



Airbnb's Global Support to Local Economies: Output and Employment

Prepared for Airbnb

March 2017

Project Team

David Harrison, Ph.D., Project Director
Conor Coughlin
Dylan Hogan
Eli Shakun

NERA Economic Consulting (www.nera.com) is a global firm of experts dedicated to applying economic, finance, and quantitative principles to complex business and legal challenges. For over half a century, NERA's economists have been creating strategies, studies, reports, expert testimony, and policy recommendations for government authorities and the world's leading law firms and corporations. We bring academic rigor, objectivity, and real world industry experience to bear on issues arising from competition, regulation, public policy, strategy, finance, and litigation.

Dr. David Harrison, Project Director, is a Managing Director at NERA with more than 30 years of experience estimating the economic effects of major projects and public policies at the local, state and federal levels. Before joining NERA, Dr. Harrison was an Associate Professor at the John F. Kennedy School of Government at Harvard University, where he taught courses in microeconomics, regional economic analysis, energy and environmental policy and other topics. Dr. Harrison earlier served on the senior staff of the President's Council of Economic Advisors. Dr. Harrison has a B.A. in economics from Harvard College, a M.Sc. in economics from the London School of Economics, and a Ph.D. in economics from Harvard University.

NERA Economic Consulting
11th Floor, 200 Clarendon Street
Boston, Massachusetts 02116
Tel: 1 (617) 927-4500 Fax: 1 (617) 927-4501
www.nera.com

Contents

I.	Introduction and Overview	1
A.	Overview of Results	1
B.	Background on Airbnb	1
C.	Overview of Approach	2
D.	Organization of Report	4
II.	Overview of Methodology	5
A.	Methodology to Develop Estimates of 2016 Airbnb Global Support	5
B.	Methodology to Develop Illustrative Future Values for Airbnb Global Support	8
III.	Results for 2016 Airbnb Annual Support and Illustrative Future Support	10
A.	2016 Annual Estimates of Airbnb Support	10
B.	Illustrative Future Values for Airbnb Support	10
	Appendix A: List of Cities Included by Country and Region	A-1

List of Tables

Table 1. Airbnb Estimated 2016 Output and Employment Support (US and non-US Cities)	1
Table 2. Airbnb Estimated 2016 Output and Employment Support (Global Regions)	10
Table 3. Development of Illustrative Airbnb Growth Rates	11
Table 4. Illustrative Future Values for Airbnb Support to Global Local Economies	12
Table 5. Illustrative Future Values of Airbnb Support to US Local Economies	12
Table 6. Illustrative Future Values for Airbnb Support to Non-US Local Economies	13
Table A.1. List of 200 Cities Included in Detailed Analysis by Country and Region	A-1

I. Introduction and Overview

NERA Economic Consulting (NERA) was asked by Airbnb to develop estimates of the support that Airbnb provides to the local economies in major global cities in which it operates. Although Airbnb has hosts and guests in many other cities, this study focuses on the 200 cities with the largest number of stays and develops detailed estimates of the support provided by Airbnb-related expenditures in these cities. The support provided to these individual cities is added together to provide an estimate of the cumulative global support due to Airbnb expenditures. This report provides a brief overview of the approach NERA used to develop the estimates, information on the specific data and steps NERA used to develop the estimates, and the results of the NERA analyses.

A. Overview of Results

This report develops estimates of Airbnb's annual support to 200 of the local economies in which Airbnb operated in 2016. Table 1 provides estimates of global support in terms of total output of goods and services and total jobs, divided into US and non-US cities. We estimate that, in total, Airbnb supported about 730,000 jobs in the 200 cities included in our analysis and supported more than \$60 billion in output in these cities.

Table 1. Airbnb Estimated 2016 Output and Employment Support (US and non-US Cities)

Region	Output Supported (Millions, 2016\$)	Jobs Supported (Annual Jobs)
US	\$14,000	130,000
Non-US	\$47,000	600,000
Global	\$61,000	730,000

Note: All dollar values are in 2016 dollars. Values are based upon results for 200 cities.

Source: Airbnb data and NERA calculations as explained in text.

The report also includes potential Airbnb support in future years by applying illustrative growth rates (i.e., changes from one year to the next) to the 2016 annual estimates. (The illustrative growth rates are based on ranges of future rates given Airbnb's experience over the period from 2009 to 2016.) The mid-point of the range for these illustrative future values is 1.3 million global jobs supported in 2017 and about 2 million global jobs supported in 2018.

B. Background on Airbnb

Airbnb is an online marketplace and hospitality service that enables people to list, discover, and book accommodations around the world. Founded in 2008 in San Francisco, California, Airbnb supports accommodations for over three million lodging listings in over 190 countries worldwide. Airbnb does not own or operate any of its accommodations, but rather is an online sharing platform that connects guests with hosts (home, apartment, and property owners) for short-term rentals in locations around the world. Airbnb functions as an income-earning platform that

allows hosts to earn rent on their homes, apartments, and properties, while providing guests with unique travel experiences.

C. Overview of Approach

Airbnb, by facilitating millions of trips worldwide each year in these 200 cities, supports expenditures by the visitors who come to these cities and by the hosts who obtain the additional income. These visitor and host expenditures in turn lead to “multiplier” effects on the local economy as this spending percolates through the local economy.

1. Direct Expenditures

The beginning point for assessing support is the amount of expenditures related to Airbnb bookings. Our assessments are based upon two types of spending for which detailed data have been developed by Airbnb and thus can be measured with reasonable accuracy.

- **Visitor Guest Spending.** This category includes expenditures by out-of-town guests during their stays at Airbnb facilities. Airbnb has detailed survey information on the nature and size of these visitor expenditures. Note that spending by local residents (which represent a small share of the total in most cities) is excluded, since these expenditures would for the most part be made elsewhere in the city if not made during the Airbnb stay.
- **Host Income and Spending.** This category includes expenditures by hosts due to the increased income from Airbnb hosting. Airbnb has detailed survey information on the nature and size of the expenditures hosts make due to the income they obtain from the Airbnb bookings.

Note that the information on direct spending understates the total spending associated with Airbnb for two reasons. First, these two categories do not include some other categories of increased local demand due to Airbnb. The omitted categories include (a) expenditures related to income from Airbnb employees, (b) revenue from Airbnb’s non-core products, such as “Experiences”, and (c) “start-up” expenditures related to hosts getting Airbnb units initially ready for stays. Second, these 200 cities constitute a fraction of the total cities in which Airbnb stays occur (although these are the 200 cities with the largest numbers of stays). For these reasons, the results are conservative estimates of Airbnb support.

2. Multiplier Effect and IMPLAN Multipliers

The visitor and host expenditures constitute “direct effects” on the local economy. These expenditures trigger additional economic activity in the local economy, leading to a multiplier effect. The various effects of increased expenditures typically are decomposed into the following three effects (including the “direct effect” noted above):

1. **Direct effects.** These represent the initial increased demand due to expenditures (e.g., expenditures for restaurant meals or local transportation).

2. **Indirect effects.** These effects represent the effect of local sectors buying from other local sectors (e.g., local restaurants buy from local meat markets and grocers), effects that go on round-by-round (e.g., local meat markets buy from local transportation firms).
3. **Induced effects.** These effects represent the spending from household income due to the direct effects (e.g., the income from restaurant wait-staff).

Economic models have been developed to estimate multipliers that reflect the indirect and induced effects of direct spending.

We use multipliers developed by the IMPLAN Group, LLC (IMPLAN). IMPLAN is the leading provider of economic impact data and economic modeling software. By pairing classic input-output analysis with regional social accounting matrices, IMPLAN lets users model custom economic impacts. (Wassily Leontief received the Nobel Prize in Economics in 1973 for his work on input-output tables; these tables allow one to estimate changes in demand for inputs due to a change in demand for a final good.) IMPLAN currently serves nearly 20,000 individuals all over the world and across all industries. The IMPLAN database allows regions to be defined in terms of various jurisdictions (e.g., city, county, state) and thus IMPLAN multipliers can be developed that can be applied to the 200 cities we evaluate.

In particular, we use the following IMPLAN multipliers.

- **Type II multipliers**, which reflect the full (direct+indirect+induced) effects of increases in expenditures. Thus, for example, an output multiplier of 2.0 indicates that for every \$1,000 of expenditure in a particular sector (e.g., transportation), \$1,000 of additional output would be added in other sectors so that there would be a total of \$2,000 of additional output in the region. Note that although the initial (“direct”) increase would be in a particular sector, the \$1,000 of additional output would be spread across many different sectors reflecting the indirect and induced effects.

The use of these Type II IMPLAN multipliers allows us to estimate the full support that host and visitor guest expenditures contribute to local economies. As discussed below, the IMPLAN multipliers we use in this study are highly disaggregated both by expenditure category and by city.

3. Measures of Local Airbnb Support

We develop two measures of the support that Airbnb expenditures provide to the local economy.

1. **Output support.** Output support reflects the annual value of goods and services (measured in dollars) within the city due to the guest and host expenditures after all of the multiplier effects are taken into account.
2. **Employment support.** Employment support reflects the annual jobs within the city due to the guest and host expenditures, taking into account the multiplier effects as well as the labor associated with the additional output. In other words, Airbnb supports local jobs

when the initial (“direct”) and multiplier (“indirect” and “induced”) spending leads to more local jobs.

It is useful to provide an example to illustrate the nature of the jobs supported by Airbnb. As a simple example of a “direct job supported,” consider a city restaurant that relies on both local and out-of-town customers. Suppose that without Airbnb, the restaurant would hire 9 employees for the year. Suppose further that the additional business from Airbnb out-of-town guests and local spending from Airbnb hosts using this Airbnb income would result in the restaurant hiring 10 employees for the year. This additional hire would be a job supported by Airbnb’s “direct” expenditures. But the “multiplier effect would lead to even more customers. Suppose that this additional business would result in hiring 11 employees; this other hire would be another job supported by Airbnb’s activity. Thus, taking all effects into account, Airbnb’s activity would support 2 additional jobs in this simple example.

4. Results and Future Values

We develop two sets of estimates of Airbnb support, one based upon detailed information for 2016 expenditures and one based upon simple illustrative extrapolations using historical levels of Airbnb growth.

- **Estimated 2016 Support.** We develop detailed estimates of jobs and output support based upon very detailed information for 2016 expenditures in each of the 200 cities. The data and methodological steps to develop these estimates are described in the next section of this report.
- **Illustrative Future Support.** We develop illustrative forecasts of future impacts for the period from 2017 to 2025 by applying illustrative growth rates (i.e., changes from one year to the next) to the detailed 2016 annual estimates. The illustrative growth rates are based upon a potential range of possible trends given Airbnb’s experience over the period from 2009 to 2016. We show results for the mid-point of the illustrative growth rates in the results tables.

As noted, we develop detailed output and jobs estimates for the 200 cities for which we have detailed data. To develop estimates of global support, we sum the support of all 200 cities. (As discussed above, because Airbnb operates in many more than 200 cities, this sum understates the full global support.) In addition to global support, we report subtotals for various global regions (e.g., United States, Europe, and Asia).

D. Organization of Report

The remainder of this report is organized as follows. Section II provides an overview of the methodology and assumptions underlying our estimates of 2016 annual support as well as the methodology we use to provide illustrative values for future support. Section III provides additional results for our 2016 annual estimated support as well as the results of the illustrative future values. An appendix provides a list of the 200 cities included in the study.

II. Overview of Methodology

This section outlines the steps used to develop estimates of 2016 global employment and output support associated with Airbnb guest and host spending. We also provide an overview of the methods used to develop illustrative future values.

A. Methodology to Develop Estimates of 2016 Airbnb Global Support

The methodology to develop estimates of the support Airbnb contributes to the economies of the 200 global cities is divided into the following five major steps:

1. Step 1: Calculate Annual Guest Spending by IMPLAN Category by City;
2. Step 2: Calculate Annual Host Income/Spending by IMPLAN Category by City;
3. Step 3: Aggregate IMPLAN Expenditure Inputs for Guest and Host Expenditures by City;
4. Step 4: Determine Output and Employment Multipliers by Global City; and
5. Step 5: Calculate Annual Airbnb Output and Employment Support for 2016.

The following sections provide the various elements of these steps, including references to the data used and some of the assumptions made.

1. Step 1: Calculate Annual Guest Spending by IMPLAN Category by City

1. Calculate the number of annual guest nights in each city in the 200 global cities based upon detailed Airbnb data on 2016 guest stays.
 - a. US cities represent 68 and non-US cities represent 132 of the 200 global cities.
2. Calculate average guest spending per night and by spending category for each of the 62 cities included in the Airbnb guest survey data.
 - a. US cities and non-US cities make up 29 and 33, respectively, of these 62 cities.
 - b. Guest spending is broken down by eight spending categories.
3. Calculate total annual guest spending for each of the 200 global cities.
 - a. Multiply the annual guest nights (1) by the average guest spending per night (2).
 - b. Use the most similar city (or country or international average) as a proxy for cities without guest survey information.
 - c. Include separate calculations for each of the guest spending categories.

4. Allocate annual guest spending in each of the eight spending categories to one or more IMPLAN categories and an IMPLAN region for each of the 200 global cities.
 - a. Expenditures allocated to retail categories are modified to exclude the value of the goods based on IMPLAN information on retail margins. This methodology assumes that production of the retail goods for sale has no local expenditures, which may understate effects for some goods.
 - b. Note that the IMPLAN expenditure categories are more disaggregated (536 categories) in the US cities than in the non-US cities (35 categories).
 - c. Use the most similar IMPLAN region (Metropolitan area, international country, US average, or international average) for cities with no city-specific multiplier. (IMPLAN multiplier information was developed for 59 specific cities—19 US metropolitan areas and 40 international countries.)

2. Step 2: Calculate Annual Host Income/Spending by IMPLAN Category by City

1. Calculate annual host income in each of the 200 global cities based upon detailed Airbnb data.
2. Calculate average host spending shares by spending category for each of the 145 cities included in the Airbnb detailed host survey data.
 - a. US cities and non-US cities make up 33 and 112, respectively, of these 145 cities.
 - b. Host spending is broken down by ten spending categories that generally differ from those for guest spending.
3. Calculate total annual host spending for each of the 200 global cities.
 - a. Multiply the annual host income (1) by the average host spending shares (2).
 - b. Use the most similar city (or country or international average) as a proxy for cities without host survey information.
 - c. Include separate calculations for each of the host spending categories.
4. Allocate annual host spending in each of the ten spending categories to one or more IMPLAN categories and an IMPLAN region for each of the 200 global cities.
 - a. Expenditures allocated to retail categories in IMPLAN are modified to exclude the value of goods coming from outside the region based upon IMPLAN information on retail margins.

- b. As noted above, the IMPLAN categories are more disaggregated (536 categories) in the US cities than in the non-US cities (35 categories).
- c. Use most similar IMPLAN region (metropolitan area, international country, US average, or international average). (NERA has IMPLAN multiplier information for 59 regions—19 US Metropolitan areas and 40 international countries.)

3. Step 3: Aggregate IMPLAN Expenditure Inputs for Guest and Host Expenditures by City

1. Sum the annual guest and host spending by IMPLAN category for each of the 200 global cities.
 - a. Note because many of the Airbnb survey categories would correspond to numerous IMPLAN categories, the number of IMPLAN categories is large.
2. Reduce all spending (guest and host) in each city by the fraction of city-specific intra-city stays.
 - a. Intra-city stays would not contribute to city economies (money would have been spent elsewhere in the local economy for local residents).
 - b. Fractions of intra-regional guests are relatively small, ranging from 0.0 percent to 29.6 percent across the 200 global cities (3.1 percent on average, unweighted).

4. Step 4: Determine Output and Employment Multipliers by Global City

1. Obtain IMPLAN output multipliers for each of the relevant expenditure categories for each of the global cities based on the 59 IMPLAN regions.
 - a. These 59 global regions represent the vast majority (90 percent) of total global guest nights for the 200 cities.
 - b. These multipliers are calculated as $[(\text{direct} + \text{indirect} + \text{induced output}) / \text{direct expenditures}]$. As an example, for a given expenditure category in a given city, an output multiplier of 2.0 would indicate that \$100 dollars of expenditures would translate into an output support of \$200 dollars in the city.
 - c. For cities without a corresponding IMPLAN region (US city or international country), we rely upon US or international (non-US) average output multipliers. Because cities without multipliers represent a small share of total Airbnb activity (about 10 percent), the simplicity of this assumption should not have a major effect on the global results.
2. Obtain IMPLAN employment multipliers for each of the relevant expenditure categories for each of the global cities based on the 59 IMPLAN regions.

- a. These multipliers are calculated as $[(\text{direct} + \text{indirect} + \text{induced employment}) / \text{direct expenditures}]$. Thus, for a given expenditure category in a given city, an employment multiplier of 0.02 would indicate that \$100 of expenditures would translate into $(\$100 * .02) = 2$ jobs.
- b. IMPLAN employment multipliers are modified to be consistent with 2016 year dollars included in the Airbnb data.
- c. For cities without a corresponding IMPLAN region (US city or international country), we rely upon US or international (non-US) average employment multipliers. Because cities without multipliers represent a small share of total Airbnb activity (about 10 percent), the simplicity of this assumption should not have a major effect on the global results.

5. Step 5: Calculate Annual Airbnb Output and Employment Support for 2016

1. For each city, multiply direct expenditures in each category by the relevant output multiplier.
2. For each city, multiply direct expenditures in each category by the relevant employment multiplier.
3. Sum the output results for all expenditure categories in each city.
4. Sum the employment results for all expenditures in each city.
5. Sum the output results for all 200 global cities to obtain estimates of the global output supported by Airbnb in 2016.
6. Sum the employment results for all 200 global cities to obtain estimates of the global jobs supported by Airbnb in 2016.

B. Methodology to Develop Illustrative Future Values for Airbnb Global Support

The methodology to develop illustrative values for future support can be divided into the following basic steps:

1. Step 1: Calculate annual growth rate in total guest arrivals for years 2012-2016 based upon publically available Airbnb information.
 - a. The number for total guest arrivals represents the total number of guests who stayed at Airbnb properties during a specific time period (including registered guests of guests).

- b. This metric is chosen to be in line with international tourism standards. The standard metric used by authorities like the UN World Tourism Organization and the World Bank is “tourist arrivals.” Each time a traveler arrives in a country, they are counted as a tourist arrival. Similarly, each time a guest arrives at an Airbnb listing for a new trip, they are counted as a guest arrival.
 - c. The growth in total guest arrivals over time reflects changes in arrivals for existing cities as well as growth in the number of cities with Airbnb facilities.
 2. Step 2: Develop illustrative “low,” “mid,” and “high” growth rates for Airbnb for years 2017-2025 based upon historical growth rates in total guest arrivals and illustrative values for what future growth rates might be.
 - a. The “mid” growth rate, which is used in the results tables, is the mid-point between the “low” and “high” growth rates.
 3. Step 3: Escalate the estimated annual 2016 output support and jobs supported by the “mid” growth rate to develop illustrative values for future support.
 - a. The resulting future values are of course highly uncertain, an uncertainty reflected in part by the range of potential growth rates.
 - b. Note that these values implicitly assume growth in the number of cities as well as changes for the 200 cities.
 - c. The same growth assumptions are used for all global regions.

III. Results for 2016 Airbnb Annual Support and Illustrative Future Support

This section provides additional global and regional results of the analyses, including the estimates of 2016 annual support and the illustrative future values.

A. 2016 Annual Estimates of Airbnb Support

This section provides regional estimates of Airbnb's annual support to 200 of the local economies in which they operated in 2016. Table 2 provides estimates of global support to output and jobs, organized into seven global regions. We estimate that, in total, Airbnb supported about 730,000 jobs in the 200 cities included in our analysis and supported more than \$60 billion in output in these cities. (As noted, the list of cities is in Appendix A.)

Table 2. Airbnb Estimated 2016 Output and Employment Support (Global Regions)

Region	Output Supported (Millions, 2016\$)	Jobs Supported (Annual Jobs)
Asia	\$9,000	170,000
Europe	\$31,000	260,000
Oceania	\$2,000	10,000
North America/Caribbean	\$3,000	50,000
South America	\$2,000	100,000
United States	\$14,000	130,000
Other	\$1,000	10,000
Global	\$61,000	730,000

Note: All dollar values are in 2016 dollars. All values are based on results for 200 cities. Values may not sum to total due to rounding. North America/Caribbean excludes United States.

Source: Airbnb data and NERA calculations as explained in text.

B. Illustrative Future Values for Airbnb Support

This section provides illustrative future values for Airbnb's future support to output and jobs in cities. Table 3 shows the Airbnb information on annual global arrivals that NERA relied on to develop illustrative ranges for future growth. The table shows the year-over-year growth rates from 2009 to 2016, indicating substantial growth rates that are declining over time. The range of future growth rates from 2017 to 2025 is illustrative, showing a continuation of the trajectory in previous years.

Table 3. Development of Illustrative Airbnb Growth Rates

	(a)	(b)
	Annual	
Year	Arrivals	Growth Rate
2009	20,000	-
2010	140,000	600%
2011	690,000	390%
2012	2,600,000	280%
2013	7,300,000	180%
2014	18,000,000	150%
2015	42,000,000	130%
2016	81,000,000	90%
2017	140,000,000	65-85%
2018	210,000,000	40-60%
2019	260,000,000	15-35%
2020	290,000,000	0-20%
2021	320,000,000	0-20%
2022	350,000,000	0-20%
2023	390,000,000	0-20%
2024	430,000,000	0-20%
2025	470,000,000	0-20%

These illustrative future values were provided by NERA solely for the purpose of this report and not by Airbnb.

Note: All future values (i.e., 2017-2025, gray shaded region) are illustrative values provided by NERA solely for the purpose of this report and not by Airbnb.

- (a) Historical data for all Airbnb arrivals based on data provided by Airbnb. Annual arrivals refer to the total number of guests who stayed at Airbnb properties during a given year (including registered guests of guests).
- (b) Annual growth rate based on arrival data for 2009 through 2016 and illustrative range of growth rates for 2017 to 2025.

Source: Airbnb data and NERA calculations as explained in text.

Table 4 provides illustrative values for Airbnb's support based upon the mid-point of the illustrative growth rates in Table 3, with the growth rates applied to the global totals for jobs support and output support for 2016. Table 5 provides equivalent illustrative values for US cities based on the same illustrative growth rates, and Table 6 provides equivalent illustrative values for non-US cities. Note that the illustrative values assume the same growth rates for US and non-US cities.

Table 4. Illustrative Future Values for Airbnb Support to Global Local Economies

	(a)	(b)	(c)	(d)
Year	Growth Rate	Annual Jobs	Annual Output (millions, 2016\$)	Cumulative Output (millions, 2016\$)
2016	90%	730,000	\$61,000	\$61,000
2017	65-85%	1,300,000	\$107,000	\$168,000
2018	40-60%	2,000,000	\$161,000	\$329,000
2019	15-35%	2,500,000	\$201,000	\$530,000
2020	0-20%	2,800,000	\$221,000	\$751,000
2021	0-20%	3,100,000	\$243,000	\$994,000
2022	0-20%	3,400,000	\$267,000	\$1,261,000
2023	0-20%	3,700,000	\$294,000	\$1,555,000
2024	0-20%	4,100,000	\$323,000	\$1,878,000
2025	0-20%	4,500,000	\$355,000	\$2,233,000

These illustrative future values were provided by NERA solely for the purpose of this report and not by Airbnb.

Note: All future values (i.e., 2017-2025, gray shaded region) are illustrative values that were provided by NERA solely for the purpose of this report and not by Airbnb.

(a) Annual growth rates from the prior year are illustrative future values based on arrival data provided in Table 3.

(b) 2016 value is an estimate of global jobs supported based on results for 200 global cities; future values are based on midpoint of illustrative growth future values in column (a).

(c) Same as (b) except for annual output rather than jobs

(d) Undiscounted cumulative sum of output supported since 2016.

Source: Airbnb data and NERA calculations as explained in text.

Table 5. Illustrative Future Values of Airbnb Support to US Local Economies

	(a)	(b)	(c)	(d)
Year	Growth Rate	Annual Jobs	Annual Output (millions, 2016\$)	Cumulative Output (millions, 2016\$)
2016	90%	130,000	\$14,000	\$14,000
2017	65-85%	230,000	\$25,000	\$39,000
2018	40-60%	350,000	\$38,000	\$77,000
2019	15-35%	440,000	\$48,000	\$125,000
2020	0-20%	480,000	\$53,000	\$178,000
2021	0-20%	530,000	\$58,000	\$236,000
2022	0-20%	580,000	\$64,000	\$300,000
2023	0-20%	640,000	\$70,000	\$370,000
2024	0-20%	700,000	\$77,000	\$447,000
2025	0-20%	770,000	\$85,000	\$532,000

These illustrative future values were provided by NERA solely for the purpose of this report and not by Airbnb.

Note: All future values (i.e., 2017-2025, gray shaded region) are illustrative future values that were provided by NERA solely for the purpose of this report and not by Airbnb.

(a) Annual growth rates are illustrative future values based on arrival data provided in Table 3.

(b) 2016 value is an estimate of jobs supported in US local economies based on results for 200 cities; future values are based on midpoint of illustrative growth future values in column (a)

(c) Same as (b) except for annual output rather than jobs

(d) Undiscounted cumulative sum of output supported since 2016.

Source: Airbnb data and NERA calculations as explained in text.

Table 6. Illustrative Future Values for Airbnb Support to Non-US Local Economies

Year	(a) Growth Rate	(b) Annual Jobs	(c) Annual Output (millions, 2016\$)	(d) Cumulative Output (millions, 2016\$)
2016	90%	600,000	\$47,000	\$47,000
2017	65-85%	1,100,000	\$82,000	\$129,000
2018	40-60%	1,700,000	\$123,000	\$252,000
2019	15-35%	2,100,000	\$154,000	\$406,000
2020	0-20%	2,300,000	\$169,000	\$575,000
2021	0-20%	2,500,000	\$186,000	\$761,000
2022	0-20%	2,800,000	\$205,000	\$966,000
2023	0-20%	3,100,000	\$226,000	\$1,192,000
2024	0-20%	3,400,000	\$249,000	\$1,441,000
2025	0-20%	3,700,000	\$274,000	\$1,715,000

These illustrative future values were provided by NERA solely for the purpose of this report and not by Airbnb.

Note: All future values (i.e., 2017-2025, gray shaded region) are illustrative future values that were provided by NERA solely for the purpose of this report and not by Airbnb.

(a) Annual growth rates are illustrative values based on arrival data provided in Table 3.

(b) 2016 value is an estimate of jobs supported in non-US local economies based on results for 200 cities; future values are based on midpoint of illustrative growth rate values in column (a).

(c) Same as (b) except for annual output rather than jobs

(d) Undiscounted cumulative sum of output contributed since 2016.

Source: Airbnb data and NERA calculations as explained in text.

Appendix A: List of Cities Included by Country and Region

Table A.1 provides a list of the 200 cities included in the analysis, organized by country.

Table A.1. List of 200 Cities Included in Detailed Analysis by Country and Region

	City	Country	Region
1	Buenos Aires	Argentina	South America
2	Brisbane	Australia	Other
3	Byron Bay	Australia	Other
4	Gold Coast	Australia	Other
5	Hobart	Australia	Other
6	Melbourne	Australia	Other
7	Perth	Australia	Other
8	Southbank	Australia	Other
9	Surfers Paradise	Australia	Other
10	Sydney	Australia	Other
11	Vienna	Austria	Europe
12	Brussels	Belgium	Europe
13	Florianópolis	Brazil	South America
14	Rio de Janeiro	Brazil	South America
15	São Paulo	Brazil	South America
16	Calgary	Canada	North America/Caribbean
17	Montreal	Canada	North America/Caribbean
18	Ottawa	Canada	North America/Caribbean
19	Quebec	Canada	North America/Caribbean
20	Toronto	Canada	North America/Caribbean
21	Vancouver	Canada	North America/Caribbean
22	Victoria	Canada	North America/Caribbean
23	Whistler	Canada	North America/Caribbean
24	Santiago	Chile	South America
25	Beijing	China	Asia
26	Shanghai	China	Asia
27	Cartagena	Colombia	South America
28	Medellín	Colombia	South America
29	Dubrovnik	Croatia	Europe
30	Split	Croatia	Europe
31	Havana	Cuba	North America/Caribbean
32	Prague	Czech Republic	Europe
33	Copenhagen	Denmark	Europe
34	Frederiksberg	Denmark	Europe
35	Helsinki	Finland	Europe
36	Aix-en-Provence	France	Europe
37	Antibes	France	Europe
38	Biarritz	France	Europe
39	Bordeaux	France	Europe
40	Cannes	France	Europe
41	La Rochelle	France	Europe

	City	Country	Region
42	Lille	France	Europe
43	Lyon	France	Europe
44	Marseille	France	Europe
45	Montpellier	France	Europe
46	Nice	France	Europe
47	Paris	France	Europe
48	Strasbourg	France	Europe
49	Toulouse	France	Europe
50	Berlin	Germany	Europe
51	Düsseldorf	Germany	Europe
52	Hamburg	Germany	Europe
53	Cologne	Germany	Europe
54	Munich	Germany	Europe
55	Athens	Greece	Europe
56	Mykonos	Greece	Europe
57	Hong Kong	Hong Kong	Asia
58	Budapest	Hungary	Europe
59	Reykjavik	Iceland	Europe
60	Denpasar	Indonesia	Asia
61	Kuta	Indonesia	Asia
62	Ubud	Indonesia	Asia
63	Dublin	Ireland	Europe
64	Jerusalem	Israel	Other
65	Tel Aviv	Israel	Other
66	Bologna	Italy	Europe
67	Florence	Italy	Europe
68	Milano	Italy	Europe
69	Napoli	Italy	Europe
70	Rome	Italy	Europe
71	Turin	Italy	Europe
72	Venice	Italy	Europe
73	Verona	Italy	Europe
74	Fukuoka-shi	Japan	Asia
75	Kyoto	Japan	Asia
76	Osaka-shi	Japan	Asia
77	Sapporo	Japan	Asia
78	Tokyo	Japan	Asia
79	Busan	Korea	Asia
80	Jeju-si	Korea	Asia
81	Seoul	Korea	Asia
82	Kuala Lumpur	Malaysia	Asia
83	Cancún	Mexico	North America/Caribbean
84	Mexico City	Mexico	North America/Caribbean
85	Playa del Carmen	Mexico	North America/Caribbean
86	Puerto Vallarta	Mexico	North America/Caribbean
87	Tulum	Mexico	North America/Caribbean

	City	Country	Region
88	Marrakesh	Morocco	Other
89	Amsterdam	Netherlands	Europe
90	Auckland	New Zealand	Other
91	Queenstown	New Zealand	Other
92	Bergen	Norway	Europe
93	Oslo	Norway	Europe
94	Lima	Peru	South America
95	Manila	Philippines	Asia
96	Kraków	Poland	Europe
97	Warsaw	Poland	Europe
98	Lagos	Portugal	Europe
99	Lisbon	Portugal	Europe
100	Porto	Portugal	Europe
101	San Juan	Puerto Rico	North America/Caribbean
102	Moscow	Russia	Europe
103	Saint Petersburg	Russia	Europe
104	Singapore	Singapore	Asia
105	Cape Town	South Africa	Other
106	Barcelona	Spain	Europe
107	Donostia / San Sebastián	Spain	Europe
108	Granada	Spain	Europe
109	Ibiza	Spain	Europe
110	Madrid	Spain	Europe
111	Marbella	Spain	Europe
112	Málaga	Spain	Europe
113	Palma	Spain	Europe
114	Sant Josep de sa Talaia	Spain	Europe
115	Sevilla	Spain	Europe
116	Valencia	Spain	Europe
117	Stockholm	Sweden	Europe
118	Geneva	Switzerland	Europe
119	Zürich	Switzerland	Europe
120	Taipei	Taiwan	Asia
121	Bangkok	Thailand	Asia
122	Ko Samui	Thailand	Asia
123	Istanbul	Turkey	Asia
124	Dubai	United Arab Emirates	Other
125	Bath	United Kingdom	Europe
126	Brighton	United Kingdom	Europe
127	Bristol	United Kingdom	Europe
128	Edinburgh	United Kingdom	Europe
129	Glasgow	United Kingdom	Europe
130	London	United Kingdom	Europe
131	Manchester	United Kingdom	Europe
132	Oxford	United Kingdom	Europe
133	Anaheim, CA	United States	United States

	City	Country	Region
134	Arlington, VA	United States	United States
135	Asheville, NC	United States	United States
136	Atlanta, GA	United States	United States
137	Austin, TX	United States	United States
138	Baltimore, MD	United States	United States
139	Berkeley, CA	United States	United States
140	Beverly Hills, CA	United States	United States
141	Big Bear Lake, CA	United States	United States
142	Boston, MA	United States	United States
143	Boulder, CO	United States	United States
144	Breckenridge, CO	United States	United States
145	Cambridge, MA	United States	United States
146	Charleston, SC	United States	United States
147	Chicago, IL	United States	United States
148	Dallas, TX	United States	United States
149	Denver, CO	United States	United States
150	Fort Lauderdale, FL	United States	United States
151	Hollywood, CA	United States	United States
152	Honolulu, HI	United States	United States
153	Houston, TX	United States	United States
154	Irvine, CA	United States	United States
155	Jersey City, NJ	United States	United States
156	Kailua, HI	United States	United States
157	Kissimmee, FL	United States	United States
158	Kóâhei, HI	United States	United States
159	Lahaina, HI	United States	United States
160	Las Vegas, NV	United States	United States
161	Long Beach, CA	United States	United States
162	Los Angeles, CA	United States	United States
163	Malibu, CA	United States	United States
164	Mammoth Lakes, CA	United States	United States
165	Marina del Rey, CA	United States	United States
166	Miami, FL	United States	United States
167	Miami Beach, FL	United States	United States
168	Minneapolis, MN	United States	United States
169	Mountain View, CA	United States	United States
170	Napa, CA	United States	United States
171	Nashville, TN	United States	United States
172	New Orleans, LA	United States	United States
173	New York City, NY	United States	United States
174	Newport Beach, CA	United States	United States
175	Oakland, CA	United States	United States
176	Orlando, FL	United States	United States
177	Palm Springs, FL	United States	United States
178	Palo Alto, CA	United States	United States
179	Park City, UT	United States	United States

	City	Country	Region
180	Philadelphia, PA	United States	United States
181	Phoenix, AZ	United States	United States
182	Portland, OR	United States	United States
183	Salt Lake City, UT	United States	United States
184	San Antonio, TX	United States	United States
185	San Diego, CA	United States	United States
186	San Francisco, CA	United States	United States
187	San Jose, CA	United States	United States
188	Santa Barbara, CA	United States	United States
189	Santa Cruz, CA	United States	United States
190	Santa Monica, CA	United States	United States
191	Savannah, GA	United States	United States
192	Scottsdale, AZ	United States	United States
193	Seattle, WA	United States	United States
194	Somerville, MA	United States	United States
195	Sonoma, CA	United States	United States
196	South Lake Tahoe, CA	United States	United States
197	Sunny Isles Beach, FL	United States	United States
198	Truckee, CA	United States	United States
199	Washington, D.C.	United States	United States
200	West Hollywood, CA	United States	United States

NERA

ECONOMIC CONSULTING

This report is for the exclusive use of the NERA Economic Consulting (NERA) client named herein. The report reflects the research, opinions, and conclusions of its authors and does not necessarily reflect those of NERA or its clients.

Information furnished by others, upon which all or portions of this report are based, is believed to be reliable but has not been independently verified, unless otherwise expressly indicated. Public information and industry and statistical data are from sources we deem to be reliable; however, we make no representation as to the accuracy or completeness of such information. The findings contained in this report may contain predictions based on current data and historical trends. Any such predictions are subject to inherent risks and uncertainties. NERA accepts no responsibility for actual results or future events.

The opinions expressed in this report are valid only for the purpose stated herein and as of the date of this report. No obligation is assumed to revise this report to reflect changes, events or conditions, which occur subsequent to the date hereof.

All decisions in connection with the implementation or use of advice or recommendations contained in this report are the sole responsibility of the client. This report does not represent investment advice nor does it provide an opinion regarding the fairness of any transaction to any and all parties.

NERA Economic Consulting
11th Floor, 200 Clarendon Street
Boston, Massachusetts 02116
Tel: 1 (617) 927-4500 Fax: 1 (617) 927-4501
www.nera.com