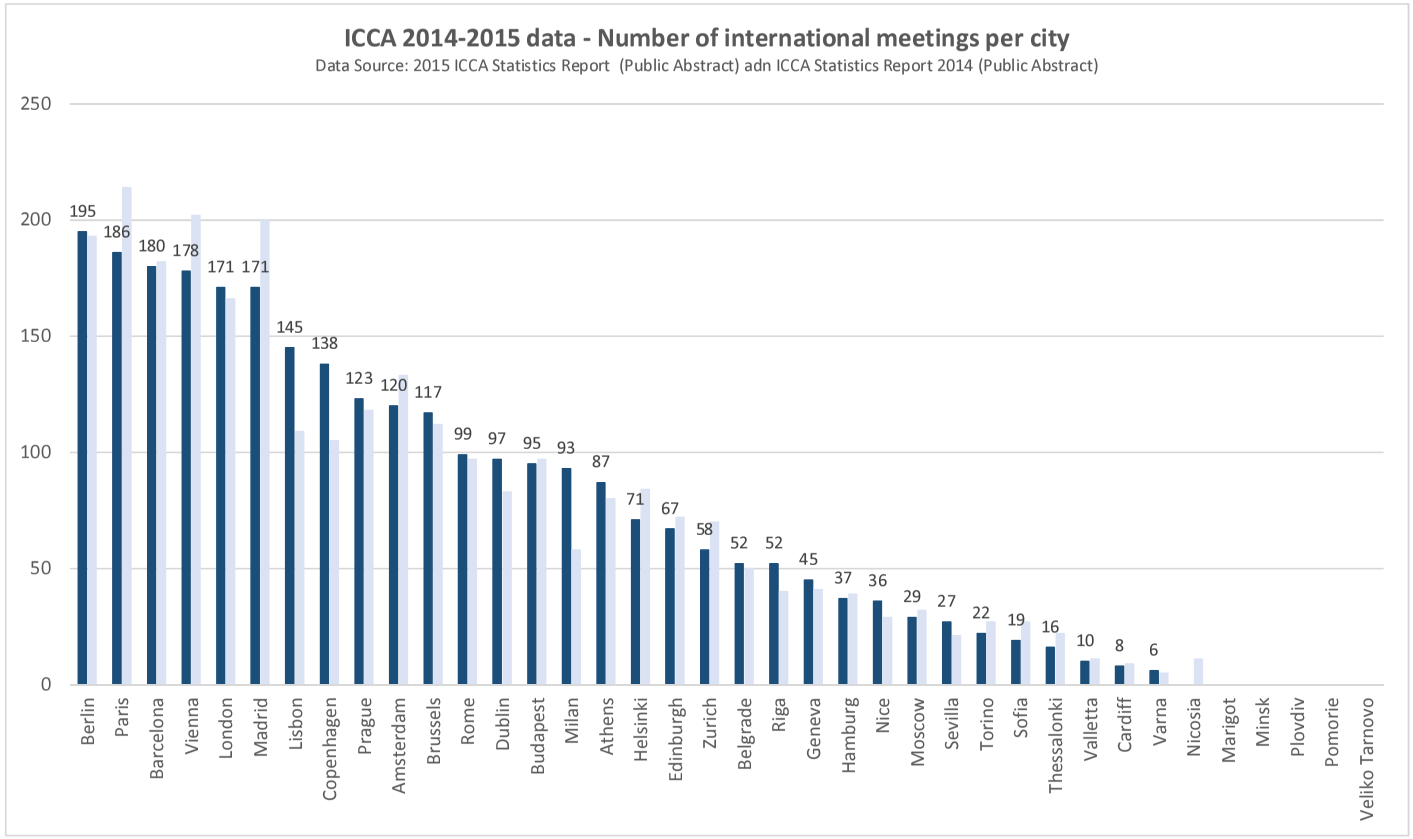
Top 20 country ranking by number of meeting organised in 2015

>' indicates WTCF City Member

Rank	City	# Meetings in 2015	Change in Rank
1	Berlin	195	3 ▲*
2	Paris	186	1 ▼
3	Barcelona	180	2 ▲
4	Vienna	178	2 ▼
5	London	171	1 ▲
	Madrid	171	2 ▼
7	Singapore	156	—
8	Istanbul	148	1 ▲
9	Lisbon	145	3 ▲
10	Copenhagen	138	3 ▲
11	Prague	123	1 ▼
12	Amsterdam	120	4 ▼
13	Brussels	117	2 ▼
13	Seoul	117	2 ▲
15	Hong Kong	112	1 ▲
16	Bangkok	103	13 ▲
17	Rome	99	—
18	Dublin	97	6 ▲
19	Beijing	95	5 ▼
	Budapest	95	2 ▼

*indicates the rise or drop in the 2015 ranking compared to 2014 | long dash means no change

ICCA 2014-2015 data - Number of international meetings per city



ICCA top 20 city ranking by number of meeting organised in 2015 (WTCF European City Members only)

Rank	City	Number of Meetings in 2015	Number of Meetings in 2014	Number of participants in 2014
1	Berlin	195	193	76,880
2	Paris	186	214	130,516
3	Barcelona	180	182	127,469
4	Vienna	178	202	81,902
=5	London	171	166	89,969
=5	Madrid	171	200	91,452
9	Lisbon	145	109	40,532
10	Copenhagen	138	105	57,551
11	Prague	123	118	46,921
12	Amsterdam	120	133	79,356
=13	Brussels	117	112	31,140
17	Rome	99	97	31,936
18	Dublin	97	83	35,823
=19	Budapest	95	97	<25,000
21	Milan	93	58	52,669
24	Athens	87	80	35,811
33	Helsinki	71	84	<25,000
35	Edinburgh	67	72	<25,000
44	Zurich	58	70	<25,000
=52	Belgrade	52	50	<25,000
=52	Riga	52	40	<25,000
=57	Geneva	45	41	26,508
69	Hamburg	37	39	<25,000
=70	Nice	36	29	25,292
=89	Moscow	29	32	<25,000
100	Sevilla	27	21	<25,000
117	Torino	22	27	<25,000
=132	Sofia	19	27	<25,000
=163	Thessaloniki	16	22	<25,000
	Nicosia		11	<25,000
=230	Valletta	10	11	<25,000
=276	Cardiff	8	9	<25,000
=335	Varna	6	5	<25,000

Source: ICCA 2015 Statistics Report (Public Abstract) at http://www.iccaworld.com/npps/story.cfm?nppage=5756

- 'The estimated total number of participants to international meetings is calculated by multiplying the total number of meetings in a specific destination with the average number of participants per meeting in the same destinations'
- 'This formula enables meetings where no accurate figures are known to be included in the estimated total.'

1.5.3 Tourism Economic Impact Indicators

Source: MasterCard 2015 Global Destination Cities Index – Tracking Global Growth: 2009-2015 at http://newsroom.mastercard.com/digital-press-kits/mastercard-global-destination-cities-index-2015/

Findings of the MasterCard 2015 Global Destinations Cities Index show that:

- Six WTCF European City Members (London, Paris, Barcelona, Madrid, Rome and Berlin) are within the top 20 in MasterCard 2015 ranking of cities by international Overnight Visitors Spend.
- London was ranked first with over US$20 billion visitor cross-border spending.

'**The MasterCard Index of Global Destination Cities** ranks cities in terms of the number of their total international overnight visitor arrivals and the cross-border spending by these same visitors in the destination cities, and gives visitor and passenger growth forecasts for 2015.

Public data is used in deriving the international overnight visitor arrivals and their cross-border spending in each of the 132 destination cities, using custom-made algorithms; paying special attention to eliminate the hub effects for destination cities such as Singapore, Dubai, Amsterdam and Frankfurt.'

MasterCard 2015 Global Destination Cities Index – International Overnight Visitors Spend 2015 (WTCF European City Members only)

Note: no ranking available after Global Top 20

	City	Overnight International Visitor Spend (US$ bn)
1	London	20.2
3	Paris	16.6
6	Barcelona	13.9
15	Madrid	7.1
19	Rome	5.3
20	Berlin	5.2
	Milan	4.9
	Vienna	4.6
	Amsterdam	3.7
	Prague	3.3
	Lisbon	1.8
	Hamburg	1.5
	Budapest	1.1
	Copenhagen	0.9

Global Top 20 Destination Cities by International Overnight Visitor Spend (2015)

>' indicates WTCF City Member

1	London	$20.23 bn	11	Taipei	$9.28 bn
2	New York	$17.37 bn	12	Tokyo	$8.44 bn
3	Paris	$16.61 bn	13	Hong Kong	$7.44 bn
4	Seoul	$15.24 bn	14	Los Angeles	$7.36 bn
5	Singapore	$14.65 bn	15	Madrid	$7.13 bn
6	Barcelona	$13.86 bn	16	Miami	$6.40 bn
7	Bangkok	$12.36 bn	17	Sydney	$6.15 bn
8	Kuala Lumpur	$12.02 bn	18	Munich	$5.57 bn
9	Dubai	$11.68 bn	19	Rome	$5.29 bn
10	Istanbul	$9.37 bn	20	Berlin	$5.22 bn

Source: MasterCard 2015 Global Destination Cities Index – Tracking Global Growth: 2009-2015 at http://newsroom.mastercard.com/digital-press-kits/mastercard-global-destination-cities-index-2015/

1.6 City competitiveness indicators

There are many different indices and indicators relating to the performance or potential of cities around the world, and they are not necessarily directly relating to tourism. The following presents some of the most respected and widely referred to. Each is based on a different set of criteria, so they are not directly comparable, and most are limited in that they relate primarily to capital or major cities, but they all have considerable value in highlighting different strengths and weaknesses of cities.

Although they are not tourism indicators, most focus on the overall competitiveness of cities – existing or potential – which does of course impact on the cities' attractiveness for tourism, whether business or leisure. The criteria on which they are based include, for example, infrastructure and local transport, ease of access (e.g. visa restrictions) or of doing business, affordability, safety and security, level and quality of convention facilities, popular events, culture and climate, language issues, cuisine and nightlife, popularity (e.g. based on hits through Facebook) and, not least, shopping (choice, value for money, but also hours of business).

Selected indicators and indices are considered in terms of their relevance for WTCF Member cities, as well as how they can be used for benchmarking purposes, although care must be taken in interpreting the results as some are qualitative, rather than quantitative; and in some cases, the reliability of the sources is not clear.

Overall, London and Paris have the strongest competitive positioning among European Members, but a number of other cities are consistently highly ranked. It should also be noted – as already stated – that these indicators exclude many of Europe's smaller ciities. London ranks in the top 3 in all the current/past performance indicators, as well as in the top 10 in the Global Cities Outlook. Paris ranks in the top 3 in two of the current/past performance indicators and in the top 10 for the rest, while scoring in the top 11-25 in the Global Cities Outlook.

The matrix below summarises the results of the different benchmarking indices analysed for this report. Apart from London and Paris, cities also featuring strongly in one or more category are Barcelona, Madrid, Amsterdam and Berlin.

Results of the individual indices/indicators are presented in the following pages.

Summary matrix of key benchmarking indices

Blank - indicates that the destination was not included in the ranking or data is not available.

Indices Ranking	Between 1-3	Between 4-10	Between 11-25	Between 25-50	Over 50	Not included

	Amsterdam	Athens	Barcelona	Belgrade	Berlin	Brussels	Budapest	Cardiff	Copenhagen	Dublin	Edinburgh	Geneva	Hamburg	Helsinki	Lisbon	London	Madrid	Marigot	Milan	Minsk
Global Blue Globe Shopper Index – Europe	8	16	2	31	6	15	10		18	14	26	33	20	30	7	1	2		11	
Guardian Cities Global Brand Index (2013)			6		25				48						36	3	12		24	
PwC Cities of Opportunity Index (2014)					11											1	15		18	
Mori MMF Global Power City Index (2015)	9		26		8	25			19			28				1	22		29	
The Economist Intelligence Unit 2025 City Competitiveness Index	13	78	55		34	25	53		15	22		30	46		57	2	46		58	
AT Kearney – Global Cities Index 2016	22		26		16	12	54		42	48		36				1	13		45	
AT Kearney – Global Cities Outlook 2016	8		34		14	22	53		24	28		16				4	46		29	

Indices Ranking	Between 1-3	Between 4-10	Between 11-25	Between 25-50	Over 50	Not included

	Moscow	Nice	Nicosia	Paris	Plovdiv	Pomorie	Prague	Riga	Rome	Sevilla	Sofia	Thessalonki	Torino	Valletta	Varna	Veliko Tarnovo	Vienna	Zurich
Global Blue Globe Shopper Index – Europe	19			4			9		5		24						12	
Guardian Cities Global Brand Index (2013)				4					26		51						39	
PwC Cities of Opportunity Index (2014)	21			6														
Mori MMF Global Power City Index (2015)	36			3													10	13
The Economist Intelligence Unit 2025 City Competitiveness Index	59			7			54		68								29	11
AT Kearney – Global Cities Index 2016	18			3			46		35								19	31
AT Kearney – Global Cities Outlook 2016	35			13			38		49								41	10

1.6.1 Global Blue Globe Shopper Index – Europe

Source: The Globe Shopper Index – Europe, created by the Economist Intelligence Unit for Global Blue Holdings AB at http://globeshopperindex.com/en/destinations/europe?ranks=1.

The Globe Shopper Index was designed and created by the Economist Intelligence Unit and commissioned by Global Blue in an attempt to rank the world's best shopping destinations. The EIU collected data for the Index between May and July 2011. 33 European and 25 Asia Pacific cities were ranked. Scores are based on both quantitative data and qualitative assessments. To make indicators directly comparable across cities, the values were turned into standardised scores on a scale of 0 to 100 and aggregated into category scores and an overall score.

Indicators are divided into five priorities categories:

- Shops
- Affordability
- Convenience
- Hotels & transport
- Culture & climate

Global Blue Globe Shopper Index – Europe (WTCF European City Members only)

1	London
=2	Madrid
=2	Barcelona
4	Paris
5	Rome
6	Berlin
7	Lisbon
8	Amsterdam
9	Prague
10	Budapest
11	Milan
12	Vienna
14	Dublin
15	Brussels
16	Athens
18	Copenhagen
19	Moscow
=20	Hamburg
=24	Sofia
=26	Edinburgh
30	Helsinki
33	Geneva

22 out of the 33 European Cities in the Global Blue Globe Shopper Index are WTCF European Cities Members. Overall the top ranking WTCF European Cities Members are: London (1), Madrid (=2), Barcelona (=2), Paris (4) and Rome (5). Key findings of the Index show that:

- 'London tops the Index for its variety of goods and choice of locations, but London is near the bottom for overall affordability'.
- 'Madrid and Barcelona tie for second place with consistently strong performances across all categories. The Spanish cities top the Index for the low cost of a range of luxury goods'.
- 'Most Index cities score strongly in at least one specific category meaning that shoppers can choose options'.

Global Blue Shopper Index - Europe

Blue Globe Shopper Index

'>' indicates WTCF City Member

European cities

	Rank	City Name	Overall score
>	1	London	67.3
>	=2	Madrid	67.1
>	=2	Barcelona	67.1
>	4	Paris	65.5
>	5	Rome	62.9
>	6	Berlin	62.3
>	7	Lisbon	61.6
>	8	Amsterdam	61.3
>	9	Prague	59.7
>	10	Budapest	59.6
>	11	Milan	59.3
>	12	Vienna	59.1
	13	Istanbul	58.4
>	14	Dublin	57.6
>	15	Brussels	56.8
>	16	Athens	56.2
	17	Munich	55.5
>	18	Copenhagen	54.1
>	19	Moscow	53.9
>	=20	Hamburg	53.4
	=20	Stockholm	53.4
	22	Lyon	53.3
	23	Bratislava	52.3
	=24	Bucharest	52.2
>	=24	Sofia	52.2
>	=26	Edinburgh	51.4
	=26	Kiev	51.4
	28	Warsaw	50.9
	29	St. Petersburg	49.1
>	30	Helsinki	48.2
>	31	Belgrade	43.6
	32	Oslo	43.1
>	33	Geneva	41.0

"=" indicates tie

Global Blue Globe Shopper Index – Priorities and factors explained

Priority 1 – Shops
Malls & boutiques
International brands
Seasonal sales
Genuine (as opposed to counterfeit) goods
Priority 2 - Affordability
Exchange-rate stability
Dining
Hotels
Shopper favourites
City transport
Priority 3 - Convenience
Use of foreign languages
Shopping hours
Price negotiation
Safety
Priority 4 – Hotels & transport
Quality hotels
Airports & flights
Convenient transport to city centre
Dependable city transport
Priority 5 – Culture & climate
Attractions & UNESCO sites
International cuisine
Popular events
Strictness of visa regulations
Agreeability of climate

Global Blue Globe Shopper Index – score by priority

All scores 0-100, where 100=best shopping environment

Overall score			Shops			Affordability		
1	London	67.3	1	London	80.6	1	Sofia	86.4
=2	Madrid	67.1	2	Paris	74.7	2	Bratislava	83.6
=2	Barcelona	67.1	3	Madrid	69.3	3	Bucharest	79.0
4	Paris	65.5	4	Dublin	61.9	4	Kiev	78.7
5	Rome	62.9	5	Amsterdam	61.7	5	Belgrade	75.9
6	Berlin	62.3	6	Barcelona	61.2	6	Budapest	75.7
7	Lisbon	61.6	7	Milan	59.9	7	Lisbon	72.1
8	Amsterdam	61.3	8	Moscow	58.6	8	Athens	72.0
9	Prague	59.7	9	Vienna	56.7	=9	Rome	70.9
10	Budapest	59.6	10	Rome	56.1	=9	Barcelona	70.9
11	Milan	59.3	11	Berlin	51.8	11	Berlin	69.7
12	Vienna	59.1	12	Istanbul	51.1	12	Madrid	69.3
13	Istanbul	58.4	13	Stockholm	50.7	13	Lyon	69.2
14	Dublin	57.6	14	Lisbon	48.2	=14	Istanbul	67.2
15	Brussels	56.8	15	Prague	47.9	=14	Edinburgh	67.2
16	Athens	56.2	16	Brussels	47.0	16	Warsaw	67.0
17	Munich	55.5	17	Munich	46.0	=17	Hamburg	66.5
18	Copenhagen	54.1	18	Budapest	44.5	=17	Brussels	66.5
19	Moscow	53.9	=19	St.Petersburg	44.0	19	Dublin	66.3
=20	Stockholm	53.4	=19	Lyon	44.0	20	Vienna	66.1
=20	Hamburg	53.4	21	Warsaw	43.7	21	Munich	64.1
22	Lyon	53.3	22	Oslo	43.5	22	Milan	62.1
23	Bratislava	52.3	23	Hamburg	43.3	23	Prague	59.0
=24	Sofia	52.2	24	Copenhagen	42.7	=24	London	55.0
=24	Bucharest	52.2	25	Edinburgh	42.2	=24	Helsinki	55.0
=26	Kiev	51.4	=26	Kiev	41.7	26	Amsterdam	54.4
=26	Edinburgh	51.4	=26	Helsinki	41.7	27	Copenhagen	48.7
28	Warsaw	50.9	28	Bucharest	40.3	28	Paris	48.6
29	St.Petersburg	49.1	29	Sofia	37.5	29	St.Petersburg	46.2
30	Helsinki	48.2	30	Athens	37.2	30	Moscow	42.8
31	Belgrade	43.6	31	Belgrade	32.0	31	Stockholm	36.9
32	Oslo	43.1	32	Bratislava	30.9	32	Oslo	27.4
33	Geneva	41.0	33	Geneva	28.3	33	Geneva	27.3

All scores 0-100, where 100=best shopping environment

	Convenience		Hotels and transport		Culture & climate	
1	Istanbul	58.7	London	72.2	Paris	84.5
=2	Prague	58.3	Copenhagen	70.2	Rome	84.0
=2	Kiev	58.3	Barcelona	68.3	Berlin	82.1
4	St.Petersburg	57.0	Paris	67.2	Barcelona	78.7
5	Bucharest	56.4	Madrid	66.4	London	77.6
6	Barcelona	56.3	Berlin	65.1	Madrid	76.7
=7	Sofia	55.4	Amsterdam	63.4	Lisbon	76.7
=7	Lisbon	55.4	Hamburg	61.0	Brussels	74.3
9	Edinburgh	55.2	Stockholm	60.6	Prague	74.2
10	Moscow	54.7	Athens	59.4	Amsterdam	74.2
11	Madrid	53.9	Prague	59.3	Vienna	73.0
12	Dublin	53.1	Budapest	59.3	Milan	70.9
13	Rome	52.9	Istanbul	55.9	Budapest	70.9
14	Amsterdam	52.8	Munich	55.7	Munich	68.7
15	Paris	52.7	Vienna	55.6	Stockholm	66.1
16	Stockholm	52.6	Moscow	55.6	Athens	66.0
17	Bratislava	52.4	Lisbon	55.6	Dublin	65.2
18	Milan	52.3	Brussels	54.0	Lyon	62.6
19	London	51.4	Bucharest	52.1	Copenhagen	62.0
20	Warsaw	48.6	Milan	51.6	Istanbul	58.9
21	Budapest	47.8	Oslo	51.3	Moscow	57.7
22	Copenhagen	46.8	Geneva	50.8	Helsinki	57.3
23	Athens	46.6	Rome	50.5	Warsaw	57.1
24	Lyon	46.0	St.Petersburg	48.2	Edinburgh	56.0
=25	Geneva	45.3	Bratislava	45.2	Geneva	53.6
=25	Belgrade	45.3	Lyon	44.8	Hamburg	52.7
=27	Vienna	44.4	Helsinki	42.8	St.Petersburg	50.1
=27	Helsinki	44.4	Dublin	41.3	Bratislava	49.4
29	Oslo	44.0	Sofia	39.6	Oslo	49.3
30	Hamburg	43.7	Warsaw	38.0	Kiev	46.8
31	Munich	43.0	Edinburgh	36.4	Sofia	42.1
32	Berlin	42.7	Belgrade	34.9	Bucharest	33.3
33	Brussels	42.5	Kiev	31.6	Belgrade	30.2

Source: The Globe Shopper Index – Europe, created by the Economist Intelligence Unit for Global Blue Holdings AB at http://globeshopperindex.com/en/destinations/europe?ranks=1

1.6.2 Guardian Cities Global Brand Index

Source: Guardian Cities Global Brand Index (2013) at https://www.theguardian.com/cities/datablog/2014/may/06/world-cities-most-powerful-brands-get-the-data

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- 11 WTCF City Members are in the Guardian Cities Global Brand Index.
- London and Paris were in the 'Top 4'; Barcelona came among the 'challengers', while Madrid, Milan, Berlin and Rome were ranked among the 'ones to watch'.

Guardian Cities Global Brand Survey 2013 by Saffron among 57 major cities around the globe. The index measures two aspects of a city's brand:

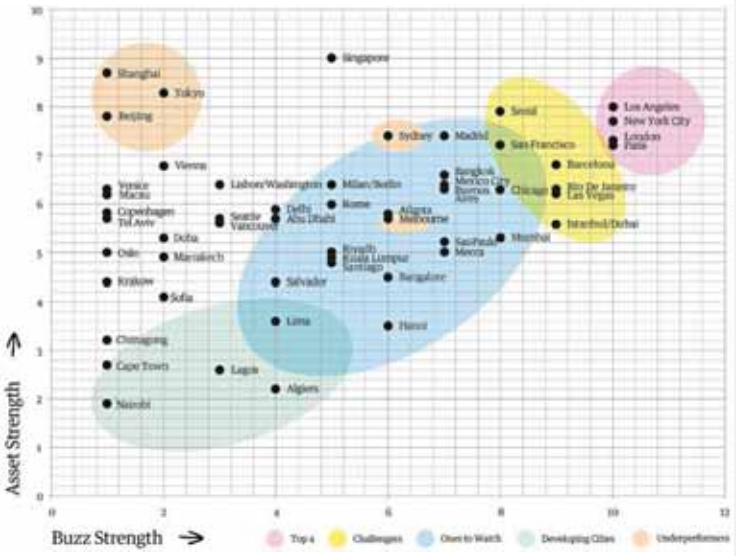
- its 'assets' - attractions, climate, infrastructure (particularly transport), safety and economic prosperity)
- its "buzz" - a combination of social media (Facebook likes and Twitter sentiment analysis) and media mention.

Assets and buzz were each graded out of 10; the numbers were added to produce a total strength score out of 20.

Guardian Cities Global Brand Index 2013 (WTCF European City Members only)

3	London
4	Paris
6	Barcelona
12	Madrid
24	Milan
25	Berlin
26	Rome
36	Lisbon
39	Vienna
48	Copenhagen
51	Sofia

Guardian Cities Global Brand Index 2013



Guardian City Global Brand Index 2013 – Score

WTCF European Cities Members in light blue

Ranking	City	Total Strength Out of 20	Buzz Strength	Asset Strength
1	Los Angeles	18	10	8
2	New York City	17.7	10	7.7
3	London	17.3	10	7.3
4	Paris	17.2	10	7.2
5	Seoul	15.9	8	7.9
6	Barcelona	15.8	9	6.8
7	Rio de Janeiro	15.3	9	6.3
8	San Francisco	15.2	8	7.2
9	Las Vegas	15.2	9	6.2
10	Dubai	14.6	9	5.6
11	Istanbul	14.6	9	5.6
12	Madrid	14.4	7	7.4
13	Chicago	14.3	8	6.3
14	Singapore	14	5	9
15	Bangkok	13.6	7	6.6
16	Sydney	13.4	6	7.4
17	Mexico City	13.4	7	6.4
18	Buenos Aires	13.3	7	6.3
19	Mumbai	13.3	8	5.3
20	Sao Paulo	12.2	7	5.2
21	Mecca	12	7	5
22	Atlanta	11.8	6	5.8
23	Melbourne	11.7	6	5.7
24	Milan	11.4	5	6.4
25	Berlin	11.4	5	6.4
26	Rome	11	5	6
27	Bangalore	10.5	6	4.5
28	Tokyo	10.3	2	8.3
29	Riyadh	10	5	5
30	Delhi	9.9	4	5.9
31	Kuala Lumpur	9.9	5	4.9
32	Santiago	9.8	5	4.8
33	Shanghai	9.7	1	8.7
34	Abu Dhabi	9.7	4	5.7
35	Hanoi	9.5	6	3.5
36	Lisbon	9.4	3	6.4
37	Washington DC	9.4	3	6.4
38	Beijing	8.8	1	7.8
39	Vienna	8.8	2	6.8
40	Seattle	8.7	3	5.7
41	Vancouver	8.6	3	5.6
42	Salvador	8.4	4	4.4
43	Lima	7.6	4	3.6
44	Venice	7.3	1	6.3
45	Doha	7.3	2	5.3
46	Macau	7.2	1	6.2
47	Marrakech	6.9	2	4.9
48	Copenhagen	6.8	1	5.8
49	Tel Aviv	6.7	1	5.7
50	Algiers	6.2	4	2.2
51	Sofia	6.1	2	4.1
52	Oslo	6	1	5
53	Lagos	5.6	3	2.6
54	Krakow	5.4	1	4.4
55	Chittagong	4.2	1	3.2
56	Cape Town	3.7	1	2.7
57	Nairobi	2.9	1	1.9

1.6.3 PwC Cities of Opportunity Index (2014)

Source – Cities of Opportunity 6, PwC at http://www.pwc.com/us/en/cities-of-opportunity.html.

- Only 6 out of the 38 WTCF European City Members are featured in this ranking of 30 worldwide capitals of finance, commerce, and culture.
- London posted the highest score by a clear margin, finishing first in technology readiness, economic clout and city gateway – all measures of its stature as a thriving centre of the world economy.
- The City Gateway indicator category is based on the ranking of following variables: Hotel rooms, International tourists, Number of international association meetings, Incoming/outgoing passenger flows, Airport to CBD access, Top 100 airports, On-time flight departures.

Cities of Opportunity 6 (the sixth edition of Cities of Opportunity) *'analyzes the trajectory of 30 cities, all capitals of finance, commerce, and culture – and through their current performance, seeks to open a window on what makes cities function best'.*

The Index is based on ranking among 10 indicator categories, organized into three families that reflect the balance of urban life:

Tools for a changing world
Intellectual capital and innovation
Technology readiness
City's openness as a Global hub

Quality of Life
Transportation and infrastructure
Health, safety, and security
Sustainability and the natural environment
Demographics and livability

Economics
Economic clout
East of doing business
Cost

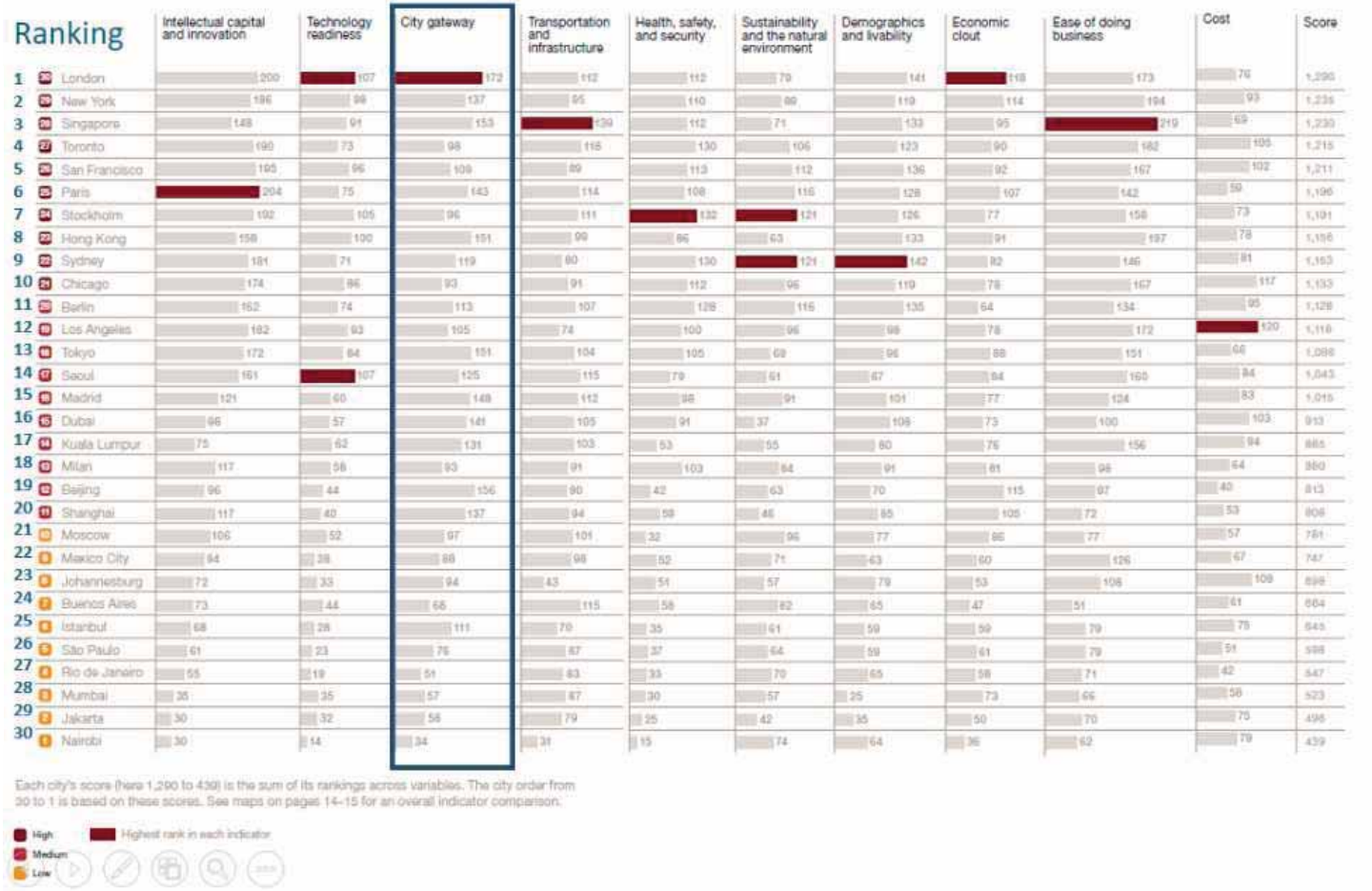
PwC Cities of Opportunity 6 (2014) (WTCF European City Members only)

Overall Index ranking		City Gateway indicator ranking	
1	London	1	London
6	Paris	6	Madrid
11	Berlin	7	Paris
15	Madrid	14	Berlin
18	Milan	19	Moscow
21	Moscow	23	Milan

PwC Cities of Opportunity 6 – City gateway

PwC Cities of Opportunity Index 2014

'>' indicates WTCF City Member



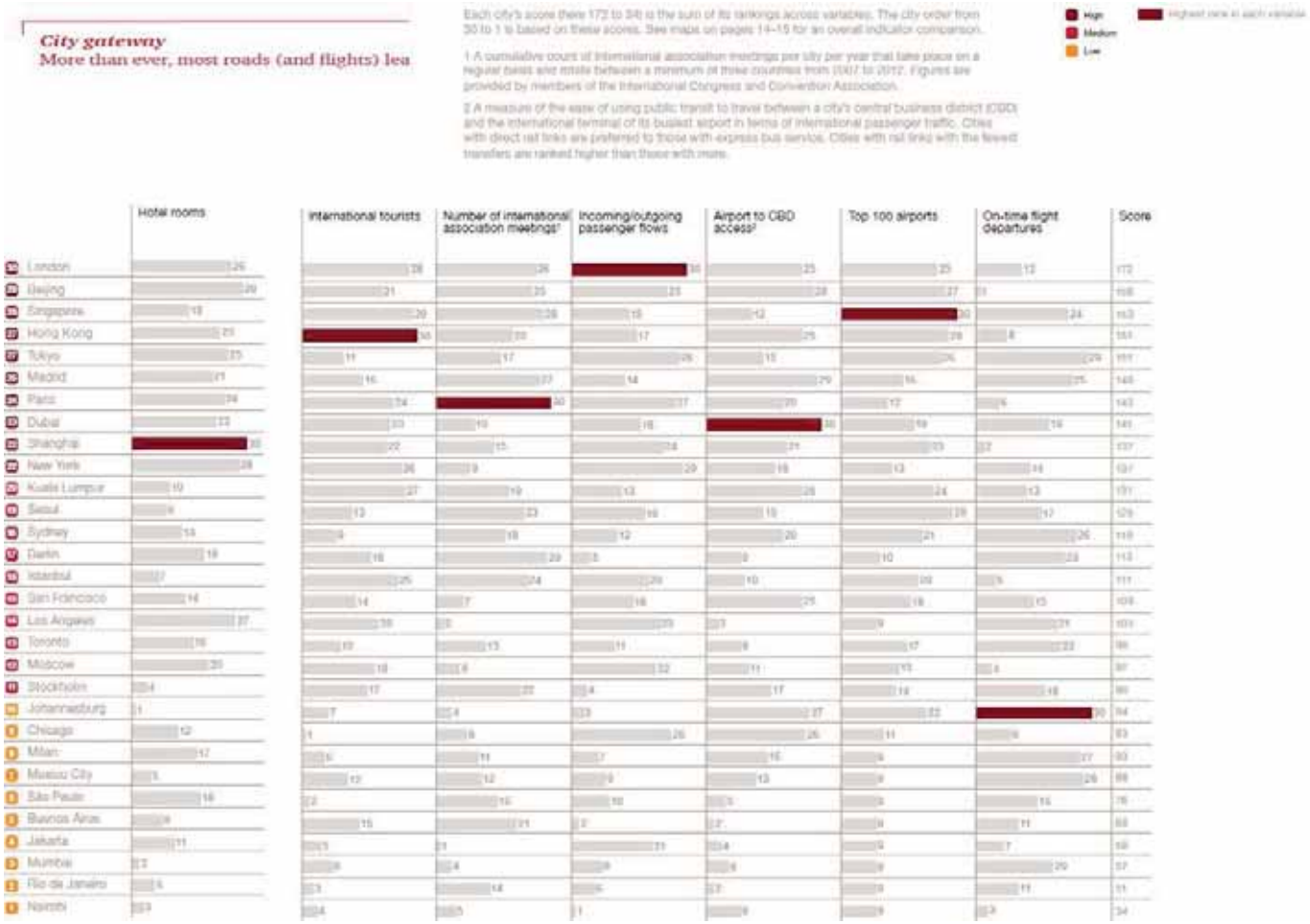
	Ranking		Intellectual capital and innovation	Technology readiness	City gateway	Transportation and infrastructure	Health, safety, and security	Sustainability and the natural environment	Demographics and livability	Economic clout	Ease of doing business	Cost	Score
>	1	London	200	107	172	112	112	79	141	118	173	70	1,290
	2	New York	186	98	137	85	110	89	119	114	194	93	1,235
	3	Singapore	148	91	153	139	112	71	133	95	219	69	1,230
	4	Toronto	190	73	98	116	130	106	123	90	162	105	1,215
	5	San Francisco	195	96	109	89	113	112	136	92	167	102	1,211
>	6	Paris	204	75	143	114	108	116	128	107	142	59	1,196
	7	Stockholm	192	105	96	111	132	121	126	77	158	73	1,191
	8	Hong Kong	158	100	151	99	86	63	133	91	197	78	1,156
	9	Sydney	181	71	119	80	130	121	142	82	146	81	1,153
	10	Chicago	174	86	93	91	112	96	119	78	167	117	1,133
>	11	Berlin	162	74	113	107	128	116	135	64	134	95	1,128
	12	Los Angeles	182	93	105	74	100	96	98	78	172	120	1,118
	13	Tokyo	172	84	151	104	105	69	96	88	151	68	1,088
	14	Seoul	161	107	125	115	79	61	87	84	160	84	1,043
>	15	Madrid	121	60	149	112	88	91	101	77	124	83	1,015
	16	Dubai	96	57	141	105	91	37	109	73	100	103	913
	17	Kuala Lumpur	75	62	131	103	53	55	80	76	156	94	885
>	18	Milan	117	58	93	91	103	64	91	61	98	64	880
	19	Beijing	96	44	156	90	42	63	70	115	97	40	813
	20	Shanghai	117	40	137	94	58	46	85	105	72	53	806
>	21	Moscow	106	52	97	101	32	96	77	86	77	57	781
	22	Mexico City	94	38	88	98	52	71	63	60	126	67	747
	23	Johannesburg	72	33	94	43	51	57	79	53	108	109	696
	24	Buenos Aires	73	44	66	115	58	82	65	47	51	61	664
	25	Istanbul	68	28	111	70	35	61	59	59	79	79	649
	26	São Paulo	61	23	76	67	37	64	59	61	79	51	598
	27	Rio de Janeiro	55	19	51	83	33	70	65	58	71	42	547
	28	Mumbai	35	35	57	87	30	57	25	73	66	58	523
	29	Jakarta	30	32	58	79	25	42	35	50	70	70	496
	30	Nairobi	30	14	34	31	15	74	64	36	62	79	439

Each city's score (here 1,290 to 439) is the sum of its rankings across variables. The city order from 30 to 1 is based on these scores. See maps on pages 14–15 for an overall indicator comparison.

High
Medium
Low
Highest rank in each indicator

PwC Cities of Opportunity Index 2014

'>' indicates WTCF City Member



1.6.4 Mori MMF Global Power City Index (2015)

Source – Global Power City Index 2015, MMF Institute for Urban Strategies, The Mori Memorial Foundation at http://www.mori-m-foundation.or.jp/english/ius2/gpci2/.

The Global Power City Index (GPCI) 'evaluates and ranks the major cities of the world according to their 'magnetism', i.e. their comprehensive power which allows them to attract creative individuals and business enterprises from every continent and to mobilize their assets in securing economic, social and environmental development'.

- 13 out of the 38 WTCF European City Members are featured in this ranking of 40 of the world's leading cities
- London (1), Paris (3), Berlin (8), Amsterdam (9) and Vienna (10) are in the top 10.

Mori MMF Global Power City Index (2015) (WTCF European City Members only)

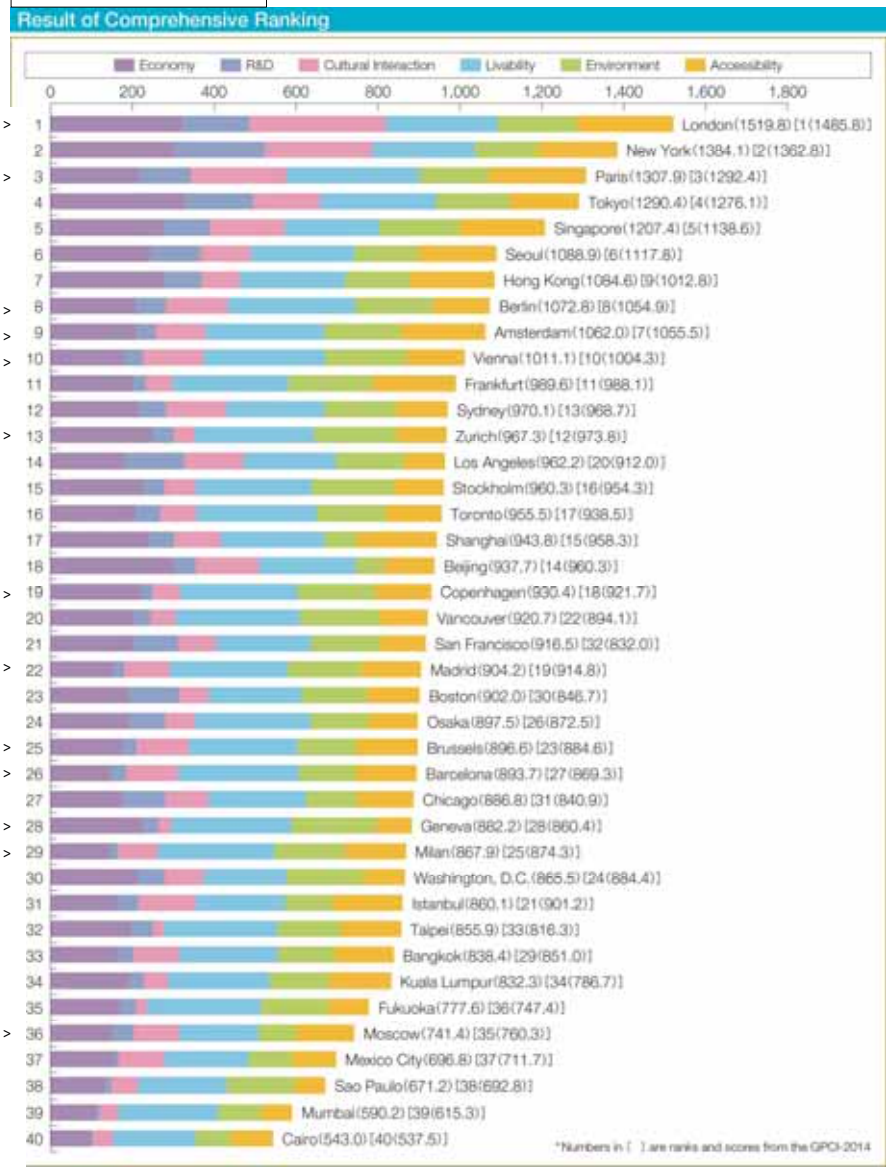
1	London
3	Paris
8	Berlin
9	Amsterdam
10	Vienna
13	Zurich
19	Copenhagen
22	Madrid
25	Brussels
26	Barcelona
28	Geneva
29	Milan
36	Moscow

Features of the Global Power City Index (GPCI)

1. As opposed to limiting the ranking to particular areas of research such as finance and livability, the GPCI focuses on a wide variety of functions in order to assess and rank the global potential and comprehensive power of a city.
2. The GPCI evaluates the comprehensive power of 40 of the world's leading cities according to six main functions (Economy, Research and Development, Cultural Interaction, Livability, Environment and Accessibility) representing city strength. Additionally, the same cities were examined from the viewpoints of four global actors (Manager, Researcher, Artist and Visitor) and one local actor (Resident). They are personifications of representative citizens with diverse sets of needs and preferences. This double evaluation provides an all-encompassing view of the cities.
3. The GPCI reveals both the strengths and weaknesses of each city and uncovers specific problems to be addressed.
4. The GPCI was produced with the involvement of the late Professor Sir Peter Hall, a global authority in urban studies, as well as other academics in this field. The ranking is peer reviewed by international third parties who are experts in their fields.

Mori MMF Global Power City Index (2015) – Result of comprehensive ranking

'>' indicates WTCF City Member



1.6.5 The Economist Intelligence Unit 2025 City Competitiveness Index

Source – Hot spots 2025 – Benchmarking the future competitiveness of cities, The Economist Intelligence Unit at http://www.citigroup.com/citi/citiforcities/pdfs/hotspots2025.pdf.

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- Europe, with seven of the 20 best-performing cities is a hotspot of competitiveness. However, the index is highlighting a 'competitiveness divide' between northern and western Europe on the one hand, and southern and eastern Europe on the other. The top 15 cities in Europe are located in the core of the Eurozone (Paris, Amsterdam, Copenhagen, London, Stockholm and Zurich), while the bottom half are located in Eurozone countries that have been hit particularly hard by the euro crisis (Madrid, Rome, Lisbon, and Athens among them) or in new EU members states.
- London ranks second overall in the Index. It is the only European city apart from Paris (7th) and Stockholm (8th) in the top 10.
- 20 of the WTCF European City Members are featured in this ranking of top 120 cities.

2025 City Competitiveness Index

The Economist Intelligence Unit defines a city's competitiveness as its ability to attract capital, business, talent and visitors. The Index benchmarks the competitiveness of 120 cities across the world at two distinct points in time: 2012 and in 2025. The Index examine 32 indicators for each city. Indicators are grouped into eight thematic categories and assigned weights:

- Economic strength (30%)
- Physical capital (10%)
- Financial maturity (10%)
- Institutional Character (15%)
- Human capital (15%)
- Global appeal (10%)
- Social and Cultural Character (5%)
- Environment and natural hazards (5%).

The Economist Intelligence Unit, 2025 City Competitiveness Index (WTCF European City Members only)

2	London
7	Paris
=11	Zurich
13	Amsterdam
=15	Copenhagen
22	Dublin
25	Brussels
29	Vienna
30	Geneva
34	Berlin
=46	Hamburg
=46	Madrid
53	Budapest

54	Prague
55	Barcelona
57	Lisbon
58	Milan
59	Moscow
68	Rome
78	Athens

Overall 2025 City Competitiveness rankings table

Weighted total of all category scores (0-100 where 100=most favourable).
'>' indicates WTCF City Member

	Rank 2025	Change from 2012	City	Score/100	Change from 2012
	1	+1	New York	75.7	+7.1
>	2	+4	London	73.1	+5.3
	3	-2	Singapore	71.2	+0.6
	4	-1	Hong Kong	68.1	+0.1
	5	-2	Tokyo	68.0	-0.1
	6	+2	Sydney	67.3	+4.5
>	7	-2	Paris	67.0	-0.9
	8	+5	Stockholm	65.7	+5.7
	9	+3	Chicago	65.6	+4.6
	10	-	Toronto	64.7	+2.6
	=11	+14	Taipei	64.1	+6.5
>	=11	-4	Zurich	64.1	-
>	13	-2	Amsterdam	63.8	+2.0
	14	+3	Washington	63.2	+4.0
>	=15	+6	Copenhagen	63.0	+4.9
	=15	+7	Seoul	63.0	+5.0
	17	+7	Los Angeles	62.7	+5.0
	18	+1	San Francisco	62.5	+4.0
	19	-3	Boston	62.3	+2.7
	=20	-11	Frankfurt	62.0	-0.3
	=20	-6	Melbourne	62.0	+2.2
>	22	+5	Dublin	61.4	+4.3
	23	+6	Dubai	61.3	+5.2
	24	+14	Doha	61.1	+6.3
>	25	+1	Brussels	61.0	+3.6
	26	+8	Oslo	60.8	+5.4
	27	+2	Houston	60.7	+4.7
	28	-5	Vancouver	60.6	+2.8

Rank 2025	Change from 2012	City	Score/100	Change from 2012
> 29	-15	Vienna	60.4	+0.6
> 30	-10	Geneva	59.4	+1.0
31	+8	Kuala Lumpur	58.9	+4.3
32	+1	Dallas	58.6	+2.9
33	+9	Atlanta	58.1	+4.2
> 34	+2	Berlin	57.7	+2.8
35	-1	Seattle	57.6	+2.2
=36	-8	Montréal	57.5	+0.7
=36	+25	São Paulo	57.5	+9.6
38	-6	Shanghai	57.3	+1.3
39	+2	Abu Dhabi	57.2	+3.1
40	+10	Miami	56.5	+5.9
41	+16	Tel Aviv	56.1	+6.7
42	-11	Auckland	56.0	+0.1
=43	+3	Birmingham	55.8	+3.5
=43	+17	Incheon	55.8	+7.6
=43	+6	Warsaw	55.8	+5.0
> =46	-2	Hamburg	55.7	+2.2
> =46	-28	Madrid	55.7	-3.0
48	-8	Philadelphia	55.0	+0.5
49	-13	Beijing	54.9	+0.1
50	-	Osaka	54.5	+4.0
=51	+12	Busan	54.3	+6.9
=51	+16	Mumbai	54.3	+7.8
> 53	-5	Budapest	54.0	+2.1
> 54	-7	Prague	53.9	+1.8
> 55	-13	Barcelona	53.6	-0.1
56	+13	Delhi	53.3	+7.8
> 57	+1	Lisbon	53.1	+3.8
> 58	-13	Milan	53.0	-0.3
> 59	-	Moscow	52.5	+3.9
=60	+2	Monaco	52.1	+4.4
=60	+8	Santiago	52.1	+5.9
62	-9	Bangkok	52.0	+2.1
63	+12	Kuwait City	51.7	+6.7
64	+14	Muscat	51.4	+7.2
65	-2	Panama City	50.8	+3.4
66	-1	Johannesburg	50.5	+3.5
67	-11	Buenos Aires	49.9	+0.4

Rank 2025	Change from 2012	City	Score/100	Change from 2012
> 68	-16	Rome	49.8	-0.5
69	-16	Shenzhen	49.4	-0.5
70	+1	Istanbul	49.3	+3.9
71	-	Fukuoka	49.2	+3.9
72	+1	Mexico City	49.0	+4.0
73	-18	Nagoya	48.6	-1.2
74	+2	Jakarta	48.1	+3.1
75	+8	Lima	48.0	+4.6
76	+13	Rio de Janeiro	47.6	+5.8
77	+10	Cape Town	47.4	+4.8
> 78	+2	Athens	47.3	+3.3
79	+12	Manila	47.1	+5.7
80	-3	Bucharest	46.9	+2.5
81	-12	Tianjin	46.7	+1.2
82	+6	Qingdao	46.4	+4.3
=83	-2	Dalian	46.1	+2.5
=83	-1	Suzhou (Jiangsu)	46.1	+2.6
85	-	Bogotá	45.8	+2.6
86	-8	Chengdu	45.4	+1.2
=87	-14	Kraków	45.3	+0.3
=87	+11	Riyadh	45.3	+6.3
89	-23	Guangzhou	45.2	-1.4
90	+13	Kiev	44.9	+7.2
91	+7	Medellín	44.4	+5.4
92	+15	Saint Petersburg	44.1	+7.1
93	-3	Hangzhou	44.0	+2.4
94	-8	Bangalore	43.6	+1.0
95	-2	Durban	42.9	+2.9
96	-	Ho Chi Minh City	42.3	+2.9
97	+12	Porto Alegre	41.7	+4.8
98	-15	Chongqing	41.0	-2.4
99	+2	Pune	40.9	+2.7
100	-2	Hyderabad	40.6	+1.6
=101	+4	Chennai	39.7	+2.3
=101	-6	Monterrey	39.7	+0.1
103	-	Ankara	39.6	+2.0
104	-12	Ahmedabad	39.2	-1.0
105	+3	Belo Horizonte	38.8	+1.9
106	+8	Cairo	38.5	+3.5

1.6.6 AT Kearney Global Cities Index 2016

Source: AT Kearney Global Cities 2016 at https://www.atkearney.com/research-studies/global-cities-index.

AT Kearney Global Cities 2016 comprises the Global Cities Index and the Global Cities Outlook. 'Together, the Index and the Outlook provide a unique look at 125 of the world's largest and most influential cities today and those primed to make an impact in the future'.

- **The Global Cities Index** 'provides insights into the global reach, performance, and level of development of the world's largest cities. It is based on 27 metrics across five dimensions: business activity, human capital, information exchange, cultural experience, and political engagement'.
- **The Global Cities Outlook** is a 'projection of a city's potential based on rate of change in 13 indicators across four dimensions: personal well-being, economics, innovation, and governance'.

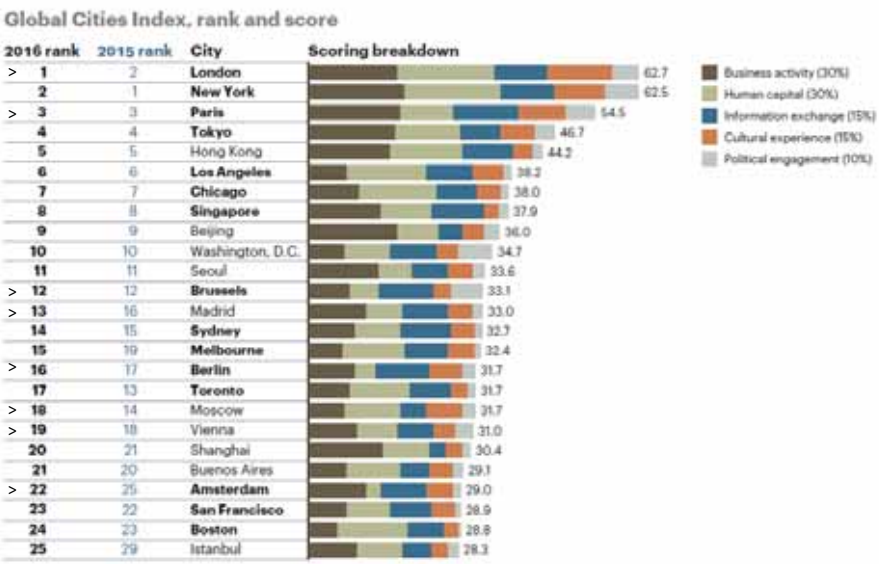
- Seventeen WTCF European City Members are listed in AT Kearney Global Cities Index and Outlook 2016.
- London ranks first in the Global Cities Index and 4th on the Global Cities Outlook.
- In bold below are cities within the top 25 in both Index and Outlook and described as A.T. Kearney's as 'Global Elite' (cities, which given their strong performance in 2016 and high potential, are likely to 'exert their global influence well into the future'. These include: London, Paris, Brussels, Berlin, and Amsterdam.

A.T. Kearney Global Cities 2016 (WTCF European City Members only)

Global Cities Index		**Global Cities Outlook**	
1	London	4	London
3	Paris	8	Amsterdam
12	Brussels	10	Zurich
13	Madrid	13	Paris
16	Berlin	14	Berlin
18	Moscow	16	Geneva
19	Vienna	22	Brussels
22	Amsterdam	24	Copenhagen
26	Barcelona	28	Dublin
31	Zurich	29	Milan
35	Rome	34	Barcelona
36	Geneva	35	Moscow
42	Copenhagen	38	Prague
45	Milan	41	Vienna
46	Prague	46	Madrid
48	Dublin	49	Rome
54	Budapest	53	Budapest

AT Kearney Global Cities Index results, 2015-2016

'>' indicates WTCF City Member



AT Kearney Global Cities Outlook results, 2015-2016

'>' indicates WTCF City Member

Global Cities Outlook results, 2015-2016

City rank 2016	2015	City
1	1	San Francisco
2	4	New York
3	3	Boston
> 4	2	London
5	6	Houston
6	16	Atlanta
7	8	Stockholm
> 8	9	Amsterdam
9	7	Munich
> 10	5	Zurich
11	17	Chicago
12	11	Sydney
> 13	19	Paris
> 14	13	Berlin
15	15	Melbourne
> 16	12	Geneva
17	14	Singapore
18	20	Toronto
19	18	Tokyo
20	29	Dallas
21	21	Los Angeles
> 22	24	Brussels
23	28	Taipei
> 24	23	Copenhagen
25	27	Vancouver
26	25	Dubai
27	34	Washington
> 28	22	Dublin
> 29	33	Milan
30	30	Düsseldorf
31	31	Montreal
32	10	Seoul
33	36	Osaka
> 34	32	Barcelona
> 35	49	Moscow
36	26	Santiago
37	40	Phoenix
> 38	37	Prague
39	38	Warsaw
40	35	Frankfurt
> 41	39	Vienna
42	45	Beijing

City rank 2016	2015	City
43	43	Philadelphia
44	46	Miami
45	71	Saint Petersburg
> 46	42	Madrid
47	41	Nagoya
48	48	Tel Aviv
> 49	47	Rome
50	50	Shenzhen
51	51	Abu Dhabi
52	52	Bogotá
> 53	54	Budapest
54	44	Kuala Lumpur
55	58	Buenos Aires
56	57	Mexico City
57	53	Hong Kong
58	59	Kuwait City
59	56	Suzhou
60	64	Nanjing
61	55	Tianjin
62	60	Doha
63	65	Shanghai
64	62	Guadalajara
65	70	Lima
66	69	Rio de Janeiro
67	61	Monterrey
68	63	Wuhan
69	74	Hangzhou
70	82	São Paulo
71	67	Shenyang
72	75	Riyadh
73	90	Bangalore
74	68	Manila
75	72	Chengdu
76	87	New Delhi
77	78	Quanzhou
78	76	Guangzhou
79	79	Dalian
80	66	Istanbul
81	77	Harbin
82	83	Dongguan
83	80	Manama
84	85	Zhengzhou

City rank 2016	2015	City
85	81	Xi'an
86	73	Ankara
87	93	Mumbai
88	92	Belo Horizonte
89	89	Bangkok
90	91	Chongqing
91	97	Hyderabad
92	84	Qingdao
93	88	Recife
94	86	Ahmedabad
95	94	Salvador
96	96	Porto Alegre
97	98	Ho Chi Minh
98	109	Chennai
99	120	Karachi
100	112	Kolkata
101	113	Nairobi
102	99	Johannesburg
103	100	Pune
104	95	Casablanca
105	102	Surat
106	116	Abidjan
107	106	Accra
108	107	Cape Town
109	103	Surabaya
110	105	Jakarta
111	111	Bandung
112	104	Cairo
113	110	Tunis
114	115	Lahore
115	108	Yangon (Rangoon)
116	101	Alexandria
117	117	Caracas
118	118	Tehran
119	119	Baghdad
120	121	Kinshasa
121	114	Addis Ababa
122	124	Lagos
123	123	Luanda
124	122	Dhaka
125	125	Khartoum

Source: A.T. Kearney Global Cities 2016

Section 2 - Overview of European Air Transport

2.1 The role of air transport in European tourism

Over the past couple of decades, Europe and its citizens have enjoyed the benefits of unprecedented growth in trade and tourism links. These benefits are the direct result of the liberalisation of European air transport – a policy that has not only changed the rules of the game for airlines, but also led European airports to undergo a process of business transformation. In the process, they have become destinations in themselves, playing a much stronger role in fuelling local economic growth, prosperity and job creation.

Outside the capital cities, in the regions of Europe where most of the continent's citizens live, the liberalisation of European air transport and the resulting revolution in low-cost air services, have proved especially beneficial, expanding and enhancing direct links to and from secondary cities and local communities. Europeans and non-European visitors to the continent have been able to access an ever-expanding network of safe, efficient and affordable air services. This in turn has given a huge boost to tourism, not least for Europe's cities.

According to Airports Council International (ACI) Europe, the number of air routes within the European Union member states alone has increased by 170% since the creation of the single aviation market in 1993. More recently, more than a thousand new 'city pairs' were added to European airline schedules between 2003 and 2007. As a result, competition has flourished throughout the airline and airport sector, from small regional airlines and airports to the largest legacy carriers and major hubs. This has also allowed aviation to play a key role in advancing the integration of new entrant EU member states with the rest of the Community.

Regional airports play a vital role in connecting the regions of Europe, as well as largely defining the economy of their communities and bolstering social cohesion. Proximity to an airport is still in the top five considerations of any international company considering investing in a region. And business and leisure tourists increasingly choose the convenience of direct airline services rather than transiting at major hubs to reach their destinations.

Despite the uncertain political and economic environment – not to mention the fear of continued terrorist attacks and natural disasters – demand for air transport in Europe is expected to continue, with a doubling of passenger traffic forecast by 2030.

2.2 Air transport in 2015

2.2.1 Global trends – best results since 2010

The International Air Transport Association (IATA) reported a 6.5% increase in passenger traffic worldwide in 2015 (expressed in revenue passenger-km or RPKs). This was the strongest result since the 2010 rebound after the 2008/09 global financial crisis, and well above the ten-year average annual growth rate of 5.5%. While economic fundamentals were weaker in 2015 than in 2014, passenger demand was boosted by lower airfares. After adjusting for distortions caused by the rise of the US dollar, global airfares were approximately 5% lower in 2015 than in the previous year.

Annual capacity rose 5.6% last year, with the result that load factor climbed 0.6 percentage points to a record annual high of 80.3%. International demand was slightly stronger than domestic demand, as the table below shows, but a higher increase in available seat capacity (ASK) on international routes kept the average seat load factor at below 80%.

IATA airlines global traffic performance, 2015

(% annual growth 2015/2014)

Type of traffic	RPK	ASK	PLF (%)
International	6.5	5.9	79.7
Domestic	6.3	5.2	81.5
Total	6.5	5.6	80.3

Source: International Air Transport Association (IATA)

2.2.2 Healthy operating performance for Europe

European airlines' international traffic grew 5.0% in 2015 – below the global average, but on a capacity rise of just 3.8%, which boosted average seat load factor to 82.6%, the highest among all world regions. This healthy result can largely be attributed to a pick-up in consumer spending in the eurozone, as well

as a moderate increase in flight frequencies. European traffic growth slowed towards the end of the year as a result of strikes at Lufthansa and the shutdown of Russia's second biggest airline, Transaero.

Capacity on domestic routes in Europe increased by a similar percentage to that on international services (+3.9%), while domestic passenger traffic increased by 5.1%, and the region-wide seat load factor for the full 12 months averaged 81.7%.

IATA airlines' international traffic performance by region, 2015

(% growth 2015/2014)

Region	RPK	ASK	PLF
Asia Pacific	8.2	6.4	78.2
Europe	**5.0**	**3.8**	**82.6**
North America	3.2	3.1	81.8
Middle East	10.5	13.2	76.4
Latin America	9.3	9.2	80.1
Africa	3.0	1.5	68.5
Total international	**6.5**	**5.9**	**79.7**

RPK = revenue passenger-km; ASK = available seat-km; PLF = passenger load factor

Source: IATA

2.2.3 Low oil prices help to improve profitability

In 2015, IATA airlines generated a global aggregate profit of US$35.3 billion – up from the US$33.0 billion previously estimated in December 2015. All regions contributed positively to the US$4.1 billion boost over 2015 profits, thanks to their improved results, although there were sharp regional differences in performance. Over 60% the industry's profits were generated in North America (US$22.9 billion), while Europe contributed a rather more modest 21% – slightly above Asia Pacific's share.

Lower oil prices are certainly helping to improve profitability, IATA said, although the impact has been tempered by hedging and exchange rates. More important are cost efficiencies, with load factors at record levels and new value streams increasing ancillary revenues. Joint ventures and other forms of co-operation are also helping, as well as increasing consumer choice and fostering healthy competition.

2.2.4 Positive outlook tempered by market uncertainties

The latest forecasts for 2016 (from IATA in early June) point to a further improvement in IATA airlines' financial outlook – the fifth consecutive year of improving aggregate industry profits – although prospects have been clouded by uncertainties due to geopolitical developments and terrorism risks.

The outlook for European airlines is, not surprisingly, less bullish than for the global industry overall. Strikes by air traffic controllers in some countries and bad weather have also contributed to a slowdown in growth and profit warnings from some carriers, such as Lufthansa and easyJet. Since the British voted for Brexit (to leave the European Union) at the end of June, sterling has fallen sharply in value. While the impact has been fairly muted until now, Brexit is expected to dampen business and consumer confidence, which in turn is likely to depress air transport demand from one of Europe's most important source markets.

An estimated 5 million UK citizens have reportedly reorganised their 2015 holiday plans since end-June, according to a survey conducted by VoucherCodes.co.uk. Around 50% of them have decided to take a domestic holiday, or 'staycation', while the other half have postponed any decision for the time being. Brexit itself is not the main reason for the change of heart – rather it is the collapse of sterling that has made foreign travel so much more expensive.

Most significantly, for Europe's cities, one of the main sectors expected to be most affected in the medium term is that of secondary short breaks, which could have a longer-term negative impact on city tourism, as well as causing some airlines to plan capacity and fleet adjustments.

2.3 European airport connectivity

2.3.1 Growth at major hubs lags well behind growth at small, regional airports

2015 was also a positive year for European airports, with an increase in total airport connectivity of 8.9% over 2014 levels. This was driven by a healthy 4.6% increase in direct connectivity, and an 11.1% increase in indirect connectivity. However, the annual result was in stark contrast to that recorded in the previous years – i.e. since the global financial crisis erupted in 2008. Year-on-year direct connectivity growth in Europe between 2009 and 2014 was only 1.4%, and there was an actual decline between 2011 and 2014.

ACI Europe's 2015 results do, however, highlight increased connectivity in/to relatively more mature markets – within Europe and to North America – and the continuously strong connectivity growth to the Middle East, driven by the Gulf States.

Nevertheless, beneath these generally positive headline figures, there are underlying trends which indicate Europe's air connectivity cannot be taken for granted, and which illustrate some of the threats facing the continent. In particular, while 2015 saw Europe finally push past its pre-crisis 2008 direct connectivity levels, this recovery remains unevenly distributed across the airport industry and Europe's cities.

The first table below presents the leading 30 airports in Europe in 2015 and their average annual passenger growth over 2010. The top airport in 2015 in passenger throughput was London Heathrow, followed by Paris Charles-de Gaulle, Istanbul Atatürk and Frankfurt – all recording over 60 million passengers. In terms of annual growth over the five years, however, Istanbul Sabiha Göken topped the ranking (with +20.2%), ahead of Istanbul Atatürk (+13.8). Moscow Sheremetyevo was the only other airport to register a double-digit annual increase in traffic. Only two airports suffered an annual decline: Madrid Barajas (-1.2%) and Milan Malpensa (-0.4).

The second table below shows the growth over a 15-year period – from 2000-2015. Once again, Istanbul's two airports and Moscow Sheremetyevo recorded the strongest annual increases. Istanbul Sabiha Gökçen, located on the Asian side of the bi-continental city, was not opened until 2003. But in the ten years from 2005-2015, its annual traffic increase was over 39%. The majority of passengers are on domestic services but the airport has fast become a major hub for low-cost carriers operating international as well as domestic routes, in particular Turkey's own Pegasus Airlines.

The best performers among Europe's airports have of course not come from the major hubs, which are featured in the two tables above and below. The most aggressive growth has been seen among airports with a passenger throughput of less than 25 million annually. Airports recording fewer than 5 million passengers – those predominantly served by point-to-point, regional low-cost carriers – have seen growth of between 7% and 11% over the same period. Long-term growth trends for these are difficult to determine, however, as many of these carriers have either not been in existence for many years, or have disappeared from the scene.

Leading European airports and their respective growth, 2010-2015

Airport	Rank		Passengers (mn)		Growth[a]
	2010	2015	2010	2015	(%)[a]
London Heathrow	1	1	65.9	75.0	2.6
Paris Charles de Gaulle	2	2	58.2	65.8	2.5
Istanbul Atatürk	8	3	32.1	61.3	13.8
Frankfurt	3	4	53.0	61.0	2.9
Amsterdam Schiphol	5	5	45.2	58.3	5.2
Madrid–Barajas (Adolfo Suárez)	4	6	49.9	46.8	-1.2
Munich	7	7	34.7	41.0	3.4
London Gatwick	9	8	31.4	40.3	5.1
Rome Fiumicino (Leonardo da Vinci)	6	9	36.3	40.2	2.1
Barcelona El Prat	10	10	29.2	39.7	6.3
Moscow Sheremetyevo	18	11	19.1	31.3	10.3
Moscow Domodedovo	13	12	22.3	30.5	6.5
Paris Orly	11	13	25.2	29.7	3.3
Istanbul Sabiha Gökçen	35	14	11.2	28.1	20.2
Antalya	14	15	22.0	27.7	4.7
Copenhagen	15	16	21.5	26.6	4.4
Zürich	12	17	22.9	26.3	2.8
Dublin	23	18	18.4	25.0	6.3
Oslo Gardermoen	19	19	19.1	24.7	5.3
Palma de Mallorca	16	20	21.1	23.7	2.4
Brussels	25	21	17.2	23.5	6.4
Stockholm Arlanda	26	22	17.0	23.1	6.4
Manchester	24	23	17.8	23.1	5.4
Vienna International	17	24	19.7	22.8	3.0
London Stansted	22	25	18.6	22.5	3.9
Düsseldorf	20	26	19.0	22.5	3.4
Berlin Tegel	28	27	15.0	21.0	6.9
Lisbon Portela	29	28	14.1	20.1	7.4
Milan Malpensa	21	29	18.9	18.6	-0.4
Athens International	27	30	15.4	18.1	3.3

[a] Average annual % growth, 2010-2015

Source: Wikipedia (https://en.wikipedia.org/wiki/List_of_the_busiest_airports_in_Europe) from ACI Europe

Leading European airports and their respective growth, 2000-2015

	Rank		Passengers (mn)		Growth
Airport	2000	2015	2000	2015	(%)[a]
London Heathrow	1	1	64.3	75.0	1.0
Paris Charles de Gaulle	3	2	48.1	65.8	2.1
Istanbul Atatürk	19	3	14.6	61.3	10.0
Frankfurt	2	4	49.0	61.0	1.5
Amsterdam Schiphol	4	5	39.3	58.3	2.7
Madrid–Barajas (Adolfo Suárez)	5	6	32.7	46.8	2.4
Munich	9	7	22.9	41.0	3.9
London Gatwick	6	8	31.9	40.3	1.6
Rome Fiumicino (Leonardo da Vinci)	7	9	25.9	40.2	3.0
Barcelona El Prat	13	10	19.5	39.7	4.9
Moscow Sheremetyevo	24	11	10.8	31.3	7.4
Moscow Domodedovo	...	12	...	30.5	...
Paris Orly	8	13	25.4	29.7	1.0
Istanbul Sabiha Gökçen	–	14	–	28.1	–
Antalya	36	15	7.5	27.7	9.1
Copenhagen	17	16	18.2	26.6	2.6
Zürich	10	17	22.4	26.3	1.1
Dublin	21	18	13.7	25.0	4.1
Oslo Gardermoen	20	19	14.2	24.7	3.8
Palma de Mallorca	14	20	19.3	23.7	1.4
Brussels	11	21	21.5	23.5	0.6
Stockholm Arlanda	16	22	18.3	23.1	1.6
Manchester	15	23	18.4	23.1	1.5
Vienna International	23	24	11.8	22.8	4.5
London Stansted	22	25	11.9	22.5	4.4
Düsseldorf	18	26	16.0	22.5	2.3
Berlin Tegel	25	27	10.3	21.0	4.9
Lisbon Portela	30	28	9.2	20.1	5.3
Milan Malpensa	12	29	20.5	18.6	-0.7
Athens International	...	30	...	18.1	...

[a] Average annual percentage growth, 2000-2015

Source: ACI Europe

The following is a selection of smaller, either secondary or regional airports, with a comparison of passenger numbers and respective growth over the 15 years 2000-2015. As can be seen, the results are extremely mixed. The top performers have been Brussels Charleroi, a major low-cost airport, Riga and Reykjavik's Keflavik.

Air services from/to Brussels Charleroi Airport Operations really took off with the arrival of Irish low-cost carrier (LCC) Ryanair in 1997, and the airline opened its first continental base at Charleroi a few years later. Although criticised for the subsidies paid by the Walloon Government to help its installation, Ryanair opened new routes from Brussels South Charleroi, and other LCCs, including Wizz Air, joined Ryanair later. The Polish airline Air Polonia operated services from there to Warsaw and Katowice before going bankrupt in August 2004.

Riga, capital of Latvia, is one of the three Baltic States that became members of the EU in 2004, and which has become a very popular city-break destination for other European tourist markets, as has Estonia's capital, Tallinn. However, while annual growth averaged 25.2% from 2004, when it joined the EU, to 2011, passenger numbers stagnated from 2011 to 2015 (+0.3%).

Growth in passenger numbers at selected smaller airports, 2000-2015

Airport	Code	Passengers (000s)		Growth
		2000	2015	(% pa)
Berlin Schönefeld	SXF	2,134	8,526	9.7
Brussels Charleroi	CRL	255	6,956	24.6
Geneva	GVA	7,677	15,772	4.9
London Luton	LTN	6,173	12,264	4.7
Malta	MLA	2,966	4,619	3.0
Riga	RIX	574	5,163	15.8
Reykjavik Keflavik	KEF	1,076	4,856	10.6

Source: ACI Europe

London Luton, the UK capital's fifth largest airport, is of course one of the leading low-cost and charter hubs in Europe, serving as a base for easyJet, Monarch, Thomson Airways and Ryanair. The vast majority of the routes served are within Europe, although there are some charter and scheduled routes to destinations in Northern Africa, the USA and Asia.

Berlin Schönefeld, Geneva, Keflavik and Malta are all discussed in more detail in the low-cost airline case study in Section III.

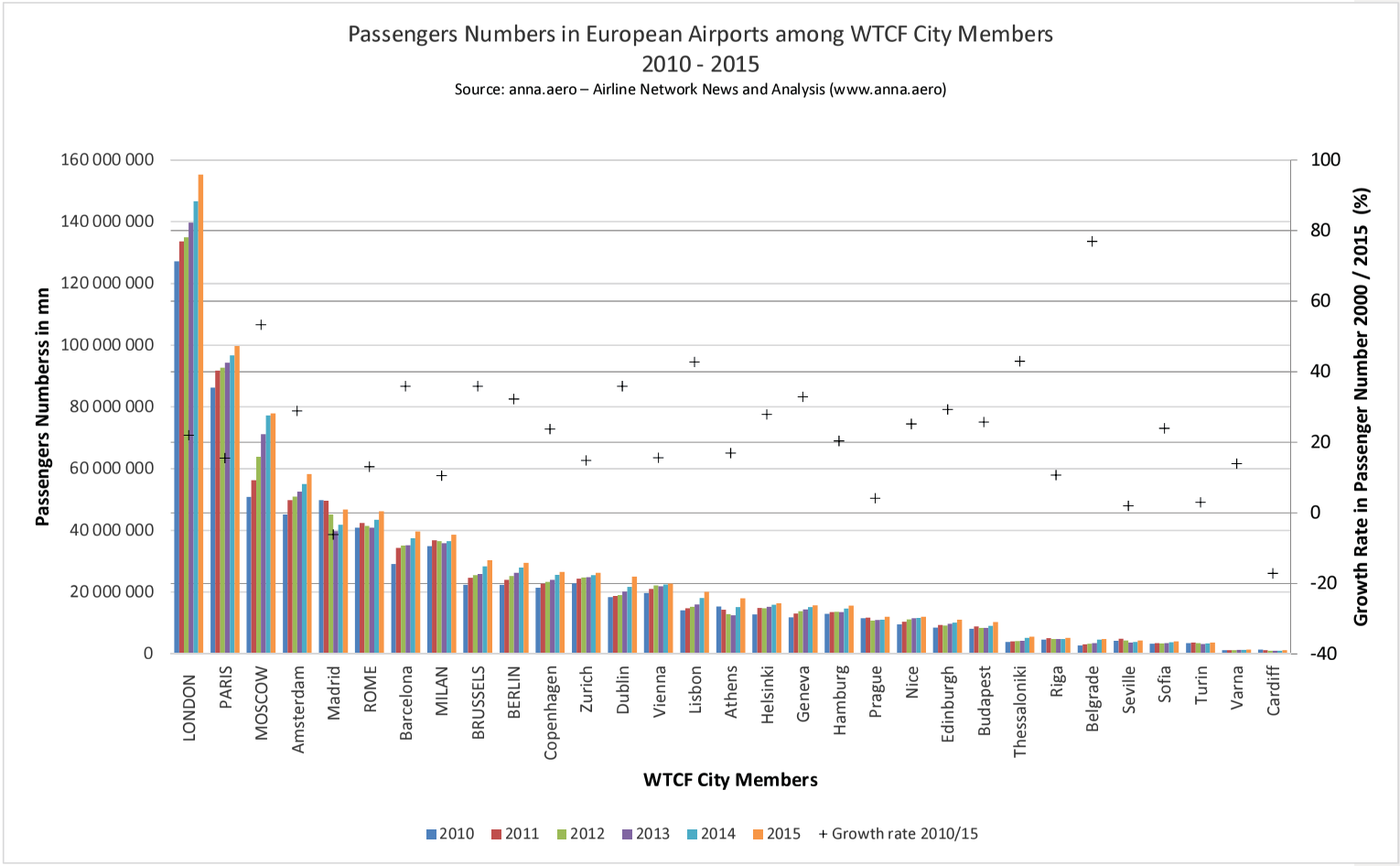
2.3.2 Comparing WTCF member cities' airports

Charts on the following pages, from data published with kind permission from www.anna.aero and 2thinknow (www.citybenchmarkingdata.com), provide a graphic presentation of trends in airport performance across Europe, and in particular for WTCF Member cities.

The first figure below shows five-year trends for WTCF Member airports. All WTCF European cities increased their passenger throughput between 2010 and 2015, with the exception of Cardiff, which recorded a decline of 17%. Belgrade attracted the strongest growth over the five years, of 77%.

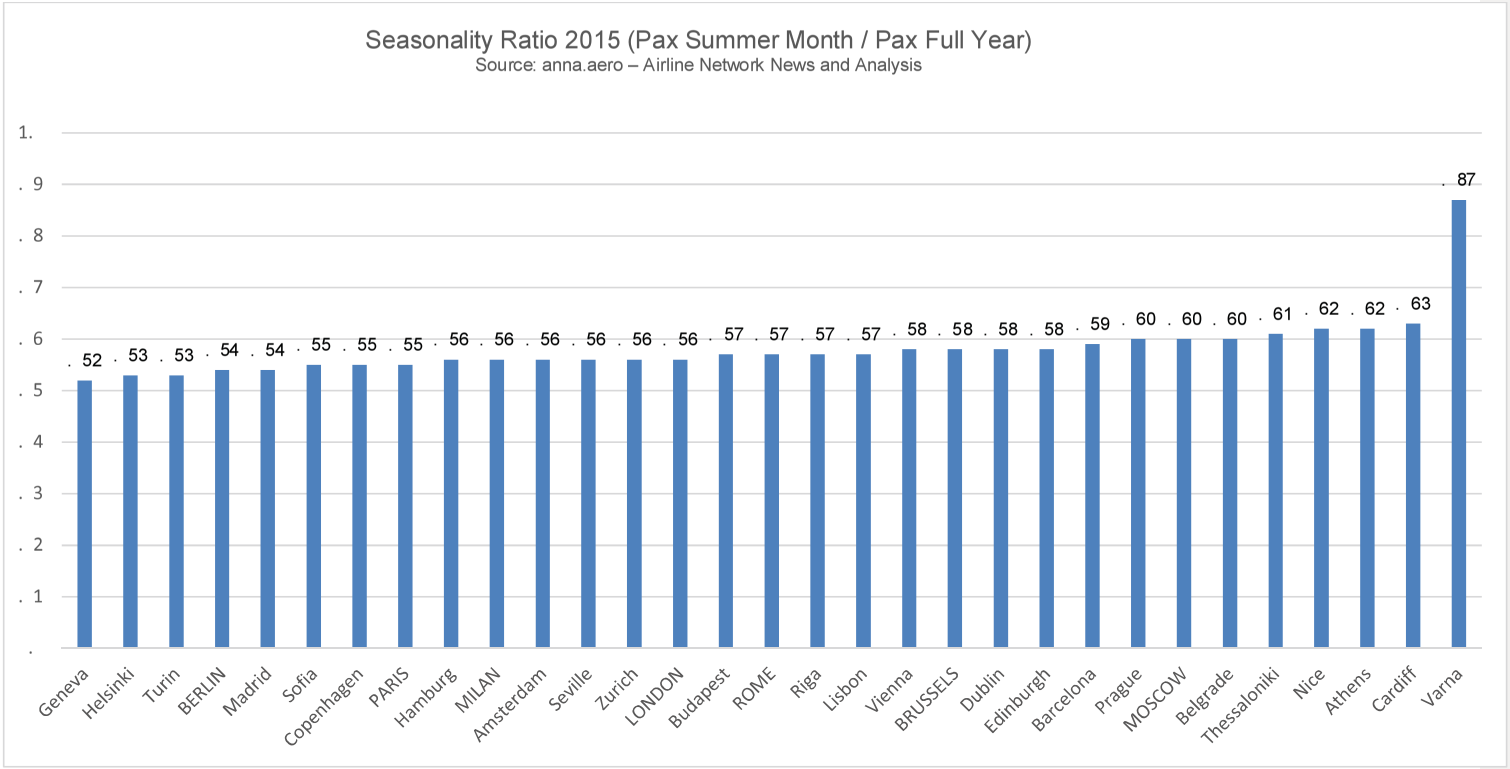
As highlighted in the second figure below, there is little seasonality in passenger numbers among most WTCF European City Members, with 61% showing a seasonality ratio of below 0.6. Not surprisingly, given its importance as a leisure destination, the Black Sea city of Varna has the highest ratio of summer:winter air arrivals.

Passenger throughput at airports WTCF City Member airports, 2010-2015



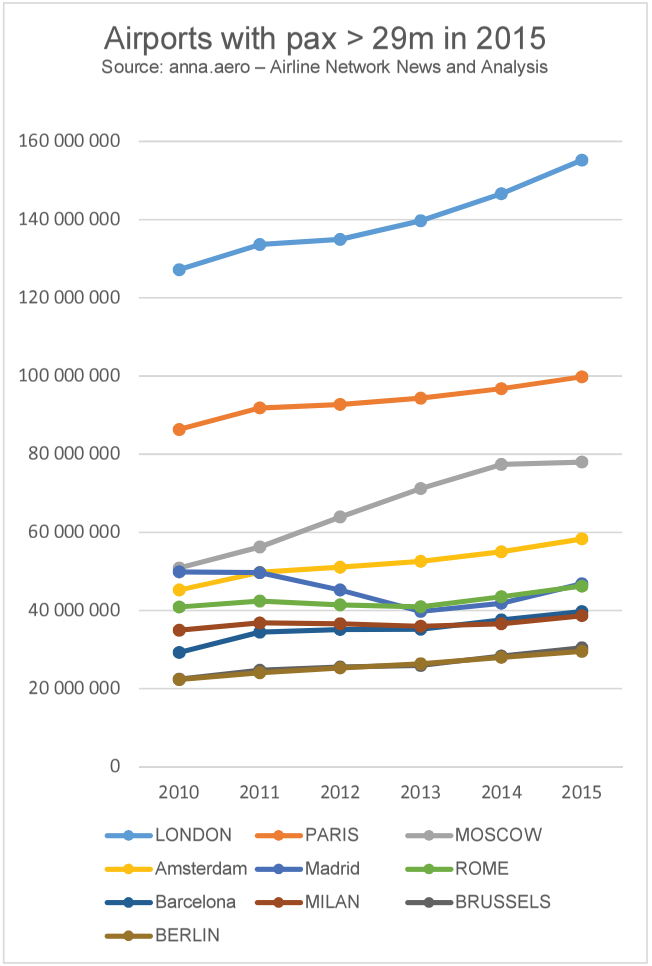
Source: anna.aero – Airline Network News and Analysis (www.anna.aero)

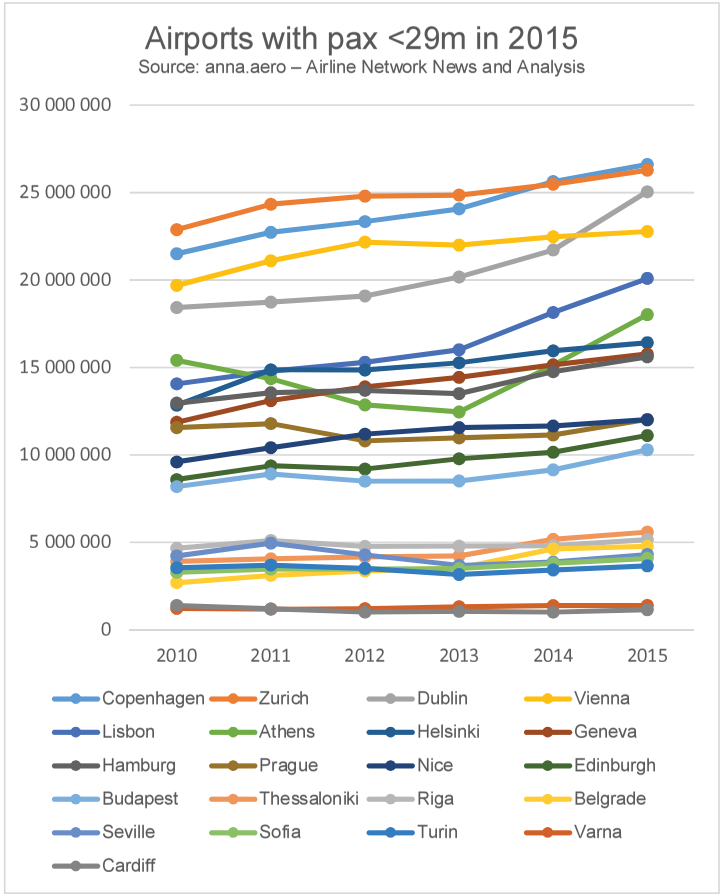
Passenger numbers at airports of WTCF European City Members, 2015 – seasonality ratio for 2015



Source: anna.aero – Airline Network News and Analysis

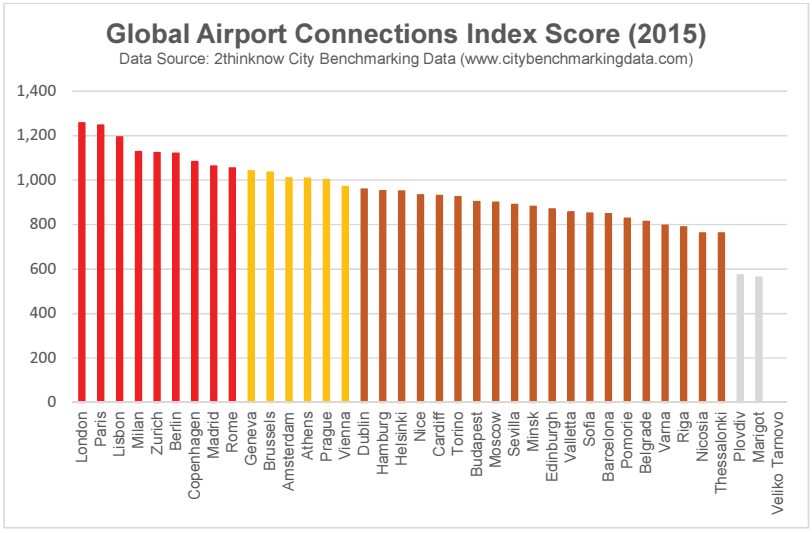
Evolution of passenger numbers at airports of WTCF European City Members, 2010-2015





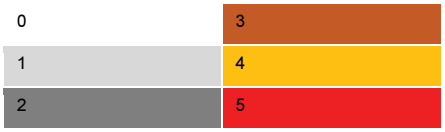
Source: anna.aero

Global airport Connections Index Score (2015)



Source: Data available from and published with permission from 2thinknow®: City Benchmarking Data at www.citybenchmarkingdata.com

2thinknow Analyst Benchmark Score (0/5)



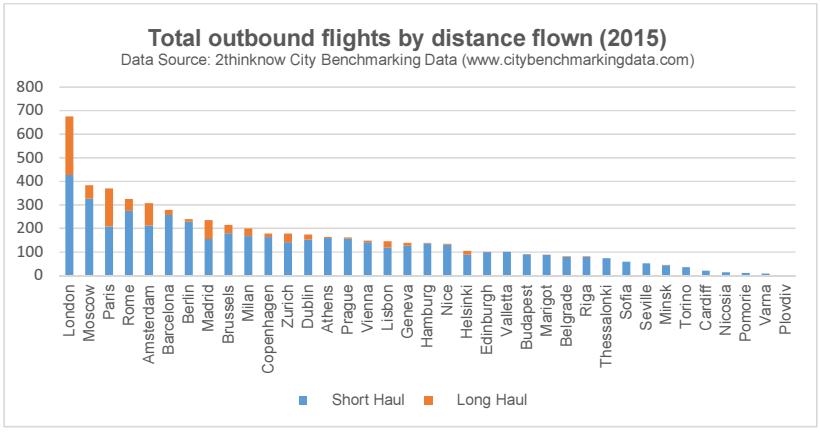
All scores for the 500 cities in 2thinknow® 2015 data-set form a bell curve, with the majority of developed cities centered around the globally

The large majority of WTCF European Cities Members (92%) scored on or above the globally competitive 3 score in the 2015 Index:

- 24% (9) scored the highest score of 5
- 15% (6) scored a 4
- (20) score a 3
- (2) score a 1
- (1) scores a 0 as it has no commercial flights.

The figure below, again from 2thinknow, shows the total number of outbound flights from European airports. London ranks in first position – for short- and long-haul flights combined – and Paris has the highest share of long-haul flights (44%).

Total outbound flights by distance flown, 2015



Source: Data available from and published with permission from 2thinknow®: City Benchmarking Data at www.citybenchmarkingdata.com

The matrix below summarises the different ratings on airport competitiveness from 2thinknow City Benchmarking Data. Airports that are closer to major destination and/or source market cities, such as New York, London or Shanghai, naturally tend to be more globally connected in terms of direct flights/routes. European cities generally do well in this indicator. The large majority of WTCF European city members (92%) scored on or above the globally competitive 3 score in 2015.

The data on 'air connectivity' is from 2thinknow®. The 2thinknow® 'Global Airport Connections' indicator is designed to highlight city connectivity in terms of flying time and proximity to airports. Airports that are closer to major destination and/or source market cities, such as New York, London or Shanghai, naturally tend to be more globally connected in terms of direct flights/routes. European cities generally do well in this indicator. The large majority of WTCF European Cities Members (92%) scored on or above the globally competitive 3 score in 2015.

Summary of air connectivity and airport indicators, 2015

Indices Ranking	London	Paris	Lisbon	Milan	Zurich	Berlin	Copenhagen	Madrid	Rome	Geneva	Brussels	Amsterdam	Athens	Prague	Vienna
Top ranking															
Runner-up ranking															
2TK Global Airport Connections Index Score	**1,257**	**1,247**	**1,195**	**1,128**	**1,123**	**1,121**	**1,083**	**1,064**	**1,055**	**1,043**	**1,035**	**1,010**	**1,008**	**1,003**	**971**
2TK Analyst Benchmark Score 0/5	5	5	5	5	5	5	5	5	5	4	4	4	4	4	4
No. of Airports within <50km	9	10	6	5	6	5	5	5	5	3	5	4	6	4	4
Total Outbound Flights	**675**	**369**	**145**	**200**	**179**	**240**	**179**	**236**	**325**	**139**	**215**	**308**	**163**	**162**	**149**
Short-haul Flight	428	208	119	168	141	229	164	155	275	127	180	212	159	156	142
Long-haul Flights	247	161	26	32	38	11	15	81	50	12	35	96	4	6	7
Share of Long-haul Flights	37%	44%	18%	16%	21%	5%	8%	34%	15%	9%	16%	31%	2%	4%	5%
Commercial Flying Time (London/Paris) in hours	1.33	1.17	2.83	1.83	1.50	1.75	1.83	2.33	2.42	1.58	1.08	1.00	3.75	1.75	2.33
Commercial Flying Time (New York) in hours	7.50	8.08	8.08	9.00	8.75	8.75	8.33	8.25	9.58	8.67	8.33	8.00	11.50	11.08	9.17
Commercial Flying Time (Shanghai) in hours	12.92	12.08	17.17	12.75	12.83	14.83	13.08	16.08	15.08	15.00	14.08	11.92	15.83	15.67	14.83
Est. no. of passengers in 2015[a] (mn)	155.2	99.8	20.1	38.6	26.3	29.5	26.6	46.8	46.2	15.8	30.4	58.3	18.0	12.0	22.8

Indices Ranking	Top ranking	Dublin	Hamburg	Helsinki	Nice	Cardiff	Turin	Budapest	Moscow	Seville	Minsk	Edinburgh	Valletta	Sofia	Barcelona
	Runner-up ranking														
2TK Global Airport Connections Index Score		**960**	**952**	**950**	**934**	**931**	**925**	**904**	**901**	**891**	**883**	**870**	**857**	**851**	**849**
2TK Analyst Benchmark Score 0/5		3	3	3	3	3	3	3	3	3	3	3	3	3	3
No. of Airports within <50km		3	2	3	2	4	2	3	2	2	2	1	1	1	1
Total Outbound Flights		**175**	**139**	**105**	**135**	**21**	**36**	**92**	**384**	**52**	**46**	**101**	**101**	**59**	**278**
Short-haul Flight		152	136	89	131	21	36	90	326	52	44	100	101	59	257
Long-haul Flights		23	3	16	4	0	0	2	58	0	2	1	0	0	21
Proportion of Long-haul Flights		13%	2%	15%	3%			2%	15%		4%	1%			8%
Commercial Flying Time (London/Paris) in hours		1.25	1.58	3.00	2.00	4.17	1.83	2.50	3.83	2.83	5.08	1.25	3.33	3.25	2.20
Commercial Flying Time (New York) in hours		7.67	9.08	8.67	9.92	10.25	11.00	11.42	9.42	11.50	13.00	7.83	12.58	12.67	8.82
Commercial Flying Time (Shanghai) in hours		16.08	14.25	10.58	15.42	16.92	15.33	15.42	9.25	19.17	13.33	15.83	14.75	15.92	16.25
Est. no. of passengers, 2015[a] (mn)		25.0	15.6	16.4	12.0	1.2	3.7	10.3	77.9	4.3		11.1		4.1	39.7

Indices Ranking	Top ranking
	Runner-up ranking

	Pomorie	Belgrade	Varna	Riga	Nicosia	Thessalonka	Marigot	Plovdiv	Veliko Tarnovo
2TK Global Airport Connections Index Score	**829**	**814**	**797**	**789**	**763**	**763**	**564**	**573**	**0**
2TK Analyst Benchmark Score 0/5	3	3	3	3	3	3	1	1	0
No. of Airports within <50km	1	1	1	0	2	0	1	1	0
Total Outbound Flights	**12**	**82**	**8**	**82**	**14**	**74**	**89**	**2**	**0**
Short-haul Flight	12	79	8	79	14	74	87	2	0
Long-haul Flights	0	3	0	3	0	0	2	0	0
Proportion of Long-haul Flights		4%		4%			2%		
Commercial Flying Time (London/Paris) in hours	3.67	3.00	4.83	2.67	7.17	3.33	15.00	6.92	0.00
Commercial Flying Time (New York) in hours	13.55	11.42	15.83	11.75	16.00	12.58	23.00	23.10	0.00
Commercial Flying Time (Shanghai) in hours	17.83	16.33	17.33	13.33	17.17	15.58	29.17	33.33	0.00
Est. no. of passengers in 2015[a] (mn)		4.8	1.4	5.2		5.6			

[a] Source: anna.aero – Airline Network News and Analysis

Blank - indicates that the destination was not included in the ranking or data is not available

Source: Data available from and published with permission from 2thinknow®: City Benchmarking Data at www.citybenchmarkingdata.com

2.3.3 2016 trends reflect the impact of recent events

As reflected in the tourism performance of the respective cities in 2016 so far, the latest trends from ACI Europe suggest that passenger traffic to/from Russia and Turkey has declined significantly, attributed in large part to terrorist incidents. This in turn is now also weighing down on the overall performance of European airlines and airports, although some leisure demand is shifting towards the EU market – contributing to boosting EU passenger traffic performance for airports in Portugal, Spain and Cyprus in particular. The baseline fundamentals generally remain positive for EU airports on the back of improving economic conditions and affordable prices for oil.

Airports in Ireland, Denmark, Luxembourg, Hungary, Romania, Bulgaria, Slovakia and Lithuania all registered double-digit growth in 2016, although ACI Europe reports significant weakness in other parts of the EU – especially in Germany, Austria, the Czech Republic and Slovenia.

A breakdown of ACI Europe results for selected airports during the month of May 2016, reported by category[12] show:

- GROUP 1 airports: Barcelona El-Prat (+12.3%), Dublin (+11.6%), Copenhagen (+10.8%), Istanbul SAW (+10.6%), Rome FCO (+7.7%)
- GROUP 2: Gran Canaria (+18.5%), Cologne-Bonn (+13.9%), Budapest (+13.5%), Tel Aviv (+12.9%) and Malaga (+12.2%)
- GROUP 3: Berlin SXF (+43.0%), Larnaca (+27.0%), Ibiza (+20.8%), Bucharest OTP (+18.9%) and Porto (+16.6%)
- GROUP 4: Oradea (+22,417.7%), Palanga (+97.7%), Kharkiv (+56.0%), Ohrid (+44.6%) and Bourgas (+40.4%).

These trends are substantiated by data from ForwardKeys, which analysed actual 2016 bookings January to May and real-time forward bookings May for June through August as at 31 May 2016. The ForwardKeys.com database provided a very mixed picture of the current situation in Europe regarding international long-haul demand for European cities. (It should be noted that ForwardKeys does not cover 100% of the air transport market in Europe as a number of LCCs are missing from its database. Nevertheless, coverage is extremely comprehensive.)

With regard to arrivals from January to May, the overall growth recorded by ForwardKeys was only 1.6%. And forward bookings were down by 2.1% overall. While Russia (+30%) and Poland (+28%)

[12] Group 1 = airports reporting >25 million plus passengers a year; Group 2 = 10-25 million; Group 3 = 5-10 million; and Group 4 = <5 million.

showed strong forward bookings' growth, as did Ireland (+20%) and Iceland (+45%), Turkey was down 31%, Belgium -23%, France -11%, and even Italy (-3%) and the UK (-4%) recorded a decline.

In terms of forward bookings for origin markets, the USA – which accounts for a 57% of air arrivals in Europe, according to ForwardKeys – showed no change over the same period in 2015, while all other source regions showed a decline, from -2% for Asia Pacific to -10% for Africa and the Middle East.

2.4 Short- to medium-term outlook for European airports

2.4.1 Slower growth prospects

According to the arguably outdated, if most recent, EUROCONTROL Challenges of Growth report (2013), demand for air traffic in Europe is expected to grow by 50% between 2012 and 2035. European aviation has entered a new era of slower growth prospects, says EUROCONTROL, compared to the growth rates experienced over the past decades. While the annual average traffic growth rate (aircraft movements) across Europe in the past 20 years was 3.6%, it is expected to be just 1.8% in the next 20 years.

Despite these slower growth prospects, the airport capacity crunch remains as acute as ever. By 2035, 12% of demand for air transport will not be accommodated due to a lack of airport capacity in Europe. This translates into 1.9 million flights not taking place and 237 million passengers unable to fly. This also involves airport-related flight delays increasing from less than 1 minute/flight to 5-6 minutes/flight – which means an unprecedented level of flight delays and cancellations affecting airlines and the travelling public.

One of the main reasons for this looming airport capacity crunch is the fact that airports have considerably reduced their capacity expansion plans and related investments in the wake of the crisis. Indeed, back in 2008, Europe's airports were planning for a 38% capacity increase by 2030. Now, they are just planning for a 17% capacity increase by 2035. This reflects increasing competitive and cost pressures on airports that are here to stay – resulting in more uncertain traffic developments, significant revenue pressures and generally higher capital costs. Moreover, a lack of political support, poor planning processes and decreasing confidence are all constraining airport development throughout Europe.

At the same time, the EU's Single European Sky (SES) initiative foresees the tripling of capacity, halving related costs for airspace users and reducing aviation's environmental impact by 10% as its main

objectives. While SES does not directly address airport capacity, it is clear that capacity in the air and capacity on the ground are intrinsically linked and that one cannot be achieved without the other. In other words, as long as the SES objectives are not aligned with ground capacity objectives, the airport capacity crunch will remain the most significant threat to their achievement.

Moreover, the lack of airport capacity will affect the competitive position of European aviation and, in turn, possibly European tourism. Flight delays and cancellations will come with significant costs for European airlines, while the unavailability of sufficient airport capacity will also result in missed business opportunities and will have a negative impact on Europe's global hub positioning.

Finally, the airport capacity crunch will hurt the European economy, ACI Europe maintains. It will act as an impediment to increased connectivity for European economies, at a time when the global shift to emerging and recently developed countries to Asia and Latin America gives aviation a new strategic relevance. The contrast with the airport capacity development plans of countries like China and the UAE is already striking.

2.5 The impact of Brexit on air transport demand

2.5.1 Uncertainties dampen business and consumer confidence

The British people's decision to leave the EU has clearly been a big talking point since the end of June 2016, and not least within the European tourism industry. The UK, the second most important European source of arrivals for cities in Europe, has a liberalised aviation market and one of the biggest benefits to UK aviation from EU membership has been in the area of traffic rights and the nationality of airlines. Any airline owned and controlled by nationals of EU member states is free to operate anywhere within the EU without restrictions on capacity, frequency or pricing.

The creation of the liberalised internal aviation market was one of the most important catalysts behind the rapid development of low-cost carriers in Europe in the 1990s. Today, the extensive pan-European networks of Ryanair, easyJet, Vueling, Norwegian and others are built upon this free access. Although Norway is not part of the European Union, Norwegian Air Shuttle has equal access to the internal European market for air transport, thanks to the European Common Aviation Area (ECAA).

ECAA could offer a route for UK airlines to access the single aviation market, post-Brexit. The ECAA extends the liberalised aviation market beyond the EU member states to include Norway, Iceland,

Albania, Bosnia and Herzegovina, Croatia, the former Yugoslav Republic of Macedonia, Montenegro, Serbia and Kosovo. The ECAA covers 36 countries and 500 million people. Norway and Iceland (and Liechtenstein) are also part of the European Economic Area, which extends the EU's wider single market to these non-EU countries.

If the UK were to leave the EU, its airlines would no longer enjoy automatic access to this market, although the UK might be expected to negotiate continued access. The most obvious way for the UK to do this would be to participate in the ECAA Agreement in the same way as countries such as Norway currently do. ECAA requires acceptance of EU aviation laws and "close economic co-operation" with the EU.

The Agreement provides for expansion of the ECAA to include other countries that are happy with two broad conditions. First, they must be prepared to accept EU aviation laws and, second, they must establish a "framework of close economic cooperation, such as an Association Agreement" with the EU. The UK may be prepared to continue to accept EU aviation laws, as it does currently. A similar logic would also suggest that the UK would establish continued close economic co-operation with the EU. But neither of these assumptions can be taken for granted. Would a UK that has just decided to leave

2.5.2 How some airlines have reacted

Renegotiation will definitely be needed, although major changes seem unlikely given the commercial interests involved.

EasyJet, the UK's largest LCC and second-biggest in Europe, has said it will lobby regulators to ensure UK carriers continue to have access to a "fully liberal and deregulated aviation market European air transport market." If that occurs, easyJet said it does not expect to have to alter its model.

However, it is making contingency plans. On 1 July, the carrier said it was seriously considering creating a second operation in an EU member state. If easyJet obtains an air operator's certificate (AOC) in Ireland, France, Germany, or any EU country, it could continue flying intra-European routes, even if the UK makes a clean break with the continent. However, even if easyJet added a second certificate, the company said it would remain based near London Luton Airport.

EasyJet is also looking to take advantage of the disruptions caused by Brexit by looking to boost capacity to take advantage of shifts away from the UK by the likes of Ryanair and Wizz Air. Both easyJet competitors have said they will scale back planned growth in the UK.

Perhaps more than its competitors, Norwegian Air Shuttle is most prepared for disaster in the UK. Norwegian has already diversified operations considerably, obtaining operating certificates in the UK and in Ireland, as well as in Norway. Given that it has three certificates in three countries, Norwegian would have little trouble moving assets in the event of regulatory changes. Still, it says it is too early to consider a worst-case scenario. The UK remains one of its most important markets and it says its ambitious plans for continued UK growth remain unchanged.

Europe's largest low-cost airline has already said it will pivot away from the UK. In a statement, the Irish carrier said it is "unlikely" that it will base any more aircraft in the UK starting in 2017, instead planning to grow in the EU. For now, though, Ryanair said its UK flights will continue as normal.

The airline is considering other plans. If the UK leaves the single European market, a Ryanair spokesman said the carrier might obtain a UK operating certificate. This would allow it to continue flying routes like Glasgow to London.

Though it is owned by UK-based International Airlines Group (IAG), owner of British Airways, Vueling is expecting business as usual even if the UK leaves the EU, since Vueling is a Spanish airline and has a Spanish AOC.

As for the parent company, IAG, which also owns Spain's Iberia and Ireland's Aer Lingus, the UK's proposal to leave is not expected to "have a long term material impact on its business.

2.6 LCCs driving European cities' tourism growth

The good news for European cities is that much of the air traffic growth in the region this year is being driven by low-cost services. Airline seat growth from, to and within Europe in summer 2016 (April through September) is expected to accelerate by 8%, up from 6% in summer 2015, according to the summer 2016 OAG schedules. This would be the highest summer growth rate in six years.

Capacity to Africa is expected to fall and Asia Pacific will experience slowing growth from Europe, but every other region will experience an acceleration. Intra-European seats are projected to grow by 8%,

driven largely by LCCs, including the low-cost subsidiaries of the big legacy groups. Seats on routes within Europe represent 86% of the total number of seats operated to/from Europe in the summer 2016 schedule.

Airlines that are classified as LCCs in the LCC database of the Centre for Aviation (CAPA) account for 40% of the scheduled seats recorded by OAG on intra-Europe routes for summer 2016, up from 38% in summer 2015. LCC seat growth will be 13% year on year, CAPA's early summer forecast predicted, while growth will be 5% for all other airlines in aggregate.

The top 20 groups by seats within Europe control 84% of capacity this summer. Six of these top eight airline groups are LCCs: Wizz Air, Flybe, Ryanair, TUI Group, Pegasus Airlines and easyJet. The LCC subsidiaries of the 'big three' European legacy airline groups are also growing rapidly within Europe this summer.

IAG's Vueling and Lufthansa's Eurowings/Germanwings will both increase seat numbers by 15%, although Vueling will still have 47% more intra-European seats than the Lufthansa Group's two LCC brands. Air France-KLM's Transavia will grow its seat capacity by 45% year on year in summer 2016, according to the OAG data.

2.7 Consumer ranking of European cities

It is interesting to compared traffic performance with the Skytrax World's Top Airline Awards, which are considered the most precious accolades by airports themselves and the tourism industry generally. Known as the Passengers' Choice Awards, they are a global benchmark of airport excellence and popularity.

The results of the 2015/2016 survey, shown in the figure below, put Zurich Airport in 1st place in Europe (7th in the world), ahead of London Heathrow and Amsterdam Schiphol. Some 18 WTCF Member Cities (representing 23 cities) rank in the top 100.

World's top 100 airports (2016)

2016 Rating		2015 Rating
7	Zurich Airport	6
8	London Heathrow	8
13	Amsterdam Schiphol	9
15	Helsinki Airport	18
18	Copenhagen Airport	16
27	Barcelona Airport	37
29	Vienna Airport	38
31	Madrid-Barajas Airport	27
33	Paris CDG Airport	48
40	Hamburg Airport	45
41	London City Airport	32
45	Gatwick Airport	40
53	Moscow Domodedovo	51
57	Lisbon Airport	52
60	Athens Intl Airport	55
76	Budapest Intl Airport	69
78	Moscow Sheremetyevo	84
80	Dublin Airport	81
83	Brussels Airport	78
84	Nice Airport	79
93	Prague Airport	85
95	Stansted Airport	73
96	Geneva Intl Airport	95

Source: World's Top 100 Airports 2016 by Skytrax World Airport Awards (http://www.worldairportawards.com/Awards/world_airport_rating.html)

Voted by airline customers around the world during the 9-month 2015/16 survey period.

"The World Airport Awards are the most prestigious accolades for the airport industry, and a global benchmark of airport excellence widely known as the Passengers Choice Awards"

- 18 WTCF European City Members have airports within the 'World's top 100 airports' (2016) as voted by customers.
- Zurich is the airport that achieved the highest ranking (7th).
- One other European city features in the top 10 – London, with London Heathrow.

Section 3 - Case Study on Low-cost Airline Services

3.1 The main driver of European cities' tourism growth

The proliferation of low-cost carrier (LCC) services has arguably been the main driver of European cities' tourism growth over the past couple of decades, as well as causing a key structural change in European air transport. The low-cost model has been overwhelming favoured for airline start-ups over the period, and their spread around the world, into both short- and now long-haul markets, has caused a fundamental shift in the competitive dynamics of the industry. 'Classic' characteristics of the low-cost model, to quote the Centre for Aviation (CAPA), include:

- High seating density
- High aircraft utilisation
- Single aircraft type
- Low fares, including very low promotional fares
- Single class configuration
- Point-to-point services
- No (free) frills
- Predominantly short- to medium-haul route structures
- Frequent use of second-tier airports, and
- Rapid turnaround time at airports.

3.1.1 LCC share is higher than elsewhere in the world…

According to CAPA's comprehensive database[13], derived from OAG's scheduled seat capacity data, LCCs had a seat share of 39% on routes within Europe in 2015. Nevertheless, the share reflected a 41% drop over 2014 – the first time that it had experienced a decline – and, over the first four months of 2016, it fell by a further point, to 38%.

[13] centreforaviation.com.

Although there is no widely agreed definition of what makes an LCC, and year-by-year comparisons are not always reliable, this would suggest that the previous long-term rising trend in European LCC seat share has come to an end except perhaps in and to Central & Eastern Europe, where LCC penetration still lags far behind. Nevertheless, the sector remains extremely important in terms of generating tourism demand for European travel, not least to Europe's cities. Many industry players also believe that the decline is a mere blip in the longer-term growth trends, in line with a slowdown in growth in demand due to current economic and political uncertainties.

It is also important to note that the 39% share held by LCCs on routes within Europe in 2015 compares with a global average of only 26% and a share on routes within North America of just 31%. In Asia Pacific, the 2015 LCC seat share on routes within the region was 25% – although LCCs account for 58% of seats on intra-Southeast Asian routes.

3.1.2 …and has shown the biggest growth in the past decade

A decade ago, in 2006, Europe's LCC market was 40% smaller than North America's, measured by seat capacity within the region. Although Ryanair and easyJet were then more dominant within the European LCC market, operating 60% of LCC seats between them, their combined 86 million seats was much lower than Southwest Airlines' 149 million on intra-regional routes.

Between 2006 and 2015, North America's intra-regional LCC seat numbers increased by just 17%, while Europe's doubled, according to data from OAG Schedules Analyser. The two leading European LCCs, Ryanair and easyJet, both doubled capacity and all the other European LCCs more than tripled capacity (an increase of 230%) over the same period, so that the total LCC market grew by 152% on routes within Europe.

Source: Luc Citrinot

Business travel has already contributed, and will continue to contribute to growth since the opening up of new secondary destinations and increased frequencies to established destinations have made it much easier for business travellers to reduce their business travel to same-day trips. But by far the greater demand for LCC services has come from leisure travellers eager to visit new destinations.

Low-cost carriers' shares of seat capacity (%)

Between	and	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016*
Western Europe	Western Europe	10.1	12.0	12.7	13.9	13.6	15.0	16.7	17.5	17.7	17.2
Western Europe	Rest of Europe	30.9	33.7	35.7	36.8	38.4	40.7	42.3	44.0	41.2	40.2
Eastern/Central Europe	Eastern/Central Europe	22.5	24.9	26.2	27.1	25.1	27.6	29.4	30.5	32.6	34.5
Eastern/Central Europe	Rest of Europe	5.0	5.3	5.5	5.2	3.5	4.0	4.8	4.9	6.2	7.4
All Europe	All Europe	29.5	32.0	34.0	35.0	35.8	38.1	39.6	41.0	39.0	38.6
All Europe	Rest of world	2.5	3.2	3.6	4.6	4.9	5.3	6.6	7.1	7.0	6.5
World	All destinations	17.5	19.2	20.3	21.4	22.8	23.4	25.0	25.9	25.4	25.4

* Jan-May. Notes: Seat capacity in both directions of low-cost carriers (wherever they are based)

Source: CAPA - Centre for Aviation

Source: Luc Citrinot

3.1.3 The importance of LCCs to city tourism

The importance of LCCs to European city tourism is clearly reflected in the number of seats available in the market and the vast network of destinations served point to point by LCCs. European LCCs operated a total of 378 million seats on Europe-to-Europe routes in 2015, according to CAPA. Almost half of these (181 million, or 48% of the total) were deployed by the two largest European LCC carriers, Ryanair and easyJet. But, in total, there were as many as 20 LCCs on intra-European routes in 2015.

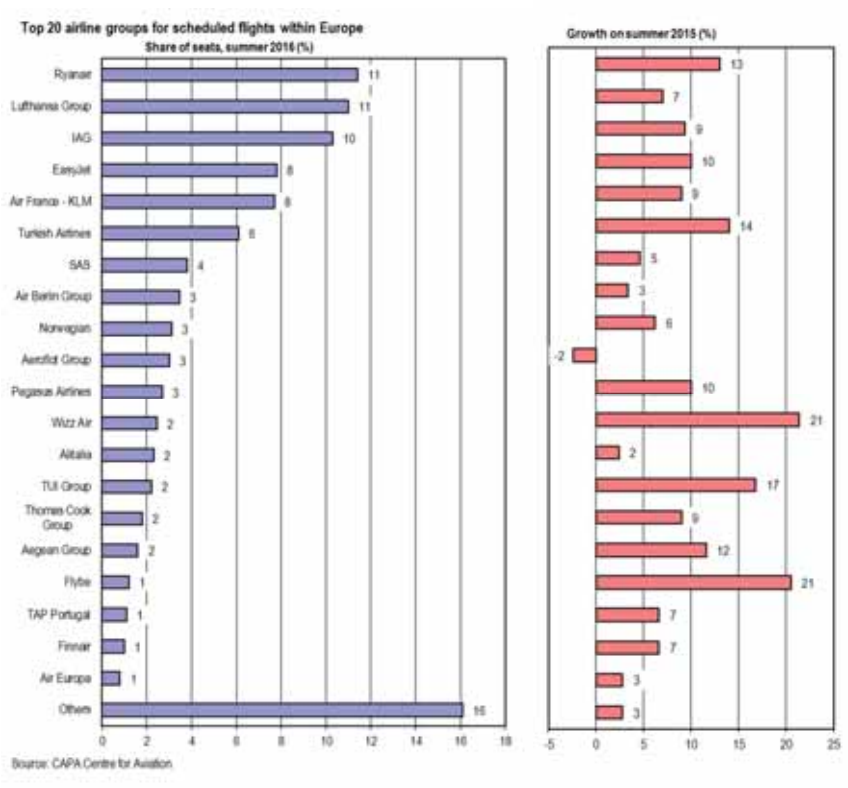
Seats on routes within Europe represent 86% of the total number of seats operated from Europe in the current (2016) summer schedule. And airlines that are classified as low-cost carriers in the CAPA LCC database account for 40% of the scheduled seats recorded by OAG on intra-Europe routes for summer 2016 (April through September), up from 38% in summer 2015. Growth is expected be 13% year on year, while growth for all other airlines combined will be just 5%.

The top 20 groups by seats within Europe shown in the figure below control 84% of capacity this summer. The same eight airline groups among the top 20, which are implementing double-digit seat growth in the overall market to all regions from Europe, are also growing at double-digit rates within Europe. Six of the eight are LCCs: Wizz Air, Flybe, Ryanair, TUI Group, Pegasus Airlines and easyJet. Turkish Airlines and Aegean Airlines Group are the only non-LCCs in the top 20 to be growing at a higher rate.

The LCC subsidiaries of the 'big three' European legacy airline groups are also growing rapidly within Europe this summer. IAG's Vueling and Lufthansa's Eurowings / Germanwings will both increase seat numbers by 15%, although Vueling's will still have 47% more intra-European seats.

Source: Luc Citrinot

Top airlines in Europe



Source: CAPA - Centre for Aviation

3.2 Opening up new destinations

3.2.1 Increased consumer choice

Consumers have been the major beneficiaries of air transport liberalisation and the emergence of low-cost airlines over the past decade, both in terms of greater choice of service providers and destinations and the resulting reduced airfares in general for travel within Europe. The lower fares on offer have

generated a sharp increase in the number of passengers who can afford to travel by air, and have also brought enormous cost savings to the travel budgets of many businesses across Europe.

The number of airlines has increased dramatically since liberalisation removed the barriers for new entrants. Prior to liberalisation, only national carriers and a small number of regional airlines were permitted to operate within Europe.

Many of the newcomers adopted the low-cost / low-fares model. Indeed, many of the national carriers also decided to adopt aspects of the model – e.g. Aer Lingus, which relaunched itself as a low-cost model – or have set up low-cost subsidiaries, such as SAS's Snowflake, KLM's Transavia/Basiqair, BA's 'go' (subsequently acquired by easyJet and merged into its own operations), Lufthansa's Germanwings and BMI's bmibaby (acquired by the IAG Group and shut down in 2012).

Source: Luc Citrinot

The table below highlights the significant growth in passengers carried by selected low-cost airlines (members of the European Low Fares Airline Association, or ELFAA) from 2006 to 2014.

Some of the leading European low-cost airlines, 2006-2010

Airlines	Country	Passengers (mn)			Flights per day			No. of destinations		
		2006	2010	2014	2006	2010	2014	2006	2010	2014
Ryanair	Ireland	40.5	72.7	86.4	750	1,500	1,600	127	160	189
EasyJet	UK	33.7	49.6	65.3	765	1,033	998	73	125	136
Norwegian	Norway	5.1	13.2	24.0	160	360	424	55	95	130
Vueling	Spain	–	11.0	21.5	–	188	339	–	40	114
Wizz Air	Hungary	3.0	9.6	15.8	63	175	302	31	69	106
Flybe	UK	5.5	7.3	7.7	270	521	517	47	63	77
Transavia	Netherlands	5.1	5.1	6.8	78	55	130	95	96	98
Jet2.com	UK	–	3.3	6.2	–	160	200	–	52	50
Volotea	Spain	–	–	1.8	–	–	59	–	–	60
Sverige flyg	Sweden	0.4	0.6	0.8	42	52	62	6	21	14

Note: ELFAA members only. Wizz Air flights per day as at June 2014

Source: European Low Fares Airline Association (ELFAA)

3.2.2 Use of secondary airports has been a critical factor for some cities

The three cities chosen as case studies to show the impact of LCCs on European cities' tourism are all important leisure tourism destinations, and would no doubt still have been important without the impact of low-cost travel. However, in the case of Berlin and Barcelona, the availability of secondary airports (Schönefeld and Girona, respectively) offering lower landing and other charges to airlines has been a key contributing factor to the growth of their tourism, as has been the case for a number of other extremely popular European cities.

Use of secondary airports in major European cities by ELFAA members

City	Primary airports(s)	Secondary airport(s)
Amsterdam	Schiphol	Rotterdam
Barcelona	El Prat	Girona, Reus
Berlin	Tegel	Schönefeld
Brussels	Zaventem	Charleroi
Copenhagen	Kastrup	Malmö
Cracow	Balice	Katowice
Düsseldorf	Düsseldorf International	Cologne/Bonn, Weeze
Frankfurt	Main	Hahn
Glasgow	Abotsinch	Prestwick
Hamburg	Hamburg Airport	Lübeck
London	Heathrow, Gatwick	Stansted, Luton
Milan	Malpensa	Bergamo
Paris	Charles de Gaulle, Orly	Beauvais
Rome	Fiumicino	Ciampino
Stockholm	Arlanda	Skavxsta, Västerås
Vienna	Vienna International	Bratislava

Source: European Low Fares Airline Associations (ELFAA)

In terms of percentage growth, many of the other smaller, secondary cities have benefited much more than capital cities and other traditional city-break destinations. Indeed, services between secondary/regional points have opened up a whole host of new destinations, as highlighted by ELFAA in the above table. Many of these would never have stood a chance of being on the European leisure tourism destination map without LCCs.

Examples of tourism destinations discovered for international air travel by low-cost airlines

Country	New international tourism destinations
Austria	Graz, Linz, Klagenfurt
Belgium	Charleroi
Denmark	Esjberg
Finland	Tampere
France	Bergerac, Rodez, Limoges, Carcassonne, Pau, La Rochelle, Nimes,
	St. Etienne, Tours, Poitiers, Dinard
Germany	Karlsruhe-Baden, Altenburg, Hahn, Tempelhof, Münster (Osnabrück), Erfurt
Ireland	Knock, Derry, Kerry
Italy	Bari, Pescara, Ancona, Brindisi, Palermo, Alghero, Trieste
Norway	Haugesund
Poland	Gdansk, Poznan
Slovakia	Košice
Spain	Bilbao, Girona, Jerez, Murcia, Santander, Valladolid, Zaragoza
Sweden	Malmo, Nyköping
United Kingdom	Blackpool, Bournemouth, Newquay

Source: European Low Fares Airline Association (ELFAA)

3.3 Attracting low-cost airline services

The majority of cities served by LCCs have been obliged to provide subsidies in one form or another to the respective airline/s if they want to attract them, at least in the early route development phase. These can be in the form of discounted airport charges – such as for landing and ground handling – marketing agreements with local and/or regional tourist offices, route development promotions, local tour operator support or, in many cases, direct state aid from regional and/or municipal authorities. From 1996 to 2010, for example, several Spanish regional governments paid some €297 million to facilitate the start-up or ensure the viability of air links in 26 airports. And this official figure is estimated to be lower than what was actually transferred, although it gives an idea of how extensive the practice of state aid had become

Over 80% of the funds were reportedly allocated to Air Nostrum and Ryanair while, in third Place, was Lagun Air, a short-lived company that received preferential treatment from the Junta de Castilla y León in its attempt to boost the region's airports. In fourth and fifth places were Vueling and Clickair (merged into Vueling in 2009), which received a major injection of public funds from 2007 on.

Most of the airports benefiting from these grants had low traffic figures, although Spanish airports like Alicante (10.6 million in 2015), Valencia (5.1 million) and Fuerteventura (5 million) handled well over 4 million passengers in 2010, and are among several Spanish airports still benefiting from state aid to Ryanair and Air Nostrum. Clearly, the injection of subsidies has done wonders for tourism to the country and the respective regions and cities.

In addition, low fares have boosted investment in real estate by foreigners eager to acquire holiday and retirement homes, not to mention being able to offer family and friends the possibility of regular cheap holidays. When Ryanair first launched services to Girona in the late 1990s, the Costa Brava airport was little more than a small terminal and a dirt field for parking. As a result of the growth in demand, terminal facilities were improved and parking garages soon replaced the field as Ryanair wooed travellers with fares that cost as little as €4. By 2009 it was operating more than 35,000 flights a year in and out of Girona, up from 100 in 2002. Foreign buyers taking advantage of the cheap fares began to drive real-estate sales – a phenomenon widely known in the industry as "the Ryanair effect." A typical three-bedroom villa priced at €220,000 in 2004 sold for close to €350,000 just five years later.

Girona, which is a purely low-cost and seasonal charter airport located at 92km north of Barcelona, has seen passenger numbers fall sharply – from 4.9 million in 2010 to 1.8 million in 2015 due to Ryanair's decision to cut flights to the destination in 2011. This followed the refusal of the then new government to honour the agreement for subsidies signed with the previous government. Ryanair accounted for a massive 95% of all traffic through the airport at the time, but its share plummeted when it pulled five aircraft based in Girona, cancelled 18 routes and reduced frequencies on another 17. Barcelona's El Prat Airport was a major beneficiary, although some source markets suffered an unwelcome drop in capacity to Europe's leading leisure destination.

Other cities and regions in Europe have also benefited hugely from Ryanair's pioneering spirit. Cities such as Bergerac in the southwest of France and Perugia in northern Italy grew into popular destinations for owners of holiday homes from 2000 to 2007, after budget airlines like Ryanair and easyJet began regular service. And Malta's tourism industry (see below) has gone from strength to strength since it opened up the destination to LCCs.

Charleroi was one of Ryanair's first European destinations outside Ireland and the UK in 1997 and the airline chose it as a base in 2001. Competitor, Brussels Zaventem, initially objected in 1999 and made a formal complaint in 2001. It said that that Charleroi Airport, owned by a regional authority, was effectively subsidising the Irish airline by giving it cut-price landing fees, ground-handling charges and marketing support.

In 2004, Ryanair was ordered by the European Commission to pay back millions of euros in "illegal" and "improper" subsidies involving Brussels Charleroi Airport. The airline enjoyed a 50% reduction in landing charges and paid a €1 landing charge per person, compared with a normal rate of up to €13, as well as negligible baggage handling charges. It also received about €420,000 a year to pay accommodation costs of air crews and about £600,000 towards pilot training.

After one of its longest-running legal battles, Ryanair made a successful appeal against the decision, and it won its case in the European Court of Justice in 2008. That meant the issue was returned to the Commission, which began an investigation into the pair's relationship that broadened out to take in other airports and airlines. The EC ruled in 2014 that its deal with Charleroi Airport did not in fact constitute illegal state aid. It found that deals that Ryanair had made with Charleroi, Frankfurt Hahn in Germany, Alghero in Sardinia and Vasteras in Sweden were not in breach of the EU's state aid rules as the airports in question all profited from the agreements.

This example just serves to highlight the fact that subsidies to LCCs, and Ryanair in particular, have proved very controversial over the years, although there is no doubt that LCCs have contributed hugely to boosting city tourism demand over the past two decades.

3.4 Cities benefiting from LCC services

The number of cities around Europe that have benefited from LCCs are too numerous to mention in this report, although the Performance Indicators highlight some of those recording the strongest growth in arrivals over the past five years thanks to the introduction and growth of LCCs. It should however be noted that, for some cities and regions, the main impact in terms of arrivals and bednight growth was felt much earlier than the period covered by the main statistics in this report (2000-2015) – soon after the introduction of the first LCC services, and as long ago as the early-1990s.

Among many different successful case studies worth noting, **Valencia** saw its first LCC flight in 2004, with the result that tourist arrivals increased by 58% from 2000 to 2005. Admittedly, the easier and cheaper access to the Spanish city coincided with the opening of its city of Arts and Sciences, a project jointly funded by government and the private sector. Over the next ten years ten years, to 2015, a further 45% growth was achieved.

Malta is an interesting example of a destination that has benefited significantly from LCCs, although most of the LCC tourists it receives – predominantly leisure tourists – are of course not headed for its

capital, **Valletta**, except to make day visits. LCCs have dramatically increased air traffic to Malta from a number of European origin points since the Maltese Government finally stopped protecting its national carrier in 2006, and agreed to support its local inbound tourism industry and encourage LCCs to launch service by offering them price incentives.

The decision was taken to boost inbound tourism, which had been stagnating, especially during the off- and shoulder seasons, since seasonality to the island had remained static for a number of years. It therefore agreed to stimulate new demand for the island's cultural and natural attractions and offered LCCs a 50% discount on passenger and landing charges during the winter schedule, and a 30% discount during the summer schedule.

Although a number of the LCCs serving Malta do operate services year round, it should be noted that the islands' seasonality problem has not really been resolved, but it has improved. A comparison of seats available in the months of May and November 2015 suggests that, of total services (low-cost and non-low-cost), the summer months account for 60% of capacity. The respective share for LCC services only is 62%.

LCCs generated 260,000 seats in May 2015 (and 65,700 in November 2015) – 42% of total capacity – with Ryanair in top slot (28%) followed by easyJet some way behind (6%). Air Malta still had a 37% share of total seats to/from Malta in 2015.

Ryanair is the most established LCC, operating to/from Malta and 11 countries or nearly 30 cities. Some 20 of these are served year round. Other important LCCs are easyJet, Vueling, Norwegian Air Shuttle and Wizz Air.

Reykjavík, Iceland's capital, is another of the less well-known capitals in Europe that has seen strong growth in tourism demand thanks to LCCs flying to Keflavik, its budget airport located at 125km from the city. In 2005, only two airlines operated year-round services to Keflavik. Now there are nine, resulting in a 133% increase in arrivals in the last ten years and double-digit growth annually. And it is currently ranked as one of the most popular new destinations by tour operators.

Geneva's tourism may not have enjoyed the double-digit annual increases in arrivals that many other European cities have seen – largely due to the continuing, and increasing, strength of the Swiss franc – but the annual increase was nevertheless 5.3% in the ten years to 2015, taking its annual total to just under 3 million. Geneva's international airport has recorded even more impressive growth, achieving 15.8 million passengers in 2015 on 20.4 million total seat capacity, with the benefits going mainly to neighbouring France and its winter ski resorts. Some 85 destinations are served from Geneva – a

remarkable number given the airport's relative size – with LCCs accounting for 33% of total passenger traffic in the summer months and an even higher 43% in winter.

The following three case studies look at tourism trends in and to three leading European tourism cities – **Barcelona**, **Berlin** and **Prague** – and assess the impact of LCC services on the respective cities' tourism development.

3.5 Barcelona case study

3.5.1 Key facts and figures

Ranking on key benchmarking indexes	
Global Blue Globe Shopper Index – Europe	2
Guardian Cities Global Brand Index (2013)	6
PwC Cities of Opportunity Index (2014)	-
Mori MMF Global Power City Index (2015)	26
EIU 2025 City Competitiveness Index	55
AT Kearney Global Cities Index	26
AT Kearney Global Cities Outlook	3

Ranking on key air connectivity and airport indicators	
2TK Global Airport Connections Index Score	849
2TK Analyst Benchmark Score 0/5	3
No. of airports within <50km	1
Total outbound flights	278
Short-haul flights	257
Long-haul flights	21
Share of long-haul flights (%)	8
Commercial flying time (London/Paris) in hours	2.20
Commercial flying time (New York) in hours	8.82
Commercial flying time (Shanghai) in hours	16.2
Est. no. of passengers in 2015, mn	39.7

Total tourist arrivals and bednights, 2000-2015

	2000	2005	2010	2015
Arrivals (000s)	3,644	6,152	7,618	8,988
Bednights (000s)	9,276	12,466	15,342	19,652
Average stay (nights)	2.5	2.0	2.0	2.2

Source: TourMIS

Hotel operating performance, 2015-2016

	2015	**% change (pp)**	
		2015/14	2016/15F
Average occupancy (%)	75	2.0	+/-0
ADR €	125	6.2	3.2
RevPAR €	71	3.2	3.3

Notes: pp = % point; F = forecast.

ADR = average daily room rate; RevPAR = revenue per available room

Source: PwC

3.5.2 Introduction

From 1992, when Barcelona hosted the summer Olympic Games, Spain's second biggest city – and number one tourism destination – was transformed from an industrial city into a leisure and city-break destination. Prior to 1992, when the city-break sector was in its infancy in Europe, Barcelona was seen by leading source markets as too distant for short breaks. And after a boost in tourism in 1992, arrivals started to decline again. It was only the launch of LCCs in the 1990s that set Barcelona on the road to recovery and tourism success.

Barcelona is now one of the most popular (5th) city-break destinations in Europe, boasting great tourist attractions, such as beaches, non-stop cultural events, highly rated gastronomy and modern architecture. It is also a leading destination for meetings, incentives, conferences and exhibitions (MICE), hosting nearly 2,000 events a year. Around 40% of tourists to the city in 2014 cited a convention or exhibition as the prime motivation for their visit.

2015 was a good year for the hotel industry in Barcelona, driven by marginal supply growth and healthy occupancy levels. However, a moratorium approved by the new Mayor and city council has stopped the opening of some high-profile new hotels in the city. This has included several pending projects totalling nearly 5,000 rooms.

3.5.3 Tourism trends

The impact of LCCs on Barcelona's tourism development is clearly reflected in the average annual growth of both airport and city arrivals before and after the advent of the LCCs. Detailed statistics prior to 2000 are not readily available but, from 3.6 million arrivals in 2000, they increased to 6.2 million in 2005 and just under 9 million in 2015. The average annual growth in 2000-2005 was 11.0% – highlighting the sharp boost from LCCs after they first entered the market – and 6.2% in the 15 years 2000-2015. Bednight growth was lower, albeit still impressive, at +6.1% and +5.1% for arrivals and nights, respectively.

Average length of stay in Barcelona has fallen since 2000, although it is up on its low of 2.0 nights, recovering to 2.2 nights by 2015. The lower average stay reflects the increased share of short breaks, in line with the growth of LCC services.

3.5.4 Airport connectivity

Barcelona is served by three airports: El Prat, which is the leading international hub only 12km southwest of the city; Girona, 92km to the north; and Reus, 100km to the southwest. Reus receives a large amount of tourist traffic from passengers destined for the beach resorts of Salou and Cambrils, but also – perhaps surprisingly – for Barcelona.

Low-cost flights were first launched to/from Barcelona El Prat Airport (then known as Barajas) although, through the first decade of the 2000s, the majority of LCC flights served Girona Costa Brava Airport, which opened in 1997. In 2004, the year that Ryanair entered the market, Girona recorded just under 3 million passengers, and it reached its peak of 5.5 million in 2008. Since then, passenger throughout has been consistently dropping every year, with only 2.1 million recorded in 2015. The decline coincides with Ryanair's arrival at Barcelona El Prat and the increase in its operation from Catalonia's main airport.

This winter, Ryanair is only offering 16 routes to and from Girona, a 20% drop over the previous season. Nevertheless, as can be seen in Table 5, Ryanair is the second most important LCC serving Barcelona after Vueling (traffic from both airports combined). EasyJet follows in third position.

LCC flight capacity to/from Barcelona airports, 2015

	May		November	
Carrier	Flights	Seats	Flights	Seats
Total, all carriers	11,902	2,070,580	9,015	1,568,203
of which: LCCs	8,592	1,527,151	6,380	1,133,840
LCCs' % share	72.2	73.8	70.8	72.3
Vueling Airlines (VY)	4,938	878,840	3,468	615,842
Ryanair (FR)	1,525	288,225	1,303	246,267
EasyJet (U2)	919	147,252	737	119,772
Norwegian Air Shuttle (DY)	336	62,496	55	10,230
Germanwings (4U)	220	34,770	154	24,967
Wizz Air (W6)	166	29,880	130	23,400
Transavia (HV)	150	25,350	104	16,656
Norwegian Air International (D8)	–	–	189	35,154
Monarch Airlines (ZB)	94	18,114	61	11,800
Transavia France (TO)	64	12,204	41	7,667
Pegasus (PC)	39	7,311	39	7,296
Jet2 (LS)	47	7,721	20	2,994
Airberlin (AB)	31	5,669	18	3,159
Jetairfly (TB)	24	2,688	26	2,912
Blue Air (0B)	17	2,703	13	2,028
Eurowings (EW)	–	–	22	3,696
WOW air (WW)	14	2,464	–	–
Smart Wings (QS)	8	1,464	–	–

Source: Innovata

Airline operations through Barcelona El Prat are predominantly short- and medium-haul, low-cost services – Europe accounts for close to 75% of seat capacity – although there are moves to promote more long-haul services. Traffic growth was strong until the financial crisis in 2008 and 2009. It bounced back quickly before the demise of Spanair interrupted the resumption of rapid growth. Nevertheless, in the period 2010-2015, growth averaged 6.3% per annum.

Almost half the international seat capacity from Barcelona is accounted for by Europe's big four nations: the UK, Germany, France and Italy. Each has a similar level of capacity from the airport, although the domestic market has around three times the number of seats compared with each of these countries. Vueling is the leading airline by seats from Barcelona to other parts of Spain, Italy and France, and number two (behind Lufthansa) to Germany.

Barcelona El Prat Airport international seats by country, 29 Jun to 5 Jul, 2015

Country	Seats
United Kingdom	106,413
Italy	96,006
France	93,204
Germany	91,708
Switzerland	36,608
Netherlands	35,570
USA	25,410
Belgium	24,726
Portugal	24,213
Russian Federation	24,022
Sweden	15,744
Others	226,284

Source: CAPA - Centre for Aviation

On routes to the UK, which is the airport's leading international destination/origin country served, Vueling ranks only in 4th place, with a seat share of 15% a week. EasyJet, Ryanair and British Airways all have a seat share of 20% or more on UK routes, which also include LCCs Monarch, Jet2.com and Norwegian Air Shuttle.

% share of seats by airline at Barcelona El Prat Airport, 29 Jun to 5 Jul, 2015

Airline	% share
Vueling	39.2
Ryanair	12.5
EasyJet	6.2
Iberia	5.3
Lufthansa	3.2
Norwegian Air Shuttle	2.7
Air Europa	2.3
British Airways	2.1
Other	26.4

Source: CAPA - Centre for Aviation

The table below shows the leading origin/destination cities linked to Barcelona. Although they do not feature in the top 20 ranking, a large number of secondary cities in the major markets also benefit from direct links, making it much easier and more cost-effective for tourists to reach their destinations.

Destinations served from Barcelona Airports, 2015

	May		November	
	Flights	Seats	Flights	Seats
No. of cities served	**135**		**105**	
Total seats	**11,703**	**1,935,468**	**9,015**	**1,568,203**
London (LON)	888	142,194	690	119,006
Paris (PAR)	790	131,531	575	99,418
Madrid (MAD)	700	126,956	686	134,300
Palma de Mallorca (PMI)	514	79,605	475	75,980
Rome (ROM)	384	68,449	289	53,913
Milan (MIL)	356	58,326	294	51,546
Frankfurt (FRA)	310	57,542	233	44,123
Amsterdam (AMS)	338	54,396	313	53,151
Brussels (BRU)	311	52,452	247	43,428
Seville (SVQ)	261	45,162	218	39,634
Ibiza (IBZ)	257	44,676	166	30,420
Munich (MUC)	234	41,204	203	35,933
Zurich (ZRH)	183	33,544	143	26,832
Moscow (MOW)	165	31,154	112	18,370
Geneva (GVA)	211	31,088	165	27,848
Vienna (VIE)	168	30,544	99	19,136
Lisbon (LIS)	232	30,296	192	27,094
Bilbao (BIO)	173	29,148	149	26,681
Malaga (AGP)	166	28,575	114	20,260
Istanbul (IST)	140	28,358	150	28,726

Source: Innovata

3.5.5 Conclusions

Barcelona is an extremely successful tourism city, and one which owes its sharp rise in popularity among leisure tourists over the past two decades in large part to LCCs. With LCCs accounting for more than 70% of traffic at Barcelona, it is Europe's leading low-cost destination by seat numbers, according to CAPA. Yet there are increasing signs that airlines like Ryanair, easyJet and Vueling are starting to eye the more lucrative, high-yield, and especially, business travel market. Industry observers expect an aggressive push in this direction in the next few years.

3.6 Berlin case study

3.6.1 Key facts and figures

Ranking on key benchmarking indexes	
Global Blue Globe Shopper Index – Europe	6
Guardian Cities Global Brand Index (2013)	25
PwC Cities of Opportunity Index (2014)	11
Mori MMF Global Power City Index (2015)	8
EIU 2025 City Competitiveness Index	34
AT Kearney Global Cities Index	16
AT Kearney Global Cities Outlook	14

Ranking on key air connectivity and airport indicators	
2TK Global Airport Connections Index Score	1
2TK Analyst Benchmark Score 0/5	5
No. of airports within <50km	5
Total outbound flights	240
Short-haul flights	229
Long-haul flights	11
Share of long-haul flights (%)	5
Commercial flying time (London/Paris) in hours	1.75
Commercial flying time (New York) in hours	8.75
Commercial flying time (Shanghai) in hours	14.83
Est. no. of passengers in 2015, mn	29.5

Total tourist arrivals and bednights, 2000-2015 (TourMIS)

	2000	**2005**	**2010**	**2015**
Arrivals (000s)	5,006	6,465	9,051	12,369
Bednights (000s)	11,413	14,620	20,802	30,250
Average stay (nights)	2.3	2.3	2.3	2.4

Source: TourMIS

Hotel operating performance, 2015-2016

	2015	**% change (pp)**	
		2015/14	**2016/15F**
Average occupancy (%)	76	2.0	+/-0
ADR €	93	4.9	2.2
RevPAR €	71	8.2	3.1

Notes: pp = % point; F = forecast.
ADR = average daily room rate; RevPAR = revenue per available room
Source: PwC

3.6.2 Introduction

More than 25 years after the fall of the Berlin Wall, Berlin's tourism performance continues to exceed expectations. Sitting at the crossroads between western and eastern Europe, and boasting a rich and colourful history and cultural heritage, the German capital is already Europe's third most visited city, behind London and Paris, and it is fast rising up the global rankings. Nevertheless, it faces a number of constraints to future growth due to the delay in opening of its new Berlin-Brandenburg (BBI) Airport – now not expected until at least late-2017/2018.

Berlin's 3.5 million population, which makes it Germany's largest city, includes 400,000 foreign nationals from 190 nations – reflected in its cultural and culinary diversity. As well as being Germany's political centre, Berlin is a dynamic centre for business and research.

The city has a wealth of historic and cultural attractions – including three opera houses, eight world-class orchestras, 150 theatres/stages of all genres, 180 museums and memorials and 440 galleries, not to mention a variety of restaurants, cafes and bars and extensive green spaces/forests. It is also a leading congress/exhibition centre, ranked 5th worldwide by ICCA in international association meetings.

Thanks to its rapid growth in tourism, Berlin is a magnet for new hotel investment and development. Occupancy is pretty high, and rising, driven by strong demand from conference/congress delegates and city leisure tourists. Although RevPAR increased by more than 8% in 2015, hotels are still affordable compared with rates in most European capital cities. After a glut in construction of new four- and five-star hotels, the growth of supply in this sector has been more muted. But several budget and midscale properties with large room capacity are planned or under construction.

3.6.3 Tourism trends

2015, one year after the 25th anniversary of the fall of the Berlin Wall, proved another record year for Berlin – with some 12.4 million inbound and domestic tourist arrivals (+4.2% over 2014) and 30.3 million nights (+5.6%). Domestic tourists account for about 55% of demand, reflecting a slow but steady decline in share since 2004.

Average length of stay was 2.4 nights overall (the same as in 2014, but up from 2.3 in 2013), with foreign tourists staying longer on average (2.8 nights) than domestic visitors (2.2 nights).

In the last ten years, Berlin has seen both its arrivals and overnight volume more than double – a remarkable achievement compared with average European city tourism performances. The average annual increase in arrivals and nights from 2005 to 2015 was 6.7% and 7.5% respectively.

Domestic tourism is extremely important to Berlin, but it has been losing share steadily to inbound tourism, which has been growing faster, and is now much less important than for many other leading German cities. Not surprisingly, given the city's colourful history, the growth in domestic tourism volume has nevertheless been very strong since the 1990s – from the fall of the Berlin Wall and the reunification of the once divided city, as well as since it was renamed Germany's capital. Demand has been boosted by LCCs.

3.6.4 Airport connectivity

Berlin is served by two airports, Tegel and Schönefeld – a result of its history as a divided city. It has still has not recovered its former principal hub status but, as the German capital again, it is gaining in importance. It is already the third largest intercontinental hub after Frankfurt and Munich (second in direct traffic), and will further improve its ranking after the opening of its new, well overdue, new airport – but not before 2017/18.

Improved accessibility thanks to LCCs operating to Schönefeld Airport has been a key driver behind its dynamic growth over recent years. Berlin is by far the largest LCC hub in continental Europe and competition overall is boosted by the presence of two major German airlines/alliances: Deutsche Lufthansa (Star Alliance) and Airberlin (OneWorld). Berlin is extremely well connected in terms of air routes to the rest of Germany.

LCC flight capacity to Berlin Tegel Airport, 2015

	May		November	
Carrier	**Flights**	**Seats**	**Flights**	**Seats**
Total	**9,876**	**1,478,765**	**9,716**	**1,542,982**
of which: LCCs	**6,508**	**978,566**	**6,623**	**1,062,604**
LCCs' % share	**65.9**	**66.2**	**68.2**	**68.9**
Airberlin (AB)	3,281	501,402	3,037	454,571
EasyJet (U2)	1,366	188,688	1,162	193,080
Germanwings (4U)	1,080	150,734	1,068	164,739
Ryanair (FR)	256	47,826	869	164,241
Norwegian Air Shuttle (DY)	228	42,028	140	26,040
Vueling Airlines (VY)	105	16,920	48	8,594
Sunexpress (XQ)	62	11,222	55	10,010
Pegasus (PC)	41	7,524	39	7,311
Norwegian Air International (D8)	–	–	79	14,694
Transavia (HV)	27	4,113	37	5,593
FlyBE (BE)	31	2,728	35	3,710
Onur Air (8Q)	–	–	30	6,310
WOW air (WW)	13	2,288	13	2,288
Transavia France (TO)	13	2,223	–	–
Eurowings (EW)	–	–	11	1,423
SunExpress Deutschland (XG)	5	870	–	–

Source: Innovata

Airberlin is strictly speaking no longer a low-cost carrier in the full sense of the term. It started out in the late-1970s operating charter services on behalf of German tour operators, but introduced its first low-cost scheduled flights in 1997. Since then, through natural growth but mainly acquisitions (e.g. of many tour operator-owned airline subsidiaries), it has grown into Germany's second largest airline after Lufthansa.

Since Berlin is an important destination as well as origin airport for domestic and outbound travel, traffic patterns are fairly well balanced across the year, with summer accounting for only slightly more passengers than winter. But 131 destinations/origin points are served in summer compared with 113 in winter (2015 schedule). LCCs generate around 65-70% of total annual numbers, although this share includes Airberlin which, as already indicated, is not strictly an LCC.

Combined passenger numbers through Berlin's Tegel and Schönefeld airports totalled just over 29.5 million in 2014, up by about 5.5% over 2014. Passenger numbers have continued to grow steadily despite the fact that its airports, especially Tegel, have an acute capacity shortage. In the five years 2010-2015, Tegel recorded an average annual increase in passengers of 6.9% from 2010 to 2015, although annual growth has slowed significantly – to +1.5% in 2015. Traffic at Schönefeld, on the other

hand, which grew by 3.2% annually over 2010-2015, was up 16.9% last year – the fastest-growing airport in Germany among the top ten leading airports.

Flights from Tegel, which will close with the opening of the new Berlin Brandenburg Airport Willy Brandt, serve 120 destinations (July 2016), of which 10 domestic and 32 in Europe. With the exception of Germanwings, most of the airport's airlines are scheduled carriers.

Growth at Schönefeld has been driven entirely by LCCs. In July 2015, 29 destinations were served, 91% of which international, with easyJet accounting for the highest share of seats – 101,500 weekly, ahead of Ryanair with 82,000. LCCs account for 87% of passenger traffic and further expansion is underway in 2016. As an example, Wizz Air has entered the market and Ryanair will have opened 16 new routes by year end. Ryanair's expansion accounts for 70% of increased seat numbers at Schönefeld over two years.

The main destination/origin points served by LCCs are domestic – Frankfurt and Munich – but London comes a close third, ahead of Cologne/Bonn and Düsseldorf. The list of cities served shown in Table 3.10 includes all traffic.

Destinations served from Berlin Airports, 2015

	May		November	
	Flights	Seats	Flights	Seats
No. of cities served	**131**		**113**	
Total seats	**10,303**	**1,480,503**	**10,196**	**1,545,388**
Frankfurt (FRA)	865	113,062	881	115,356
Munich (MUC)	606	103,060	663	113,763
London (LON)	623	99,349	632	109,437
Cologne/Bonn (CGN)	458	70,266	711	119,088
Düsseldorf (DUS)	414	65,288	448	72,600
Paris (PAR)	353	59,692	333	57,594
Zurich (ZRH)	327	54,086	291	47,983
Vienna (VIE)	288	49,779	279	48,154
Stuttgart (STR)	365	49,515	444	65,635
Moscow (MOW)	256	40,166	244	37,007
Amsterdam (AMS)	286	38,570	253	36,834
Palma de Mallorca (PMI)	221	38,512	80	15,002
Istanbul (IST)	196	36,239	220	43,007
Copenhagen (CPH)	244	36,200	239	36,854
Stockholm (STO)	207	34,649	167	28,213
Rome (ROM)	203	30,007	151	25,892
Madrid (MAD)	171	29,924	141	25,704
Milan (MIL)	202	28,247	221	33,656
Antalya (AYT)	127	24,972	71	13,140
Brussels (BRU)	191	24,604	295	46,333
Barcelona (BCN)	153	23,498	160	27,972

Source: Innovata

3.6.5 Conclusions

The growth of LCC services at Schönefeld Airport has clearly had a major impact on Berlin, which was especially marked from 2003, when easyJet announced Berlin's second airport as one of its main hubs.

The prospects for Berlin's tourism remain extremely bright. Its attractions are still relatively untapped, while its tourism offer continues to expand and be constantly enriched. Room rates remain relatively low and entry prices at theatres, museums, etc. compare very favourably with those in other west European cities. There is still a lot of scope to boost inbound tourism, especially once the new airport opens, as well as to further diversify markets and products.

The main challenge for Berlin stems from the continued delays in the opening of BBI Airport. Although rail travel within Germany and from a number of neighbouring foreign markets has improved significantly, increased air capacity is critical to the growth of tourism from medium- and long-haul

source countries. Until the airport finally opens, there can be no real certainty as to the number of new airline services and routes, and increased frequencies on existing routes that will be added when capacity permits it.

The development of new budget and midscale hotel, meanwhile, may help to ease the pressure on converted residential property in response to strong demand for short-term holiday rentals. As reported in the Sharing Economy case study in this report, landlords are now banned from renting entire apartments to tourists through Airbnb and its competitors as a means of protecting affordable housing. Non-city residents are only allowed to rent rooms via Internet portals.

3.7 Prague case study

3.7.1 Key facts and figures

Ranking on key benchmarking indexes	
Global Blue Globe Shopper Index – Europe	9
Guardian Cities Global Brand Index (2013)	-
PwC Cities of Opportunity Index (2014)	-
Mori MMF Global Power City Index (2015)	-
EIU 2025 City Competitiveness Index	54
AT Kearney Global Cities Index	46
AT Kearney Global Cities Outlook	38

Ranking on key air connectivity and airport indicators	
2TK Global Airport Connections Index Score	3
2TK Analyst Benchmark Score 0/5	4
No. of airports within <50km	4
Total outbound flights	162
Short-haul flights	156
Long-haul flights	6
Share of long-haul flights (%)	4
Commercial flying time (London/Paris) in hours	1.75
Commercial flying time (New York) in hours	11.08
Commercial flying time (Shanghai) in hours	15.67
Est. no. of passengers in 2015, mn	12.0

Total tourist arrivals and bednights, 2005-2015 (TourMIS)

	2005	2010	2015
Arrivals (000s)	4,108	4,743	6,606
Bednights (000s)	11,205	12,090	15,917
Average stay (nights)	2.7	2.5	2.4

Source: TourMIS

Hotel operating performance, 2015-2016

	2015	% change (pp)	
		2015/14	2016/15F
Average occupancy (%)	75	2.0	5.0
ADR, CZK	2113	7.3	4.7
RevPAR €	1585	14.4	6.6

Notes: pp = % point; F = forecast.

ADR = average daily room rate; RevPAR = revenue per available room

Source: PwC

3.7.2 Introduction

Prague is the capital of the Czech Republic and the country's economic and political centre with more than 1.3 million inhabitants. It is rated by leading tour operators and travellers as one of the most attractive and culturally interesting capitals in Europe and has seen a huge rise in popularity since the Velvet Revolution in 1989. Indeed, many say that it has been spoilt by becoming too popular, notably among rowdy Brits celebrating stag weekends.

The city has seen considerable investment in new hotels over the past two decades, with recent investment mostly in the four- and five-star categories.

3.7.3 Tourism trends

Although airport arrivals increased by less than 1% per annum in the five years from 2010 to 2015, arrival trends in the city itself were more impressive – +6.9% over the last five years and +4.9 in the ten years 2005-2015. This is partly attributed to the fact that a significant share of arrivals come by road. In addition, it should be said that Prague's main boom was in the years after the Velvet Revolution and through the 1990s.

3.7.4 Airport connectivity

Václav Havel Airport, the Czech capital's international airport, handled over 12 million passengers in 2015 (+7.9% over 2014), making it the busiest airport among the newer EU member states. A second terminal opened in 2006. And plans are in place to build a parallel runway and further increase the airport's capacity. Around 60 regular airlines connect Prague directly to over 140 destinations around the world.

Of the top 20 airlines operating from Prague, seven are low-cost carriers. EasyJet is the most important, operating around 142 flights weekly with a weekly seat capacity of 23,640, second only to Czech Airlines. Ryanair follows with 60 flights and 11,340 seats weekly (6th position in the ranking), and Wizz Air has 46/8,280. The others are Wizz Air, Smart Wings, Norwegian Air Shuttle and Vueling. But there are at least 17 LCCs in total, operating from all leading European tourism origin countries, some of which are primarily seasonal.

Ryanair used to operate a far larger number of services, but it pulled out of Prague in 2010 after a dispute over airport taxes. It re-entered the market relatively recently.

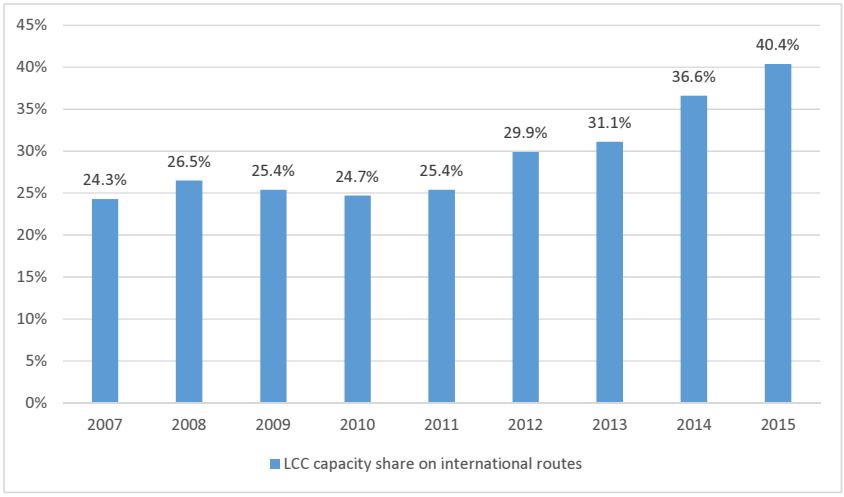
Top 20 airlines operating to/from Prague on an average week, summer 2016

Airline	Flights	Seats
Czech Airlines	476	55,360
EasyJet	142	23,640
Lufthansa	110	16,226
Aeroflot	84	12,360
Austrian Airlines	64	4,920
Ryanair	60	11,340
KLM Royal Dutch Airlines	56	6,398
British Airways	54	9,072
LOT Polish Airlines	48	3,698
SWISS	46	5,634
Wizz Air	46	8,280
Eurowings	44	4,248
Smart Wings	44	7,694
Air France	42	6,786
Turkish Airlines	42	6,390
Air Berlin	40	2,000
Norwegian Air Shuttle	38	7,068
Brussels Airlines	36	4,744
Vueling Airlines	34	6,128

Source: Regional International Magazine, from Innovata

The LCC share of international seat capacity has risen steadily in the past eight years, as the figure below shows, with strong annual increases since 2012:

LCC capacity share on international routes, Jan-Jul 2007-2015 (%)



Source: CAPA - Centre for Aviation

In 2015, flights operated to/from 115 cities in the summer and 91 in the winter, with the summer accounting for about a 53% share of total seat capacity. London, Moscow, Paris, Frankfurt and Amsterdam re the main cities served. Inbound traffic predominates although The Czech Republic has become an increasingly important outbound market as well.

Destination served from Prague airports, 2015

	May		November	
	Flights	Seats	Flights	Seats
No. of cities served	**115**		**91**	
Total seats	**5,401**	**591,133**	**4,782**	**521,923**
London (LON)	411	57,415	391	55,339
Moscow (MOW)	272	43,353	243	35,892
Paris (PAR)	291	40,813	245	37,317
Frankfurt (FRA)	393	37,879	326	28,993
Amsterdam (AMS)	285	25,771	284	27,995
Rome (ROM)	154	22,880	113	18,199
Brussels (BRU)	166	22,529	166	25,245
Istanbul (IST)	109	19,846	111	18,731
Milan (MIL)	158	16,590	151	19,192
Copenhagen (CPH)	106	14,965	70	11,008
Zurich (ZRH)	115	14,952	89	9,290
Stockholm (STO)	99	14,759	58	9,231
Barcelona (BCN)	91	14,079	48	8,136
Warsaw (WAW)	205	13,608	198	13,328
Munich (MUC)	219	12,548	222	13,278
Helsinki (HEL)	80	11,832	77	10,558
Vienna (VIE)	165	11,222	167	10,884
Dublin (DUB)	58	10,557	–	–
Düsseldorf (DUS)	131	10,207	127	10,458
Oslo (OSL)	50	8,899	30	5,580
Madrid (MAD)	54	8,398	36	6,125

Source: Innovata

3.7.5 Conclusions

Prague has clearly benefited strongly from LCCs, although overall growth has slowed significantly in recent years. This may be due to the fact that traditional visitors to the city have stayed away because of the increasing congestion and rise in prices due to the Czech capital's popularity among more budget travellers. Yet the growth in investment in upscale hotels would seem to belie this argument.

3.8 Overall Conclusions

3.8.1 Impact of LCCs on consumers and destinations

The benefits of LCCs to European cities' tourism can be summarised as follows:

- LCCs have **greatly increased the number of new tourism destinations accessible by air**. Many LCCs opt to use regional and secondary airports, thereby helping to spread traffic across a larger number of airports and regions. As an example, those wishing to travel from the British Midlands to western France, or from Düsseldorf to southern France, are no longer forced to travel via London or Paris to get to their final destination, as they now have a choice of direct links between UK and German provincial cities and the French regions.
- LCCs have played an important role in **ensuring a more even distribution of traffic through the year** (unlike charter airlines which operate predominantly in the summer months). This helps to provide a more secure and steady income for hotels, restaurants, car rental firms and other tourism-related businesses.
- LCCs have **popularised mid-week travel to the regions**. The lowest fares are offered during off-peak travel times (generally between Monday and Thursday), which incentivises customers, particularly price-sensitive groups (such as students travelling on field trips, etc.), to fly outside the weekend peaks. More evenly distributed holiday traffic throughout the week helps to avoid congestion at airports and also allows hotels, restaurants, etc. in city destinations to maintain higher booking rates during weekdays.
- Thanks in no small part to state aid and airport subsidies, **LCCs have undertaken concerted marketing campaigns to increase the 'brand awareness' of many towns and regions.** The city of Strasbourg in eastern France, for example, was essentially a business destination prior to the arrival of LCCs, given that it is the location of many European and other international institutions. However, Strasbourg has proved to be a very popular tourism destination among European travellers, especially the British, thanks to Ryanair services and its promotion of the inherent cultural attractions of the city and its surrounding region.

3.8.2 Impact of LCCs on the wider industry

In addition to having a significant impact on tourism demand for cities, the entrance of LCCs has considerably changed the tourism landscape. A budget airline passenger is not necessarily a budget traveller, so it is not only budget hotels that benefit from increased LCC travel. Guests are often willing

and eager to spend the money saved from air transport on comfortable, sometimes luxury, hotel accommodation, in addition to shopping, sightseeing and eating out in good restaurants. So the local economy can benefit significantly, not least from new investment.

In terms of hotel development, for example, STR's June 2016 Pipeline Report shows 143,825 rooms in 941 projects 'under contract' in Europe. The total represents a 10.1% increase in rooms 'under contract' compared with June 2015 and a 13.4% year-on-year increase in rooms 'in construction'. 'Under contract' data includes projects in the 'in construction', 'final planning' and 'planning' stages, but does not include projects in the 'unconfirmed' stage. The upscale segment accounted for the highest percentage of rooms in construction (of almost 25%).

At the end of 2015, the UK reported the most rooms under construction of all European countries – 14,121 rooms in 181 hotels. Three other countries reported more than 5,000 rooms under construction: Germany (8,369 rooms in 40 hotels); Turkey (8,128 rooms in 49 hotels); and Russia (7,933 rooms in 39 hotels).

Section 4 - Case Study on Smart Tourism in Smart Cities

4.1 Introduction

4.1.1 Smart Cities

Large cities worldwide are facing similar physical, social and economic challenges (increased urbanisation, congestion, pollution, energy transitions etc.) and strive to make their city a better place to live, work and visit. Many are implementing smart and sustainable models and strategies to help their cities and citizens prepare for and adapt to the current and anticipated future pressures and challenges.

Global and regional initiatives have emerged to encourage collaboration and intelligence sharing among cities in implementing such models and strategies, including:

- 100 Resilient Cities (100RC), pioneered by the Rockefeller Foundation, is "dedicated to helping cities around the world become more resilient to the physical, social and economic challenges that are a growing part of the 21st century". 100RC's aims are to help the individual cities become more resilient and to facilitate the building of global practice of resilience among governments, non-governmental organisations (NGOs), the private sector and individual citizens.
- Select for Cities is an open innovation challenge project developed by the cities of Antwerp, Copenhagen and Helsinki with a €5.6 million budget for a three-stage competition between December 2015 and November 2018. The challenge is for European companies to propose solutions to the following question: How can the cities reinvent themselves as linked and large-scale 'Internet of Everything' labs, with easy access to developers and innovators to pilot, test and validate their solutions?
- The Smart City Expo World Congress (SCEWC), created in 2011 by Fira Barcelona, has become the world's leading event for Smart Cities, taking place annually in Barcelona. Such has been its success and relevance that it has proliferated, with a variety of spinoff events around the world. It aims to "define what smart cities are, what their challenges include and examine which solutions and responses are most relevant."[14] SCEWC established the World Smart City Awards in order "to

[14] www.smartcityexpo.com/en/past-editions (accessed on 24 August 2016).

identify cities, projects and innovative ideas in line with nurturing sustainable urban development."[15] City Award Winners of the World Smart City Awards were:

- 2015 – Peterborough, for delivering a living smart and circular urban laboratory. Finalists included Bandung, Buenos Aires, Curitiba, Dubai and Moscow.
- 2014 – Tel-Aviv, for delivering digital and personalised, interest and location-based tools for the city. Finalists included Coruña, Hengshui, Mumbai, Porto Alegre and Rivas Vaciamadrid.
- 2013 – Rio de Janeiro, for the deployment of a long-term project to turn the city into a smart benchmark in the Southern Hemisphere. Finalists were Berlin, Buenos Aires, Copenhagen, Sabadell and Taiyuan.
- 2012 – Amsterdam, for making the city more accessible through opening public data to optimise mobility and transportation.

In a report entitled Mapping Smart Cities in the EU, the European Parliament defines the Smart City as "a city seeking to address public issues via ICT-based solutions on the basis of a multi-stakeholder, municipally based partnership."[16] They Initially considered the 468 cities in the EU-28 with 100,000+ residents and have identified Amsterdam, Barcelona, Copenhagen, Helsinki, Manchester and Vienna as the six most successful cities for further analysis.

This paper focuses on the smart city initiatives of three WTCF European city Members: Amsterdam, Copenhagen and Paris. This desk research focuses particularly on cities which performed well in a number of smart city rankings/indexes and in smart city initiatives with a strong tourism dimension.

The ranking shown in the figure below comes from The 10 Smartest Cities in Europe (2013)'[17] , produced in 2013 by Boyd Cohen[18]. It put Copenhagen (1st) and Amsterdam (2nd) at the top, with Paris in 5th place.

[15] www.smartcityexpo.com/en/awards (accessed on 24 August 2016).
[16] Mapping Smart Cities in the EU', European Parliament Directorate-General for Internal Policies, Policy Department Economic and Scientific Policy (2014) at www.europarl.europa.eu/RegData/etudes/etudes/join/2014/507480/IPOL-ITRE_ET(2014)507480_EN.pdf (accessed on 24 August 2016).
[17] Fast Company (2013). Their methodology can be accessed here (accessed on 24 August 2016).
[18] Boyd Cohen PhD is an urban strategist helping to lead communities, cities and companies on the journey towards the smart, innovative and low carbon economy. In collaboration with Buenos Aires and Barcelona, he developed a set of indicators to be used for benchmarking and ranking smart cities. While the complete indicator list numbers nearly 400, they created a bare bones indicator list consisting of 28 indicators to be collected directly from cities interested in benchmarking their performance against their peers. Once he created the list of eligible cities he sent out the indicator list to contacts working within each of the eligible cities and collected his own data when cities didn't respond.

10 Smartest Cities in Europe (2013)

City	Economy Ranking	Enviro Ranking	Gov Ranking	Liv Ranking	Mob Rank	People Rankin	Final Rank
Copenhagen	7	1	7	2	4	1	1
Amsterdam	6	4	9	4	1	2	2
Vienna	4	6	3	1	6	7	3
Barcelona	5	5	5	6	3	5	4
Paris	3	7	8	9	2	4	5
Stockholm	8	2	4	7	7	6	6
London	1	10	2	10	10	3	7
Hamburg	8	3	10	3	5	8	8
Berlin	2	8	6	5	8	10	9
Helsinki	10	9	1	8	9	9	10

Source: 'The 10 Smartest Cities in Europe (2013)', Fast Company (2013). Their methodology can be accessed here.

In addition:

- Copenhagen Connecting (see Copenhagen Case Study) won the World Smart City Awards for Project in 2014.
- Amsterdam was the 2012 winner for the City Award with its Amsterdam Smart City approach (see Amsterdam Case Study).
- Paris was the first city in the world to launch an incubator project dedicated to tourism in 2013, setting itself the goal to position Paris as the 'innovation leader in urban tourism' (see Paris Case Study).

4.1.2 Smart Tourism in Smart Cities

A 'smart tourism destination' has been defined as:

> "an innovative tourism destination, built on an infrastructure of state-of-the-art technology guaranteeing the sustainable development of tourist areas, accessible to everyone, which facilitates the visitor's interaction with and integration into his or her surroundings, increases the quality of the experience at the destination, and improves residents' quality of life."[19]

[19] Lopez de Avila (in Gretzel et al.).

The idea is that destinations can increase their competitiveness by applying the 'smart' concept to address travellers' needs before, during and after their trip.[20] Smart tourism destinations take advantage of:

- technology embedded environments
- responsive processes at micro and macro level;
- end-user devices in multiple touch-points; and
- engaged stakeholders that use the platform dynamically as a neural system.

The approach to, and support for, smart tourism initiatives has varied in different in countries and world regions.

"Especially in Asia, there have been concerted efforts to drive the smart tourism agenda forward. Governments in China and South Korea are heavily funding initiatives mostly focused on building the technological infrastructure that supports smart tourism. In Europe, many of the smart tourism initiatives were born out of smart city projects and, as a consequence, smart tourism destinations are increasingly making an appearance in the European tourism landscape. The focus in Europe, however, is more on innovation and competitiveness and developing smart end-user applications that support enriched tourism experiences using already existing data combined and processed in new ways. In Australia, the emphasis is on smart governance and specifically open data. What governments universally recognise is the transformative power of smart technologies, not only in terms of the economic potential but also the social and experiential dimensions."

"Smart tourism is a distinct step in the evolution of ICT in tourism, with fundamentally different ways of creating, exchanging, consuming and sharing tourism experiences".[21] There are three forms of ICT which are vital for setting up Smart Destinations, namely Cloud Computing (to provide access and data storage), the Internet of Things (to link the virtual and real worlds) and an End-user Internet Service System (which provides the interface with the tourist through a range of applications). In order to become a Smart Tourism Destination there must be destination-wide access to real-time information, ensuring open access to data generated from elements within the city and users' activities.[22]

[20] Buhalis D and Amaranggana, A. (2014): Smart Tourism Destinations, in Xiang, Z. and Tussyadiah, I. (eds.), Information and Communication Technologies in Tourism 2014. Available from: http://www.cyberstrat.net/ENTER14SmartTourismDestinations-libre.pdf (accessed on 24 August 2016).
[21] Gretzel, U., Sigala, M., Xiang, Z and Koo, C. (2015): Smart Tourism: foundations and developments, in Electronic Markets, Vol.25, Issue 3, pp 179-188.
[22] Buhalis and Amaranggana (2014).

Both the general concept of 'smart tourism' and the implementation of related applications are new and data is not available to assess the effectiveness in achieving desired outcomes. Little research exists that aims to understand the processes of information and knowledge transfer, sharing and conversion in the smart tourism destination.

However, it has been noted[23] that, as a result of the increased use of technology, the pre-trip and post-trip stages in the 'customer journey' have been shortened and are now being fulfilled during the consumption stage. Travellers tend to plan less and become more spontaneous, they are open to change when an activity is unsatisfactory and plan alternatives on the spot. Post-trip is less important because experiences have been shared live on social networks during the consumption stage. There is also research which suggests a significant relationship between social-media enabled communication and emotion, i.e. tourists can have a more enjoyable and memorable experience if they acquire positive emotional support on social media during their trip.

One example exists in relation to Amsterdam, prepared for the International Tourism Student Conference in April 2016. This is a case study on the influence of iBeacons on customer experience during the 2015 SAIL Amsterdam event. The app for the event was installed by 69,000 people, representing 3% of all SAIL visitors. Of these, only 47% (fewer than 1.5% of SAIL visitors) had their Bluetooth turned on, allowing them to receive notifications. Of the 71,863 notification opportunities, sent out, only 22% were opened[24]. However, over 8.6 million interactions were counted, which allowed organizers to track visitor distributions and flows.

A new crowd monitoring system was set up as a pilot project during the SAIL 2015 event which used multiple technologies, such as counting cameras, WiFi/Bluetooth tracking, GPS sensors and social media analytics. The latter allowed not only location-based tracking but also monitoring as to whether people talked about crowdedness on social media. As a pilot project, the data collected was not acted upon, but it was suggested that the monitoring of pedestrian flows was successful.

Challenges relating to smart tourism in smart cities relate to both infrastructure and users. Regarding infrastructure, a key issue is the ability to connect to the Internet efficiently and cost-effectively while abroad. Tanti & Buhalis[25] have noted the following:

[23] Tanti, A & Buhalis, D. (2016): Connectivity and the Consequences of Being (Dis)connected, in Information and Communication Technologies in Tourism 2016: Proceedings of the international Conference in Bilbao, Spain, February 2-5, 2016, pp 31-44.
[24] http://inbeacon.nl/media/SAIL-2015-infographic-inBeacon.pdf (accessed on 24 August 2016). N.B. (it is not clear what counts as a notification opportunity). Graphs of visitor flows are available on this link.
[25] Tanti & Buhalis, 2016.

- The speed at which information can be retrieved heavily influences the level of interest in using smart technology to enhance an experience.
- Increasingly, the provision of free Wi-Fi is being integrated with social logins. However, there is a lack of research on travellers' perception of this connectivity enabler.
- The abolition of roaming charges in Europe in June 2017 will also enable travellers to use their data allowance throughout Europe.
- While this will facilitate constant connectivity, it may remove the current data collection provided through free WiFi logins.
- Smart cities have largely been designed for residents, not tourists – i.e. applications are often available only in the relevant national language. Non-intuitive applications can be a barrier for visitors to connect.
- Increased use of apps drains smart phone/tablets batteries. Barcelona has addressed this in part by providing USB ports for charging mobile devices in bus stops.
- Destinations and organisations need to ensure their telecommunication infrastructure is capable of addressing the needs of the market, and that their (technological) goals match the (experience) goals of their target market.

User-related constraints (identified by the SAIL 2015 research) include the following:

- Technological knowledge – users may not be aware of different functions of the app or how they work. For example, at the SAIL 2015 event noted above, some people were not aware that they had to have Bluetooth turned on in order to receive the iBeacon notifications containing valuable information. There was also some wariness of the iBeacons as a whole and their function.
- Privacy – the extent of the problem depends on a user's knowledge and awareness of how an application works. Visitors may feel a loss of privacy and delete apps completely, rather than manage privacy settings. The approach to dealing with this is the trade-off visitors get for sharing their information – when the user perceives added value he/she is willing to share information.
- Visitors may choose to be disconnected while on holiday.
- Visitor psychology – in relation to crowd management, for example, there is a risk that notifying people a particular spot is busy will encourage visitors rather than deter them on the basis that there is something worth seeing there. Further research is needed on how users respond to push notifications during events (based on SAIL 2015 experience).

4.2 Amsterdam case study

4.2.1 Overview

The Amsterdam City Council developed the Structural Vision Amsterdam 2040 city master plan, integrating innovative urban design and neighbourhood rejuvenation strategies, smart technology systems and more advanced mobility options for residents and visitors.

Complementing that, the Amsterdam Smart City (ASC) is a public-private partnership collaborative innovation platform aimed at tackling urban issues. The list below shows some of the challenges faced by Amsterdam identified by ASC:

- Amsterdam has one of the most diverse populations in Europe – how can we keep the city attractive and enjoyable for everyone?
- City residents are living longer – how can we guarantee their quality of life?
- 30% of the cars in Amsterdam are used less than once a week – shouldn't we start sharing cars?
- A smart city is not just a matter of technology – surely it requires smart citizens as well?
- Climate change and increasing population density are making the city vulnerable to extreme weather – how can we keep our feet dry?
- Last year Amsterdam welcomed millions of visitors – can the city remain attractive for both tourists and residents?
- An Amsterdam household produces about 550 kg of waste a year – how can we reduce and reuse this waste?
- What will future energy look like? – will we generate it at home?

To foster the development of innovative projects that are making the city progressively smarter, ASC uses a '**Connect / Accelerate / Strengthen approach'** to connect the right people to accelerate start-up projects to tackle the challenges that Amsterdam is facing.

Video 'Skift Future Cities: How Amsterdam is Building the City of the Future'

Source: https://youtu.be/wswyjR1cDL8

Video 'Amsterdam Smart City – The future starts now'

Source: www.youtube.com/watch?v=ZMUvQZqvjFg.

Video 'Amsterdam – Winner, European Capital of Innovation 2016'

Source: www.youtube.com/watch?v=llK5sa3MG8E&list=PLvpwIjZTs-LgakOivJc_GQ07glOmGJQ6e.

4.2.2 Future Vision for the City

Amsterdam City Council developed the Structural Vision Amsterdam 2040 city master plan[26], integrating innovative urban design and neighbourhood rejuvenation strategies, smart technology systems and more advanced mobility options for residents and visitors.

The long-term spatial development strategy for Amsterdam to 2040 has four major thrusts:
1. Rolling out the city centre
2. Interweaving metropolitan landscape and city
3. The rediscovery of the waterfront
4. Internationalisation of southern flank.

The Structural Vision places the emphasis on six spatial developmental tasks:
1. Densify
2. Transform
3. Public transport on a regional scale
4. High quality layout of public space
5. Invest in the recreational use of green space and water
6. Converting to sustainable energy.

4.2.3 Smart city fostering

Organisation

Amsterdam Smart City (ASC)[27] is a public private partnership comprising public authorities, business, citizens and knowledge institutions to tackle urban issues in the Amsterdam Metropolitan Area. ASC is a collaborative innovation platform, resulting in innovative projects aimed to make the city progressively smarter. The network counts over 500 innovators, start-ups and corporates.

ASC aims to:

- Contribute to the liveability of the Amsterdam Metropolitan Area
- Promote sustainable economic growth
- Help develop new markets.

[26] Amsterdam City Council, Structural Vision Amsterdam 20140 city master plan available at https://www.amsterdam.nl/wonen-leefomgeving/structuurvisie/structural-vision-am/ (accessed on 24 August 2016).
[27] https://amsterdamsmartcity.com/p/about (accessed on 24 August 2016).

The ASC is managed by a core team surrounded by representatives from its key partners. They meet every two weeks to discuss the latest concepts, questions and calls for Innovation.

Amsterdam Smart City's collaborative organisation

Source: amsmarterdam city at https://amsterdamsmartcity.com/p/about (accessed on 24 August 2016).

Activities

ASC are active in six different themes:

- **Infrastructure & technology** – more connected people and enablers to help governments maintain and create more resilient, sustainable and liveable cities
- **Energy, water & waste** – new ways of generating energy, new approaches for water and waste management
- **Mobility** – mobility and transport approaches to keep the city accessible and sustainable
- **Circular City** – moving towards a circular economy in which the goal is to minimise waste and pollution by reducing, recycling and reusing
- **Governance & education** – shifting government's role with smart government tools and smart educational programmes to attract and retain talent
- **Citizens & living** – participation of smart citizens in grass-roots initiatives with bright ideas.

ASC's approach is to connect the right people to accelerate the start-up of projects to tackle the challenges Amsterdam is facing.

Amsterdam Smart City's approach 'connect / accelerate / strengthen'

Source: amsmarterdam city at https://amsterdamsmartcity.com/p/about (accessed on 24 August 2016).

ASC is a public private partnership focused on using the city as an urban laboratory for the use of open data, new mobility solutions and ultimately improved quality of life for all residents and visitors. It is a collaboration of over 100 local municipalities, businesses, residents and academic institutions partnering on more than 90 smart city projects. It includes crowdsourcing data from the local community through the Smart Citizen project to engage residents who can purchase low-cost sensors to share air pollution and noise levels with the city's open data program.

Amsterdam Smart City – The future starts now video

Source: https://youtu.be/ZMUvQZqvjFg.

ASC encourage the development of solutions for tourism challenges, for example with the **I Amsterdam Museumacht Hackathon**[28]. The Museum Night Foundation together with its partners I amsterdam, Glimworm, Ziggo, booking.com, Yelp, van Gogh Museum, Scheepvaartmuseum, JCDecaux developed the Appsterdam Museumnacht Hackathon[29] calling all Appsterdammers to help find new ideas, tools and technologies for improving mobility, navigation and crowd management in the city. All app developers, start-ups, designers and other creative minds are welcome to join this unique event to make Amsterdam the best city in the world for people to live and to visit.

4.2.4 Tourism-related smart city initiatives

Stedelijk Museum augmented reality mobile app

The Stedelijk Museum ARtours app[30] allows visitors to experience interactive tours on their smartphones and enjoy the rich content (video, audio, photos, stories, tasks and augmented reality additions) as they explore the museum or the streets of Amsterdam.

The Stedelijk Museum launched the app with a series of tours focusing on the design collection developed by the Stedelijk over the years. There is also a tour conceived by Timo de Rijk, Professor of Design Cultures, which takes visitors on a journey through Amsterdam and the history of the city's built environment, as well as an AR tour 'This is Not a Church', created by Jan Rothuizen especially for the Stedelijk Museum. The app is currently only available in Dutch.

The Stedelijk Museum ARtours app

Source: www.stedelijk.nl/en/artours/artours-app.

[28] www.youtube.com/watch?v=tSQQZgazLeE (accessed on 24 August 2016).
[29] https://etrigg.com/event/opening-appsterdam-museumnacht-hackathon/1983051/ (accessed on 24 August 2016).
[30] www.stedelijk.nl/en/artours/artours-app (accessed on 24 August 2016).

Mobility portal – crowd circulation management

The city is collaborating with the Amsterdam Arena, which is a privately run stadium that hosts concerts and sporting events, on ways to use smartphones to manage crowd circulation. The city and the arena are also looking at apps that would improve how spectators experience events. The Amsterdam ArenA Innovation Center[31] was created to offer effective resources for research, development and education, with the ambition to be the world's leading nucleus for innovative smart city and stadium solutions.

Amsterdam ArenA Innovation Center video

Source: https://youtu.be/fXuWBh7Axtc

The Mobility Portal[32] is one of the largest key projects of the Innovation Center and makes it possible to present visitors with all the fragmented traffic information from and to the ArenAPoort-area in one single application. It provides personalised advice as well as stimulating people to choose the green option. The mobility portal is a three-year project at the end of which all the different transport modes should be included.

[31] www.amsterdamarena.nl/innovation-center-2.htm (accessed on 24 August 2016).
[32] www.amsterdamarena.nl/innovation-center-2/innovatie-nieuws-tonen-op/-mobility-portal-changing-peoples-behavior-with-smart-measures.-.htm (accessed on 24 August 2016).

The Mobility Portal

Source: www.amsterdamarena.nl/innovation-center-2/innovatie-nieuws-tonen-op/-mobility-portal-changing-peoples-behavior-with-smart-measures.-.htm.

Smart public wayfinding and information initiatives

The iBeacon/Internet of Things (IoT) Living Lab[33] is an Amsterdam Smart City project "implemented in public spaces to provide access to developers and solution providers to test next generation interactive mobile applications that also generate open data, thus creating new value chains across industries."

It features live installations and several beacon networks connected along a 2.4km urban street path. The sensors are wired to test and experiment innovations in designing public wayfinding, developing popular tourist routes, promoting hyper-local points of interest, and augmenting existing apps with additional proximity data.

[33] https://amsterdamsmartcity.com/projects/iot-living-lab (accessed on 24 August 2016).

Amsterdam Beacon Mile, running between central station and Marineterrein

Source: https://amsterdamsmartcity.com/projects/iot-living-lab.

Amsterdam Beacon Mile video

Source: https://youtu.be/w7yF1ONDp7A.

Smart transport initiatives

Amsterdam was home to the first bike-sharing project in the world. Cycling is a favourite mode of transport in the city with 67% of all trips by bicycle or walking in 2013.

Part of the Structural Vision Amsterdam 2040 Master Plan emphasises the need to develop more public transportation routes, more public parks and more bicycle lanes to dissuade automobile traffic as much as possible.

Examples of mobility initiatives:

- **Yeller**: app with chat functionality that helps visitors meet other visitors to share a cab.

Yeller mobile app

Source: www.getyeller.com/.

- **WeGo**: peer-to-peer car sharing platform where non-car owners can rent cars from car owners in their neighbourhood.

WeGo website

Source: http://wego.nu/.

- **Mobypark**[34] – sharing parking app platform that displays all available parking places in real time, so cars emit fewer exhaust fumes as people drive through the streets in search of parking spaces.
- **Tour Buzz**[35] – a web app with relevant information day by day for tour bus drivers in Amsterdam, indicating where they can drop off and pick up passengers.
- Commuter trains in the Amsterdam area are being equipped with a system to display which carriages on an incoming train have empty seats.

Other initiatives which can be used by visitors

- **Ship to grid**[36] is an Amsterdam Smart City project consisting of the installation of about 200 shore power stations in its harbour, allowing green energy to replace polluting diesel generators on board. The first phase of the project is aimed at river cruisers and inland cargo vessels, but it could be extended to large ocean-going cruise ships. The shore power is available through connections that use a pay-by-telephone system. The captain of a boat who wants to use a green energy source when visiting Amsterdam can activate a connection with the power point via a mobile app, and then enter a personal code; the amount of money owed will be transferred automatically from the vessel's account. However, although such a scheme can be used by tourists, they first need an account with the harbour authorities.

Ship to grid project

Source: https://amsterdamsmartcity.com/projects/ship-to-grid.

[34] www.mobypark.com/en/parking-amsterdam (accessed on 24 August 2016).
[35] www.tourbuzz.nl/haltes (accessed on 24 August 2016).
[36] https://amsterdamsmartcity.com/projects/ship-to-grid (accessed on 24 August 2016).

4.3 Copenhagen case study

4.3.1 Introduction

Although Copenhagen has one of the lowest carbon footprints per capita in the world, like many other large cities it suffers from issues such as congestion, increased population, flash floods and pollution, and is working towards reaching ambitious climate targets.

Copenhagen believes that smart city thinking can help challenge those issues with political courage and a holistic approach to public management. The Municipality has recently launched Copenhagen Solutions Lab to lead the implementation of innovation and smart city development in close collaboration with businesses, knowledge institutions and citizens, based on Copenhagen's smart city concept 'Copenhagen Connecting'.

Copenhagen Connecting won the prestigious International World Smart Cities Award in Barcelona in 2014. Copenhagen Connecting is an integrated approach, linking visions, action plans and technologies together to make the city smarter by delivering "better and faster on goals through intelligent use of data." The focus is not on technology but rather how to make Copenhagen a better city in which to live, and to solve the challenges the cities are facing. It uses socio-economic analysis as a tool to prioritise between the different solutions. For example, it is expected that by 2018, travel times for cyclists and bus passengers in Copenhagen will be reduced by 10%, while motorists will have unchanged travel times. Furthermore, the City of Copenhagen estimates that when fully implemented, Copenhagen Connecting will create economic benefits for society of Dkr4.4 billion every year.

Copenhagen Connecting model: the added value

Source: CiS 2015 Mayors Panel at https://youtu.be/g608CT7HZog.

4.3.2 Future vision for the city

Copenhagen aspires to become the first carbon-neutral capital by 2025. To reach this goal, Copenhagen has established targets including energy efficiency and renewable objectives, green building standards and increased transit access.

Copenhagen also aims "to become a central hub for the development of sustainable solutions to aid future urban challenges." To this end, in June 2016, Copenhagen Municipality launched a new Smart Lab in the centre of the city (see section 2 for more details).

Copenhagen is working towards making the city a better place in which to live.

Video of Copenhagen Solutions Lab speaking on panel with smart city mayors at the City Innovate conference in San Francisco in 2015

Source: https://youtu.be/g608CT7HZog (section on Copenhagen starts at 22:34.).

4.3.3 Smart city fostering

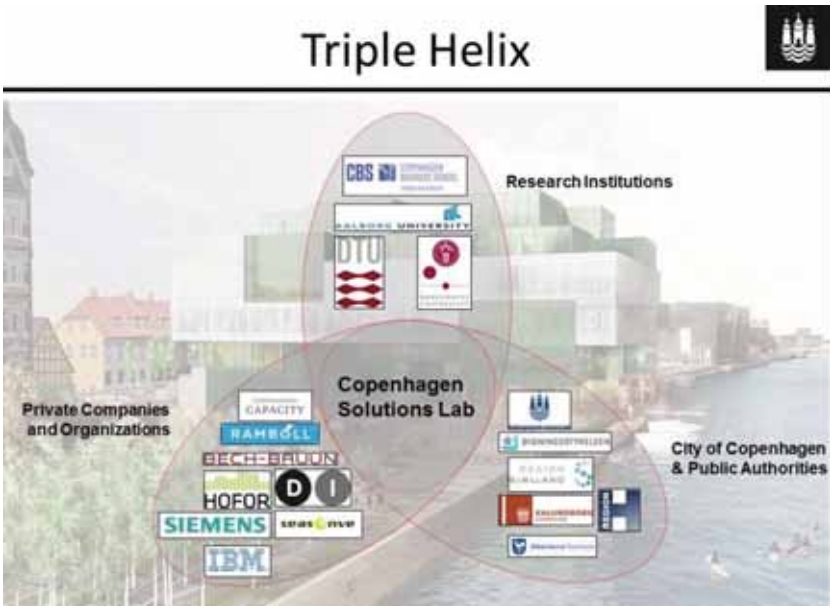
Organisation

Copenhagen Solutions Lab[37] is the City of Copenhagen's incubator for smart city initiatives across all sectors in the city. The City of Copenhagen (and other related public authorities) will work in close collaboration with local and international companies, knowledge institutions and citizens to create triple helix partnerships "to create and test new ideas, technologies and solutions to real urban challenges, and create new ways to relate to urban planning and the built environment."

The use of big data and new technologies will help to rethink how city solutions can be restructure in new smart ways. Current partners include Realdania, the Danish Architecture Centre, the Technical University of Denmark, Hitachi and Cisco Systems.

[37] http://cphsolutionslab.dk/ (accessed on 24 August 2016).

Copenhagen Solutions Lab's triple helix model



Source: CiS 2015 Mayors Panel at https://youtu.be/g608CT7HZog.

Activities

Street Lab was launched in June 2016. It is an area in the heart of Copenhagen designated for smart city solutions in real urban space, deriving from the award-winning world best smart city concept, Copenhagen Connecting. It will be used as a showcase to demonstrate the potential of new technologies and provide a proof of concept for scaling qualified solutions to larger parts of the city and potentially to other cities (regionally, nationally and/or internationally).

Copenhagen Street Lab area

Source: Street Lab at http://cphsolutionslab.dk/.

The Lab will focus on new information technology solutions, reduced carbon emissions, the implementation of sensors that create real-time data and information on the city and the build-up and architecture of a new 'Big Data Digital Infrastructure Platform'.

Copenhagen Open Data[38] is a free portal providing access to statistics on Copenhagen. It contains data on traffic, infrastructure, cultural activities and much more.

Copenhagen City Data Exchange[39] is an innovative platform for the city of Copenhagen built by Hitachi. The platform is supported by the Copenhagen Municipality, CLEAN (a Danish clean-tech cluster), the Capital Region and a consortium of other partners. The objective of the platform is "to take a further

[38] http://cphsolutionslab.dk/#what-we-do (accessed on 24 August 2016).
[39] https://www.citydataexchange.com/#/home (accessed on 24 August 2016).

step beyond the existing open data platforms by developing a citywide marketplace for the purchase and sale of data between all sorts of users in the market." It is the first of its kind to deliver and integrate public and private data in one place.

The first phase of the three-year period (until 2018) lab project will include the testing of solutions relating to:

- Smart parking
- Waste management
- Air quality and noise monitoring
- Water management
- Mobility monitoring
- City WiFi for tourists
- Data offloading
- Asset tracking
- Services for citizens and tourists.

In the longer term, the Lab will also test solutions for tackling floods, mobility and the tracing of city equipment.

4.3.4 Tourism-related smart city initiatives

City WiFi

City WiFi is one of the solutions tested in the Street Lab. The aim is to develop internet access for tourists and online information for citizens and tourists regarding activities and opportunities in the city.

Smart transport / mobility initiatives

Examples of smart transport initiatives include:

- **'Super bikeways'** – In Copenhagen more than 50% of all commutes are by bike[40]. As a solution to the growing number of cyclists and congestion, as well as safety problems with pedestrians, an

[40] http://whenonearth.net/cykelslangen-k-bicycle-snake-copenhagen-denmark/ (accessed on 24 August 2016).

elevated cycle track called 'Cykelslangen' (or 'The Bicycle Snake') has been designed to connect sites for cyclists while allowing them to enjoy the view of Copenhagen. The 235-m long track was fully opened in mid-2014.

Copenhagen's 'Cykelslangen'

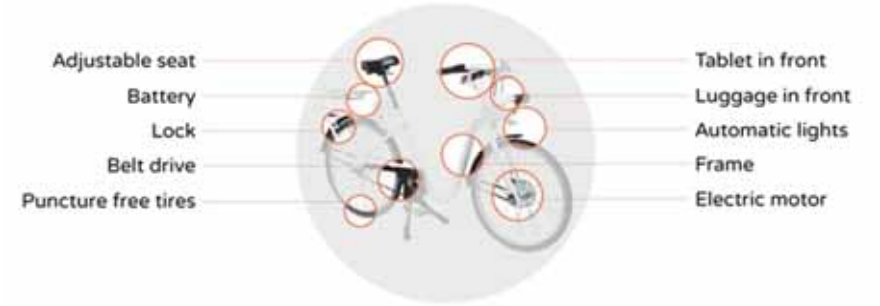
Source: http://whenonearth.net/cykelslangen-k-bicycle-snake-copenhagen-denmark/.

- **Byclyklen smart bike** – latest generation of urban electric, combining state-of-the-art mobility, touchscreen computing and GPS navigation. Visitors can use the point-to-point travel navigation, display current timetables thanks to its integration to existing urban transports, and view city sites through the onboard computer: attractions, museums, events, restaurants, weather and charging stations. It can be rented by the hour or a subscription is available for regular users and booked online at http://www.bycyklen.dk/en.

Copenhagen Cycyklen

BYCKLEN QUICK FACTS

- Bycyklen offers point-to-point travel that seamlessly integrates with existing urban transport
- The Bycyklen smart bike integrates with → www.rejseplanen.dk and displayscurrent timetables
- Easy and simple online booking with an overview of available bikes at each charging station
- Charging stations are located close to existing urban transport for ease of use and journey integration
- The city sites can be viewed all through the smart bikes onboard computer; attractions, museums, events, restaurants, weather and more BYCKLEN



Source: https://bycyklen.dk/en/the-bycykel/ and www.visitcopenhagen.com/press/copenhagen/new-copenhagen-city-bike-bycyklen.

- **Smart parking** – this is another solution being tested by the Street Lab involving the testing and establishment of sensors to help drivers find vacant parking spots via an app, and to enable better use the city's parking spaces.
- Collaboration with MIT for the **development of smart bikes equipped with sensors** to deliver real-time info, not only to the rider but also to administrators for open data aggregation on issues such as air contamination and traffic congestion.

Other initiatives which can be used by visitors

- **Digital Car parking payment scheme** – Street Lab will also be testing a digital car parking payment scheme with which drivers can pay for parking using their vehicle's number plate (watch video at http://video.kk.dk/video/12513590/digitale-parkingsautomater – in Danish only).

4.4 Paris case study

4.4.1 Introduction

Like other large city conurbations, Paris is facing new challenges such as energy transition, sustainable transport and changing life styles. The City of Paris is working towards a smart and sustainable Paris by "finding winning combinations of solutions to those challenges and the alignment of these solutions with the city's residents."

With this goal in mind, the City of Paris launched in 2015 a Strategy and set of actions to be adopted by the City for 2020 and beyond: Smart and Sustainable Paris – A view of 2020 and beyond, see Section 2 for more details. The vision for Paris combines three city models, each adding value and resources to the overall process – Open City, Ingenious City and Connected City.

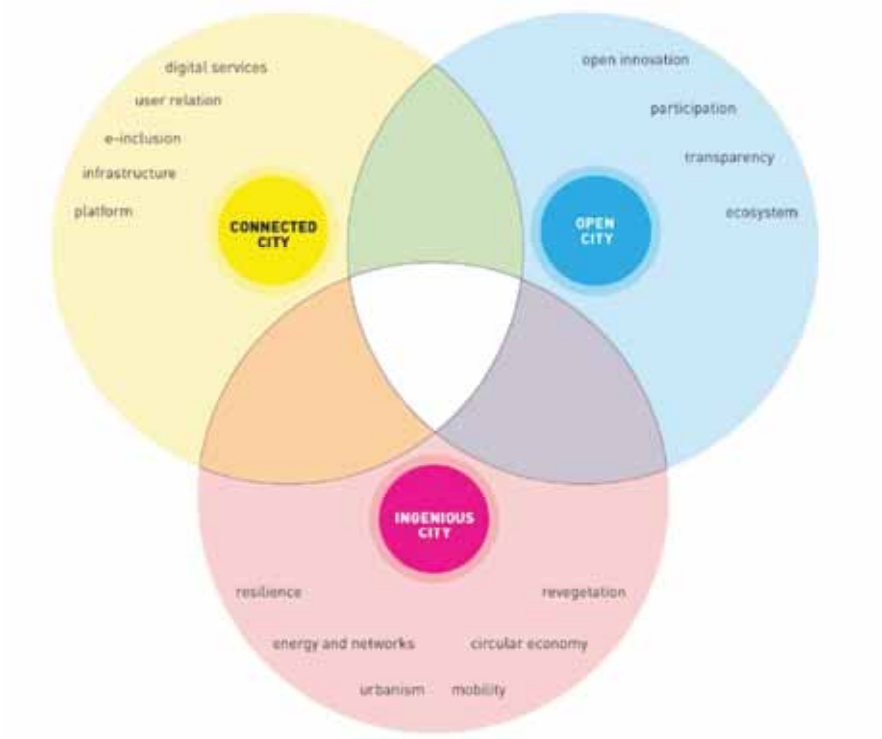
Paris was also the first city in the world to launch an incubator project dedicated to tourism, setting itself the goal of positioning Paris as the "innovation leader in urban tourism". In July 2013, Paris&Co launched Welcome City Lab with four key missions: incubation, academy, experimentation and economic intelligence. Welcome City Lab focuses particularly on the smart city and all the new technologies which can help facilitate a tourist's orientation in Paris. In 2015 alone, Welcome City Labs was the catalyst for 30 incubated companies, the creation of over 100 job, and over €12.5 million of funds raised from investors.

4.4.2 Future vision for the city

In June 2015, the City of Paris launched a report on Paris's environmentally friendly future called Smart and Sustainable Paris: A view of 2020 and beyond. It aims to build a common vision of Paris as a smart and sustainable city, in order to mobilise the energy, creativity and inventiveness of all those who believe in a sustainable, low-emission city. It encourages citizen participation, open data, project co-construction, support for the innovation ecosystem and network interconnection.

The vision for Paris combines three city models, each adding value and resources to the overall process – Open City, Ingenious City and Connected City.

Paris's Vision combining, mutualising and catalysing three city models



Source: Smart and Sustainable Paris: A view of 2020 and Beyond, Mairie de Paris at http://next.paris.fr/viewmultimediadocument?multimediadocument-id=156549.

The **Open City** is a collaborative method placing humans at the heart of the system and organising data sharing in order to:

- Stimulate citizen participation and project co-construction
- Strengthen the Parisian innovation ecosystem
- Open up Paris to French and international researchers and innovators.

The **Connected City** relates to innovative tools provided by digital technology and is based on a progressive infrastructure adapted to user needs. It aims for inter-operability and sharing by:

- Developing a range of efficient digital public services

- Developing support infrastructure for high-quality digital services
- Enabling digital technology access for all.

The **Ingenious City** is the fundamental aim of a city that intends to transform itself, in order to respond to pressing economic, social and environmental needs:

- Co-construct smart networks and systems
- Make Paris a sustainable metropolis
- Make Paris a city at the forefront of energy transition
- Be more responsible consumers
- Make transport more environmentally friendly
- Strengthen the importance of nature within the city
- Make the city more resilient.

Interrelated objectives to be developed by Paris by 2020 and beyond

Open City	***Stimulate Citizen Participation and Project Co-Construction***	***€500 million investment dedicated to projects chosen by participatory budgeting by 2020***
	Strengthen the Parisian Innovation Ecosytem	***An additional 100,000m2 of innovation spaces.*** ***30% of international start-ups in Parisian business incubators.***
	Open up Paris to French and international researchers and innovators	***At least 2 data analyses carried out each year (data and big data analysis)***
Connected City	***Develop a range of efficient digital public services***	***€180 million invested in services via the Digital City 2015-2020 master plan.***
	Develop support infrastructure for high-quality digital services	***At least 2,000 Wi-Fi spots across Paris.***
	Enable digital technology access for all	*-*
Ingenious City	***Co-construct smart networks and systems***	***90,000 mutually telemetered buildings.*** ***1,000 municipal facility boilers renovated and remote-controlled.***
	Make Paris a sustainable metropolis	***The whole of Paris (103km2) modelled in 3D.*** ***1,000 high-energy-consumption buildings renovated.***
	Make Paris a city at the forefront of energy transition	***25% of Paris's overall energy consumption to be renewable or recycled in 2020.***
	Be more responsible consumers	***0 single-use plastic bags.*** ***Reduce the tonnage of household waste by 15% in 2020 compared to 2007.*** ***Waste and collect 100% of bio-waste from large-scale municipal facilities.***
	Make transport more environmentally friendly	***60% reduction of greenhouse gases emanating from traffic by 2020 compared to 2007.*** ***50% of last-mile deliveries made in non-diesel vehicles by 2017 (100% in 2020).*** ***60 new electric charging points alongside the 700 existing ones.*** ***Double the total length of cycle lanes (from 700km to 1,400km) and multiply the number of people cycling by 2020.*** ***30km/h speed limit (excluding major roads).***
	Strengthen the place of nature within the city	***100 ha of additional vegetation on rooftops and walls, 30 ha of which will be dedicated to urban agriculture.*** ***200 new revegetation projects in public spaces.*** ***20,000 additional trees.*** ***30 ha of additional public green spaces.***
	Make the city more resilient	***1 new 'adaptation to climate change' booklet related to the Climate Plan.*** ***1 Chief Resilient Officer to co-ordinate the action within the framework of the Rockefeller Foundation initiative.***

Source: Smart and Sustainable Paris: A view of 2020 and Beyond, Mairie de Paris at http://next.paris.fr/viewmultimediadocument?multimediadocument-id=156549.

4.4.3 Smart city fostering

Organisation

In 2013, Paris was the first city in the World to launch a dedicated tourism innovation incubator - Welcome City Labs[41], created by Paris&Co (the agency charged with the economic development of the French Capital) with the support of the Town of Paris, BpiFrance, the Tourist office and the Congresses of Paris and Head office of Companies (DGE). Its founder members are Aéroports de Paris, Air France, Amadeus, Carlson Wagonlit Travel, Galeries Lafayette, the RATP, Skyboard, Sodexo Prestige and Viparis.[42]

Welcome City Lab focuses particularly on smart tourism and all the new technologies which can help facilitate a tourist's orientation in Paris. Its goal is to "position Paris as the innovation leader in urban tourism." Its missions are:

- **Incubation** – accompanying and supporting start-ups that invent today how we will travel tomorrow
- **Academy** – helping start-ups acquire expertise in the field of tourism and sensitising professionals to innovation
- **Experimentation** – testing these products and services with their partners to ensure they stick closer to market expectations
- **Economic intelligence** – identifying trends in tourism innovation and ensuring an international monitoring mission.

[41] www.welcomecitylab.com/ (accessed on 24 August 2016).
[42] See more at: http://en.www.welcomecitylab.com.systranlinks.net/a-propos/#sthash.1WexhrWP.dpuf (accessed on 24 August 2016).

Paris&Co Welcome City Labs' Missions

Source: www.welcomecitylab.com/wp-content/uploads/2014/10/ParisCo-Welcome-city-lab-v7-2.pdf.

Activities

In 2015 alone, Welcome City Labs was the catalyst for 30 incubated companies, the creation of over 100 jobs and for over €12.5 million of funding raised from investors.

Welcome City Lab's Key Figures 2015

Source: www.welcomecitylab.com/wp-content/uploads/2014/10/ParisCo-Welcome-city-lab-v7-2.pdf.

Welcome City Labs is also creating an international tourism innovation network in collaboration with Montréal and Mexico and planned collaboration with Tokyo and Singapore.

4.4.4 Tourism-related smart city initiatives

The sections below provide examples of success stories of Welcome City Labs incubators and other smart tourism initiatives in Paris.

Culture and events initiatives

Success stories of Welcome City Labs include:

- **Theatre in Paris**[43] – a platform to experience French theatre performances with English subtitles.

Theatre in Paris website

Source: www.theatreinparis.com/.

- **ArchiTrip**[44] – a company offering ten walking contemporary architecture tours in Paris led by passionate architects, urban planners and art historians.

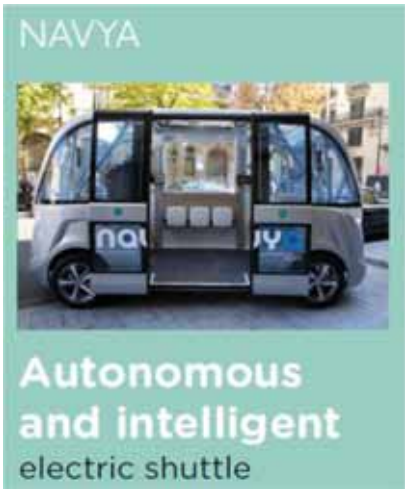
[43] www.theatreinparis.com/ (accessed on 24 August 2016).
[44] http://architrip.fr/en/ (accessed on 24 August 2016).

- Some innovations focus on the customisation/personalisation of travel with applications such as **WeGuideYou**[45] and **Meetrip**[46] which enable tourists to book guides in advance according to their cultural interests.
- Others focus on the provision of real-time information, such as **Toot Sweet**[47], an app giving real-time access to events taking place nearby.

Crowd circulation management

- **Navya** is another success story of Welcome City Labs. It is about facilitating movement within tourist sites with a futuristic vision of independent travel pods from Navya, which will be able to transport tourists around museums and exhibitions where and when they want without waiting time.

Navya



Source: www.welcomecitylab.com/wp-content/uploads/2014/10/ParisCo-Welcome-city-lab-v7-2.pdf.

[45] https://weguideyou.co/fr/ (accessed on 24 August 2016).
[46] http://meetrip.fr/ (accessed on 24 August 2016).
[47] http://tootsweet-app.com/ (accessed on 24 August 2016).

Food and catering initiatives

Examples of Welcome City Labs success stories relating to food and catering include:

- **La Belle Assiettte**[48] – an online marketplace to book a chef in residence
- **TouchandPlay**[49] – an online management and communications platform revolutionising the catering and services sector.

Tourism booking initiatives

Examples of success stories of Welcome City Labs include:

- **GuestToGuest**[50] – world's leading home exchange website
- **Evaneos**[51] – online travel agency.
- **Optionizr**[52] – app enabling people to book a hotel room or an airline seat provisionally for 48 hours while they shop around for a possibly better deal.

Meeting and events initiatives

Examples of success stories of Welcome City Labs include:

- **Weezevent**[53] – online ticketing service.
- **Bird Office**[54] – an online booking of meeting rooms or work stations.

Digital infrastructure

The 'Smart and Sustainable Paris' strategy pledges the development of support infrastructure for high-quality digital services providing at least 2,000 Wi-Fi spots across Paris.

[48] https://labelleassiette.fr/ (accessed on 24 August 2016).
[49] www.touchandplay.fr/ (accessed on 24 August 2016).
[50] www.guesttoguest.com/en/ (accessed on 24 August 2016).
[51] www.evaneos-travel.com/ (accessed on 24 August 2016).
[52] www.optionizr.com/ (accessed on 24 August 2016).
[53] www.weezevent.com/ (accessed on 24 August 2016).
[54] www.bird-office.com/en/ (accessed on 24 August 2016).

Examples of projects planned include:

- Expansion of 'Paris Wi-Fi' to the majority of Parisian public spaces
- Vertical deployment of fibre-optic both for individuals and for small and medium-sized enterprises (SMEs)
- Creation of new connected street furniture, as started with passenger shelters, for new uses of digital services in public spaces and facilities
- Implementation of an urban sensor network throughout the city.

Smart transport / mobility initiatives

Paris home to shared mobility initiatives:

- **Vélib'**[55] – expansive and widely used bike-sharing network, Vélib' (with over 23,600 bikes covering the city). Anecdotal vidence suggests that Velib' has led to a 5% reduction in vehicle congestion in the city).

Paris Vélib'

Source: http://en.velib.paris.fr/.

- **Autolib'**[56] – one of the world's first and most expansive EV car-sharing programmes launched in 2011 in partnership with Bolloré (about 3,000 EVs).

[55] http://en.velib.paris.fr/ (accessed on 24 August 2016).
[56] www.autolib.eu/en/ (accessed on 24 August 2016).

- Other examples of mobility projects within in the 'Smart and Sustainable Paris' Strategy include the testing of presence sensors around delivery spots, taxi ranks and priority parking spots, coupled with a reservation system.

4.5 Conclusions

The European Parliament in its Mapping Smart Cities in the EU report[57] described the factors for successful Smart Cities as Vision, People and Process, with the characteristics of a Smart Cities including smart governance, smart economy, smart mobility, smart environment, smart people and smart living.

Factors for successful Smart Cities according to the European Parliament

Table 1 : Factors for successful Smart Cities

Factors for success	Description
Vision	The study makes clear that inclusion and participation are important targets for successful Smart City programmes to avoid the polarisation between the urban elite and low income areas.
People	The case studies highlight the inspiring leaders ('city champions') behind many successful initiatives. Citizens should be empowered through active participation to create a sense of ownership and commitment, and it is important to foster participative environments that facilitate and stimulate business, the public sector and citizens to contribute.
Process	The creation of a central office that acts as go-between for Smart City ideas and initiatives, drawing in diverse stakeholders, is of vital importance and allows coordination of ideas, projects, stakeholders and beneficiaries. Local level coordination can also be important for uptake, to ensure the integration of solutions across the portfolio of initiatives. For example, many municipalities insist that information about public services be provided as 'open data'. This allows individuals and companies to process and recombine these and other available data in order to create useful resources for the public, for example real-time traffic information. It is important for cities to participate in networks to share knowledge and experiences, therefore promoting their own initiatives as well as learning from others and laying the foundations for future collaboration.

Source: European Parliament, 'Mapping Smart Cities in the EU'.

[57] European Parliament, 'Mapping Smart Cities in the EU', available from www.europarl.europa.eu/RegData/etudes/etudes/join/2014/507480/IPOL-ITRE_ET(2014)507480_EN.pdf (accessed on 24 August 2016).

All our three case studies have highlighted:

- The importance for a city to stimulate, encourage, and foster smart initiatives in the city with the development in the three cities of incubators projects
- The need for open data for sharing real-time data to inform better decision-making
- The need for involvement of the citizens in contributing to building a better city.
- The will to work collectively and distributing and spreading best practice nationally and internationally.

Section 5 - Case Study on The Sharing Economy

5.1 Introduction

Few sectors of the global economy have experienced such profound change in recent years as the so-called 'sharing' or 'shared' economy. This is almost entirely due to the Internet, which has made it easier and cheaper to link supply and demand – a key factor underlying the dynamic growth of this sector, not least in Europe. PWC (2016)[58] estimates that at least 275 sharing economy platforms have already been established in the region, providing a range of online services that enable people to share cars, accommodation, bicycles, household appliances and many other items, connecting owners of underused assets with others willing to pay to use them. And many more service platforms are forecast.

Statistics on the sharing economy are few and far between, except for the accommodation sector – and only really with regard to Airbnb. Nevertheless, the UK sharing economy was estimated by the Office for National Statistics (ONS) to be worth £0.5 billion (approx. €630 million) in 2014 and is forecast to reach £9 billion (€11.5 billion) by 2025. And in 2015, five key sectors of the sharing economy facilitated a reported (PwC) €28 billion worth of transactions in Europe (PwC). These sectors are:

- **Peer-to-peer accommodation**: households sharing access to unused space or renting out a holiday home to travellers (such as Airbnb, HomeAway, onefinestay and Couchsurfing)
- **Peer-to-peer transportation**: individuals sharing a ride, car or parking space with others – either providing a taxi-like service (e.g. Uber, Lyft, Weeels, Side-Car) or car rental /car-sharing(e.g. Buzzer, Getaround, RelayRides)
- **On-demand household services**: accessing support with household tasks such as food delivery and DIY (Amazon Home Services, EatWith, Bon Appetour)
- **On-demand professional services**: accessing support with skills such as administration, consultancy and accountancy (RealTime PS, Radware), and
- **Collaborative finance**: individuals and businesses that invest, lend and borrow directly from each other, such as crowd-funding and peer-to-peer lending (e.g. Funding Circle, Kickstarter, IndieGogo).

[58] PWC (2016): Assessing the Size and Presence of the Collaborative Economy in Europe, report prepared for the European Commission.

By far the most prominent sharing services are those based around accommodation and transport, especially car travel, and this explains why the sector has had such a significant impact on the global tourism industry. Uber, worldwide leader in the transportation sector, is essentially an app that connects drivers with passengers directly, instead of through a centralised booking service or just hailing a car in the street. It pitches itself as a safe and reliable way to get on-demand rides, and is established in most of the world's major cities. It also offers ride sharing and car pooling – all at a competitive price to consumers.

Operating in 400 cities in 68 countries around the world, Uber is now valued at US$62.5 billion. By comparison, Lyft – a competitor in some markets – was recently valued by GM Motors at US$5.5 billion. Lyft is currently looking for a buyer and is reported to have asked for US$9 billion from one potential bidder, but Uber says it would not pay more than US$2 billion for it.

Even more impressive growth has been recorded by peer-to-peer accommodation rental schemes, outpacing the traditional lodging industry. From an estimated US$2.3 billion in sales in 2015, Jupiter Research forecasts a rise to US$6.1 billion by 2019. Sharing space with tourists provides welcome additional income for owners/ landlords, as well as being less costly and more convenient for borrowers.

Occasional renting is cheaper than renting from a traditional provider, and it also enables holiday travellers to enhance their destination experience by living like the locals.

Accommodation

Airbnb is the leader worldwide in the accommodation sector of the sharing economy, operating across ten European cities. This platform has already expanded traditional accommodation capacity by between 7% (Athens) and 34% (Amsterdam). And the Spanish Alliance for Excellence in Tourism, Exceltur[59], suggests that in Barcelona, Malaga, Alicante and San Sebastián, the combined capacity of nine sharing platforms active in Spain actually exceeds the total capacity of the formal/traditional offer (hotels, apartments, hostels, etc.).

[59] Exceltur (2015): 'Impacts of the exponential growth of tourist accommodation in rental houses in Spain, driven by P2P models and marketing platforms.' Presentation dated 25 June 2015.

Comparison of Airbnb listings for 10 European cities

City	No. of Airbnb listings (a)	No. of Airbnb bed spaces (b)	Home/ apt as a % of Airbnb total stock (c)	% availa-bility (d)	% multiple listings (e)	No. of hotel beds (f)	Airbnb beds as a % of hotel beds (g)
Amsterdam	11,400	21,900	80	74	25	64,100	34
Athens	2,120	4,400	82	97	43	61,800	7
Barcelona	14,900	33,900	53	88	54	123,500	27
Berlin	15,400	26,600	61	73	26	112,000	24
Brussels	4,900	8,650	65	81	35	36,300	24
Dublin	3,770	6,680	45	74	39	n/a	n/a
London	42,600	72,400	51	63	41	391,000	19
Madrid	7,450	15,000	62	88	53	112,000	13
Paris	41,500	n/a	85	63	18	302,000	n/a
Vienna	4,960	9,400	67	86	38	65,000	14

(a) to (f) Data from InsideAirbnb.com, accessed July 2016.

(c) Hosts can register either a room(s) within their own home, or the entire home. The greater the number of entire homes/apartments rented out, the greater impact it has on local housing stock.

(d) The no. of nights that a rental property is available can clearly indicate whether it is a host's main residence. The greater the availability, the less likely this is, and the greater the impact therefore on housing stock.

(e) Multiple listings indicate rentals are more likely to be operated as a business.

(f) Data from Eurostat: No. of bed-places in hotels and similar accommodation for the latest year available, accessed July 2016.

(g) This figure is purely illustrative and data may cover different geographical areas.

Car-sharing

Although many cities in Europe have introduced new legislation to ban, or more commonly to ensure controls, especially in terms of public liability insurance – consumer protection and workers' compensation – peer-rental models are increasingly being accepted and endorsed by incumbent car manufacturers and car rental forms. GM Ventures, the investment arm of the USA's biggest car manufacturer, was among a number of different investors who injected US$13 million into RelayRides in 2011. And ZipCar was acquired by Avis, a conventional car rental company, in January 2013 for US$491 million.

A report by the Bundesverband[60] on the state of car-sharing in Europe suggests that Germany dominates the market in Europe, although the report's statistics are too out of date (2009) to be very useful, especially given the reported rapid growth in the market in recent years.

As already indicated, the transportation sector of the sharing economy provides two types of services: car rental; and a taxi-like service, in which sector Uber is the clear leader. UberPop, an older version of UberX – which has been banned in many European countries (e.g. France, Belgium, Italy, Spain and the Netherlands), mainly in response to strong objections from local taxi drivers – enables individuals to share and split the fare of a car trip with multiple drivers. And anyone can operate the service – including individual car owners in their own cars.

Recent (2014) research[61] suggests that both round- trip and point-to-point car-sharing encourage reductions in car ownership, with the effect being stronger on a per-customer basis for round-trip car-sharing (a reduction of 67% for round-trip car-sharing, as against 23% for point-to- point). Both types of services in Paris are likewise associated with decreased driving distance, again with a larger per-user impact (-127 km per user per month) for customers of round-trip car-sharing than point-to-point car-sharing users (-43 kilometres per user per month). It also found that point-to-point car-sharing customers in Paris use the service on average more frequently than round-trip car-sharing users, with 57% doing so more than twice per week, whereas 80% of round-trip car-sharing customers reported using it fewer than three times a month.

Other sharing platforms

Other peer-rental and sharing models gaining in popularity include food-sharing platforms, like Paris-based Vizeat, and Rome-based BonAppetour. Vizeat is currently enjoying some 20-30% growth a month – as reported by Oates, G. (Feb 2016). In November 2015, at the annual Airbnb Open Conference in Paris, it hosted over 1,000 out-of-town Airbnb hosts for dinner at 170 private residences.

In terms of trends:

- Sharing brands are increasingly partnering with online agents
- Locals, in particular Airbnb hosts, are offering personal tours and other activities
- Additional service businesses are being introduced, such as cleaning/housekeeping services for accommodation, in-house dining, dog-sitting, short-term car-parking rentals, sharing of gardening or kitchen equipment, and many other similar services

[60] The State of European Car-Sharing (http://www.eltis.org/sites/eltis/files/tool/the_state_of_carsharing_europe.pdf).
[61] ACEA Scientific Advisory Group Report, European Automobile Manufacturers' Association (ACEA).

- Existing sharing brands are expanding, i.e. Airbnb has plans to expand into new travel services including restaurant reservations and city tours, transforming the company into a multipurpose trip planner. Hosts can make money by recommending restaurants and giving tours.

5.1.1 Supply and demand

In 2014, the number of European consumers participating in the sharing economy was variously estimated at between 5% and 9%. But this has reportedly doubled since then in some markets – it is already 17% among Russians and 18% among Brazilians – and is expected to increase significantly over the next few years. Nielsen reports that more than 50% of Europeans are willing to share their assets. EURO2016 in France in summer 2016 stimulated demand for accommodation sharing, and 36% of hosts during the event were renting out rooms for the first time ever.

Participation is highest among younger generations (under 35-year-old age group), although the share varies sharply from one market to another. The under-35s account for the highest share (73) among Chinese outbound travellers, while the respective share is just 40% among Germans, and 42% and 47% among the French and British, respectively. Although shared space rental and ride sharing are reported to be more popular among the well-educated, cost savings seem to be the main drivers of the decision-making. And countries that have experienced weak economic growth in recent years, such as Spain and Italy, are not surprisingly the highest adopters of the sharing economy in Europe, in terms of supply.

5.1.2 Policy Implications and Regulation

While the rapid development of these platforms can be considered an opportunity for Europe, and European cities in particular, to foster sustainable and more widely spread growth, it also poses significant challenges for policy-makers and regulators. The traditional taxi sector has rebelled in many cities, resulting in an outright ban on Uber and other providers of the service in some cities. In France, for example, some forms of ride sharing are now illegal. And in London, Uber drivers are now rebelling themselves, contesting their status as self-employed.

In total contrast, the South Korean Government is promoting the development of the sharing economy and has issued its own vehicle-sharing platform, providing financial assistance to selected small and medium-sized enterprises entering the dining and tour provisions service sector.

In the accommodation-sharing sector, a wide spectrum of regulatory and tax policies has emerged, accompanied by varying levels of application and enforcement. In some cities, self-regulation is favoured while, in others, tough regulations are being imposed. The New York state legislature, for example, passed a bill in June that would heavily fine hosts on Airbnb and other short-term rental sites, which post listings that violate the state's laws on short-term rentals. The new law has a penalty of up to US$1,000 for the first violation, US$5,000 for the second violation, and US$7,500 for the third and subsequent violations.

New York's short-term rental laws, which were last updated in 2010, basically prohibit most apartments (buildings with three or more units) in New York City from being rented out for less than 30 days. This means that the majority of entire home/apartment listings that one finds on Airbnb and other sites for NYC would be considered illegal, especially if they can be booked for a period of less than 30 days.

In an effort to establish a fair regulatory framework for the sharing economy, ensuring consumer protection while at the same time committing to fair competition, a number of international organisations involved in tourism are working on developing innovative ways of addressing some of the policy issues. These include the World Tourism Organization, WTCF and, in Europe, Hotrec, the voice of hotels, restaurants, cafés and similar establishments in Europe.

The European Parliament has recognized the impact of companies such as Uber, termed Transportation Network Companies (TNCs), and is concerned about the regulation of these activities. It notes that is an American term, and that, in Europe, companies such as Blablacar and Carpooling.com do not consider them TNCs and are instead not-for-profit car-sharing companies. It can be seen that there are issues in definition and classification.

The European Commission has launched two studies, both due to report later in 2016:

- 'Passenger Transport by Taxi, Hire Car and Ridesharing in the EU' under the Directorate General for Mobility and Transport; and
- 'Consumer Issues in the Sharing Economy' under the DG for Justice and Consumers.

On the basis of these studies, the EC will consider whether action at EU level is necessary.

The Organisation for Economic Co-operation and Development (OECD) is calling on governments, meanwhile, to begin rethinking current policies for the tourism sharing economy, recognising that the sector is here to stay and that a positive approach to its development is needed.

The three case studies selected for this report, which focus primarily on the accommodation sector – due to a lack of supporting data on other peer-sharing sectors – provide some examples of the different issues faced by European cities and some different approaches taken by the authorities to date:

- **Berlin** is facing a housing shortage, with accommodation-sharing platforms alleged to be a large part of the problem. The city authority has chosen to limit short-term lettings through a permit system and will fine non-compliant landlords.
- **Barcelona** and its residents are facing the strain of increasing tourism. The growing popularity of short-term holiday lets through online platforms is increasing pressure and crowding out residents from central and tourist areas. In addition, transport-sharing platforms have also been criticised for unfair competition against traditional sectors. Barcelona has adopted a strong regulatory stance to address these issues.
- **Amsterdam** is Europe's first Sharing City, fully embracing the concept for the benefit of its residents. It has changed its rental laws to allow residents to participate in the accommodation-sharing market and has signed an agreement with Airbnb to address compliance issues, including the collection of tourist tax.

5.2 Berlin case study

5.2.1 Overview

The city of Berlin is embracing the sharing economy in a variety of ways, some quite unusual, while taking action to address negative aspects. One unusual example is that, since 2012, the city has operated an online food-sharing system, enabled by a network of public refrigerators. There are also collaborative workspaces, car sharing, outdoor bookshelves, community cupboards, borrowing shops and other initiatives[62].

The first car-sharing firm in Germany, *Stattauto*, was set up in Berlin in 1988. Now, in 2016, there are 1.26 million registered car sharers in Germany – an increase of 17% (220,000 users) over 2015[63]. Peer-to-peer sharing is accompanied by schemes operated by car manufacturers, such as Drivenow (BMW) and Car2go (Daimler) and Berlin has the largest number of schemes operating, with 3,180 shared cars at the end of 2014. As many as 45% of households in Berlin do not own a car, and this enthusiasm for car

[62] O'Neill, E (2016): 'Berlin's Sharing Economy: A Glimpse of the Future?', in The Irish Times, www.irishtimes.com, dated 4 January 2016, accessed 9 July 2016.
[63] www.carsharing.de.

sharing has had positive effects on parking and congestion within the city. In 2015, the Transport Minister promoted car sharing by offering free parking to shared vehicles[64].

In contrast, accommodation-sharing operations such as Airbnb, Wimdu and 9flats, have come in for criticism. In recent years, Berliners have seen rents rise faster than any other city in Germany. In the Neukölln district, prices have increased by 54% in five years[65] and real-estate values are rising much faster than rents. It is alleged that sharing economy websites have fuelled the rent increases by allowing landlords to offer short-term rental to the tourist market. Of these, Airbnb is the most popular.

This case study therefore focuses on the impact of accommodation that is shared, particularly through Airbnb, on the city and the regulatory response from the municipal authorities.

5.2.2 The impact of Airbnb in Berlin

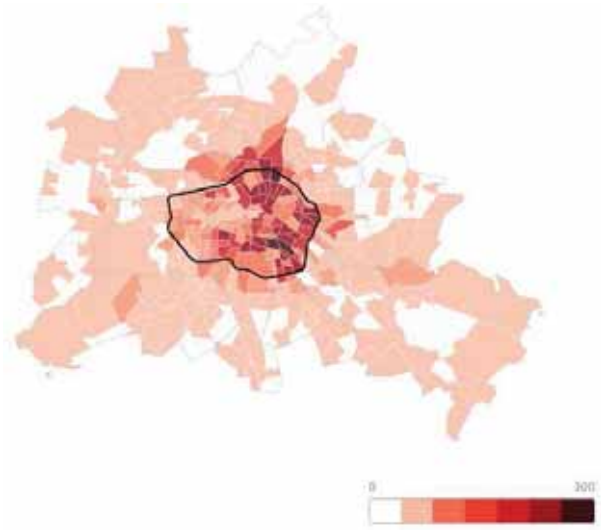
Not surprisingly, Berlin has by far the most Airbnb listings of any city in Germany, of around 15,400 (as at early 2016) – equal to approximately 24% of the traditional hotel offer. Within Europe, only Paris (around 41,500) and London (around 42,600) have a larger choice in properties offered on Airbnb.

Company data indicates that 245,000 Airbnb guests visited Berlin last year, of whom 80% came from outside Germany. This compared with an estimated 12 million visitors overall to Berlin. Airbnb also suggests that its hosts in Berlin generated a total income of €31.5 million over the 12 months and that Airbnb guests in Berlin over the same period spent a total of €136.5 million, 45% of which in the neighbourhood in which they were staying.

Further analysis of Airbnb data has been undertaken by the website AirbnbvsBerlin.com. Most of the rental flats on offer are located in inner city districts like Neukölln, Friedrichshahn-Kreuzberg and Prenzlauer Berg. The figure below illustrates the relative concentration of Airbnb properties. Its properties are located outside the main hotel districts.

[64] 'The Local (2015) Car-sharing accelerates rapidly in Germany', dated 21 June 2015 www.thelocal.de.
[65] Immobilien Scout 24 (2015), Daten Deutschlands wichtigste Immobilienmärkte im Überblick, available from www.immobiliensout24.de (accessed July 10 2016).

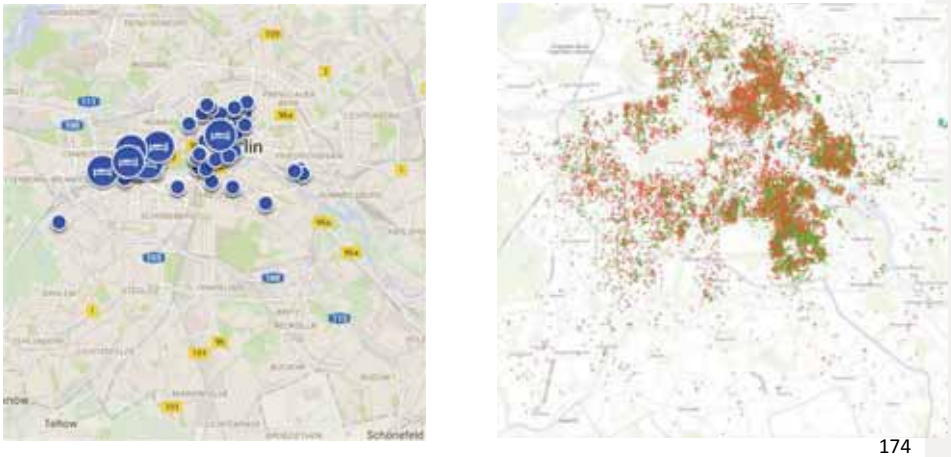
Number of Airbnb properties by neighbourhood in Berlin, 2015



Source: www.AirbnbvsBerlin.com

Airbnb says that the figure below compares the results of a web search for hotels on TripAdvisor, showing the location of approximately 664 hotels (aggregated), with data from Airbnb on the location of homes, apartments and rooms. Taken together, these maps do show a large proportion of Airbnb properties beyond the hotel sector.

Comparison of hotel locations (left) and Airbnb properties (right)



The neighbourhood of Reuterkiez in Neukölln leads the ranking for the most concentrated provision of Airbnb rentals with 476 rooms and flats offered, approximately 16-17 per thousand residents. As shown in the figure below, Neukölln, which hosts visible Airbnb 'clusters', has around 200 properties for rent in just two streets, Sonnenallee and Weserstraße.

Street map of Airbnb properties in Berlin

– the darker colour indicates a higher number of rental properties

Source: www.AirbnbvsBerlin.com

5.2.3 Berlin's response to the sharing economy

In response to growing concern in government and among the public about an acute shortage of accommodation for rental by local residents, Berlin passed a law in autumn 2013 requiring all short-term rental property owners to register for a city permit by summer 2014. This law, known as the 'Zweckentfremdungsverbot' (ban on misappropriation), provided for a transition period which ended in

April 2016. Since 1 May, the illegal renting of properties carries a fine of a minimum €10,000, but which can be as high as €100,000 for repeated non-compliance.

Landlords are now also banned from renting entire apartments to tourists through Airbnb and its competitors as a further means of protecting affordable housing. Non-city residents are only allowed to rent rooms via Internet portals.

The Berlin Senate also announced that it would not make an exception for Airbnb within their regulations. And responsibility for providing data on the landlords/owners who use their services to the Berlin Senate, in order to ensure compliance with the law, is firmly with Airbnb and similar operators[66].

In the first month after the new law came into effect, Airbnb's listings in Berlin fell by 40%.

5.2.4 Car-sharing platforms

Like Airbnb, Uber has also gone through troubled times in Germany due to legislation. In 2015, the German court banned Uber from using unlicensed drivers after it was deemed to be in violation of the country's transport laws. Authorities warned that, if caught doing so, the service would face harsh fines of up to €250,000. The legal case, which was launched by a German taxi group, is only one of many lawsuits the company has been forced to fight across Europe.

In light of the German court's decision, Uber has only been allowed to employ drivers who hold the relevant passenger transport licence to transport people using the UberX (formerly UberPop) and UberBlack smartphone apps. However, the service has reportedly run into a shortage of drivers over the past year and, as a result, currently only operates UberX in Munich.

In 2015, Uber slashed its services in other German cities, although it did plan on maintaining UberX in Berlin as well and Munich. But, in the end, it was forced to delay its introduction in Berlin due to the shortage of drivers. It finally launched the service in June this year.

All Uber's car-sharing offers in Berlin are operated in collaboration with car manufacturers, conventional car rental forms, or Deutsche Bahn, the national railway company.

[66] The Maybachufer (2016): 'No Exception for Airbnb on Holiday Rental Ban in Be', www.themaybachufer.com, dated March 26 2016, accessed 10 July 2016.

Selection of car-sharing offers in Berlin

Company	Flinkster	E-Flinkster	DriveNow	Car2go	Multi-city Car-sharing
Type	Station-based	Station-based	Flexible	Flexible	Flexible
Booking	In advance	In advance	Spontaneous	Spontaneous	Spontaneous
Return	After booking time has expired	After booking time has expired	Parking when no longer needed	Parking when no longer needed	Parking when no longer needed
Propulsion Type	Combustor	Electric	Combustor and electric	Combustor and electric	Electric
In Berlin since	2001	2010	2011	2012	2012
Vehicles in Berlin	~350	~50	~500	~1,200	~350
Operator	Deutsche Bahn	Deutsche Bahn	BMW & Sixt	Daimler and Europcar	Deutsche Bahn & Citroen

Source: Wappelhorst et al. (2016): Flexible Carsharing – Potential for the Diffusion of Electric Mobility, in Fornahl, D. & Hulsmann, M. (eds) Markets and Policy Measures in the Evolution of Electric Mobility, Springer.

5.2.5 Conclusions

Despite the constant battles facing Uber and other car-sharing platforms, the city of Berlin and its residents appear to recognise economic and social value of the sharing economy – especially on less affluent neighbourhoods for which tourism has brought fewer benefits in the past. The local authorities have endorsed many of the initiatives, especially car-sharing. However, in the accommodation sector, the negative impact of the shortage of available housing for local residents has understandably resulted in stronger regulation of the temporary letting market.

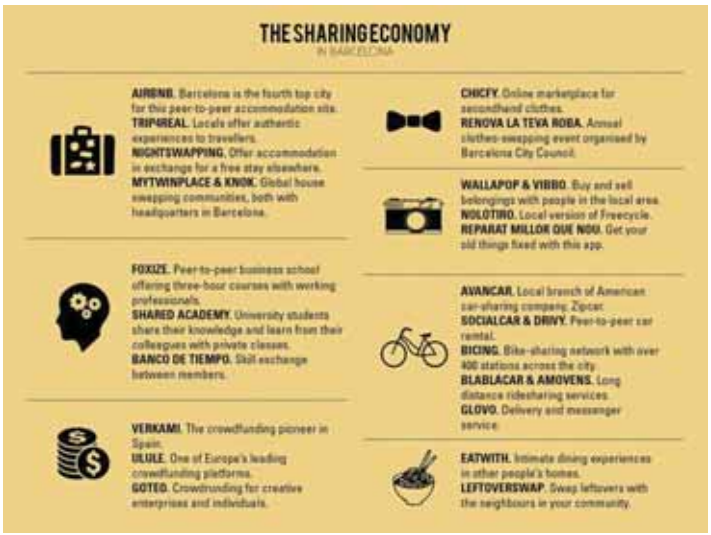
Although the figure has not been substantiated, an estimated 10,000 properties are reported to have been taken off the short-term rental market since the beginning of 2016.

5.3 Barcelona case study

5.3.1 Overview

In Barcelona, the sharing economy is well developed, going hand in hand with other innovations such as the Smart City initiative. Many large companies, like Airbnb, Wallapop and Socialcar, have their global or national headquarters in Barcelona, and their presence has stimulated start-ups and positioned Barcelona as an attractive place for the sharing economy to flourish[67]. The figure below highlights some of the initiatives within the city.

The sharing economy in Barcelona, 2016



Moran's report, *The Sharing Economy in Metropolitan Barcelona*, refers to the study by Nielsen, which suggests that countries more affected by the financial crisis, such as Barcelona and other Spanish cities, are more open to the sharing economy, with more than half of all Spaniards (53%) willing to share or rent personal property. The report notes that "as well as offering the potential to earn some extra cash, peer-to-peer platforms offer access to goods or services that may otherwise be off limits, budget-wise."

[67] Moran, C (2016): Report: The Sharing Economy in Metropolitan Barcelona, available at: www.barcelona-metropolitan.com/features/report-the-sharing-economy/.

In other words, the sharing economy helps people in times of financial crisis to save money by allowing them to share, rather than purchase, goods or services.

5.3.2 The impact of the sharing economy – accommodation in Barcelona

There are nine key accommodation-sharing platforms active in Spain. Of these three, Airbnb, HomeAway and Wimdu are responsible for 65% of all shared tourist accommodation online[68].

The number of bed spaces offered in rental accommodation in Barcelona is approximately 137,000, of which close to 34,000 are offered by Airbnb. This can be compared with the bed capacity of hotels and other regulated accommodation in Barcelona, which is between 78,400 (Exceltur, 2015) and 124,000 (Eurostat, 2015), depending on the definition used. In either case it can be seen that the size of the accommodation-sharing economy in Barcelona is very significant.

In 2014, Airbnb completed a study of the economic impact of its hosts and guests in Barcelona. It reported the following findings[69]:

- Airbnb generated €158 million in economic activity in one year and supported more than 4,000 jobs
- Airbnb attracts new visitors to Barcelona – 61% of Airbnb guests were visiting Barcelona for the first time
- Guests are looking for authentic, cultural and sustainable experiences
- Airbnb guests stay 2.4 times longer and spend 2.3 times more money than typical tourists.

Exceltur, which represents all sectors of the Spanish tourism industry – and not least hotels – reports that the number of foreign tourists staying in rented accommodation across Spain increased by 59.7% in the four years from 2010 to 2014. Exceltur says that the rapid growth in volume and concentration is putting pressure on city centres and tourist areas (and hotels), increasing house prices and gradually excluding the resident population.

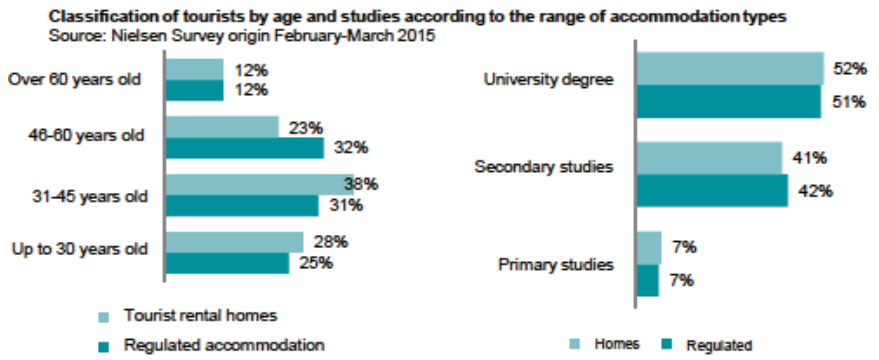
Although Airbnb denies that it is having an impact on prices across the city, the concentration of holiday rental accommodation in certain areas does appear to have a substantial impact. In Barcelona, 91% of the rental homes are located in tourist districts, compared with 71% of regulated accommodation. This causes a crowding out of residents in the most central and/or tourist areas. In Ciutat Vella in Barcelona,

[68] Exceltur (2015).
[69] http://blog.airbnb.com/economic-impact-airbnb/?_ga=1.135197169.137229671.1467119096#barcelona.

for example, house prices increased by 24.5% from 2012 to 2014, while the resident population fell by 3.6%.

Perhaps not surprisingly, Exceltur suggests that these private rental properties are not attracting a new segment of tourists – it says they are in fact very similar customers, as illustrated in Figure 5 below. Interaction with the host is not a key reason for choosing this type of accommodation, rather it is price, independence and greater space which are the key drivers. Exceltur (2015) also suggests that the daily contribution of these tourists is also lower because the accommodation costs less and savings are not being spent in the destination. This contrasts to Airbnb's assertion that their guests spend 2.3 times more money than the average tourist.

Comparison of tourists by accommodation type, 2015



Source: Exceltur

Given that the hotel trade in Barcelona experienced a growth in occupancy rates from 2010 to 2014 and is forecast to experience further growth in 2016[70], it seems reasonable to suggest the accommodation sharing economy is generating more tourism, albeit of a similar demographic to existing tourists. The conflicting reports on tourism expenditure are difficult to reconcile at this time.

The figure below illustrates the relative location of hotels (as advertised on TripAdvisor) and private rental accommodation (as advertised on Airbnb) respectively. This shows that, while the distribution of private rentals is wider than hotels, there is a high concentration in central areas.

[70] PWC (2015): Room for Growth – European Cities Hotel Forecast for 2015 and 2016 for 20 gateway cities from Amsterdam to Zurich Available from www.pwc.ie.

Comparison of hotel locations (left) and Airbnb properties (right)

Source: www.Tripadvisor.com and www.InsideAirbnb.com

5.3.3 Barcelona's response to the sharing economy

Central Barcelona has clearly been feeling the strain of the growing number of visitors to the city, and initiatives to stimulate the sharing economy in tourism have come in for criticism by regulators and residents. Criticism has not been confined to the accommodation sector only, either, and the regional and municipal authorities in Spain have taken action against a number of sharing platforms, including car-sharing platforms such as Uber and BlaBlaCar.

With regard to accommodation, residents have complained about the disruptive behaviour of guests staying in residential properties and rising house prices. And heavy lobbying by the hotel industry, not least through Exceltur, increased concerns over illegal earnings and unregulated accommodation.

Partly in response to these complaints, the authorities suspended the registration of any new holiday lets for six months in May 2014. It also imposed a freeze on new hotel development.

A tax of €0.65 per night per guest staying on short-term rented properties was imposed in 2015, with rooms outside the city incurring a per night, per person tax of €0.45. Owners/landlords were henceforth also obliged to register their properties, declaring their specific usage, and were henceforth obliged to spend the night in the same property during the guest's/guests' stay – thereby ensuring that full

apartments could not be rented out to non-residents. The owner/landlord is also limited to renting a maximum of two rooms for a maximum of four months a year.

In Spain, in order to register one's house or apartment, one has to pay a modest fee, prove that one has rental insurance and that the property is in a safe condition, and pay tax on any revenue earned. By 2015, the City Council had discovered 6,000 unregistered apartments on offer, compared with 9,600 officially registered holiday apartments. As a result, it imposed fines of €30,000 each on Airbnb and HomeAway for advertising illegal properties, i.e. those without a tourist permit[71].

In July 2016, Barcelona City Council announced a new action plan to address illegal tourist rentals, including tougher measures and higher fines, under the Tourism Law of the Generalitat (the Catalonia Provincial Government). The Tourism Law envisages fines of between €30,000 and €600,000 for serious infractions, aimed at landlords and short-term rental management companies. This is accompanied by an extended moratorium on holiday rental licences, an increase in the number of inspectors, and the possibility of asking tourists to produce a rental contract[72].

By way of interest, Uber was outlawed in Barcelona in December 2014 following strong opposition from traditional taxi drivers. In July 2015 the case was referred to the European Court of Justice, whose ruling is expected during 2016. Meanwhile, it is suggested that Uber is considering re-entering the Spanish market by implementing a new approach that would involve working exclusively with drivers who carry a valid professional VTC licence (hire cars with a driver).

Most recently, the Spanish Confederation of Bus Transportation (Confebús) took lift-sharing platform BlaBlaCar to court in a bid to shut the service down, accusing it of unfair competition and operating a public transportation company without complying with regulations. However, in February 2016, the court ruled against Confebús.

5.3.4 Conclusions

Barcelona has adopted a strong regulatory stance vis-à-vis the sharing economy, fining and banning companies for non-compliance. This reflects the significant pressures that the city faces from increasing

[71] O'Sullivan (2015): 'Tourist-Heavy Barcelona is Cracking Down on Airbnb', dated 23 December 2015, available at: http://www.citylab.com/housing/2015/12/barcelona-airbnb-tourism/421788/.
[72] Stücklin, M (2016): 'Barcelona threatens Airbnb and others with fines of up to €600,000', Spanish Property Insight, available at: http://www.spanishpropertyinsight.com/2016/07/07/barcelona-threatens-airbnb-others-fines-e600000/.

tourism and the attitude of its residents to this. However, some of the restrictions, such as a moratorium on new licences, do not only affect the sharing sector, but also the traditional accommodation market.

The main concerns of the authorities are:

- Less-than-average or no tax is being paid on short-term rentals
- Consumer rights are not guaranteed
- Rental houses and apartments are being run as commercial businesses
- Tourist prices exceed the rental value, and
- There is unfair competition in the sharing economy generally.

5.4 Amsterdam case study

5.4.1 Overview

The adoption of the sharing economy is well advanced in Amsterdam and, in 2015, it became the first European city to be named a 'Sharing City'[73].

"Amsterdam Sharing City recognises the sharing economy as a key driver of a sustainable and economically resilient city, rich in social capital, and acknowledges the need to consider sharing economy principles and incorporate them into the process of recreating the political, economic and social landscape."[74]

The purpose of Amsterdam Sharing City is to embrace the opportunities that the sharing economy offers the city in terms of sustainability, social cohesion and economic growth[75]. It is a joint initiative in which over 30 'ambassadors' work together. Unusually, some of Amsterdam's larger banks and insurance companies are participating in the sharing economy pool, while the local government has consistently demonstrated a willingness to work with sharing start-ups towards integration with the regulation economy.

[73] www.sharenl.nl, accessed 11 July 2016.
[74] www.collaborativeconsumption.com, accessed 23 August 2016.
[75] www.amsterdamsharingcity.worldpress.com, accessed 11 July 2016.

The project was initiated in response to several factors:

- A willingness by citizens to share in the city of Amsterdam - 84% of Amsterdam's citizens showed a motivation to share
- An established digital infrastructure with more than 90% of citizens having online access
- An environment that encourages sharing economy start-ups - an atmosphere of promoting innovation
- Entrepreneurial spirit and ambitious initiatives within the sharing economy and sustainability circles, and
- The potential to apply the sharing city concept, developed in Seoul, to a European city.

The environment in Amsterdam is particularly supportive, because its local business community is already strongly networked and its compactness lends itself to neighbourhood-based initiatives.

However, as shown in the table below, this rapidly growing phenomenon is posing challenges to the traditional economy and Amsterdam City Council has stated that it will intervene in cases that adversely impact the city[76] .

Opportunities and challenges in the sharing city

Opportunities from the sharing city	Challenges created by the sharing city
• Increased sustainable and efficient use of scarce resources • Enhanced affordability and accessibility of products and services for the consumer • Nurturing innovation of products & services • Attracting creative industries and fostering a knowledge economy • Increasing social cohesion and safety • Improving efficiency of space and mobility • Creating opportunities for new public-private partnerships • Enabling growth of local economic investments • Identifying possibilities of new means of existence • Making accessibility easier and empowering for example entrepreneurs.	• An unfair playing field • A risk of market dominance • Exponential growth and monopoly • Doubts and difficulties regarding social security and labour laws • Questions concerning when to be considered a consumer/ citizen and when an entrepreneur • Difficulties in monitoring quality, safety, disturbance and when to intervene • Oversimplified image • Insufficient attention as to the perspective of the user • Difficulty of predicting the development of the trend and impacts.

Source: www.sharenl.nl (accessed 11 July 2016)

[76] Amsterdam Action Plan.

In April 2016, the Mayor and the Executive Board of the Municipality of Amsterdam published an Action Plan on the Sharing Economy[77]. This sets out five key areas to its approach:

- **Stimulating the sharing economy –** The aim is to use the power of the sharing economy to tackle urban challenges, hand in hand with Amsterdam residents – by connecting people, removing obstacles and supporting pilot projects. For example, a study is underway to determine if and how car sharing can contribute to the municipality's parking and sustainability goals. The analysis will result in a new municipal policy and is part of the implementation agenda for mobility.
- **Leading by example** – The city authority intends to launch its own pilot project, involving complimentary sharing of its own assets, starting with its vehicle fleet, office space and tools and other items available at the city wharfs. The municipality has already started with a pilot involving parts of its own vehicle fleet within municipal departments and city districts.
- **A sharing economy for all Amsterdam residents** – The aim is to expand the reach of the sharing economy and thereby enhance the social inclusion of Amsterdam residents. One example being investigated is connecting sharing platforms to the city pass (Stadspas). This pass provides a means of introducing around 180,000 residents (low-income and elderly groups) to the sharing economy.
- **Rules and regulations** – The city states that it wants to remove hindrances posed by rules and regulations in order to stimulate this new form of economy, but it must also keep a close eye on any excesses that may have an adverse impact on the city – in which cases it will intervene. Examples include proper regulations for letting residences to tourists and preventing public nuisances caused by illegal hotels, as well as working with the national government on issues relating to transportation. It notes that certain features of the sharing economy require specific regulation.
- **Putting Amsterdam on the map as Amsterdam sharing city with a sharing city event –** Its Action Plan notes that Amsterdam is in the spotlight as a sharing city, and planned to hold a Sharing City Event in May 2016.

5.4.2 The impact of the sharing economy

The shortage of statistics and even qualitative data on the transport sector of the sharing economy makes it difficult to provide any kind of reliable analysis. However, media reports suggest that Uber is a popular car rental service, used by locals and visitors to the city. As in a number of other European cities, Uber suspended its controversial Uberpop service in the Netherlands at the end of 2015, following a decision by the Dutch courts to brand it as illegal. branded as illegal by the Dutch. Uberblack, Uberlux and UberX, which involve licenced drivers, were not affected.

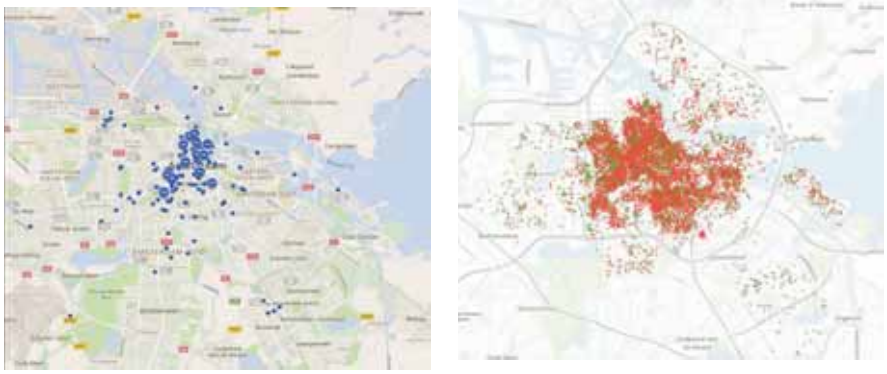
[77] Amsterdam Action Plan Sharing Economy (2016), available at www.slideshare.net/shareNL/amsterdam-actionplan-sharing-economy.

Earlier in 2016, transport ministry inspectors raised the fine payable by Uber for breaking taxi sector rules to a maximum of €1 million. Uberpop drivers themselves can be fined up to €4,200 and are given a criminal record if they contravene the law.

The accommodation sector of the sharing economy has had a much easier time in Amsterdam, which has around 11,400 properties listed on the Airbnb sharing platform, with a capacity of 21,900 beds – equal to 34% of hotel capacity. According to Amsterdam City Council, at least 73% of listed Airbnb properties are outside the neighbourhoods where the majority of hotels are located, suggesting a broader spread of the benefits of tourism spending.

This is illustrated in the figure below, which shows the distribution of hotels, as advertised by TripAdvisor, and private lettings, as advertised by Airbnb, respectively.

Comparison of hotel locations (left) and Airbnb properties (right)



Source: www.Tripadvisor.com and www.InsideAirbnb.com

5.4.3 Amsterdam's response to the sharing economy

As stated in its Action Plan, Amsterdam City Council has agreed to intervene when and where the sharing economy has adverse impacts. A key area is the use of sharing platforms for short-term rentals.

In 2013, the Council had planned to stop temporary rentals altogether as they reduced the number of houses available to local residents, adding to the city's housing shortage. However, in 2014, the Council decided that short-term rentals were acceptable, as long as tourist tax was paid and the process was

carried out “safely and honestly, without causing nuisance”. In February 2014, a law created a new category of accommodation ‘Private Rental’, which allows local residents to rent their residences for up to 60 days a year.

In December 2014, the City of Amsterdam and Airbnb signed an agreement, which is the first of its kind in Europe, to promote responsible house sharing. Airbnb has agreed to display prominently the laws and regulations for house sharing to those offering accommodation on its site, and will email hosts twice a year to remind them of their obligations. Airbnb also collects and remits tourist tax on behalf of hosts and, in October 2015, it expected to hand over €5.5 million in tourist tax to Amsterdam for 2014.

Amsterdam continues to crack down on illegal hotels through sites like Airbnb. From April 2016 local authorities will ‘scrape’ data from Airbnb’s booking database. Officials are looking for landlords who no longer live in their homes, rent multiple properties to tourists, rent for over 60 days a year, or to more than four people at once. It is thought that the measures against illegal hotels will cost the city around €1 million.

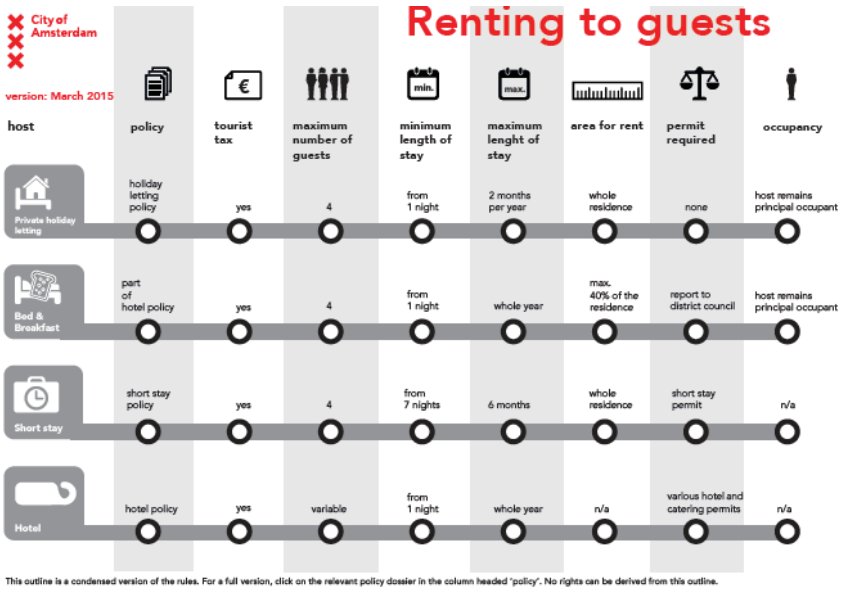
The Action Plan notes that its agreement with Airbnb is viewed worldwide as the most far-reaching agreement concluded with the platform so far. It states that arrangements with other platforms are expected in 2016.

The two following figures show information provided by the City Council on private holiday lettings.

Information to residents about holiday lettings

Keep rentals safe, honest and peaceful.

Information to residents about holiday lettings



5.4.4 Other sectors of the sharing economy

- In an effort to embrace all sectors of the sharing economy, Airbnb Inc. is pressing ahead with plans to expand into new travel services including restaurant reservations and city tours, transforming the company from a single-minded home-rental service to a multipurpose trip planner. The company is testing a standalone mobile app for finding and organizing travel plans, highlighting the importance of the initiative to the company.
- A test version of the software is called Airbnb Trips, according to an Android app listing on the Google Play Store. The app offers access to personal itineraries with information about upcoming Airbnb rentals, city guidebooks, dining and happy hour events. A person familiar with the matter said the app's name and features could change before its release.
- Offering local services could help Airbnb differentiate itself from HomeAway, VRBO and other room-booking websites. Airbnb hopes to provide a more personalized touch akin to a hotel concierge – or, at least, the rack of brochures by the counter. Bloomberg reported in March that Airbnb has referred internally to the initiative, including plans to sell add-on services, as "magical trips" and that it's one of the company's top priorities for 2016.

- Airbnb released a new version of its main app in April that added neighbourhood travel guides. The San Francisco company began running a national advertising campaign this year suggesting it will help customers feel more at home while traveling. The slogan: “Don’t Go There. Live There.”
- Activity booking has been a promising revenue source for online travel giants such as Expedia Inc. and TripAdvisor Inc. Startups building activity-booking marketplaces, including Seattle’s Utrip and San Francisco’s Peek, have attracted interest from venture capitalists. For Airbnb, add-on services could provide a new business to help justify its lofty valuation. The company filed with regulators last month to raise $850 million in a funding round valuing the company at $30 billion.
- Airbnb is expected to unveil the new trips app at its annual conference in November. Technology website the Information reported last week that the company plans to roll out a program in November allowing hosts to make money by recommending restaurants and giving tours. Rumours of the eight-year-old company’s interest in such a service, which would help guests find activities during a trip, have been swirling since at least 2014.
- Nick Papas, a spokesman for Airbnb, wrote in an e-mail: “We’re continually experimenting with new things and we don’t have anything to share right now, but we have a few exciting things in the works.”
- The listing for Airbnb Trips on Google’s app store said the software is “unreleased” and that it was last updated on April 1. Accompanying screen shots show example agenda items called “Mission: Happy Hour,” referring to a meet-up in San Francisco’s Mission neighbourhood, and a full-day “Table to Farm” event.

5.4.5 Conclusions

Amsterdam has strongly embraced the sharing economy. This is demonstrated by the City Council's aim to lead by example, setting up sharing of its own resources free of charge, while encouraging others to do the same.

Its approach to the issue of private holiday rentals clearly demonstrates Amsterdam's progressive attitude towards the sharing economy. The key aspects of this are:

- An action plan to maximise the benefits of the sharing economy for its residents
- A change in the law to allow short-term rentals
- An agreement with Airbnb, and others in the pipeline, to address concerns, e.g. collection of tourist taxes
- Active promotion of the laws and regulations regarding short-term rentals.

Airbnb research, conducted in February 2016, shows some interesting trends with regard to supply and market demand. The first Airbnb rentals in Amsterdam were made in 2008 and, by 2015, it counted 14,200 hosts, 86% of whom were sharing the homes in which they live, earning an average of €3,800 annually over an average 28 hosted days/nights. The total number of guests per listing annually is 31.4. Some 73% of all properties in Amsterdam are located outside the main hotel locations.

The average age of Airbnb's Amsterdam tourists is 37 years old in a party size of 2.5 people, and the average stay is 3.3 nights. As many as 90% choose Airbnb so they can live like a local.

In terms of geographic sources, Europe accounts for 68% of Airbnb's Amsterdam guests – with 14% from each of the UK and France and 10% from Germany. The USA generates 19%.

5.5 Overall conclusions

The sharing economy is celebrated for its sustainable attributes, such as facilitating access to goods and services, promoting community spirit, reducing environmental impact and generating economic value at a local level. However, the case studies above illustrate the conflicting impact of accommodation sharing on city centres. While there is evidence to suggest that local neighbourhoods benefit financially from increased visitor spending – thanks to a broader spread of tourists across the city – the wider impacts of increased housing rental prices, reduced housing stock and diminished communities are considered by some governments and industry players to counteract the positive aspects.

The approaches taken to address this at a city level vary and include:

- **Regulating short-term or temporary rentals** – Barcelona and Berlin have both taken steps to limit the number of rentals possible. Barcelona has introduced an outright ban, given the tourism pressures it is facing, while Berlin has restricted the letting of any property without a permit (thus reducing the financial viability of such lettings). In contrast, Amsterdam has changed its laws to facilitate short-term lettings within the sharing economy.
- **Ensuring compliance with regulations** – Amsterdam's agreement with Airbnb facilitates the collection of tourism taxes. However, Airbnb is under no obligation to provide the authorities with data on its hosts/landlords. Conversely, Berlin's latest ruling requires Airbnb to disclose data so that compliance can be checked, while Barcelona has fined the sharing platforms directly for advertising non-compliant properties.

It is clear that the sharing economy is growing and will challenge cities to adapt to new forms of tourist behaviour in future. The co-existence with traditional forms is possible, as illustrated by Amsterdam, but the relationship needs to be managed carefully, taking into account the available evidence of impact on the economy and environment of the city, and on existing tourism businesses.

> *"The big question for our city management organisations is not whether to be pro or con the sharing economy. It is how destinations can actively interact with [it], simply because this phenomenon is here to stay.*
>
> *"Destination Marketing Organisations (DMOs) in general are the connectors between industry players and authorities, they are the stage managers of their city. And for our member DMOs, it is a crucial need to balance the interest of their established partners with the popularity of the new collaborative platforms."*
>
> ***Ignasi de Delàs, President, European Cities Marketing***

Tax evasion, the violation of labour/social rights and consumer protection laws clearly need to be addressed to ensure a strong, strategic operating framework across the region. Ensuring a level playing field. But the opportunities offered by the sharing economy to growth the tourism economy through innovation and entrepreneurship – and not least to extend the benefits of tourism to more communities – would seem to far outweigh the detrimental effects and challenges.

Following the publication of its recent research on the sharing economy, the UK's Office for National Statistics (ONS) said it has encountered problems associated with:

- Lack of a widely recognised definition of the sharing economy
- Lack of clarity and considerable variations in interpretation between businesses and individuals
- Measuring non-monetary transactions
- Issues with consumer recall and data confidentiality
- Issues associated with data access, such as the legal implications of web scraping and Application Programming Interface (API).

Since it is possible for a business in any industry to contribute to the sharing economy, it does not fit within the existing classification system for industry. In addition, it is not only businesses but individuals who participate. In any measure, under-coverage is likely to be a problem.

In order to better answer some of these questions, and reach a better understanding of the size and importance of the sharing economy, as well as its potential, the ONS plans to expand the scope of its planned Internet Access Survey in 2017. It will be harmonised across all EU Member States and updated annually. Eurostat, the statistical office of the European Union, has agreed that a small number of questions relating to individuals' use of the Internet for the provision of accommodation and transport services will be added. However, they will avoid attempting to measure financial value and will simply measure incidence of use. The results of this survey will be published in late 2017.

Appendices

Appendix 1 – Methodology of city tourism metrics

The development of indicators and metrics systems is considered of paramount importance by many CTOs and international tourism organisations (Antonio Massieu, UNWTO, 2008; OECD, 2014). Appendix 1 focuses on European city tourism statistics, highlighting the statistical gaps between theory, practice and reality. It provides details of the differences and problems existing in European city tourism statistics and defines the strengths and weaknesses of the various methodologies and definitions.

Although the statistical measurement of tourism is a relatively recent activity, a considerable amount of data on tourism movements is already available at national level. This tends to be collected by public organisations, including national tourism administrations and organisations (NTAs and NTOs) and public offices of statistics. Statistics offices analyse tourism to, within and sometimes from their own countries, with a view to evaluating its impacts on their respective economies.

The international compilation of these sources is organised by international organisations such as UNWTO, the United Nations Statistical Office, the International Air Transport Association (IATA), regional organisations such as the Organisation for Economic Co-operation and Development (OECD), the Statistical Office of the European Communities (EUROSTAT) and associations such as the Pacific Asia Travel Association (PATA) and the World Travel & Tourism Council (WTTC). They attempt to highlight differences in the data collection procedures and definitions, and they group the countries accordingly.

At the 1st UNWTO City Tourism Summit on Catalysing Economic Development and Social Progress, held in Istanbul in November 2012, government officials and international networks determined that economic and social progress in city tourism must also ensure a sustainable development vision (UNWTO, 2012).

Sustainable city tourism must consider not only environmental issues, but also societal and economic issues. Indicators for measuring the sustainability of destinations are still not clearly defined. The main reasons for not having a universal list of sustainability indicators are mainly the multivariate character of sustainability and the difficulty of retrieving the required information (Fernandez and Rivero, 2009).

In 2016, Önder, Wöber and Zekan proposed a system of indicators for measuring the performance of city tourism policies that will increase awareness of the economic and social impacts of city tourism, and thereby improve the governance of city tourism development. Based on the European Tourism Indicator System (ETIS) for countries, potential objectives for city tourism policy-makers have been developed, as well as indicators for their measurement (EU 2013, see Table 6). These objectives and indicators are categorised as economic, social or environmental, in line with the recognised dimensions of sustainability. In addition, the authors provide a list of resources which represent the drivers for sustainable city tourism development processes, and are categorised as capital, land or labour (see Table 7).

The definition of city tourism

The statistical definition of city tourism has many shortcomings and, as a result, even elementary tourism data – such as number of nights, arrivals, beds, accommodation establishments, occupancy ratios and length of stay – varies significantly between cities.

The challenge starts when considering the definition of the term 'city'. The word has distinct meanings: Either it may refer to an entity, which offers functions, activities and an atmosphere, or it may refer to quite specific services or facilities. In turn, there is no clear – or at least accepted – definition of what a city is. However, there are different approaches available on how to decide what a 'city' is:

- The visitor's perception in which local users with the readiness to consume urban travel facilities (guests with typical travel motives such as shopping, culture, congress, etc.) decide on a particular destination.
- The city's self-image or the attempt of the local tourism authorities to portray the city.
- Objective criteria like community size, accommodation capacity and typical urban facilities are considered in the definition of the city tourism market.

The importance of the definition of territorial boundaries is self-evident. However, the spatial borders of the tourism product purchased by the consumer may not correspond with the administrative boundaries of the city. Therefore, cities have to make a decision as to whether their statistics cover an area:

- identical to the political city limits,
- defined by the responsibility of the local tourist office,
- defined by its population density,
- defined by the volume of visitors, or

- defined by being accessible by public transport within a certain period of time from the city centre.

All the listed possibilities of defining the territorial boundaries for measuring city tourism statistics have their strengths and weaknesses. While the area defined by the political city limits would probably be the easiest and best to compare, this is unfortunately not often tourism relevant. The very interesting approach of linking the territorial boundaries with criteria relating to public transport also has its shortcomings, considering that the territorial boundaries would have to be changed every time a new railway or subway station is opened. Linking the territorial boundaries to population density and the volume of visitors that visit that area is unfortunately not an easy undertaking, either. Since the local tourist offices are the primary users that need statistics for strategic planning purposes, linking the boundaries to the responsibility of the local tourist offices seems to be a reasonable approach. However, more frequently, tourist offices have also become responsible for the rural area surrounding the city.

The different approaches used for compiling city tourism statistics, plus the fact that it is often not possible to retrace which areas the statistics actually cover, create misunderstandings among the different actors in the industry. Moreover, defining and measuring tourism are two independent issues as pointed out by Law (1993, p. 169): "… it is often very difficult to measure the flow of tourists, even when a definition has been agreed."

Methods for measuring city tourism demand

As national tourism statistics frequently lack information on city tourism trends, many regional authorities and CTOs have organised private market research initiatives for generating statistics on the development of tourism in their destinations.

There are three important types of tourism statistics that are generated by these initiatives. Statistics on human flows often deal with the measurement of arrivals, trips and tourist nights on the demand side (often split into categories such as country of origin or business versus leisure travel), plus capacity on the supply side, whereas tourism statistics of monetary flows focus on the income and expenditure of tourism. While these two categories commonly deal with the macroeconomics of tourism, the statistics generated by visitor or travel surveys provide further information on the profile of visitors and trip characteristics. Statistics relating to the profile of the visitors and trip characteristics include details of age, sex, occupation, income, origin, purpose of visit, mode of transport, type of accommodation and details of activities in which the visitor engaged (Latham, 1989).

All three types of statistics serve important functions, as well as helping tourism marketers to improve the information basis on which they make their decisions. When focusing on statistics of human flows in general, there are four main ways to measure tourism demand at the destination in question: observation, sample surveys (among visitors or suppliers), registration and estimation. Each of these methods has its advantages and disadvantages. Moreover, differences occur when these measurement techniques are applied in an environment in which participation is voluntary, or if federal regulations provide a legal framework in which suppliers and visitors are forced to collaborate. In selecting the appropriate technique for measuring tourism demand, the accuracy and reliability of information, as well as the simplicity of measurement and the costs, become important.

Counting visitors at tourist sites and main entry points to the city is a very basic form of data collection, which does not usually yield enough information for assessing tourism demand in a particular city. Moreover, no distinction between travellers and visitors can be made when just 'observing' tourism flows. Estimates based on this data compilation technique are often too inaccurate to be used for market analysis.

Richer information can be compiled from surveys among visitors at tourist sites, conference facilities, airports, railway stations and other main entry points to a city. However, the disadvantages of this data compilation technique are the high cost and the highly professional and knowledgeable staff required for organising and operating the survey. Due to the cost and complexity of such approaches, only a limited number of CTOs in Europe are in a position to undertake and maintain such surveys. Moreover, for the purpose of comparison, non-standardised surveys among visitors are not the best method of data collection.

Apart from the fact that many cities do not have the necessary financial and human resources, sampling- and non-sampling-related effects (e. g. the problem of recall) need to be considered. The scarce time availability of visitors and the resulting interviewing time constraints constitute another issue. Business tourists in particular often have no time for interviews, but holidaymakers usually do not want to be bothered, either. Language barriers might pose another problem.

When weighing the advantages and disadvantages of all methods, it becomes obvious why the registration of visitors at professional (paid) accommodation providers is the preferred methodology by many tourism destinations in Europe. This method is conceptually easy to understand an, when carried out properly, delivers accurate information. Furthermore, it is relatively easy to organise, does not leave wide margins for errors, and generates valuable information on the number of arrivals, nights spent, length of stay and occupancy ratios at professional accommodation establishments.

The more visitors stay at professional forms of accommodation establishments, the more useful collecting visitor statistics from accommodation establishment records will be. In many European countries, there are federal regulations regarding the implementation of tourism statistics, which require visitors to register when staying with professional accommodation providers. This widespread use provides a relatively good base for comparisons of city tourism demand in Europe.

Census studies can provide managers with estimates of domestic and outbound trips, including information on people staying with friends and relatives. From a tourism manager's perspective, census data is extremely valuable if it is available for the main generating markets. Therefore, the data must be compiled in the visitor's country of origin. Such data can also be consulted to check the plausibility of data ('mirror statistics'). Partner countries usually provide data at no or low cost. However, time lag, lack of information on the quality of the data, as well as varying collection methods and definitions, frequently create problems when comparing this data.

Data generated by embarkation or debarkation forms, or information recorded by border control officials, provides valuable information on arrivals by nationality. Apart from the fact that the information may change between what is stated when entering the destination and what is actually experienced during the trip, the data is only available at centres having entry and exit restrictions. The simplification or elimination of documentation and of border controls inside the European Community, although highly desirable for travellers and governments, reduces the data sources available for tourism statistics. Registration by embarkation or debarkation forms, or information recorded by border control officials, is therefore only applicable for very small and isolated destinations (e.g. islands).

Comparability of European city tourism statistics

The results of an analysis of city tourism statistics available in the database of TourMIS (www.tourmis.info) and a survey, which was targeted at tourism-relevant European cities, provides information on which standards exist and how comparable European city tourism statistics actually are.

Some 68 cities representing 50% of all those cities approached, participated in the survey. In general, the analysis of the data underlined the statement by Verma (2002, p. 3) that "Comparability is a relative concept: We can only have 'degrees of comparability', not absolute comparability." It showed that the best-case scenario of absolute comparability is not achievable, since the different methodologies and interpretations of definitions currently in use, as well as the different areas covered by statistics, create severe problems that have to be considered in comparative studies.

Of course, when comparing statistics from different cities, the data is more valuable when based on a similar territorial area. More than half of the cities (39 cities) answered that their statistics include data generated within the historic centre or downtown area and another area within the official city limits. Some 24 cities stated that their statistics cover a different area. Three cities (Birmingham, La Coruña and Metz) said that their statistics cover the historic centre or downtown area only, and two cities (Basel and Tarragona) reported that they include data generated within an area larger than the historic centre or downtown area but smaller than the official city limits. In addition, 13 cities compile data covering an area, which also includes surrounding suburbs, and six cities cover an area even greater than that.

The results of the survey also showed that most cities equate the term 'City Area Only' with an area within the official city limits, and the term 'Greater City Area' with an area also including surrounding suburbs. About 80% of the cities stated that they compile data for these two definitions. The analyses showed, however, that some cities equate the term 'City Area Only' with the area covering only the historic centre or downtown area or an area, which is larger than that but smaller than the official city limits. On the other hand, there are cities that equate the term 'Greater City Area' with an area including suburbs and rural areas. The spatial concepts 'City Area Only' and 'Greater City Area' are often misinterpreted and lead to confusion among tourism managers.

The analysis of the responses demonstrated that the managers also had major difficulties in interpreting some of the other definitions. For instance, the definitions concerning all accommodation establishments were often mixed up with the definitions related to hotels and similar establishments. Overall, it confirmed that the definitions are often not used as intended.

The survey indicates that 45% of European cities compile their figures on nights and/or arrivals with the help of an official registration of visitors at the place of accommodation. The majority of the cities (46) tend to use only one collection method. Some 35 of these cities rely on data from the official registration of visitors at the place of accommodation. Seven cities, however, base their figures solely on surveys among professional accommodation suppliers and one city (London) only uses estimates based on surveys among visitors. City tourism statistics in Gijón, Malmö and Paris rely on estimates based on regional or national statistics. It is very encouraging that no city bases its data solely on own estimates but uses this technique only in combination with other collection methods. Birmingham, Bologna and Copenhagen, for example, use all five of the stated methods to compile their statistics.

Hamburg, Metz and Valencia compile their statistics by combining different forms of estimations. While Hamburg combines estimates based on interviews with visitors and estimations based on regional or national statistics, Metz and Valencia further include their own estimates. In general, however, a strong

tendency towards collection methods focusing on accommodation suppliers is obvious. Therefore, it is interesting to see if all units of professional accommodation establishments are included in the statistics or if smaller units are excluded. The analysis revealed that in some European countries all cities use the same thresholds. For example, Finland excludes accommodations establishments smaller than ten rooms in their statistics. Similarly, German cities do not include accommodation providers with less than nine rooms. On the other hand, there are countries in which tourism statistics in cities include all paid forms of accommodation establishments. These countries include Austria, Croatia, the Czech Republic and Italy. While some cities reported that they only cover hotels, youth hostels and camping, others stated that they cover hotels, youth hostels and bed & breakfast accommodation. Paris claimed that they only include 'classified' hotels and Lisbon stated that they only include 'registered' hotels and similar establishments.

In contrast to US and Canadian cities, most European cities base their tourism statistics on data generated from the suppliers' side. In general, it can be said that cities either only include hotels and similar establishments, or that they exclude establishments with fewer than a minimum number of rooms. Given that reliable comparisons require identical survey designs and definitions, the main message is that data collected from accommodation statistics is the most accessible data and is therefore a good reference point for comparative analyses of city tourism in Europe. The minimum standard for city tourism statistics appears to be the collection of capacity data and data on arrivals and bednights in all paid forms of accommodation establishments, or in hotels and similar establishments, by means of accommodation statistics.

The analysis also showed that apart from compiling data from accommodation suppliers, other collection methods are also in use. Therefore, the data should not be compared directly and it should not be generalised. Absolute figures should only be compared when other destinations provide figures for exactly the same definition and data collection methodology. In order to overcome comparison problems due to differing definitions and collection methods, comparative analyses and rankings based on the monitoring of relative changes rather than absolute values are essential. Furthermore, the median instead of the arithmetic mean should be used when aggregating data, since it is a measure that is more robust against outliers.

In summary, city tourism statistics in Europe are grossly in need of re-evaluation because a majority of destinations are not able to distinguish between overnight visitors and same-day visitors, even though same-day visitors or excursionists generate a significant share of tourism in cities. In addition, only a few European destinations measure the number of people staying with friends and relatives, and many destinations do not measure tourists staying in very small accommodation establishments, and not all destinations measure domestic tourism, involving residents travelling only within the urban area.

For further insight into the methodology of city tourism metrics, refer to Ostertag and Wöber (2009).

Potential objectives and indicators (output factors) for city tourism policy-makers

Objectives	Indicators	Type	References
Competitiveness (max)	bednights, arrivals, tourism revenues, value added (absolute values or market shares)	economic	Wöber (1997), UNWTO (2014), EU (2013)
Growth (max)	bednights, arrivals, tourism revenues, value added (changes of values or market shares)	economic	Wöber (1997), UNWTO (2014)
Tourism supply chain (max)	% of value added by local tourism enterprises	economic	EU (2013)
Market risks (min)	guest mix distribution	economic	Wöber (1997)
Satisfaction of visitors (max)	overall, repeat visitor rate/intention (survey)	economic, social	Kozak (2004)
Use of resources (max)	occupancy rate	economic, environmental	Wöber (1997), EU (2013)
Seasonality (min)	distribution of demand	economic, environmental, social	EU (2013)
Emissions during arrival and departure (min)	CO2 for travelling to/from the city, mix of modes of transportation of guests, average distance of travellers, average length of stay	environmental	UNWTO (2014), EU (2013)
Emissions during stay (min)	CO2 emissions in the city	environmental	UNWTO (2014), EU (2013)
Energy use (min)	Consumption of non-renewable energy per tourist night	environmental	EU (2013)
Water consumption (min)	volume of fresh water consumed by tourists	environmental	UNWTO (2014)
Waste (min)	volume of solid waste generated by tourists	environmental	UNWTO (2014), EU (2013)
Congestion and intrusion (min)	tourism density rate, percentage of same day visitors to total number of visitors to the city	environmental	UNWTO (2014), EU (2013)
Employment (max)	tourism employment rate	social, economic	UNWTO (2014), EU (2013)
Equal opportunity of tourism enterprises (max)	distribution of bed spaces	social, economic	EU (2013)
Satisfaction of employees (max)	overall (survey)	social, economic	
Satisfaction of residents with tourism (max)	overall (survey)	social	UNWTO (2014), EU (2013)

Potential resources (input factors)

Resources	Indicators	Type	References
Size	km², population	land	UNWTO (2014)
Climate	# of sunny days, # of days >20 degree Celsius	land	Ritchie et al. (2001)
Natural resources	% of green spaces (designated protection) in the city, # and distance to recreational areas (e.g. sea, lakes, mountains)	land	Ritchie et al. (2001), EU (2013), Blanke and Chiesa (2014)
Accessibility and mobility	distance to main travel markets weighted by size/importance, # of connections by airlines; time x price to the airport by public transportation; density of inner city public transportation system; percentage of public transportation stops accessible for people with disabilities	land, capital	Ritchie et al. (2001), Wöber and Fesenmaier (2004), Mazanec et al. (2007), EU (2013), Blanke and Chiesa (2014)
Governance	total budget of local tourism organization, total investment in public infrastructure, safety and health; openness of country	capital	Ritchie et al. (2001), Wöber and Fesenmaier (2004), EU (2013), Blanke and Chiesa (2014)
Capacity of primary tourism infrastructure	# of accommodation establishments, bed spaces	capital	Ritchie et al. (2001), UNWTO (2014), Blanke and Chiesa (2014)
Quality of primary tourism infrastructure	% of capacity in 4 or 5 star categories, investments made by the private tourism sector during the last 3 years in % of total capital of the sector	capital	Ritchie et al. (2001), Blanke and Chiesa (2014)
Cultural resources	# of cultural attractions, # of UNESCO sites, # of major events/festival days per year	capital	Ritchie et al. (2001), Blanke and Chiesa (2014)
Resources of the meetings industry	total conference centre capacity, conference capacity of accommodation providers	capital	Ritchie et al. (2001)
Shopping facilities	# of shops of touristic interest, # of shopping hours per year	capital	Ritchie et al. (2001)
ICT infrastructure	# of free WiFi spots in the city, average bandwidth of free WiFi spots, online presence of destination and its touristic offer	capital	Blanke and Chiesa (2014)
Prices of tourist services	consumer prices (of tourism goods), currency exchange rates, purchasing power parity index	capital	Ritchie et al. (2001), EU (2013), Blanke and Chiesa (2014)
Human resources	average number of years of education and/or professional experience of people working in the tourism sector	labour	Ritchie et al. (2001), Blanke and Chiesa (2014)

Appendix 2 – Bibliography / List of References

Section 1 – European City Tourism Trends

AT Kearney (2016). AT Kearney Global Cities 2016, available from https://www.atkearney.com/research-studies/global-cities-index [Accessed: 24 August 2016].

Banker, R.D., Charnes, A., & Cooper, W.W. (1984). "Some Models for Estimating Technical and Scale Inefficiencies in Data Envelopment Analysis." Management Science 30(9): 1078-1092.

Barr, R.S. (2004). DEA Software Tools and Technology. A State-of-the-art Survey. Handbook on Data Envelopment Analysis W. W. Cooper, L. M. Seiford & J. Zhu (eds.). Norwell, MA: Kluwer Academic Publishers: 539-566.

Bauernfeind, U., & Mitsche, N. (2008). "The Application of the Data Envelopment Analysis for Tourism Website Evaluation." Information Technology & Tourism 10(3):245-257.

Bell, R.A., & Morey, R.C. (1994). "The Search for Appropriate Benchmarking Partners: A Macro Approach and Application to Corporate Travel Management." Omega, International Journal of Management Science22(5): 477-490.

Blanke, J., & Chiesa T. (2014). "The Travel and Tourism Competitiveness Report 2013. Reducing Barriers to Economic Growth and Job Growth, Lucerne: World Economic Forum."', available on http://www.weforum.org/issues/travel-and-tourism-competitiveness [Accessed: 29 January 2015].

Bosetti, V., Cassinelli, M., & Lanza, A. (2006). "Benchmarking in Tourism Destination, Deeping in Mind the Sustainable Paradigm (Fondazione Eni Enrico Mattei Working Paper) ", available on http://papers.ssrn.com/sol3/papers.cfm?abstract_id=879706 [Accessed: 20 July 2010].

Cook, W.D., Tone K., & Zhu J. (2014). "Data Envelopment Analysis: Prior to Choosing a Model." Omega44: 1-4.

Cracolici, M.F., Nijkamp, P., & Rietveld, P. (2008). "Assessment of Tourism Competitiveness by Analysing Destination Efficiency. " Tourism Economics, 14(2):325-342.

Crouch, G. I., & Ritchie, J. R. B. (1994). "Destination Competitiveness – Exploring Foundations for a long-term Research Programme.", Proceedings of the Administrative Sciences Association of Canada 1994 Annual Conference, pp.79-88. Halifax, Nova Scotia.

Crouch, G. I., & Ritchie, J. R. B. (1995). "Destination Competitiveness and the Role of the Tourism Enterprise." Proceedings of the Fourth Annual Business Congress, pp.43-48. Istanbul, Turkey, 13-16 July.

Crouch, G. I., & Ritchie, J. R. B. (1999). ”Tourism, Competitiveness, and Societal Prosperity.” Journal of Business Research44(3):137-152.

Crouch, G. I., & Ritchie, J. R. B. (2005). “Application of the Analytic Hierarchy Process to Tourism Choice and Decision Making: A Review and Illustration Applied to Destination Competitiveness.” Tourism Analysis10(1):17-25.

Crouch, G. I. (2011). “Destination Competitiveness: An Analysis of Determinant Attributes.” Journal of Travel Research50(1):27-45.

ECM (2016). “The European Cities Marketing Benchmarking Report.”, 12th ed., ECM: Dijon. http://www.europeancitiesmarketing.com/research/reports-and-studies/ecm-benchmarking-report/ [Accessed on 24 August 2016].

Enright, M. J., & Newton, J. (2005). ”Determinants of Tourism Destination Competitiveness in Asia Pacific: Comprehensiveness and Universality.” Journal of Travel Research 43(4)339-350.

EU (2013). ‘European Tourism Indicator System TOOLKIT for Sustainable Destinations, DG Enterprise and Industry‘, Available from http://ec.europa.eu/enterprise/sectors/tourism/sustainable-tourism/indicators/index_en.htm [Accessed on 28 January 2015].

Fernandez, J. I. P., & Rivero, M. S. (2009). ”Measuring Tourism Sustainability: Proposal for a Composite Index.” Tourism Economics 15(2):277-296.

Gooroochurn, N., & Sugiyarto, G. (2005). “Competitiveness Indicators in the Travel and Tourism Industry.”, Tourism Economics 11(1)25-43.

ICCA (2015). ICCA Statistics Report 2014 (Public Abstract), available from http://www.iccaworld.com//dcps/doc.cfm?docid=1789 [Accessed on 24 August 2016].

ICCA (2016). ICCA 2015 Statistics Report (Public Abstract), available from http://www.iccaworld.com/npps/story.cfm?nppage=5756 [Accessed on 24 August 2016].

Johns, N., Howcroft, B., & Drake, L. (1997). “The Use of Data Envelopment Analysis to Monitor Hotel Productivity.”. Progress in Tourism and Hospitality Research 3(2):119-127.

Kozak, M. (2004). Destination Benchmarking. Concepts, Practices and Opportunities. Wallingford: CABI Publishing.

Köksal, C.D., & Aksu, A.A. (2007). “Efficiency Evaluation of A-group Travel Agencies with Data Envelopment Analysis (DEA): A Case Study in the Antalya Region, Turkey.” Tourism Management 28(3)830-834.

Latham, J., & Edwards, C. (2003). "The Statistical Measurement of Tourism.". ICooper, C. P. (ed.) Classic reviews in tourism. Cleverdon: Channel View Publications: 55-76.

Law, C. M. (1993). Urban tourism. Attracting Visitors to Large Cities., New York: Mansell.

Massieu, A. (2008). "Developing tourism statistics at the sub-national level: the measurement of flows of trips and visitors." International Conference of Tourism, October 29-31, 2008, UNWTO: Malaga, available from http://statistics.unwto.org/sites/all/files/pdf/massieu_eng_0.pdf [Accessed 28 January 2015].

MasterCard (2015). MasterCard 2015 Global Destination Cities Index – Tracking Global Growth: 2009-2015, available from http://newsroom.mastercard.com/digital-press-kits/mastercard-global-destination-cities-index-2015/ [Accessed 24 August 2016].

Mazanec, J., Wöber, K., & Zins, A. (2007). "Tourism Destination Competitiveness: From Definition to Explanation?", Journal of Travel Research 46(1): 86-95.

Mazanec, J., & Wöber, K. (Eds.) (2010). Analysing International City Tourism., 2. ed., Vienna: Springer.

MMF Institute for Urban Strategies, The Mori Memorial Foundation (2015). Global Power City Index 2015, available from http://www.mori-m-foundation.or.jp/english/ius2/gpci2/ [Accessed 24 August 2016].

Morey, R.C., & Dittman, D.A. (1995). "Evaluating a Hotel GM's Performance." Cornell Hotel and Restaurant Administration Quarterly 36(5): 30-35.

OECD (2014). "Measuring Tourism at Sub-National Level."' in Progress Report, Centre for Entrepreneurship, SMEs, and Local Development Tourism Committee, September 25, 2014, available from http://www.oecd.org/cfe/tourism/measuring-tourism-economic-impacts.htm [Accessed 28 January 2015].

Önder, I., Wöber, K.W., & B. Zekan (2016). "Towards a Sustainable Urban Tourism Development in Europe. The Role of Benchmarking and Tourism Management Information Systems. A Partial Model of Destination Competitiveness." Tourism Economics, forthcoming.

Ostertag, J. & K.W. Wöber (2009). "European City Tourism Statistics.". In J.A. Mazanec and K.W. Wöber (eds.), Analysing International City Tourism, 2nd edition, Wien-New York: Springer:25-42.

PwC (2014). Cities of Opportunity 6, available from http://www.pwc.com/us/en/cities-of-opportunity.html [Accessed 24 August 2016].

PwC (2016). Staying power – European cities hotel forecast for 2016 and 2017 (5th Edition, March 2016), available from http://www.pwc.com/hospitality [Accessed 24 August 2016].

Remich, A. (2002). "Marketing Strategies for European Museums: An Inter-City Comparison by Means of Advanced Benchmarking Methodologies.". In K.W. Wöber (ed.), City Tourism 2002. Vienna: Springer: 353-362.

Ritchie, J. R. B., & Crouch, G. I. (1993). "Competitiveness in International Tourism: A Framework for Understanding and Analysis." Proceedings of the 43rd Congress of Association Internationale d'Experts Scientifiques du Tourisme. San Carlos de Bariloche, Argentina, 17-23 October.

Ritchie, J. R. B., Crouch, G. I., & Hudson, S. (2001). "Developing Operational Measures for the Components of a Destination Competitiveness/Sustainability Model: Consumer versus Managerial Perspectives.", in: Mazanec, J. A., G. I. Crouch, J. R. B. Ritchie and A. G. Woodside (eds.) Consumer Psychology of Tourism, Hospitality and Leisure. Wallingford: CABI Publishing: 1-17..

Ritchie, J. R. B., & Crouch, G. I. (2005). The Competitive Destination - A Sustainable Tourism Perspective. Oxford: Oxford University Press.

Scheel, H. (2000). "EMS: Efficiency Measurement System User´s Manual.", available from http://www.holger-scheel.de/ems/ems.pdf [Accessed 22 February 2015].

Sigala, M. (2003). "Developing and Benchmarking Internet Marketing Strategies in the Hotel Sector in Greece." Journal of Hospitality & Tourism Research27(4):375-401.

The Economist Intelligence Unit (2013). Hot spots 2025 – Benchmarking the future competitiveness of cities, available from http://www.citigroup.com/citi/citiforcities/pdfs/hotspots2025.pdf [Accessed 24 August, 2015].

The Economist Intelligence Unit for Global Blue Holdings AB (2011). The Globe Shopper Index – Europe, available from http://globeshopperindex.com/en/destinations/europe?ranks=1 [Accessed 24 August 2016].

The Guardian (2013). Guardian Cities Global Brand Index, available from https://www.theguardian.com/cities/datablog/2014/may/06/world-cities-most-powerful-brands-get-the-data [Accessed 24 August 2016].

UNWTO (2012). "'Global Report on City Tourism.", AM reports Vol. 6, UNWTO: Madrid, available from http://affiliatemembers.unwto.org/en/publication/global-report-city-tourism [Accessed 28 January 2015).

UNWTO (2014). "Global Benchmarking for City Tourism Measurement." AM reports Vol. 10, UNWTO: Madrid, available from http://affiliatemembers.unwto.org/news/2014-12-15/am-

reports-volume-ten-global-benchmarking-city-tourism-measurement [Accessed 28 January 2015].

Verma, V., (2002). "Comparability in International Survey Statistics." Proceedings of the International Conference on Improving Surveys 2002. Copenhagen.

Wöber, K.W. (1997). "International city tourism flows."International City Tourism. Analysis and Strategy, J.A. Mazanec (Ed.), London: Cassel:.39-53.

Wöber, K.W. (2002). "Benchmarking in tourism and hospitality industries: The selection of benchmarking partners." Wallingford: CABI Publishing.

Wöber, K.W. (2003). "Information Supply in Tourism Management by Marketing Decision Support Systems." Tourism Management 24(3):241-255.

Wöber, K. W. & Fesenmaier, D. R. (2004). "A Multi-criteria Approach to Destination Benchmarking: A Case Study of State Tourism Advertising Programs in the United States." Journal of Travel and Tourism Marketing 16(2/3):1-18.

Section 2 – European Air Transport

2thinknow. Available from www.citybenchmarkingdata.com [Accessed 24 August 2016].

Airline Network News and Analysis. Available from http://www.worldairportawards.com/Awards/world_airport_rating.html [Accessed 24 August 2016].

Airline Network News and Analysis. Available from www.anna.aero [Accessed 24 August 2016].

Airports Council International (ACI) Europe. Available from https://www.aci-europe.org [Accessed 24 August 2016].

Centre for Aviation (CAPA). Available from centreforaviation.com [Accessed 24 August 2016].

International Air Transport Association (IATA). Available from iata.org [Accessed 24 August 2016].

Wikipedia. List of the Busiest Airports in Europe, from ACI, available from https://en.wikipedia.org/wiki/List_of_the_busiest_airports_in_Europe [Accessed 24 August 2016].

Section 3 – Low-cost Airlines

Airports Council International (ACI) Europe. Available from https://www.aci-europe.org [Accessed 24 August 2016].

Flight Global, Innovata. Available from http://www.innovata-llc.com [Accessed 24 August 2016].

ForwardKeys. Available from https://www.aci-europe.org [Accessed 24 August 2016].

International Air Transport Association (IATA). Available from iata.org [Accessed 24 August 2016].

PwC Hospitality and Leisure. Available from http://www.innovata-llc.com [Accessed 24 August 2016].

Section 4 – Smart Tourism in Smart Cities

General

Buhalis D and Amaranggana, A. (2014): Smart Tourism Destinations, in Xiang, Z. and Tussyadiah, I. (eds.), Information and Communication Technologies in Tourism 2014, available from: http://www.cyberstrat.net/ENTER14SmartTourismDestinations-libre.pdf [Accessed 24 August 2016].

European Parliament Directorate-General for Internal Policies, Policy Department Economic and Scientific Policy (2014). 'Mapping Smart Cities in the EU', available from http://www.europarl.europa.eu/RegData/etudes/etudes/join/2014/507480/IPOL-ITRE_ET(2014)507480_EN.pdf [Accessed 24 August 2016].

Fast Company (2013). Their methodology is available from http://www.fastcoexist.com/3021661/the-smartest-cities-methodology [Accessed 24 August 2016].

Gretzel, U., Sigala, M., Xiang, Z and Koo, C. (2015). Smart Tourism: foundations and developments, in Electronic Markets, Vol.25, Issue 3, pp 179-188.

Tanti, A & Buhalis, D. (2016): Connectivity and the Consequences of Being (Dis)connected, in Information and Communication Technologies in Tourism 2016: Proceedings of the international Conference in Bilbao, Spain, February 2-5, 2016, pp 31-44.

Wayne, Scott. 'How smart cities are leading the way to smart tourism', available from http://www.hotelmanagement.net/tech/how-smart-cities-are-leading-way-to-smart-tourism [Accessed 12 August 2016].

www.smartcityexpo.com/en/past-editions [Accessed 24 August 2016].

www.smartcityexpo.com/en/awards [Accessed 24 August 2016].

Amsterdam

"About Amsterdam Smart City." Retrieved August 22, 2016, from https://amsterdamsmartcity.com/p/about.

“Amsterdam: A Master Plan for a Smart City.” Skift Future Cities (August 2015) Retrieved August 12, 2016, from http://futurecities.skift.com/2015/08/17/amsterdam-future-smart-city-masterplan/.

“Amsterdam Smart City FAQ.” Retrieved August 8, 2016, from https://amsterdamsmartcity.com/p/faq.

“Amsterdam Smart City Brochure.” Retrieved August 12, 2016, from https://issuu.com/amsterdamsmartcity3/docs/asc-twopager-0416/1?e=25011940/35781111.

“Amsterdam Smart City – Mobility: Ship to grid.” Retrieved August 4, 2016, from https://amsterdamsmartcity.com/projects/ship-to-grid.

“ARtours app.” Retrieved August 4, 2016, from http://www.stedelijk.nl/en/artours/artours-app.

“Mobility Portal: Changing people’s behaviour with smart measures.” Amsterdam Arena (February 2016) Retrieved August 2, 2016, from http://www.amsterdamarena.nl/innovation-center-2/innovatie-nieuws-tonen-op/-mobility-portal-changing-peoples-behavior-with-smart-measures.-.htm.

“Structural Vision Amsterdam 2040.” Retrieved August 12, 2016, from https://www.amsterdam.nl/wonen-leefomgeving/structuurvisie/structural-vision-am/.

Taaffe, J. (2014) ”Smart city infrastructure is helping Europe's cities better understand and serve tourists.”, Cisco Press Release, available from https://newsroom.cisco.com/press-release-content?articleId=1488545 [Accessed 12 August 2016].

Copenhagen

“The Cykelslangen a.k.a. The Bicycle Snake in Copenhagen, Denmark.”, When on Earth (December 2014). Retrieved August 3, 2016, from http://whenonearth.net/cykelslangen-k-bicycle-snake-copenhagen-denmark/.

Changing Cities [medsinNC14]. (2014, October 28). 'Super Bikeways' in Copenhagen are connecting the city with continuous safe cycle paths and bridges: [Tweet]. Retrieved from https://twitter.com/medsinnc14/status/527047584637288448.

Cohen, B. (2013). "The 10 Smartest Cities in Europe", Retrieved August 3, 2016 from http://www.fastcoexist.com/3024721/the-10-smartest-cities-in-europe. Their methodology can be accessed here.

"Copenhagen Connecting: Driving Data to Quality Service – To the Benefit of Citizens and Businesses", State of Green. Retrieved August 12, 2016, from https://stateofgreen.com/en/profiles/city-of-copenhagen/solutions/copenhagen-connecting-driving-data-to-quality-service-to-the-benefit-of-citizens-and-businesses.

"City Data Exchange Copenhagen" Retrieved August 12, 2016, from https://www.citydataexchange.com/#/dataset/explore.

"Copenhagen getting a smart city lab", CPH POST Online (March 2016). Retrieved August 1, 2016, from http://cphpost.dk/news/copenhagen-getting-a-smart-city-lab.html.

"Copenhagen is the world's smartest city"', Copenhagen Convention Bureau (December 2014) Retrieved August 1, 2016, from http://www.copcap.com/newslist/2014/copenhagen-is-the-worlds-smartest-city.

"Copenhagen Solutions Lab" Retrieved August 1, 2016, from http://cphsolutionslab.dk/.

"Copenhagen Solutions Lab speaking on panel with smart city mayors.", Copenhagen Solutions Lab (June 2015) Retrieved August 5, 2016, from http://cphsolutionslab.dk/.

"Copenhagen ushering in digital parking throughout the city."', CPH POST ONLINE (February 2016) Retrieved August 6, 2016, from http://cphpost.dk/news/copenhagen-ushering-in-digital-parking-throughout-the-city.html.

"Copenhagen wins a World Smart Cities Award." Retrieved August 3, 2016, from http://www.investindk.com/News-and-events/News/2014/Copenhagen-Wins-Smart-City-Award.

"Open call for smart parking solutions.", Copenhagen Solutions Lab (June 2016). Retrieved August 3, 2016, from http://cphsolutionslab.dk/open-call-for-smart-parking-solutions/.

"The new Copenhagen city bike: BYCYKLEN.", Visit Copenhagen (April 2014). Retrieved August 3, 2016 from http://www.visitcopenhagen.com/press/copenhagen/new-copenhagen-city-bike-bycyklen.

Paris

"Le 'smart tourism', une aubaine pour les start-up de la smart city." JDN Journal du Net (March 2016). Retrieved April 3, 2016 from http://www.journaldunet.com/economie/services/1174028-smart-tourism-destination/.

"Paris publishes its Smart and Sustainable City report.", Mairie de Paris (July 2015). Retrieved April 3, 2016 from http://next.paris.fr/english/english/paris-publishes-its-smart-and-sustainable-city-report/rub_8118_actu_156544_port_19237.

"Smart and Sustainable Paris: A view of 2020 and beyond"., Mairie de Paris (June 2015). Retrieved April 3, 2016 from https://www.google.at/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&ved=0ahUKEwj6qc-E6NTOAhWDDRoKHW56DQEQFgglMAE&url=http%3A%2F%2Fnext.paris.fr%2Fviewmultimediadocument%3Fmultimediadocument-id%3D156549&usg=AFQjCNFWNKSG7WFcbtM1A7__FH3h45QX2Q&cad=rja.

"Tourism Innovation Platform.", Paris&Co Welcome City Lab brochure. Retrieved August 6, 2016 from https://www.google.at/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0ahUKEwiGq_qo6NTOAhVFOhoKHd1iCIkQFggcMAA&url=http%3A%2F%2Fwww.welcomecitylab.com%2Fwp-content%2Fuploads%2F2014%2F10%2FParisCo-Welcome-city-lab-v7-2.pdf&usg=AFQjCNEj2Y83CZQGi8KCrRb-oHxrqbnarw&bvm=bv.129759880,d.d2s.

Section 4 - The Sharing Economy

General

Queensland Tourism Industry Council (2014). "The Sharing Economy – How will it impact the tourism landscape and what businesses can do." Available from: https://www.qtic.com.au/sites/default/files/140714_draft_sharing_economy_paper.pdf [Accessed 12 June 2016].

Ting Deanna. 'The Manifesto for a Common Sense Approach to Regulating Airbnb.' Skift, 1 August 2016. Available from: https://skift.com/2016/08/01/the-manifesto-for-a-common-sense-approach-to-regulating-airbnb/ [Accessed 12 August 2016].

UK Office of National Statistics (April 2016). Retrieved August 6, 2016 from (https://www.ons.gov.uk/economy/economicoutputandproductivity/output/articles/thefeasibilityofmeasuringthesharingeconomy/2016-04-05)

Wappelhorst et al. (2016): 'Flexible Carsharing – Potential for the Diffusion of Electric Mobility', in Fornahl, D. & Hulsmann, M. (eds) Markets and Policy Measures in the Evolution of Electric Mobility, Springer.

Berlin

www.InsideAirbnb.com.

www.AirbnbvsBerlin.com.

O'Neill, E (2016): 'Berlin's Sharing Economy: A Glimpse of the Future?' in The Irish Times, www.irishtimes.com, dated 4 January 2016, accessed 9 July 2016.

www.carsharing.de.

The Local (2015): 'Car-sharing accelerates rapidly in Germany', dated 21 June 2015 www.thelocal.de.

Immobilien Scout 24 (2015), Daten Deutschlands wichtigste Immobilienma?rkte im U?berblick, available from www.immobiliensout24.de (accessed July 10 2016).

The Maybachufer (2016): 'No Exception for Airbnb on Holiday Rental Ban in Berlin', www.themaybachufer.com, dated March 26 2016, accessed 10 July 2016.

Bundesverband CarSharing (n.d.) report on "The State of European Car-Sharing" Retrieved August 6, 2016 from http://www.eltis.org/sites/eltis/files/tool/the_state_of_carsharing_europe.pdf.

"Collaborative Consumption". Retrieved August 6, 2016 from http://www.collaborativeconsumption.com/.

European Parliament (2015). "Social, Economic and Legal Consequences of Uber and similar Transportation Network Companies (TNCs).". Available from: http://www.europarl.europa.eu/RegData/etudes/BRIE/2015/563398/IPOL_BRI(2015)563398_EN.pdf [Accessed 1 April 2016].

"How is Airbnb really being used in and affecting the neighbourhoods of your city?" Retrieved August 6, 2016 from www.insideairbnb.com.

Le Vine, S., Zolfaghari, A. & Polak, J. (2014). "Carsharing: Evolution, Challenges and Opportunities." ACEA Scientific Advisory Group Report. Available from: https://www.acea.be/uploads/publications/SAG_Report_-_Car_Sharing.pdf. [Accessed 1 June 2016].

Barcelona

Exceltur (2015): 'Impacts of the exponential growth of tourist accommodation in rental houses in Spain, driven by P2P models and marketing platforms', presentation dated 25 June 2015.

Moran, C (2016): 'The Sharing Economy, in Metropolitan Barcelona', available at: http://www.barcelona-metropolitan.com/features/report-the-sharing-economy/ [Accessed 24 August 2016].

O'Sullivan (2015): 'Tourist-Heavy Barcelona is Cracking Down on Airbnb', dated 23 December 2015, available at: http://www.citylab.com/housing/2015/12/barcelona-airbnb-tourism/421788/
PWC (2015): 'Room for Growth – European Cities Hotel Forecast for 2015 and 2016 for 20 gateway cities from Amsterdam to Zurich', Available from www.pwc.ie [Accessed 24 August 2016].

Stücklin, M (2016): 'Barcelona threatens Airbnb and others with fines of up to €600,000', Spanish Property Insight, available at: http://www.spanishpropertyinsight.com/2016/07/07/barcelona-threatens-airbnb-others-fines-e600000/ [Accessed 24 August 2016].

www.insideairbnb.com [Accessed 24 August 2016].

Amsterdam

Amsterdam Action Plan Sharing Economy, available at: www.slideshare.net/shareNL/amsterdam-actionplan-sharing-economy [Accessed 24 August 2016]..

www.amsterdamsharingcity.worldpress.com.

www.collaborativeconsumption.com [Accessed 24 August 2016].

www.insideairbnb.com [Accessed 24 August 2016].

www.share.nl.

Appendix 3 – List of Acronyms

ACEA	European Automobile Manufacturers Association
AOC	Air operator's licence
CAPA	Centre for Aviation
CTO	City Tourism Organisation
DEA	Data envelopment analysis
DMO	Destination Management Organisation
ECAA	European Common Aviation Area
ECM	European Cities Marketing
ELFAA	European Low Fares Airline Association
ETC	European Tourism Commission
ETIS	European Tourism Indicator System
IAG	International Airlines Group
ICCA	International Congresses and Conventions Association
IATA	International Air Transport Association
JLL	Jones Lang LaSalle
NGO	Non-governmental Organisation
ONS	Office for National Statistics
SES	Single European Sky
TNC	Transportation Network Company
UNWTO	World Tourism Organization
WEF	World Economic Forum
WTTC	World Travel & Tourism Council