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Understanding the impacts of peer-to-peer accommodation, the role of data and data observatories

Open Data Institute

Contents

About

This report has been researched and produced by the Open Data Institute, and published in April 2018. Its lead author was Jack Hardinges. It was contributed to by Rachel Wilson, Izy Champion, Peter Wells, Karin Christiansen, Jeni Tennison, Leigh Dodds, Lucia Chauvet, Caley Dewhurst, Anna Scott and Tess Millar.

How can it be improved? We welcome suggestions from the community in the comments.

Executive summary

Peer-to-peer accommodation platforms enable people to make their home or spare room available for others to rent, normally for a short period of time.

The global market for peer-to-peer accommodation has grown significantly in recent years and is expected to be worth as much as £250bn by 2025.

In addition to this growth there is debate around the wider impacts of peer-to-peer accommodation. For example, residents of some cities are concerned that it changes the way people feel about their homes and communities. There is a risk that this debate – and subsequent decisions and actions made by policymakers and other stakeholders – will be based on assumptions rather than evidence and opinions informed by data.

The Open Data Institute (ODI) has undertaken a project to understand how data can improve the peer-to-peer accommodation market to support businesses, consumers and communities. As part of this work, we have conducted interviews and desk research to better understand the stakeholders interested in the impact of peer-to-peer accommodation and the impacts they focus on, the role of data in understanding impact and the potential use of a data observatory.

We have made a number of findings, including that there is a diverse set of stakeholders interested in the impacts of peer-to-peer accommodation for different purposes. We also found that although peer-to-peer accommodation platforms hold vast amounts of data that could be used to understand the market's impacts, restricted access to this data inhibits its use. We also found that data observatories could help to meet the demand for more data and increase understanding of the impacts of peer-to-peer accommodation.

Based on the findings of our research, we recommend that:

1. public and private sector organisations that hold data should commit to working together to build data infrastructure that is as open as possible while respecting privacy and commercial confidentiality
2. national government officials should facilitate and support the creation of open data infrastructure in the peer-to-peer accommodation market and the development of data observatories
3. local government officials should create environments that can support the development of data observatories
4. stakeholders with similar needs should develop data observatories collaboratively
5. local and national government officials should engage with different stakeholders to inform decision-making related to the impacts of peer-to-peer accommodation

Taking these actions will help to improve the collective understanding of the impact of the peer-to-peer accommodation market.

1. Introduction

Across a variety of sectors, platforms that enable people to exchange goods and services are challenging traditional business models.

In finance, for example, the global peer-to-peer lending market grew by 271 per cent to more than $130bn (£106.4bn) in 2016.[1] Peer-to-peer car sharing aims to provide an alternative to traditional vehicle ownership; market leader Drivey now has 1.5 million users globally.[2] These types of platforms and the activity or exchanges they facilitate are often referred to collectively as the sharing or collaborative economy.

Peer-to-peer accommodation plays a significant role in this economy, and can be broadly defined as accommodation – such as a spare room or an entire home – made available by an existing homeowner for others to rent, normally for a short period of time.

Peer-to-peer accommodation platforms such as Airbnb, LoveHomeSwap and Wimdu have grown rapidly in recent years. Platforms like these connect homeowners with people looking for short-term accommodation, and compete with hotels and other more established providers of short-term lettings.

The rapid growth of peer-to-peer accommodation has created opportunities. It is now cheaper and easier for people to stay in many countries and cities. More people can generate income by providing access to their spare rooms or properties. In the UK, Airbnb has estimated that its guests and hosts have generated £3.46bn between July 2016 and July 2017.[3] Studies have predicted that by 2025, the value of the peer-to-peer sector could be as high as £250bn worldwide.[4]

There is ongoing debate surrounding the impacts of peer-to-peer accommodation and the growth of the sharing economy more broadly. In addition to the clear opportunities driven by the trend, some have voiced concerns about the negative outcomes it may also fuel.

There is a risk that this debate will be based on assumptions rather than informed by evidence and data. The best available evidence and data should be used to help understand the impacts, so that we can collectively make informed decisions and take appropriate action – such as how to encourage positive impacts or when to intervene to mitigate negative ones.

As part of the Open Data Institute's (ODI) data innovation programme,[5] we have undertaken a project to understand how data can improve the peer-to-peer accommodation market to support businesses, consumers and communities.

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[1] Peer2Peer Finance News (2016), 'Global P2P market worth over £106bn', http://www.p2pfinancenews.co.uk/2016/10/12/global-p2p-kpmg

[2] Telegraph (2017), 'Car sharing market expands as Europe's largest player Drivy parks up in UK with London launch', https://www.telegraph.co.uk/business/2017/11/14/car-sharing-market-expands-europes-largest-player-drivy-parks

[3] Airbnb (2017), Airbnb UK Insights Report, https://www.Airbnbcitizen.com/wp-content/uploads/sites/48/2017/09/Airbnb-UK-Insights-Report_Final_Digital_v3.pdf

[4] Financial Times (2014), 'UK 'sharing economy' companies told of £9bn potential', https://www.ft.com/content/5e0348ac-23c3-11e4-8e29-00144feabdc0

[5] Open Data Institute (2017), 'ODI secures £6m to advance data innovation', https://theodi.org/article/odi-secures-6m-to-advance-data-innovation

During a discovery phase that ran between September and December 2017,[6] attempts to understand the impact of peer-to-peer accommodation stood out as a prominent topic. The term “data observatory” was used in stakeholder interviews and workshops to describe how data from different sources could be gathered and used to inform the debate about this impact.

This report summarises the next stage of research we undertook to address these questions:

- Who is interested in the impacts of peer-to-peer accommodation and what types of impact are they interested in?
- How is data currently used to understand the impacts of peer-to-peer accommodation?
- What is a data observatory and how might it support people to better understand the impacts of peer-to-peer accommodation?

Our research consisted of structured interviews with a broad range of stakeholders, supported by desk research. The findings of our research are described throughout Sections 2, 3 and 4 of this report, and are summarised in Section 5. The final section also includes a set of recommendations designed to increase the understanding of the impacts of peer-to-peer accommodation.

[6] Open Data Institute (2017), ‘Research: what are the impacts of peer-to-peer accommodation platforms?’, https://theodi.org/article/research-what-are-the-impacts-of-peer-to-peer-accommodation-platforms

2. Stakeholders and the impacts of peer-to-peer accommodation they focus on

During the project's discovery phase, we undertook user research to identify a broad range of stakeholders interested in understanding different impacts of peer-to-peer accommodation.[7]

In the next phase of our work we conducted a series of interviews with these stakeholders and other individuals and organisations. In total we conducted 15 interviews, asking interviewees a series of questions about the types of impacts of peer-to-peer accommodation they are attempting to understand.

The core set of stakeholders attempting to understand the impacts of peer-to-peer accommodation to help them make decisions in line with their organisation's objectives are:

1. Local government officials developing local strategies for planning, economic growth and community development, and administering local housing, planning and licensing systems
2. National government officials across different departments or agencies, including policymakers focused on housing, tourism and the digital economy, and tax collection, as well national tourism agencies and bodies
3. Politicians representing the views of their constituents and parties on local issues, as well as those acting and making decisions at a national level
4. Statistical organisations such as the UK's Office for National Statistics (ONS) and commercial market researchers
5. Academic and research institutions and other centres of research
6. Independent researchers with no particular organisational affiliation
7. Think-tanks and policy organisations that undertake research and advocacy work
8. Peer-to-peer accommodation platforms and the associations and other organisations that represent them
9. Hotels and alternative providers of short-term accommodation and the associations and other organisations that represent them
10. Emergency services, including police, fire and rescue, and medical services
11. Home and contents insurance providers, including those developing products for the peer-to-peer accommodation market
12. Hosts who make their properties available using peer-to-peer accommodation platforms, ranging from home-owners making a room available sporadically through to "commercial hosts"
13. Guests who use peer-to-peer accommodation
14. Residents, as well as the associations and other organisations that represent them
15. Property developers and investors, as well as related advisors and agents

[7] Open Data Institute (2017), 'Research: what are the impacts of peer-to-peer accommodation platforms?', https://theodi.org/article/research-what-are-the-impacts-of-peer-to-peer-accommodation-platforms

We found that these stakeholders are interested in understanding numerous types of impacts, described in Table 1 below:

Impact type	Description
On the availability of long-term housing stock	The numbers of residential properties available to purchase or rent on a long-term basis. This can include comparative impacts on different types of property such as houses and apartments, or by value.
On property prices	The price of residential property available to purchase.
On property rental prices	The price of residential property available to rent on a long-term basis, often defined as for six months or more.
On tourism and visitors	The numbers of tourists or short-term visitors. This can include impacts on lengths of stays, expenditure and types/characteristics of visitors.
On alternative forms of short-term accommodation	The performance of hotels and other forms of short-term accommodation. This can include impacts on occupancy rates, profitability and employment.
On host income	The income generated by hosts who make their properties available to guests on a short-term basis.
On economic performance	The contribution to economic performance, often using indicators such as Gross Domestic Product (GDP). This can include impacts at local, national and sectoral levels.
On fire, health and safety, and other incidents	The prevalence and risks of fire, health and safety, and other incidents, including impacts on adherence to existing regulations and rules.
On noise levels, disturbance and antisocial behaviour	The incidence of noise, disturbance and antisocial behaviour.
On emergency services	The use of and demand for emergency services such as the police, fire and rescue, and medical services.
On other public services	The use of and demand for public services such as transport, refuse and recycling, parks and non-emergency medical services.
On the desirability of an area	The perceived attractiveness of an area to visit or move into. This includes impacts on existing residents and visitors, as well as potential ones.
On the sense of community in an area	The sense of community felt by residents and visitors. This can include impacts on the way people feel about their homes, neighbours, businesses and community.
On the environment	The consequences to the environment, such as impacts on energy consumption, water usage, waste and use of transport.
On tax revenues	The taxation of activity by peer-to-peer accommodation platforms, as well as by guests and hosts (such as personal income tax and business rates).

Table 1: Types of impacts of peer-to-peer accommodation

We have mapped each of the impact types to the stakeholders whom we found to have an interest in them in Figure 1 below:

Figure 1: Types of impacts of peer-to-peer accommodation and the stakeholders who are interested in them

These impacts types are presented neutrally. Whether an impact is considered positive or negative, or even non-existent, may depend on the stakeholder and their goals.

Many of these impact types are linked. For example, impacts on the availability of housing stock are likely to affect property prices. Similarly, the levels of noise, disturbance and antisocial behaviour may affect the desirability of an area or its sense of community. There may be a host of complex interactions that link multiple types of impact. The different types of impacts may also be grouped into broader topics or

domains: a group of national government officials with the remit of tourism policy may be interested in the impact of peer-to-peer accommodation on levels of tourism and visitors, on economic performance, and on alternative types of short-term accommodation.

Although different stakeholders have an interest in understanding the same types of impact of peer-to-peer accommodation, we found that their motivations are likely to differ. A national government official may be interested in an impact in their role as stewards or regulators of the market;[8] a platform will be interested as a market participant. The process of developing an understanding of the impacts of peer-to-peer accommodation and then acting on that understanding – for instance how it may be used to inform a planning or licensing decision made by a local government official – is not the focus of this report but is referenced at times in the following sections. Stakeholders are also interested in the impacts of peer-to-peer accommodation at different geographic and administrative levels. For example, a local government official responsible for planning decisions is likely to be interested in more local impacts than a national government official concerned with tourism across a country. Some are interested at impacts at local, national and international scales.

The type of impacts described in Table 1 are likely to evolve and change over time. Many of the interviewees we spoke to described the difficulty of identifying what types of impacts to measure or attempt to understand related to peer-to-peer accommodation, as well as the sharing or collaborative economy more broadly. This difficulty was generally attributed to the speed at which the peer-to-peer accommodation market has grown and its differences to traditional forms of short-term accommodation. Despite these challenges, almost all stakeholders stated a desire to increase their understanding of the impacts of peer-to-peer accommodation.

[8] As part of this project's discovery phase, we published a report exploring the different types of interventions local and national authorities have made to support the peer-to-peer accommodation market:
Open Data Institute (2018), 'Exploring interventions to support the peer-to-peer accommodation sector',
https://theodi.org/article/exploring-interventions-to-support-the-peer-to-peer-accommodation-sector

3. The role of data in understanding the impact of peer-to-peer accommodation

Our interviews and desk research found that there are different ways in which data is already being used to describe, provide evidence of and understand the impacts of peer-to-peer accommodation.

3.1 Airbnb data

Almost all information made available by peer-to-peer accommodation platforms describing their impact is published by Airbnb. This is, in part, likely due to its dominant share of the market (although it is difficult to find accurate figures describing its market share) and subsequently, the perceived scale of its impact.

Airbnb publishes summaries, reports and other documentation that include references to its impact. For example, it published its UK Insights Report "A look at the impact of home sharing across the UK" in 2017.[9] The report includes statistics related to hosts and listings, and guests and their economic activity at national and regional levels. Whilst some statistics in the report are clearly derived from data already held by the platform – such as data about its listings – the data and analysis used to generate others, like estimates of economic activity and contribution, is unclear.

Airbnb also produces reports that describe its impact in response to particular developments. It recently responded to a call for evidence by the Scottish Expert Advisory Panel on the Collaborative Economy[10] with a position paper entitled "The collaborative economy and tourism in Scotland".[11] Airbnb intended the report to "contribute to more informed recommendations" and included statistics based on data from its UK Insights Report as well as original analysis. Further statistics and figures related to the impact of its guests' and hosts' activities are also included in regulatory proposals Airbnb makes to local governments. For example, in a series of proposals made to the city of Edinburgh in January 2018, it described how "local families typically earned £3,600 per year by hosting guests from all over the world for around 38 nights of the year".[12]

In addition to reports, Airbnb has made some limited data available on the Airbnb Citizen website that describes its impact on particular cities. These overviews – for example, of

[9] Airbnb Citizen (2017), 'A look at the impact of home sharing across the UK', https://www.Airbnbcitizen.com/a-look-at-the-impact-of-home-sharing-across-the-uk
[10] Scottish Government (2017), 'Scottish Expert Advisory Panel on the Collaborative Economy', https://consult.gov.scot/digital-communications/collaborative-economy
[11] Airbnb (2017), 'Airbnb Position Paper; The Collaborative Economy and Tourism in Scotland', https://2sqy5r1jf93u30kwzc1smfqt-wpengine.netdna-ssl.com/wp-content/uploads/2018/01/Airbnb-Submission-to-the-Scottish-Expert-Panel-on-the-Collaborative-Economy-November-2017_Web.pdf
[12] Airbnb / Halogen Communications (2017), 'Press Release: Airbnb Unveils New Proposals for Edinburgh', https://greens.scot/sites/default/files/Airbnb_Edinburgh_press_position_combinepdf.pdf

the Airbnb community in Berlin[13] – are restricted to a small number of cities on a yearly basis and were last updated for 2015.[14]

Airbnb also shares data on an ad hoc basis with other organisations for research purposes, for example, to support a 2016 study into home sharing in London by the Institute for Public Policy Research (IPPR)[15] and research into the supply of accommodation during the 2016 Olympics in Rio.[16]

3.2 Third-party data intermediaries

In recent years, third-party data intermediaries such as AirDNA[17] and Inside Airbnb[18] have become popular providers of data related to the impact of peer-to-peer accommodation.

Data infrastructure[19] consists of data assets, the organisations that operate and maintain them, and guides and policies describing how to use and manage the data. Third-party intermediaries form an important part of the data infrastructure that is used to help understand the impacts of peer-to-peer accommodation. The ODI has recently used ecosystem mapping to understand the data, organisations and relationships that comprise data infrastructure, and also the organisations and communities that use and benefit from it.[20]

AirDNA says that it currently tracks around four million global Airbnb listings by scraping publicly available data about hosts and listings from the Airbnb website. It provides a number of services to users, most of which it charges for. These include an interactive map-based tool that presents information about individual Airbnb listings, reports on broader trends and raw data for further analysis. The types of information it generates include occupancy rates, average daily charges and property revenues. These services appear to be focused predominantly on supplying hosts and property investors with information on trends in the supply and demand for accommodation, and insights to support the pricing of accommodation.[21]

Inside Airbnb also provides access to data and a set of analytical tools that enable users to explore Airbnb activity in cities around the world. Inside Airbnb is similar to AirDNA in that it uses data about individual listings scraped from the Airbnb platform, although it appears to serve a different, less-commercial set of use cases. It says that it can be used to produce data in response to broad queries like “How many listings are in my neighbourhood and where are they?”, as well as more targeted ones such as “Show me all the highly available listings in Bedford-Stuyvesant in Brooklyn, New York City, which

[13] https://www.Airbnbcitizen.com/data/
[14] Airbnb has provided information about the methodology used to compile these overviews:
Airbnb Citizen (2015), ‘Data Methodology’,
https://www.Airbnbcitizen.com/data-methodology
[15] IPPR (2016), ‘Homesharing and London’s housing market’,
https://www.ippr.org/publications/homesharing-and-londons-housing-market
[16] World Economic Forum (2016), ‘Understanding the Sharing Economy’,
http://www3.weforum.org/docs/WEF_Understanding_the_Sharing_Economy_report_2016.pdf
[17] Airdna, https://www.airdna.co/methodology
[18] Inside Airbnb, http://insideAirbnb.com
[19] Open Data Institute, https://theodi.org/topic/data-infrastructure
[20] Open Data Institute (2018), ‘Using open data for public services’,
https://theodi.org/article/patterns-for-using-open-data-in-the-delivery-of-public-services
[21] Airdna, https://www.airdna.co/services/datafeed

are for the 'entire home or apartment' that have a review in the last six months AND booked frequently AND where the host has other listings."[22]

Different types of organisations – including public authorities and academic institutions – use data sourced from AirDNA and Inside Airbnb to analyse the impact of Airbnb activity. For example, recent studies by the School of Urban Planning at the McGill University on impacts in New York City[23] and Alasdair Rae's analysis of short-term lets in Edinburgh[24] rely on data from AirDNA data and Inside Airbnb respectively. Studies into the impact of peer-to-peer accommodation often combine data from these intermediaries with data from other sources, such as demographic data published by local public authorities. Some studies are then reported in popular media. For example, an article published by *Wired* in January 2018[25] referenced a number of studies and analyses, all of which were conducted using data, in part, from the two intermediaries.

Airbnb generally disputes the accuracy of data scraped by AirDNA and Inside Airbnb, and by extension, the outputs produced using data provided by them. This inaccuracy is often ascribed to the models used to infer listing occupancy and profitability. Also, as acknowledged in the City of San Francisco's analysis of the short-term rental market,[26] data related to other peer-to-peer accommodation platforms is not made available, either directly by platforms or via third-party intermediaries. As a result, most analysis focuses on Airbnb's activities only, which may distort their conclusions about the impacts of peer-to-peer accommodation, particularly for areas where other platforms are commonly used.

Airbnb's Terms of Service prohibit "use [of] any robots, spider, crawler, scraper or other automated means or processes to access, collect data or other content from or otherwise interact with the Airbnb Platform for any purpose".[27] AirDNA's and Inside Airbnb's legal basis for scraping and using data from Airbnb, and making it available to other users, is therefore unclear and questions the sustainability and legality of any applications, services or analyses that use this data. For example, Inside Airbnb asserts that the data it publishes is in the public domain, by publishing it under a CC0 waiver; it is unlikely, however, that it has the rights to do that unless it has a separate agreement with Airbnb.

There does not appear to be public debate about privacy issues related to the ways in which data scraped from Airbnb is used. For example, although available listings are displayed publicly to potential guests, the process of scraping data describing an individual property or room and using it outside of its original purpose – such as by enabling users to analyse patterns over time or to download and combine it with other datasets – may increase the risk that individual hosts could be identified. Currently, many decisions related to privacy sit with third-party intermediaries who scrape listing data –

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[22] Inside Airbnb, http://insideAirbnb.com/about.html
[23] Urban Politics and Governance research group McGill University (2018), 'The High Cost of Short-Term Rentals in New York City', http://www.sharebetter.org/wp-content/uploads/2018/01/High-Cost-Short-Term-Rentals.pdf
[24] Alasdair Rae, University of Sheffield (2018), 'Analysis of Short-Term Lets Data for Edinburgh', https://greens.scot/sites/default/files/AnalysisShortTermLetsDataforEdinburgh_AlasdairRae_PDF-FINAL_2.pdf
[25] Rowland Manthorpe (2018), 'Airbnb is taking over London – and this data proves it', http://www.wired.co.uk/article/airbnb-growth-london-housing-data-insideairbnb
[26] City and County of San Francisco Board of Supervisors (2015), 'Policy Analysis Report; Analysis of the impact of short-term rentals on housing', http://sfbos.org/sites/default/files/FileCenter/Documents/52601-BLA.ShortTermRentals.051315.pdf
[27] Airbnb, https://www.airbnb.co.uk/terms

Inside Airbnb states that the data it makes available for download “has been analysed, cleansed and aggregated where appropriate to facilitate public discussion”.[28]

Who can access data is the characteristic that most affects how it can be used to support decision-making or drive innovation. Data exists on a spectrum[29] of closed, shared or open, as shown below in Figure 2.

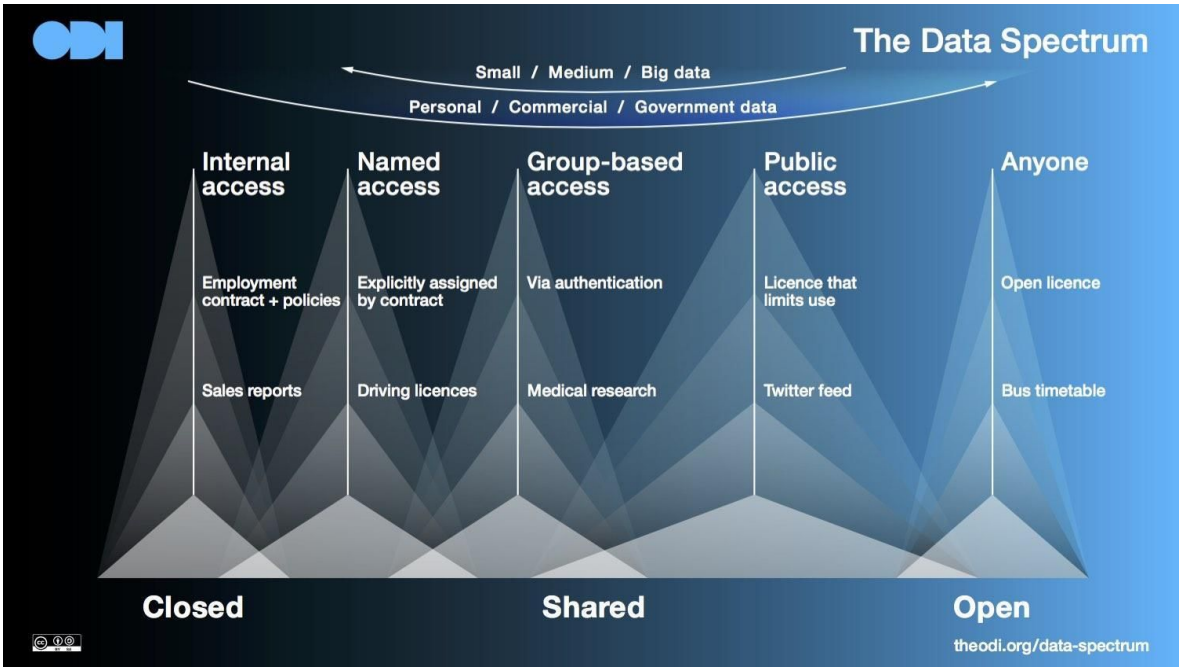

Figure 2: The Data Spectrum

Some of the types of data used to understand the impacts of peer-to-peer accommodation are made available as open data that anyone can access, use and share. This is mainly limited to data held by the public sector (described in Section 3.4), such as demographic characteristics of different areas and the outputs of business surveys. This data can be used without restriction in various studies and analyses.

Other data types exist within the shared part of the spectrum; this includes the data Airbnb sometimes shares with organisations for research purposes. The choice made by Airbnb and other peer-to-peer accommodation platforms not to publish, or share more widely, data that they hold has led to third-party intermediaries like AirDNA and Inside Airbnb scraping data from their websites. These intermediaries then make their own decisions about how users can access the data, such as by restricting it to users who pay for premium services or publishing it under certain licences.

The data relationship between private sector organisations and the places where they operate: examples from the transport sector

There is a wider debate about the ways that private sector organisations should make data generated by their products and services available to the towns, cities and other places in which they operate. This debate is perhaps strongest around operators in the transport sector who collect data about, and are thought to impact, public infrastructure at a significant scale.

[28] Inside Airbnb, http://insideAirbnb.com/get-the-data.html
[29] Open Data Institute, https://theodi.org/about-the-odi/the-data-spectrum/

Data collected by private sector transport providers could inform cities' decisions about their own public transport services, investment in physical infrastructure and much more. In response to demand for data it holds, Uber has developed Movement, an interactive mapping tool which aggregates data collected about its users' journeys and makes it available to help people understand traffic flows and patterns around cities. Similarly to Airbnb, it also shares data with some researchers. Uber's Head of Transportation Policy and Research, Andrew Salzberg, has recently said that the company is also "actively looking in a bunch of different directions to be able to share data in different ways and for different purposes".[30]

More than 100 transport planning departments around the world use Strava Metro data,[31] collected from app users tracking their running and cycling activities. The data describes aggregated cyclist and pedestrian activity such as popular or avoided routes, peak commute times and origin/destination zones. Strava Metro charges cities for access to data it holds. The cost varies based on the amount of Strava activity taking place; it was reported in 2014 that one year's-worth of data on cyclists in the city of Portland cost Oregon's department of transportation $20,000.[32] Strava states that it provides access to this data "to help improve infrastructure and safety for cyclists, runners and pedestrians".[33]

Paid data-sharing agreements and proprietary tools may not satisfy the demands that all cities have for data. In 2017 New York's Taxi and Limousine Commission introduced rules requiring rideshare and livery companies, including Uber and Lyft, to share detailed data about their passengers' journeys on a regular basis.[34] UK government and local authorities have legislated bus operators to open up data after other attempts to persuade them to do so failed.[35] A recent London Assembly Transport Committee report suggested that Transport for London (TfL) – which publishes open data that more than 13,000 developers now use to fuel their products and services – should expect "reciprocity",[36] where organisations who operate in London should be required to share data back to the city.

More cities are likely to consider making legislatory interventions to increase their access to data in the transport sector and beyond. For private operators, this is not the only reason that attempts to sell data to local and national authorities may not be sustainable. Users of products and services are gaining more control over data collected by private sector organisations, including through legislation like the General Data Protection Regulation (GDPR). They may prefer that data they contribute or is generated about them is made available to cities to help improve the infrastructure they use, rather than being monetised. Also, data that can be used for similar purposes may be collected by a number of other organisations,

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[30] Aarian Marshall (2018), 'Dying to Know Uber's Secrets, Data-hungry Cities get Creative', https://www.wired.com/story/uber-lyft-data-research-driver-pay/
[31] Strava, https://metro.strava.com/?_branch_match_id=500726494267820847
[32] Telegraph (2014), 'GPS big data: making cities safer for cyclists', https://www.telegraph.co.uk/technology/news/10818956/GPS-big-data-making-cities-safer-for-cyclists.html
[33] Strava, https://metro.strava.com/fa
[34] Aarian Marshall (2017), 'The Secret Uber Data That Could Fix Your Commute', https://www.wired.com/2017/02/ubers-coughing-data-nyc-fix-commute/
[35] House of Commons (2017), 'Bus Services Act 2017', http://researchbriefings.parliament.uk/ResearchBriefing/Summary/CBP-7545#fullreport
[36] UK Authority Data For Good (2018), 'Transport for London "should obtain data from apps"', http://www.ukauthority.com/data4good/entry/7940/transport-for-london-should-obtain-data-from-apps

products and services and so may not have unique value. In transport, Google, Apple and telecoms operators are likely to hold similar data to the transport providers about passenger trips.[37]

Rather than defer choices related to data access to legislation, private sector organisations could work collaboratively with cities to make the data they hold as open as possible while respecting privacy and commercial confidentiality. In the context of bike-sharing operators, Peter Wells has suggested that "if the bike sharing companies don't decide to be smart then I suspect the genuinely 'smart cities' will make the decision for them. Bike sharing companies will be welcomed, but only the companies that decide to provide better services by opening up their data. Smart companies will learn the lessons and get ahead of that particular game."[38]

Uses of data held by private sector organisations will extend far beyond those of the cities they operate in. Regulators, citizens and other individuals may want to use it to get involved in debates around policy. It could also support new products and services. By making data as open as possible, private sector organisations can support decision-making and drive innovation. Citymapper began publishing open data in 2017 about its Smartbus routes, stop locations, schedules and real-time arrival predictions. CityMapper was built using open data and the organisation sees the value of releasing their own – it "encourage[s] all transport operators to make their data freely available to enable innovation and accessibility".[39]

In some cases, there will be valid reasons why the data that cities require access to cannot be made available as open data – for example, the risk of re-identification of individual people whose journeys are described in the data. There is an ongoing challenge to find the level of aggregation and access that enables data to be as open as possible while protecting privacy and commercial confidentiality.

As in other sectors, making valuable data more widely available will be central to efforts to understand the impacts of peer-to-peer accommodation. As the Scottish Expert Advisory Panel on the Collaborative Economy has recently reported, "it is crucial that third party analysts focus on collaborating with platforms to access data at source, rather than relying on data-scraped information".[40]

[37] Peter Wells (2018), 'Will bike sharing benefit from learning some data lessons from other parts of transport?', https://hackernoon.com/bike-sharing-will-benefit-from-learning-some-data-lessons-9d777dbf360c

[38] It is reported that Washington DC has since forced Mobike to start opening up some data: https://twitter.com/oobr/status/973977824947253249.

[39] Citymapper, https://citymapper.com/smartride/opendata

[40] Scottish Expert Advisory Panel on the Collaborative Economy (2018), 'Scottish Expert Advisory Panel on the Collaborative Economy Report', http://www.gov.scot/Publications/2018/01/4152

3.4 Other data sources

As already described, the basis for many studies and analyses of the impact of peer-to-peer accommodation is the combination of data scraped from Airbnb with data from other sources.

Outside of AirDNA or Inside Airbnb, data is often sourced from business and consumer surveys related to the tourism and leisure industry. National tourism agencies and bodies such as VisitEngland and VisitBritain publish outputs from national surveys measuring the volume, value and characteristics of tourism, and other research.[41] STR[42] provides access to data (as well as reports and other documentation) on hotel performance for benchmarking, analytics and other insights. Its users include hotel owners and operators, investors, and researchers – STR data was used in Diane Coyle's and Timothy Yu-Cheong's study into the impacts of Airbnb in 14 European cities.[43] Studies such as "Impacts of peer-to-peer accommodation use on travel patterns"[44] adopt their own survey methodology to capture new data about the impacts of peer-to-peer accommodation.

Local and national governments are increasingly using surveys to capture data related to the sharing or collaborative economy, including in the peer-to-peer accommodation market. In the UK, the ONS has has developed a framework to support the collection and dissemination of statistics on sharing economy activity – related to both individuals and businesses – as part of its work to assess the feasibility of "measuring the sharing economy".[45] The ONS is also adapting or introducing new questions into some of its long-running surveys, such as those focused on GDP and inflation.[46]

Although our research unearthed other datasets that can be used to help understand the impacts of peer-to-peer accommodation, such as statistics related to property rental prices in an area, it was often difficult to identify definitive sources. Those we did identify were not always publically available, therefore limiting their use. In many cases, data that can be used exists at different levels of geographic and administrative scope, which can make it hard to combine or make comparisons.

Informal descriptions of the impacts of peer-to-peer accommodation are referenced in political discussions and debates around the world. In a November 2017 debate in the Scottish Parliament, for example, numerous constituent testimonies were directly quoted and "a very large number" of others were referenced.[47] The impacts these testimonies

[41] VisitBritain, https://www.visitbritain.org/england-research-insights
[42] STR, https://www.strglobal.com
[43] Diane Coyle & Timothy Yu-Cheong Yeung (2016), 'Understanding AirBnB in Fourteen European cities', https://www.tse-fr.eu/sites/default/files/TSE/documents/ChaireJJL/PolicyPapers/2016_30_12_pp_understanding_Airbnb_in_14_european_cities_coyle_yeung_v.3.1.pdf
[44] Iis Tussyadiah & Juho Pesonen (2015) 'Impacts of Peer-to-Peer Accommodation Use on Travel Patterns', https://www.researchgate.net/publication/282817382_Impacts_of_Peer-to-Peer_Accommodation_Use_on_Travel_Patterns
[45] Office for National Statistics (2017), 'The feasibility of measuring the sharing economy: November 2017 progress update', https://www.ons.gov.uk/economy/economicoutputandproductivity/output/articles/thefeasibilityofmeasuringthesharingeconomy/november2017progressupdate#potential-future-sources-of-information
[46] Philip Aldrick (2017), 'ONS plans to include "sharing economy" transactions such as Uber and Airbnb in GDP', https://www.thetimes.co.uk/article/ons-plans-to-include-sharing-economy-transactions-such-as-uber-and-Airbnb-in-gdp-z5w5h9t2q
[47] They Work For You, https://www.theyworkforyou.com/sp/?id=2017-11-08.22.0

describe – such as a report from an individual resident about the impact of peer-to-peer accommodation on their sense of community – have a more personal focus than the types of studies and analyses that rely on broader statistics. While seldom representative, these stories can make abstract numbers more tangible, engaging and useful. Access to both statistics and localised data may be needed to understand the impacts of peer-to-peer accommodation. In these political discussions and debates, a number of similar testimonies are sometimes used as evidence of wider trends, or of types or severity of impact.

Data describing the impacts of peer-to-peer accommodation can also be generated by cooperation between platforms and local public authorities.[48] Our discovery research found that some types of cooperation require property location and host identity data to be provided to local authorities as part of a property registration process.[49] Similarly, the Mayor of London's draft housing strategy states that the city will work with short-term letting operators to develop an information-sharing protocol to support councils' enforcement of the city's 90-day rule.[50] However, as data is not the focus of these types of cooperation, it is unclear whether the data they generate is also used to understand the impact of peer-to-peer accommodation.

[48] This cooperation is sometimes mandated via interventions made by local or national authorities, such as the introduction of regulation or other rules, and at other times is developed in collaboration between industry and authorities, or proposed by peer-to-peer accommodation platforms.
[49] Open Data Institute (2018), 'Exploring interventions to support the peer-to-peer accommodation sector and the role of data', https://docs.google.com/document/d/1H1jBPNtX6AIPSL60iLazCmhukVG0X_05AUU3s-a9CcQ/edit#
[50] Robert Booth & Dan Newling (2016), 'Airbnb introduces 90-day annual limit for London hosts', https://www.theguardian.com/technology/2016/dec/01/Airbnb-introduces-90-day-a-year-limit-for-london-hosts

4. Data observatories

The term “data observatory” was used frequently in the original discovery interviews and workshops we ran. It was used by different stakeholders to describe the possibility of bringing together data to enable people to better understand the impacts of peer-to-peer accommodation. As a result, we conducted further research into how the term is used in other sectors and contexts.

4.1 In the wild

We found a number of relevant examples of data observatories. The general concept appears linked to local information systems, or geographic information systems (GIS). These systems enable users to “load, store, analyse and present statistical data that has a strong geographic reference”, to provide “a place-focused evidence base that is easily accessible to a wide range of users including data experts, managers, policy makers, front-line staff and citizens”.[51]

Many modern data portals have similar functionality to these types of systems. A basic definition of a data portal is “a list of datasets with pointers to how those datasets can be accessed”,[52] helping users to discover data. Their inclusion of features such as data analysis and visualisation tools means that the distinction between a data portal, a local information or GIS system, and a data observatory is not always clear.

We have attempted to group the examples of data observatories we found:

- **Data observatories as policymaking tools**. A number of tools developed with the purpose of supporting policymaking share the characteristics and functions of other identified types of data observatories. Recent work by the Department for Work and Pensions on the Churchill tool was driven by the finding that policymakers rely on a combination of official government statistics and data about local communities.[53] The Churchill tool provides access to data from across government on-demand, and provides policymakers with tools to explore topics in more detail, and changes and trends over time. The Local Government Inform (LG Inform) tool[54] enables councils to access over 1,800 types of data to assess performance locally, regionally and nationally, and help them to make decisions about their local areas and services. The iCOASST project[55] provides real-time data, interactive maps, GIS tools and reports to support shoreline management and other long-term coastal decision-making.

- **Data observatories as collections of data held by the public sector**. We found numerous local data observatories, such as those covering East Riding[56]

[51] Wikipedia, https://en.wikipedia.org/wiki/Local_information_systems
[52] Leigh Dodds (2015), ‘What is a data portal?’, https://blog.ldodds.com/2015/10/13/what-is-a-data-portal
[53] Department for Work and Pensions (2017), ‘Data for people who don’t like data’, https://dwpdigital.blog.gov.uk/2017/02/24/data-for-people-who-dont-like-data
[54] Local Government Inform, http://lginform.local.gov.uk
[55] National Network of Regional Coastal Monitoring Programmes of England, https://www.channelcoast.org
[56] East Riding of Yorkshire Council Data Observatory, http://www2.eastriding.gov.uk/council/local-area-facts-and-figures/data-observatory

and North Lincolnshire,[57] which consist of collections of maps, statistics, facts, figures and data. Generally, these data observatories cover a broad range of topics including demography, housing and the economy based on data from sources such as local fire, police and health services. Data portals like the London Datastore,[58] data.gov.uk[59] and the European Data Portal[60] provide access to similar types of public sector data at city, national and multinational levels. These collections of public sector data are underpinned by a range of different software, such as CKAN,[61] DataPress[62] and InstantAtlas.[63]

- **Data observatories as collections of data by topic or theme**. Examples of this type are not generally referred to as data observatories but similarly gather data held by publicly funded organisations and provide users with tools to work with it. Examples in the UK include the Ministry of Housing, Communities and Local Government OpenDataCommunities,[64] MAGIC,[65] which provides access to mapping tools and data about the natural environment from across UK government, and MEDIN,[66] a portal for marine datasets from over 400 organisations and data archive centres. UK government recently launched the "Ethnicity facts and figures" website, which it describes as "the first of its kind, bringing together and publishing ethnicity data collected by government in one place".[67] We found data observatories to be particularly prevalent in the health sector. The WHO Global Health Observatory,[68] Public Health England (PHE) Fingertips[69] (which replaced PHE's network of health observatories)[70] and PHE data and analysis tools[71] all represent collections of data related to different health topics, including by diseases or conditions.

- **Data observatories as academia-led initiatives**. Funded by the Newcastle University Science Central, the Urban Observatory[72] is an attempt to provide access to data collected by real-time sensor feeds from across the city. It aims to provide a baseline for research into urban issues. A number of universities are involved in the global Web Observatory initiative[73] to develop interactive real-time systems for capturing, storing and analysing data about the web and its users. In contrast to other examples of data observatories we have found, initiatives such as these involve the collection of data from new sources or in original ways, as well as enabling its presentation or analysis.

- **Data observatories as data sharing platforms**. Platforms that enable organisations to share data with one other, or with specific types of users,

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[57] North Lincolnshire Data Observatory, http://nldo.northlincs.gov.uk/IAS_Live/
[58] London Datastore, https://data.london.gov.uk
[59] Data.gov, https://data.gov.uk/
[60] European Data Portal, https://www.europeandataportal.eu
[61] Wikipedia, https://en.wikipedia.org/wiki/CKAN
[62] DataPress, https://datapress.com
[63] InstantAtlas, https://www.instantatlas.com/extra
[64] OpenDataCommunities, http://opendatacommunities.org
[65] MAGiC, http://magic.gov.uk/home.htm
[66] Marine Environmental Data & Information Network, http://www.oceannet.org/
[67] Ethnicity Facts and Figures, Cabinet Office, https://www.ethnicity-facts-figures.service.gov.uk
[68] World Health Organisation, Global Health Observatory, http://www.who.int/gho/en/
[69] Public Health England, Public Health Profiles, https://fingertips.phe.org.uk/
[70] Public Health England, Network of Public Health Observatories, http://webarchive.nationalarchives.gov.uk/20170106081009/http://www.apho.org.uk/
[71] PHE Data and Analysis Tools, https://www.gov.uk/guidance/phe-data-and-analysis-tools
[72] Urban Observatory, http://www.urbanobservatory.ac.uk/
[73] Web Science Trust, Web Observatories, http://www.webscience.org/web-observatory/list-of-web-observatories/

can be interpreted as data observatories with limited access. For example, the Infectious Diseases Data Observatory[74] seeks to provide a platform for the research community to share data, with access managed by data contributors and the wider community. Although access to the data can be restricted, the outputs of its use (such as reports and data visualisations) are made publicly available on the platform. Similarly, the Clinical Study Data Request (CSDR) platform[75], which consists of a consortium of pharmaceutical companies and other data providers, aims to support scientific decision-making and innovation by facilitating wider access to data. Researchers can use the platform to request access to anonymised patient-level data and/or supporting documents from clinical studies. CARTO Data Observatory software[76] supports businesses to derive spatial insights for marketing, site planning and investment decision-making. It enables users to combine their own data with other demographic, economic and real estate datasets.

- **Data observatories as data and tools made available by private sector organisations**. A recent trend that can be associated with the concept of data observatories is private sector organisations making data about the use of their services publicly available. Uber Movement is an interactive mapping tool that enables the public to explore routes and travel times between areas of cities based on Uber passengers' journeys. Its aim is "to help urban planning around the world".[77] Strava makes its Global Heatmap[78] available for people to explore the aggregate routes of cyclists and runners around the world. Its Metro tool aggregates data generated by millions of rides and runs (via individuals' smartphones or GPS devices), and provides access to departments of transportation and city planning groups to improve infrastructure for bicyclists and pedestrians.[79]

- **Data observatories as physical environments**. The majority of the data observatories we found are virtual and web-based. A few, however, are physical – such as the Data Observatory at Imperial College London,[80] which consists of 64 large screens for data visualisation, and the Bristol Data Dome.[81] This category of data observatory would also include government control rooms of the past such as Project Cybersyn,[82] an early 1970s attempt to build a system to receive, store and use information for decision-making by the Chilean government.

- **Data observatories as organisations, processes and teams**. The Kent Public Health Observatory[83] is staffed by the Kent County Council. It produces analysis, knowledge and evidence to improve health and wellbeing across Kent, including in the form of health and social care maps, weekly bulletins and annual reports. Teams from across the council can contact the observatory and make requests for analysis, which are then reviewed, prioritised and completed.

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[74] Infectious Diseases Data Observatory, https://www.iddo.org/about-iddo
[75] ClinicalStudyDataRequest, https://www.clinicalstudydatarequest.com/
[76] Carto, https://carto.com/data-observatory/
[77] Uber Movement, https://movement.uber.com/cities?lang=en-US
[78] Strava, https://labs.strava.com/heatmap/#7.00/-120.90000/38.36000/hot/all
[79] Strava, https://metro.strava.com/?_branch_match_id=500726494267820847
[80] Imperial College London Data Observatory, http://www.imperial.ac.uk/data-science/data-observatory/
[81] Bristol is Open (2015), 'Bristol Is Open Launches The Data Dome', http://www.bristolisopen.com/bristol-is-open-launches-the-data-dome/
[82] Wikipedia, https://en.wikipedia.org/wiki/Project_Cybersyn
[83] Kent Public Health Observatory, https://www.kpho.org.uk/

These types of data observatories share some characteristics. In most cases, they define a particular "universe" to be observed, such as a theme or topic, or geographic area. Most provide tools for users to explore, analyse and interpret data. Their collective difference to data portals is that they are developed with a purpose, or set of purposes, in mind beyond aiding in the discovery of data.

While the term "observatory" implies a certain neutrality, this purpose ties data observatories closely towards a particular set of data users, the impacts they are trying to understand and the decisions they are trying to make. In several cases there are multiple observatories with a different lens on the same thing – like a city or a sector – but meeting different sets of user needs. Data observatories might not provide recommendations or direct action, but the choices made about the data they incorporate, how different datasets are brought together and compared, and which timescales are considered, facilitate some kinds of analyses and limit others. The purpose of the data observatory, and the organisation that has made these choices, are important factors for those using them to consider.

There are also some significant differences between the types of data observatories we found, which highlight factors to consider when designing data observatories for different user needs. For instance, they can allow for different granularities of data and analysis in terms of geography and time. Some enable users to explore monthly or yearly data at a regional level, whereas others enable users to explore data at the level of individual real-time sensors. The data observatories also have different models for funding, governance and sustainability – some are led by local authorities and others by academia or industry.

4.2. In peer-to-peer accommodation

There is a growing demand for data related to the impacts of peer-to-peer accommodation and the activities of the sharing or collaborative economy more widely. The Boston Hospitality Review has made the point that currently "there is little empirical evidence of the economic or social impacts of [peer-to-peer accommodation]... Thus, the course and the magnitude of these impacts do not go beyond speculation for the time being".[84]

This demand for data was summarised by the Scottish Expert Advisory Panel on the Collaborative Economy report published in January 2017,[85] which found that:

- "the collaborative economy is data-rich, and many advances have been made in the use of data to guide public and policy choices and improve user experiences (for example live transport data sets)... Nonetheless, we do not have accurate and up-to-date data sets that show the impact of the collaborative economy in Scotland"
- "without this input, the Scottish government cannot effectively understand the ongoing trends that are shaping its economy and communities"

[84] Tarik Dogru, Makarand Mody & Courtney Suess (2017), 'Comparing apples and oranges? Examining the impacts of Airbnb on hotel performance in Boston', http://www.bu.edu/bhr/2017/06/07/Airbnb-in-boston/

[85] Scottish Expert Advisory Panel on the Collaborative Economy (2018), 'Scottish Expert Advisory Panel on the Collaborative Economy Report', http://www.gov.scot/Publications/2018/01/4152

The panel recommended that the Scottish government:

- “set up an observatory into the collaborative economy… [to] collect, aggregate, analyse and publish a variety of datasets that show the ongoing impact of collaborative economy platforms in Scotland. This would be a new way for platforms (local authorities and conceivably workers) to agree to share certain data and would address the clear data and evidence gaps that exist in order to track activity and impacts”
- “continue the work of this panel to bring together industry (both innovators and incumbents), policy makers and stakeholders in an open dialogue with regulators; and making the most of new tools for public engagement at scale as an input to deliberating decisions on regulation”
- “resource the collection of an evidence base in considering restrictions on short-term rentals… taking into account the number of dedicated lets in any given area, the impact on rent/housing costs and the cost/benefit of loss of economic benefit to renters and the local areas”

The comments made by the panel summarise wider demand for data that can be used to describe, provide evidence of and understand the impacts of peer-to-peer accommodation.

Various examples of data observatories we found from other sectors and contexts may be applicable to the peer-to-peer accommodation market. Multiple data observatories could combine the features of numerous types of data observatory described in Section 4.1. For example, one may exist as a collection of datasets by theme, use data and tools made available by platforms, and be designed as a tool to support policy-making in housing. A data observatory may be used by a national or local authority to inform their decisions about different interventions into the peer-to-peer accommodation market, or whether an intervention is required at all. Another could combine some of the same datasets, incorporate more data about fire, health and safety, and other incidents to assist in decisions about where to prioritise emergency services capacity.

5. Findings and recommendations

5.1. Findings

In summary of the findings described throughout this report:

Stakeholders and the impacts of peer-to-peer accommodation they focus on

1. *A diverse set of stakeholders are interested in the impacts of peer-to-peer accommodation*. These stakeholders include local and national government officials, emergency services, and hotels and alternative providers of short-term accommodation. (p 4)

2. *Stakeholders are interested in a variety of different impacts of peer-to-peer accommodation*. These range from those that are more readily quantifiable, such as impacts on tourism and visitors, to the more abstract, including impacts on the desirability of an area and the sense of community. (p 5)

3. *Different stakeholders share interests in the same types of impacts of peer-to-peer accommodation*. For example, the impacts on tourism and visitors are of interest to statistical organisations such as the ONS, as well as residents and peer-to-peer accommodation platforms themselves. (p 6)

4. *Stakeholders are generally interested in the impacts of peer-to-peer accommodation for different purposes.* For example, platforms will seek to understand the impacts of their activity and the market to make decisions to sustainably grow their businesses, while emergency services want to make decisions about where resources should be prioritised. (p 7)

5. *Stakeholders are interested in the impacts of peer-to-peer accommodation at different geographic and administrative levels*. Although some stakeholders are clearly defined in these terms – such as both local and national government officials – some stakeholders can be interested in impacts at multiple different levels. For example, a peer-to-peer accommodation platform may be interested in its impacts at local, national and international scales. (p 7)

6. *We are in the early stages of understanding the types of impacts peer-to-peer accommodation may have*. The rapid growth of the peer-to-peer accommodation market and the wider sharing or collaborative economy means that it can be difficult to identify types of impacts to attempt to describe, provide evidence of and understand. (p 7)

7. *Stakeholders want to increase their understanding of the impacts of peer-to-peer accommodation.* Generally, the stakeholders we interviewed are seeking to improve their understanding of the impact of the market and its activity in order to make better decisions for their organisations. (p 7)

The role of data in understanding the impact of peer-to-peer accommodation

8. *The data that can be used to understand the various impacts of peer-to-peer accommodation has multiple sources.* These sources span the public and private sectors and different types of organisations, including local and national government, statistical organisations, and business and consumer surveying organisations. Indeed, one given impact may only be addressed using data from multiple sources, which may require coordination in order to combine them. (pp 8–15)

9. *Data that can be used to understand the impacts of peer-to-peer accommodation is not always easy to find and access.* Data related to the various impacts are not made available consistently, nor in formats that make them readily usable as inputs into a study or analysis. (pp 14)

10. *Data that can be used to understand the impacts of peer-to-peer accommodation exists at different levels of geographic and administrative scope.* Data such as constituent reports may describe an individual incident, property or guest, whereas some of the studies and analyses published by academic institutions have a city-wide, or even regional, focus. (pp 8–15)

11. *Nearly all studies and analyses focus on the impacts of Airbnb rather than peer-to-peer accommodation platforms and activity more widely.* This appears to be due in part to Airbnb's significant market share, but also the fact that third-party intermediaries do not currently scrape data from other platforms and make it available to other users. (pp 10)

12. *Peer-to-peer accommodation platforms hold vast amounts of data that could be used to understand the market's impacts, but restricted access to this data inhibits its use.* Platforms such as Airbnb make some limited data available via reports, websites and ad hoc sharing arrangements, but do not share data with stakeholders (such as local and national government) or publish data in a routine or consistent way. This has fuelled the rise of third-party intermediaries such as AirDNA and Inside Airbnb, who provide access to data scraped from Airbnb and support a whole host of downstream studies, analyses and other activity. As a result of the reliance on scraped data, there is often debate surrounding the accuracy of the outputs of these activities as opposed to debate about the impacts of peer-to-peer accommodation. (p 11)

13. *The privacy implications related to the way in which data is currently used to understand the impact of peer-to-peer accommodation are unclear.* Although most platforms make their hosts' listings publicly available, third-party intermediaries such as AirDNA and Inside Airbnb use, and enable others to use, the data they scrape for purposes beyond merely choosing a place to stay. Although some limited information about aggregation is published by these intermediaries, there does not appear to be much debate around this topic. (p 10)

14. *Not all data that can be used to understand the impacts of peer-to-peer accommodation is collected, managed or used in a coordinated way.* For example, while business surveys are explicitly designed to collect data about certain stakeholders and impacts, the reports from constituents referred to by politicians are not underpinned by a similarly robust process. Despite this, these informal descriptions contain rich information about people's experiences of impact. A lack of structured data – or even the ability to describe a type of impact in a structured way – might make it difficult to evaluate the wider extent of an impact, but there may be evidence of it nonetheless. (p 10)

15. *There is demand for increased access to data related to the impacts of peer-to-peer accommodation, including via a data observatory*. Developing a data observatory may be one approach to increasing access to data. Data infrastructure in the peer-to-peer accommodation market that is as open as possible, whilst respecting privacy, will support a breadth of different uses to help decision-making and drive innovation. (p15)

Data observatories

16. *The term "data observatory" is used to describe a wide range of services outside of the peer-to-peer accommodation market*. Types of data observatories we found include collections of data held by the public sector, policy-making tools and even physical environments. (p 16)

17. *Data observatories outside of the peer-to-peer accommodation market have some similar characteristics, but also some significant differences*. The majority are defined by a theme, topic or geographic area, and provide tools for users to work with data. There are differences, however, in the organisations responsible for them and in the level of granularity of analysis they allow. (p 19)

18. *Data observatories could help increase understanding of the impacts of peer-to-peer accommodation.* There is demand for more data that can be used to understand the impacts of peer-to-peer accommodation. Data observatories may help bring together datasets from different sources and provide tools for users to explore, analyse and interpret the data. (p 19)

19. *It is unlikely a single peer-to-peer accommodation data observatory will meet all stakeholder needs.* In this report we have described a diverse set of stakeholders, impacts and types of data observatories. Given this diversity, it may be that – alongside other types of data infrastructure – multiple data observatories could support better understanding of the impacts of peer-to-peer accommodation. Data observatories could be scoped by a combination of factors, such as types of stakeholder, geography, and/or the type of impact that needs to be understood. (p 20)

5.2. Recommendations

Improving the understanding of the impacts of peer-to-peer accommodation through access to data, evidence and informed debate is critical to ensuring that the decisions made by different stakeholders maximise the benefits of peer-to-peer accommodation and mitigate its costs.

Based on the findings of our research, we have developed five recommendations focused on improving the understanding of the impact of peer-to-peer accommodation market:

1. Public and private sector organisations that hold data should commit to working together to build data infrastructure that is as open as possible while respecting privacy and commercial confidentiality.

Data infrastructure that is as open as possible will support decision-making and drive innovation. It will make it easier for stakeholders with different needs to understand impacts and make better decisions. Creating and using data observatories is one way to achieve this.

Key stakeholders in creating, maintaining and improving this data infrastructure include local and national government officials, peer-to-peer accommodation platforms and statistical organisations.

The ODI's data infrastructure principles[86] provide some guidance to help ensure that this infrastructure is built incrementally and that it meets data user needs.

2. National government officials should facilitate and support the creation of open data infrastructure in the peer-to-peer accommodation market and the development of data observatories.

It is in national government's interest for local government to have the powers it needs to make decisions that are devolved to it, and access to the data that will help it make those decisions. National government officials should help facilitate conversations and encourage private sector organisations to publish and share data to a useful standard. It should also ensure that local government has any new powers that it requires to undertake new types of intervention, and, potentially, powers to compel the release of certain types of data from organisations if needed.

3. Local government officials should create environments that can support the development of data observatories.

Recent ODI research has identified three patterns for using open data in the delivery of public services.[87] One of these patterns focused on using data to build services that support more informed policy development. This pattern could describe the future development of a data observatory, or multiple data observatories, to support better understanding of the peer-to-peer accommodation market.

This research also identified the characteristics of environments in which these types of services are built – such as organisational collaboration, strong technology infrastructure, digital skills and literacy, open standards for data, and peer networks.

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[86] Open Data Institute (2016), 'Principles for strengthening our data infrastructure', https://theodi.org/article/principles-for-strengthening-our-data-infrastructure/
[87] Open Data Institute (2018), 'Using open data for public services', https://theodi.org/article/patterns-for-using-open-data-in-the-delivery-of-public-services/

Creating this environment will need a senior champion – such as a local mayor, chief executive or chief data officer – who can use their convening or regulatory powers to bring together the multiple stakeholders in the public and private sectors who hold data and those who want to use it to make better decisions.

4. Stakeholders with similar needs should develop data observatories collaboratively.

Different stakeholders seeking to understand the impacts of peer-to-peer accommodation may have shared needs that can be met by a data observatory. These needs may cluster based on types of stakeholder (such as officials across a local authority), geography (such as particular local area), and/or the type of impact in focus (such as tourism).

Public sector design standards, like those developed by the UK's Government Digital Service or the US Digital Service, provide guidance on how to design services. Data standards are also an important part of data infrastructure – the ODI has shared findings on approaches to developing standards and the impact of open data standards.[88] The development of data observatories may also help to build out wider data infrastructure, as each one may highlight the need for additional types or sources of data, which engaged data holders can work together to release, improve or share.

5. Local and national government officials should engage with different stakeholders to inform decision-making related to the impacts of peer-to-peer accommodation.

A better understanding of the impacts of peer-to-peer accommodation will help policymakers to make informed decisions. It is important, however, that these decisions are also informed by input from stakeholders such as statistical organisations, academic and research institutions, independent researchers and residents. This input is key to gathering data or information that is not collected, managed or used in a structured way, such as the reports of individuals who may have benefited from the peer-to-peer accommodation market and those who may have been adversely affected.

[88] Open Data Institute (2018), 'Open standards for data: adoption, approaches and impact', https://theodi.org/article/open-standards-for-data-adoption-approaches-and-impact/