

# Hosting major events: understanding the impacts of short-term rentals in Glasgow during COP26

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## Summary

Existing research analysing properties available for short-term rental on Airbnb focuses on long-term impacts. There is still a gap to examine abrupt market growth due to mega events like COP26 in Glasgow. By employing Airbnb daily scrapings, this paper summarized spatiotemporal trends and patterns of new Airbnb entire home listings and their impact on neighbourhoods with different social characteristics. We found growth in both deprived and affluent areas during the event. The growth in deprived neighbourhoods, with a smaller Airbnb market in 2020, is consistent. The benefit of responding to the surge in demand, however, is more enjoyed by affluent neighbourhoods.

**KEYWORDS:** Short-term rental, Airbnb, COP26

## 1. Introduction

The rapid growth in short-term rentals (STRs), facilitated through platforms such as Airbnb, could put pressure on existing public services (Belk 2014); undermine communities' quality of life (Perkins 2019); and magnify housing affordability issues (Wachsmuth and Weisler 2018). Conversely, it may generate income for hosts (Kolar and Zabkar 2010); bring out economic activity through spending from out-of-town visitors (Harrison et al. 2017); support the upgrading of urban amenities (Hidalgo et al. 2022), and create employment (Alyakooob and Rahman 2019). There is a lack of understanding of how neighbourhoods accommodate abrupt changes in demand for STRs.

From the 31<sup>st</sup> of October to the 13<sup>th</sup> of November, Glasgow hosted the United Nations Climate Change Conference of the Parties, COP26. Around 30,000 delegates were expected to visit the city with 15,000 hotel rooms (STV News 2021). The challenges of accommodating the demand were exacerbated by uncertainty over Covid-19 travel restrictions. Many visitors did not finalise their travel until October (Financial Times 2021). On the 28<sup>th</sup> of September, Airbnb offered £100 incentives to attract new hosts to the platform amid the accommodation crisis (Airbnb 2021). As a result, an abundance of properties was advertised during the COP26 period (Glasgow Live 2021).

A challenge to understanding the response to such an event is a lack of data. Proprietary AirDNA data is too expensive for many researchers. Open data from InsideAirbnb provides sparse data for some cities<sup>5</sup>. The gaps between data points make it difficult to track properties entering and leaving the market (Barron et al. 2019).

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<sup>5</sup> <http://insideairbnb.com/explore/>

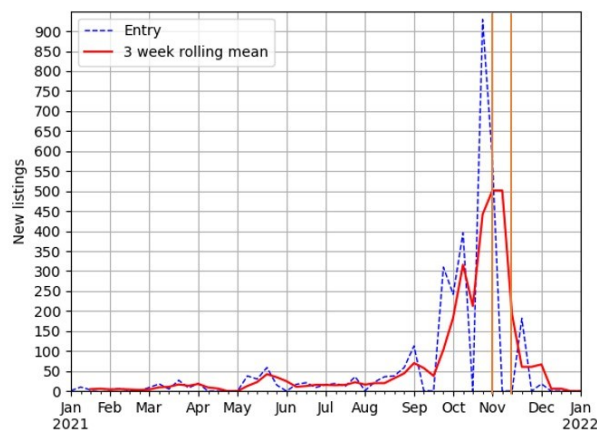
To address this challenge, the Urban Big Data Centre (UBDC) began to scrape data daily from the Airbnb website in 2020. The codebase is available on GitHub<sup>6</sup>. This paper employs these scrapes to identify how the surge in demand in Glasgow was accommodated. Questions include the distribution of new listings across neighbourhoods, and the extent to which they are concentrated in areas where STR was already well-established. We focus on entire-home listings (70% of total listings) because they are mostly relevant for regulators (Scottish Government 2022a).

## 2. Data and Method

### 2.1. Data

In total, 9675 listings were observed at least once in Glasgow in 2021. Restricting this to typical home types (e.g., flats, terraced houses) rented as entire homes, leaves 5073 listings.

To identify a new entry, we check the listing's status back to April 2020 when scraping began. If there are no records April-December 2020 but the listing became retrievable<sup>7</sup> during 2021, we treat it as a new listing. The date when it was first retrievable is its entry date. This gives 3222 new and 1851 existing listings. Figure 1 shows the weekly entries of new listings<sup>8</sup>. We see that new listings started to increase around September. A surge of entries can be observed around the COP26 period. The increasing trend slowed down after the event in December.



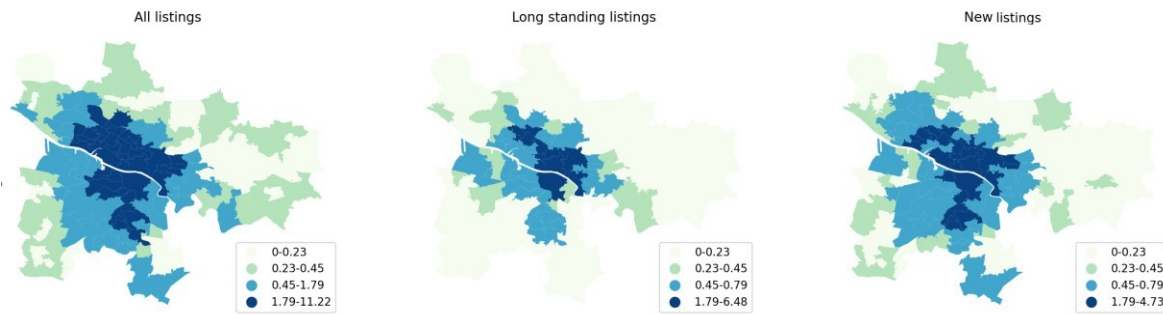
**Figure 1.** Weekly new entries (vertical orange lines: start and end of COP26).

We measure the spatial distribution of new entries, long-established listings, and all listings as a ratio of total dwellings aggregated to Intermediate Zones (National Records of Scotland 2021). Figure 2 shows that new listings expanded the STR marked beyond the city centre.

<sup>6</sup> <https://github.com/urbanbigdatacentre/ubdc-airbnb>

<sup>7</sup> 'Retrievable' means the listing has some content displayed on the platform.

<sup>8</sup> There were technical issues around September/October which caused gaps in observations. Listings created during those gaps were not captured until scraping resumed. Smoothing provides a better picture. The following trends show a 3-week rolling mean.



**Figure 2.** Spatial distribution of the listings as a percentage of total dwellings in neighbourhoods.

## 2.2. Method

We identify the level of deprivation for each listing's neighbourhood<sup>9</sup> and assign a measure of Income Deprivation from the SIMD 2020<sup>10</sup>. We compare the number of new entries with the number of total dwellings (a) and established listings (b). We aggregate the ratios by deprivation quartile. The spatiotemporal patterns reflect new STRs being created in neighbourhoods relative to housing stock and established STRs.

## 3. Result

The ratios are summarized in Table 1 which shows that STRs have a higher share of the housing stock in affluent areas and that these areas also had more new entries while deprived neighbourhoods with fewer STRs, have more new listings relative to established listings.

**Table 1** Summary of listings by deprivation

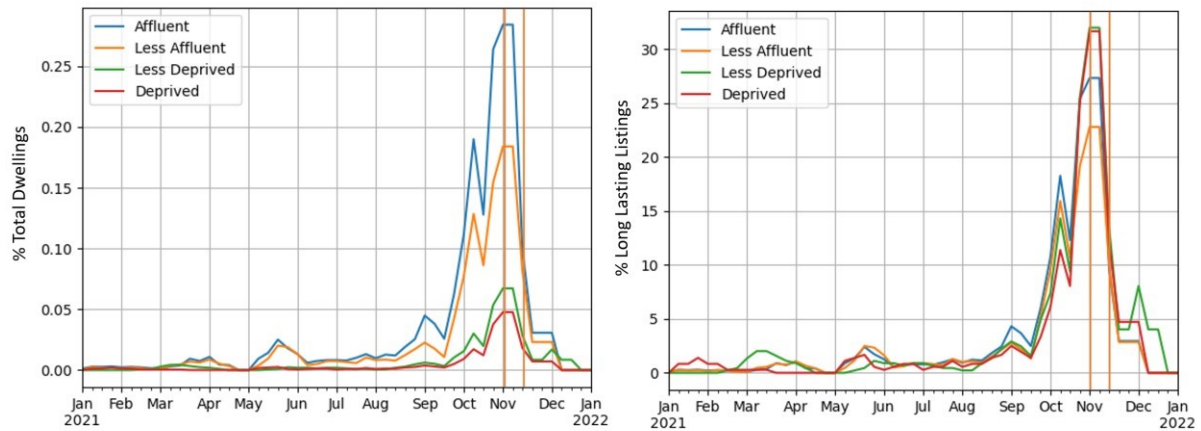
Deprivation quartile	Long-Established Listings (% of Total Dwellings)	New Entries (% of Total Dwellings)	% of New Entries/Long-Established Listings
Affluent	927 (1.04)	1697 (1.90)	1.83
Less Affluent	655 (0.81)	1034 (1.27)	1.58
Deprived	149 (0.21)	287 (0.40)	1.93
Deprived	120 (0.15)	204 (0.26)	1.70

The pattern of the ratio of STR listings to total dwellings, Figure 3 (a), shows that new listings entered from March-April and started to increase after May. The trend peaked in the first week of November after a sharp increase from September. It then eased until December. Deprived neighbourhoods have later and lower increases. STR may bring 'opportunities' for a city, but these seem to be concentrated in the most affluent areas. The ratio of STR listings to the total number of established STR listings (Figure 3 (b)) shows that the increasing trend started in March-April in deprived neighbourhoods. It increased sharply to its peak, over 30% in the first week of November. This is higher than affluent

<sup>9</sup> Listing location is blurred, introducing noise but not bias.

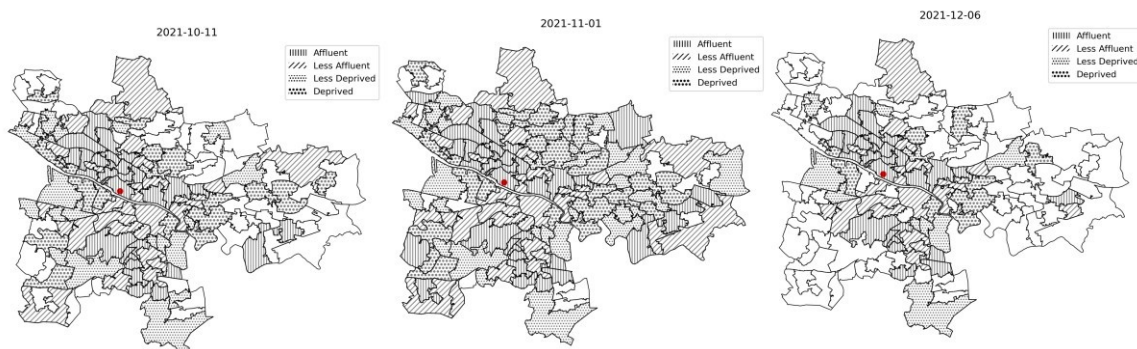
<sup>10</sup> We calculate the SIMD income deprivation ratio by aggregating the income deprived population at Intermediate Zones and normalizing by population. This gives a relative deprivation measure for Glasgow.

neighbourhoods, which peaked at around 20%. It indicates that new listings are likely to be larger relative to the existing market in the deprived neighbourhoods, where the STR market was smaller.



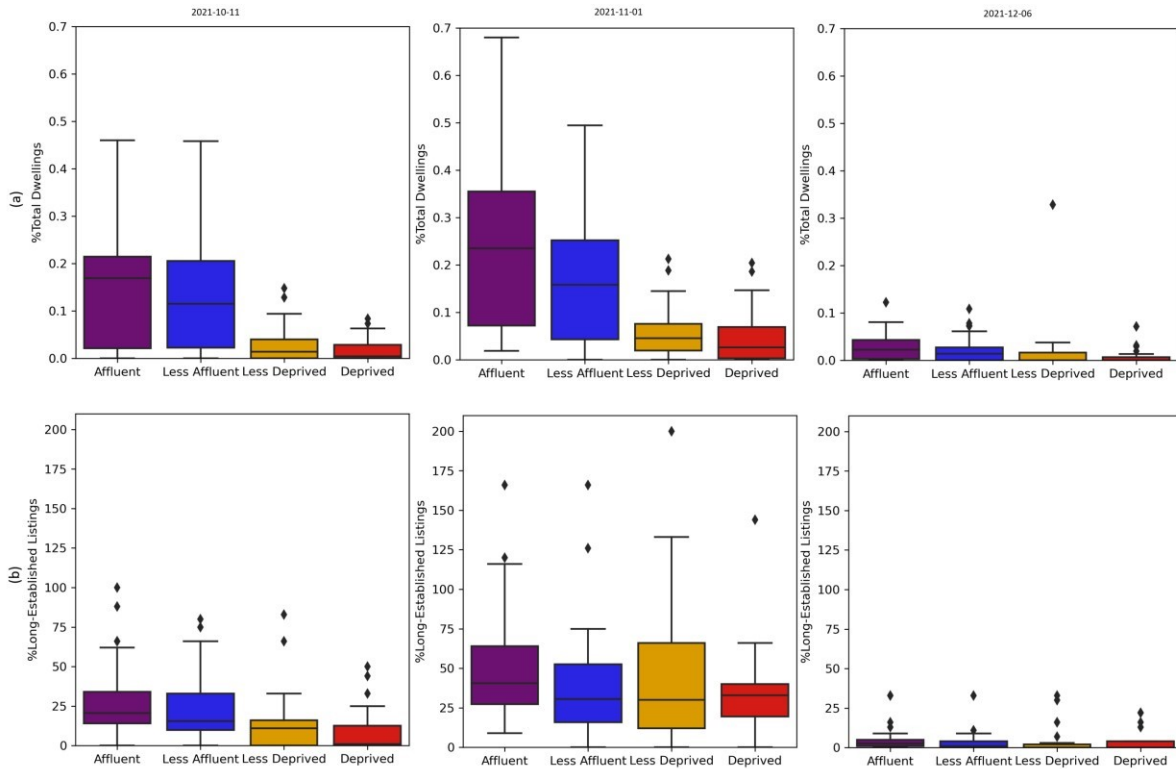
**Figure 3.** Weekly pattern of ratio of new STR listings to total dwellings (a) and ratio of new STR listings to (b) established STR listings.

We plot the distribution of the two ratios focusing on weeks before, during, and after COP26. Figure 4 shows that new listings were more likely to start developing in affluent neighbourhoods in the city centre, the west, and the south of the city before COP26. During COP26, more deprived neighbourhoods outside the centre join the growing set. After COP26, the number of new entries drops in the outskirt neighbourhoods of the city.



**Figure 4.** New entries to the total dwellings before, during, and after COP26. The neighbourhoods accommodating new entries were filled with line and dot patterns for deprivation quartiles. SEC centre is marked with red.

The distribution of the two ratios, shown in Figure 5, confirms that affluent neighbourhoods, with large existing STR market, had more new listings during COP26. STR in some deprived neighbourhoods continue to grow, shown with higher ratios both aspects, after the event.



**Figure 5.** The ratios of new listings to total dwellings (a) and to long-established listings (b).

#### 4. Conclusion

This paper analyzed new STR listings during COP26 in Glasgow. Results show that some deprived areas see continuous growth, but that absolute growth was highest in affluent areas with a strong existing STR market. The consistent continuous growth entries in relatively deprived neighbourhoods may indicate a hysteresis effect of meeting the demand for the mega event. Future work includes categorizing new entries into finer groups, understanding the performance of the new entries, and exploring room-sharing patterns.

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