Special Interests vs. the Public Interest: The Cost of STR Restrictions on Households, Cities, and Visitors

Prepared for

Airbnb

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1. INTRODUCTION

1. Short-term rentals ("**STRs**") in the United States date back to its founding,[1] have had an integral role in U.S. history,[2] and have long been available in many communities before the arrival of Airbnb and VRBO. STRs provide consumers with a competitive alternative to hotels and help property-owners earn income and afford their homes. They also generate income for those who provide services that owners use to manage their STRs (e.g., cleaners) and for those who provide services to STR guests (e.g., restaurants, coffee shops, and event venues). Finally, state and local governments share in the economic value STRs create through the taxes they levy on STRs and the services that result from them.

2. Despite the distributed benefits that STRs and related platforms create, they face opposition. Since STRs compete with hotels and reduce their pricing power, hotels benefit from restrictions on STRs. It should come as no surprise, therefore, that hotel associations have sought influence over STR regulation and made large contributions to the campaigns of local officials with the power to restrict STRs.[3] The most dramatic example of this dynamic is New York City ("**NYC**") and the passage of Local Law 18 ("**LL18**"). The law made STR hosting prohibitive, reducing the STR listings on Airbnb by around 80%.[4, 5] As a result, hotel prices in NYC have surged, despite minimal increases in hotel occupancy rates, and travelers to NYC face less diverse choices for short-term lodging.[6] These stringent STR restrictions are a classic example of well-coordinated incumbents promoting regulations that impose substantial and more widespread costs on competitors and the U.S. consumer.[7] Indeed, the law caused hotel prices for travelers to NYC to increase by

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1 Gouverneur Morris stayed at Mary Dalley's boarding house – effectively an STR – during the 1787 Constitutional Convention. Dally received tenants, including many members of Congress, at her boarding house for more than two decades yet did not own the building. Statutes and Stories. (2022, October 9). *Primary sources from Miss Dally's boarding house: Receipts and tax records (Part III)*. Retrieved October 8, 2024, from https://www.statutesandstories.com/blog_html/primary-sources-from-miss-dallys-boarding-house-receipts-and-tax-records-part-iii/

2 Catalano, R. (2024, November 9). How the forgotten tourist homes of the 1930s predicted Airbnb. *The Washington Post*. Retrieved December 3, 2024, from https://t.co/CPgesSWUUE

3 Marsella, A., Wagner, G. A., Melo, V., Anastasi, S., & Stephenson, F. (2024, June 17). The political actors behind Airbnb bans: Evidence from New York City. *SSRN*. Retrieved August 1, 2024, from http://dx.doi.org/10.2139/ssrn.4873434

4 Relman, E., & Latu, D. (2024, June 26). Short-term Airbnb rentals in NYC down 80% since new regulation started. *Business Insider*. Retrieved August 1, 2024, from https://www.businessinsider.com/airbnb-numbers-shrink-hotel-prices-soar-ban-nyc-2024-6

5 The listings that remain on STR platforms consist of long-term (30 day or more) rentals, hotels approved by the city, and some limited STRs where the host is licensed and present for the duration of the guest's stay, provides them unfettered access to the property, and does not lock any spaces, amongst other conditions.

6 Marsella et al. (2024).

7 The phenomenon of regulations that benefit well-organized special interests but impose substantial costs on others who are not as well organized is a well-established principle of political economy. For the seminal paper on the topic, see Stigler, G. J. (1971). The theory of economic regulation. *The Bell Journal of Economics and Management Science*, *2*(1), 3–21. https://doi.org/10.2307/3003160

14.4%, hitting a record high average daily rate of $524 during September 2024.[8] Based on the analysis described in more detail below, we conclude that local hosts lost at least $197 million in annual supplemental income. Additionally, local businesses lost at least $638 million, the city and state lost at least $82 million in tax revenue and travelers abandoned 2.6 million guest-nights stayed[9] in the 12 months after LL18 took effect.

3. In this paper, we estimate the cost regulatory restrictions on STRs impose on a broad array of consumers and producers: hosts, guests, providers of goods and services to STR hosts and guests, and the tax coffers of cities and states.[10] We evaluate the cost of STR restrictions in four US cities with strict STR regulations: NYC, Boston, New Orleans and Philadelphia.[11] The costs to everyday people are substantial and widely dispersed. By contrast, the benefit to hotels is highly concentrated, with over 70% of hotel rooms in the US affiliated with brands owned by a short-list of large corporations.[12] Our key findings are summarized below.[13]

4. **Key finding 1: Reduction in host earnings.** In NYC, we estimate that LL18 reduced host earnings after expenses and taxes by $197 million over the period September 2023-August 2024. Many residents shared this aggregate cost. A challenge in estimating how many (as well as how much each lost on average) is that the burden fell on two distinct groups: would-be hosts who chose not to list on Airbnb and those that did list but rented for a fewer number of nights (perhaps because conforming to the regulations made their rental unit less attractive). Since we expect that the primary effect of the regulations was to force would-be hosts off Airbnb, we estimate the number of additional listings that would have been needed to host our estimate of the aggregate guest-nights lost assuming that they accounted for the entire effect. In NYC, 25,000[14] additional listings would have been needed to accommodate the reduction in guest-nights stayed that we estimate LL18 to have caused, with average annual earnings (after expenses and taxes) of $7,900. The median number of listings per host is one listing, so this serves as a proxy for the number of hosts and cost to each based on the median host.

8 CoStar Smith Travel Research data and Marsella et al. (2024).

9 Number of nights multiplied by the number of guests. For example, 2 guests staying at an STR for 2 nights would be 4 guest-nights stayed.

10 STR regulatory restrictions reduced STR bookings across all on-line home-sharing marketplaces. However, we estimate the impact to bookings on Airbnb, which represents a portion of the total costs to hosts, local businesses, and state and local governments.

11 These are prominent examples of large cities that imposed strict STR regulations. However, this list is not exhaustive and there may be other cities with even stricter STR regulations than some of the cities in this list.

12 CoStar. (2023, October 25). Half of US economy-class hotel rooms are unbranded. Retrieved September 10, 2024, from https://www.costar.com/article/1112230909/half-of-us-economy-class-hotel-rooms-are-unbranded

13 Our methodology is described in detail throughout the paper. In summary, our estimates of the costs to the various harmed parties begins with an estimate of difference between an estimate of what "guest-nights stayed" would have been absent regulatory restrictions (or with less stringent restrictions) and what they actually were. We then estimate the cost the regulations imposed on the various groups harmed by multiplying the reduction in guest-nights stayed by the average benefit each group gets per guest-night stayed.

14 Here and elsewhere, we have rounded our statistical results to two or three significant digits.

5. Reduced earnings hampers hosts' ability to afford their mortgage and meet the rising cost of living. 65% of Airbnb hosts report that they plan to use their STR income to meet the rising cost of living and 43% said their STR income helped them stay in their home.[15]

6. The estimate of 25,000 fewer hosts is conservative because it only considers the *incremental* impact of LL18. However, New York State and NYC had imposed a series of prior restrictions on STRs. We modeled how many STR guest-nights stayed would have occurred in NYC without the additional layers of regulation. We estimate that between 45,000 and 90,000 additional listings would have been needed to accommodate the reduction in guest-nights stayed caused by the additional STR regulations.[16]

7. For the other cities, the number of additional listings needed to accommodate the reduction in guest-nights stayed that we estimate the restrictions to STRs have caused is between 2,900and 5,600 in Boston, 3,800 and 7,400 in New Orleans, and 970 and 1,300 in Philadelphia. The average annual earnings (after expenses and taxes) per listing is $27,000 in Boston and New Orleans and $14,000 in Philadelphia. The median number of listings per host in each of these cities is one listing.

8. **Key finding 2: Reduction in income of third parties serving hosts.** When hosts have fewer STR bookings, their demand for goods and services to facilitate the STRs is reduced (e.g., cleaning). We estimate that, between September 2023 and August 2024, STR restrictions reduced the demand for cleaning services from hosts by $84 million in NYC following the enforcement of LL18 or $156-$306 million when taking into account the cumulative impact of additional STR regulations. We estimate the corresponding reduction over the same period to have been $17-$34 million in Boston; $11-$22 million in New Orleans; and $5-$7 million in Philadelphia.

9. **Key finding 3: Reduction in visitors.** After accounting for the possibility of would-be STR guests substituting to alternative accommodation, we estimate that NYC had 2.6 million fewer guest-nights stayed following the enforcement of LL18 or 4.8-9.4 million when accounting for the cumulative impact of additional STR regulations, between September 2023 and August 2024. We estimate the net reduction in guest-nights stayed over the same time period to be 0.6-1.3 million in Boston, 1.0-2.0 million in New Orleans, and 0.2-0.3 million in Philadelphia.

10. **Key finding 4: Reduction in income of third parties serving guests.** Trips not taken by guests result in lower spending at local businesses. We estimate that, between September 2023-August 2024, STR restrictions reduced guest expenditures on restaurants, groceries, shopping, entertainment, transportation and other goods and services by $640 million following the enforcement of LL18 or $1.2-$2.3 billion when taking into account the cumulative impact of additional STR regulations in NYC. We estimate the corresponding reduction over the same period to be $160-$310 million in Boston, $240-$470 million in New Orleans, and $55-$76 million in Philadelphia.

11. **Key finding 5: Increased hotel prices for consumers.** NYC hotels have been able to raise their prices as a result of NYC's overregulation of STRs. Marsella et al. (2024) isolated the causal impact of LL18 on hotels' average daily rates and found that hotels' average

15 Airbnb 2023 survey of US hosts.

16 The lower bound estimate uses medium-regulation cities as a benchmark, while the upper bound estimate uses light-regulation cities as a benchmark. The same applies to all estimates expressed in ranges. See Section 2.1 for more details.

daily rates increased by 14.4%. Their results are consistent with a large body of literature showing that competition from STRs restrains hotel prices, particularly during periods of peak demand.[17] The higher hotel prices place a particular burden on families traveling with children. Many such families might prefer, say, an STR of a two-bedroom apartment to a hotel. But then, left with hotels as their only option, they have to pay inflated prices for multiple rooms or suites.

12. **Key finding 6: Reduction in state and city tax revenue.** STRs generate three main sources of state and city tax revenue: direct STR taxes (e.g., occupancy and bed taxes), state income tax on host earnings, and tax on goods and services provided to guests. We estimate that the more stringent restrictions that some cities and states have imposed on STRs have reduced state and local tax revenue. Between September 2023 and August 2024, LL 18 cost NYC and New York State $82 million in tax revenue, or $150-$300 million when considering the cumulative impact of the STR regulations. We estimate that Boston and Massachusetts lost $20-$38 million, New Orleans and Louisiana lost $37-$72 million, and Philadelphia and Pennsylvania lost $5-$6 million over the same period.[18]

13. The rest of the paper is structured as follows. Section 2 sets out our estimate of the guest-nights stayed in the scenario with less stringent regulations. Sections 3, 4 and 5 respectively look at the impact of restricting STRs on hosts and third parties serving hosts; guests and third parties serving guests; and state and city tax revenues. Section 6 concludes.

2. METHODOLOGY AND MODEL RESULTS

14. In this section, we first describe our methodology for estimating what guest-night stays would have been with no or limited regulations. We then present our estimates of the reduction in guest-nights stayed resulting from the regulatory restrictions on STRs.

2.1. Methodology

15. Airbnb has provided CRA with monthly data on host activity from January 2015 to August 2024. The data cover three sets of cities that we categorize as:

    1. Four “high-regulation cities”, i.e., cities which imposed strict STR regulations, which are the focus of our report: NYC, Boston, New Orleans and Philadelphia.

    2. A set of “light-regulation cites”, i.e., cities that imposed no or substantially less restrictive regulations on STRs.[19]

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17 Hotels increase prices as their occupancy rate increases, and may charge almost twice as much on average on “compression nights” (when occupancy exceeds 95%) as on other nights. STRs reduce the number of compression nights and therefore hotel prices by providing a flexible supply which increases available accommodations during periods of high demand.

18 These estimates are conservative as they do not account for the indirect loss of tax revenue arising from reductions in income, and therefore expenditure, of hosts and providers of goods and services to hosts. In addition, we understand that STRs are not subject to all the same taxes as hotels. If all hotel taxes were extended to STRs, the lost tax revenue would be even higher.

19 The “light-regulation” cities are Anchorage, AK; Boise, ID; Charlotte, NC; Corpus Christi, TX; El Paso, TX; Houston, TX; Indianapolis, IN; Milwaukee, WI; Omaha, NE; Phoenix-Scottsdale, AZ; Pittsburgh, PA; Rochester, NY; Tucson, AZ; and Tulsa, OK.

3. A set of "medium-regulation cities," i.e., cities that imposed regulations that were more restrictive than those in the light-regulation cities but less restrictive than those in the high-regulation cities.[20]

16. We measure the incremental effect of LL18 on guest-nights stayed in NYC as the year-over-year difference in guest nights stayed for the 12-month period after implementation of the law (i.e., September 2023-August 2024). For the remaining restrictions for which we estimate an effect, we model the pre-regulation growth of guest-nights stayed in the "highly regulated cities" as a function of the growth in STRs in the "light-regulation" or "medium-regulation" cities. We then predict what guest-nights stayed would have been with light or medium regulation by projecting the model forward to the period after the regulations took effect.

17. Our estimate of the impact of the regulation is the difference between what guest-nights stayed would have been with light or medium regulation and the actual number of guest-nights stayed. The medium-regulation benchmark provides a more conservative estimate of the impact because it supposes that the highly regulated city would have had a medium level of regulation, rather than no or limited regulation.

18. To use cities with less restrictive regulations as a benchmark to project STR activity in NYC, Boston, New Orleans, and Philadelphia absent restrictions, one must control for factors other than the difference in regulatory restrictions that would have caused the growth in STR activity to differ across cities. In particular, the less-regulated cities were often growing faster than NYC, Boston, New Orleans, and Philadelphia even pre-regulation.[21] To adjust for likely differences in STR growth rates across cities, we use a statistical technique that takes account of how the growth patterns of cities that imposed regulations differed from the growth patterns in cities with less stringent regulations.[22] As before, we express the estimated annual impact for the period from September 2023 through August 2024.

2.2. New York City

19. Both New York State and NYC have passed laws and regulations that restrict STRs.[23] These include amendments to the State's Multiple Dwelling Law ("MDL") and introduction

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20 The "medium-regulation" cities are Austin, TX; Chicago, IL; Miami, FL; Nashville, TN; San Antonio, TX; San Diego, CA; and Seattle, WA.

21 Many of the cities that imposed less stringent restrictions were in the "Sun Belt." The populations of these cities have been growing faster than the populations of NYC, Boston, New Orleans, and Philadelphia..

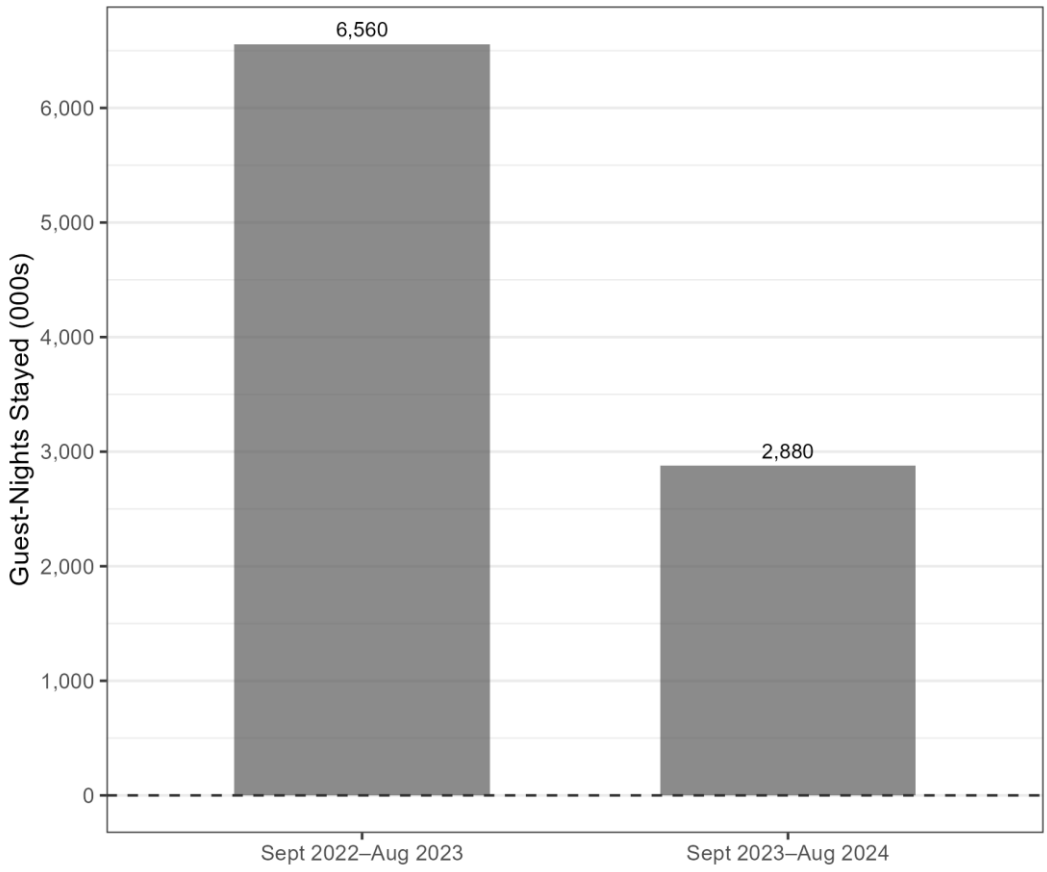
22 Formally, the statistical technique that we use is called the "synthetic control" method. It involves assigning optimal "weights" to less stringent ("control") cities, so that the weighted-average outcomes—guest-nights stayed—of these cities and a constant term best match the *pre-regulation* outcomes of the "treated" city (here, NYC, Boston, New Orleans, or Philadelphia). Synthetic controls have been widely adopted in the empirical economics literature over the last two decades. See, for example: Abadie, A., Diamond, A., & Hainmueller, J. (2010). Synthetic control methods for comparative case studies: Estimating the effect of California's tobacco control program. *Journal of the American Statistical Association*, *105*(490), 493–505. https://doi.org/10.1198/jasa.2009.ap08746; and Doudchenko, N., & Imbens, G. W. (2016). Balancing, regression, difference-in-differences and synthetic control methods: A synthesis. *National Bureau of Economic Research Working Paper 22791*. https://ssrn.com/abstract=2861723

23 Some hotels list rooms on Airbnb. NYC regulations do not similarly restrict hotel listings. The city only requires hotels' inclusion on a list maintained by NYC.

of NYC's Local Law 146 ("**LL146**") and Local Law 64 ("**LL64**"). The latest, and strictest, was NYC's Local Law 18 ("**LL18**") which took effect on September 5, 2023.[24]

20. Measuring the total reduction in STR guest-nights stayed in NYC is complicated by the history of these restrictions. Even if one can estimate with precision the incremental reduction due to LL18, such reductions occurred with respect to an already-diminished base. Still, the effect of LL18 was so dramatic that its incremental effect was substantial. As Figure 1 shows, the 2.88 million guest-nights stayed in the one-year period from September 2023 to August 2024 was less than half the 6.56 million guest-nights stayed during the same months in the year prior. This implies a loss of 3.68 million (56%) guest-nights stayed over the one-year period between September 2023 and August 2024. This estimate is conservative as it ignores any growth that would have occurred absent the new restrictions, and NYC was in fact growing when the restrictions came into effect, with guest-nights stayed increasing 18% year-over-year in the first half of 2023.

Figure 1: Incremental effect of LL18 in NYC



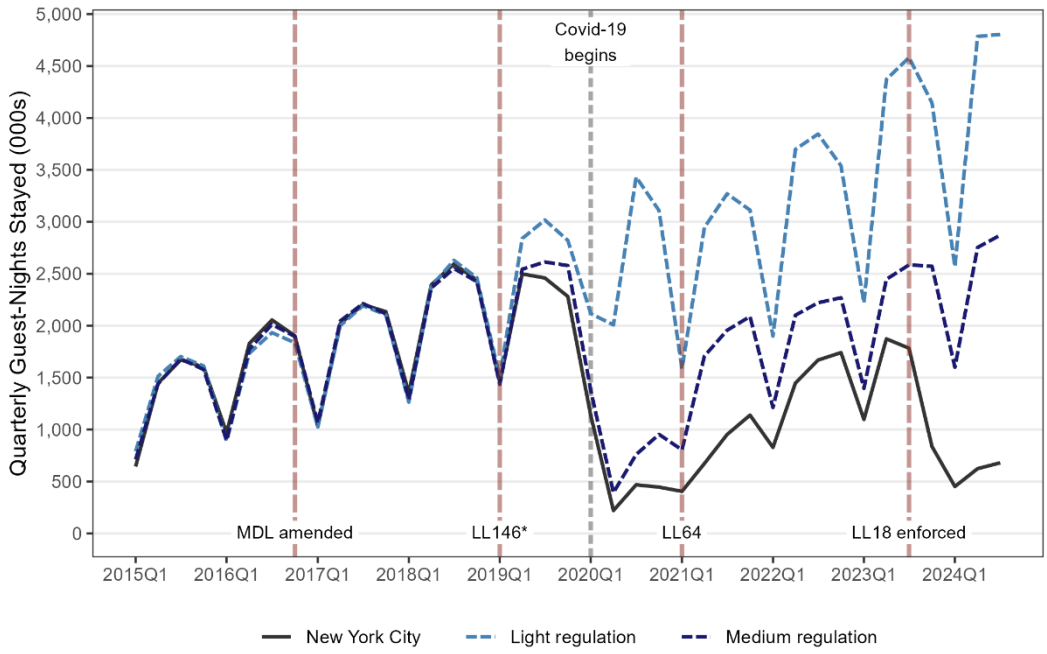
Source: Analysis of Airbnb data

21. Figure 2 shows our projections of how guest-nights stayed would have evolved in the absence of STR regulations starting from LL146, at a quarterly level. The solid line is the

24 Hoover, A. (2023). New York's Airbnb ban is descending into pure chaos. *Wired*. Retrieved August 1, 2024, from https://www.wired.com/story/airbnb-ban-new-york-illegal-listings/. See also NYC Mayor's Office of Special Enforcement. (n.d.). *Registration law*. Retrieved July 29, 2024, from https://www.nyc.gov/site/specialenforcement/registration-law/registration.page

actual number of STR guest-nights stayed for Airbnb in NYC, while the dashed light blue and dark blue lines are the model's prediction for guest-nights stayed under light regulation and medium regulation, respectively. The vertical lines mark the date of successive STR regulations. The "pre-regulation" period here is January 2015 to January 2019, the month before LL146 was supposed to go into effect, and the post-regulation period is the period from February 2019 forward.

Figure 2: Actual and predicted quarterly guest-nights stayed in New York City



Source: Analysis of Airbnb data. Vertical dashed red lines denote significant regulatory events while the gray line marks the beginning of the Covid-19 pandemic. Note: LL146 never took effect.

22. As one can see in Figure 2, both the low-regulation and medium-regulation benchmarks track NYC guest-nights stayed quite closely in the period before LL146 was to go into effect but then start to diverge after LL146 was supposed to go into effect. We estimate that regulations reduced NYC guest-nights in Q3 2019 (the peak season for travel to NYC) by 560,000 relative to the light-regulation benchmark and 150,000 relative to the medium-regulation benchmark.[25]

23. One complication in estimating the cumulative effect of STR regulations starting from LL146 is distinguishing the effect of regulations from the effect of Covid-19. As Figure 2 shows, the actual reduction in guest-nights stayed in NYC was far greater than what is predicted by the light-regulation benchmark, though only slightly lower than what is predicted by the medium-regulation benchmark. The gap at that time was likely the effect of Covid-19 rather than LL146. But just as Covid-19 took a particularly harsh toll on travel to NYC, one would have expected the differential effect of Covid-19 on NYC to have dissipated after vaccines became available and tourist traffic to NYC resumed. Thus, even if the difference between

25 The models predict that 2019 Q3 STR guest-nights stayed would have been 3.02 million with light regulation and 2.61 million with medium regulation, compared with the 2.46 million that actually occurred. Note that the reduction occurred even though legal challenges prevented LL146 from taking effect. Yet, passage of the law may have discouraged some would-be hosts from beginning to offer STRs as it was likely that NYC would soon succeed in imposing similar restrictions.

predictions from the model and actual guest-nights stayed does not provide a plausible estimate of the effect of regulations during the peak of the Covid-19 era, they do provide plausible estimates for, say, 2023 onward.

24. Over the 12-month period to August 2024 (i.e., the first 12 months in which LL18 was enforced), the cumulative impact of regulations starting from LL146 resulted in estimated lost guest-nights stayed of 6.84 million relative to the medium-regulation benchmark and 13.40 million relative to the light-regulation benchmark. Put differently, guest-nights stayed would have been 6.84 million (238%) higher under the medium-regulation scenario and 13.4 million (466%) higher under the light-regulation scenario.

25. These estimates do not take account of the impact of regulations prior to LL146, including the MDL amendments that New York State imposed. The data we have do not go far enough back prior to when the restrictions took effect for us to estimate a reliable synthetic control. However, the effect was likely substantial. The MDL amendments restricted the ability to offer entire apartment units for STR. Even if some NYC residents ignored that restriction, entire-home STRs came to account for a smaller share of guest-nights stayed in NYC than in other cities. In 2015, the percentage of guest-nights stayed in entire-home rentals was similar in NYC, Boston, and Philadelphia (approximately 67% to 69%). By 2019, it had fallen to 64% in NYC while in Boston and Philadelphia it had increased to 78% and 77%, respectively.[26] Thus, our estimates of the reduction in guest-nights stayed arising from LL18 as well as of the combined effect of LL146 and LL64 were with respect to an already substantially restricted amount of STR activity.

2.3. Boston

26. On January 1, 2019, Boston implemented its STR ordinance that severely restricted who could offer STRs to primary residents, with some exceptions.[27] Enforcement began later that year, in December 2019.

27. Figure 3 shows the number of guest-nights stayed for Airbnb in Boston, as compared to the light- and medium-regulation benchmarks. The “pre-regulation” period runs from January 2015 to December 2018, the month before Boston’s STR ordinance took effect. The actual guest-nights stayed (solid line) started to decline shortly after the effective date, even before full enforcement began. Whereas the light- and medium-regulation benchmarks saw guest-nights recover relatively quickly in the wake of the Covid-19 pandemic, Boston’s guest-nights have remained significantly lower than pre-Covid levels. Over the 12-month period to August 2024, our model suggests that guest-nights stayed would have been 1.08 million (132%) higher under the medium-regulation scenario and 2.09 million (256%) higher under the light-regulation scenario.

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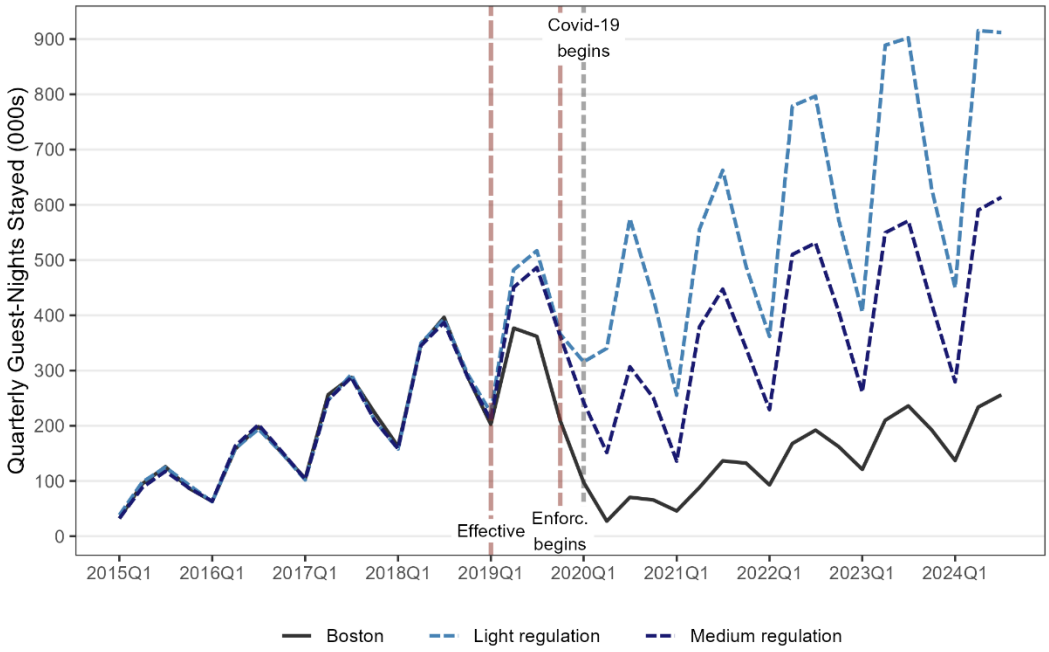
26 These data might initially seem to lead to an estimated reduction of approximately 77.5% - 64% = 13.5%. While that effect would itself be substantial, the reduction could have been much larger. To see why, note that the fraction of non-entire-home rentals in NYC was 36% compared with 22.5% or slightly more than 50% greater. To reduce the share of non-entire home rentals from 36% to 22.5% in NYC by increasing the guest-nights stayed in entire-home rentals, total guest nights stayed would have had to have been 60% greater (because 36/160 = 22.5).

27 City of Boston Municipal Code. (n.d.). § 9-14. Retrieved August 1, 2024, from https://codelibrary.amlegal.com/codes/boston/latest/boston_ma/0-0-0-17695. Exceptions include “owner-adjacent” units (primary residents of a duplex or triplex/”triple-decker” can list units in their home as an STR), hospital stays, and furnished institutional or business stays (e.g. “corporate housing”).

Figure 3: Actual and predicted quarterly guest-nights stayed in Boston



Source: Analysis of Airbnb data. Vertical dashed red lines denote significant regulatory events while the gray line marks the beginning of the Covid-19 pandemic.

2.4. New Orleans

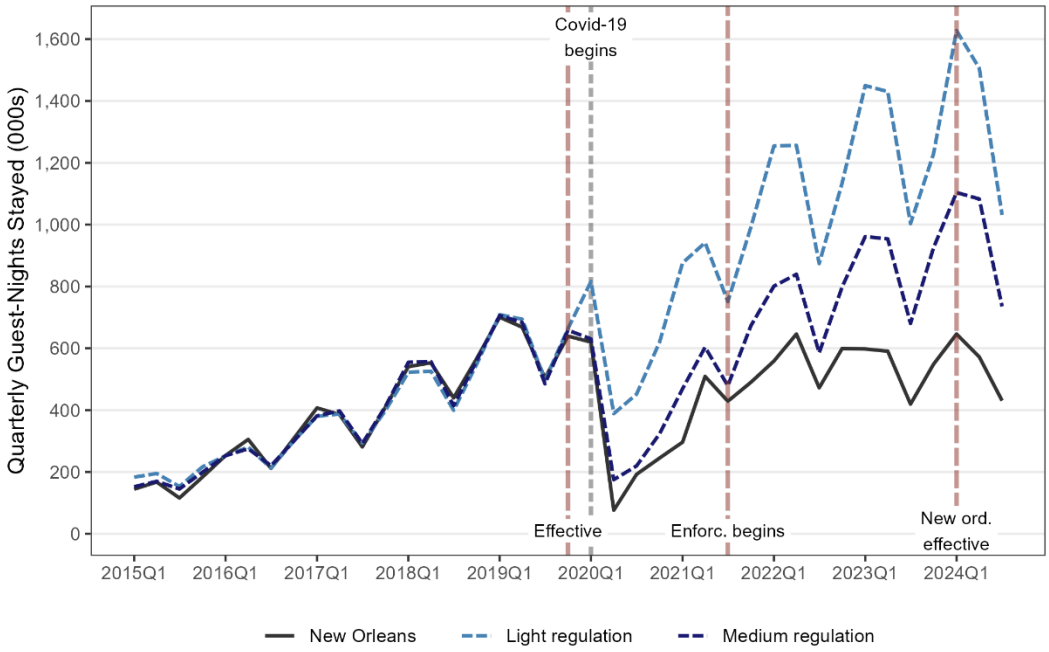
28. The City of New Orleans has passed a few rounds of STR regulations. Those effective December 2019 had enforcement suspended until September 2021.[28] A subsequent set of regulations passed in 2023 became effective in February 2024.[29]

29. Figure 4 shows the number of guest-nights stayed for Airbnb in New Orleans compared with the light- and medium-regulation benchmarks. The "pre-regulation" period runs from January 2015 to November 2019. It is unclear whether the regulation had an immediate impact once it went into effect in December 2019 (but before it was enforced), as the Covid-19 pandemic began a few months later, complicating this analysis. However, we suspect that New Orleans' subdued post-Covid recovery and the flattening-out of guest-nights stayed that we observe beginning in 2022 is a consequence of its STR regulations. Absent these regulations, our model suggests that over the 12-month period to August 2024, guest-nights stayed would have been 1.62 million (74%) higher under the medium-regulation scenario and 3.19 million (145%) higher under the light-regulation scenario.

28 There were also earlier STR regulations dating back to December 2016.

29 Hignell, M., et al. v. City of New Orleans, Civil Action No. 19-13773, *U.S. District Court for the Eastern District of Louisiana*, Opinion, February 27, 2024, 2-6.

Figure 4: Actual and predicted quarterly guest-nights stayed in New Orleans



Source: Analysis of Airbnb data. Vertical dashed red lines denote significant regulatory events while the gray line marks the beginning of the Covid-19 pandemic.

2.5. Philadelphia

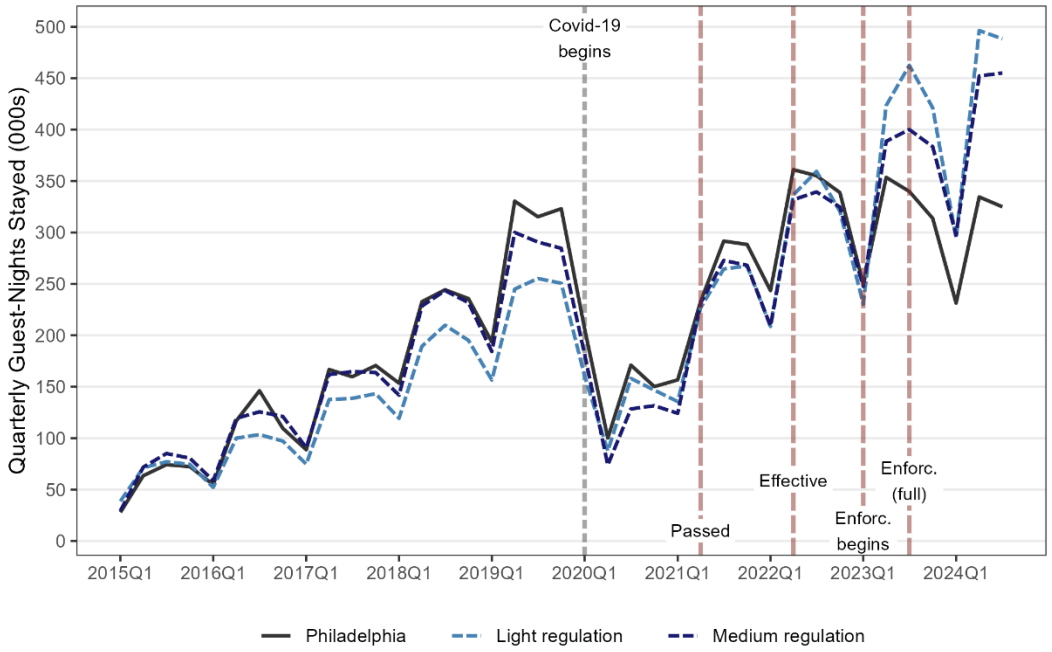
30. Philadelphia passed multiple rounds of STR regulation, starting in 2015. Amendments to the STR law passed in June 2021.[30] Over 2023, the city began enforcement.[31]

31. Figure 5 shows the number of guest-nights stayed for Airbnb in Philadelphia, as compared to the light- and medium-regulation benchmarks. Between 2015-2021, Philadelphia operated under a light/medium STR regulatory regime. The actual and predicted guest-nights stayed track each other closely until 2023, when enforcement of STR regulations begins. From there, Philadelphia's guest-nights stayed fall sharply relative to the benchmarks, especially after 2023 enforcement of the amended law. Over the 12-month period to August 2024, our model suggests that guest-nights stayed would have been 359,000 (30%) higher under the medium-regulation scenario and 492,000 (41%) higher under the light-regulation scenario. These estimates are likely conservative, given that the benchmarks somewhat underpredict actual guest-nights stayed in the period before the regulations take effect (see Figure 5).

30 There were earlier STR regulations dating back to July 2015. See *The Philadelphia Code*. (n.d.). § 9-3909. Retrieved August 1, 2024, from https://codelibrary.amlegal.com/codes/philadelphia/latest/philadelphia_pa/0-0-0-280381; and City of Philadelphia. (n.d.). Rent your property (short term). Retrieved August 1, 2024, from https://www.phila.gov/services/permits-violations-licenses/rent-or-sell-property/rent-your-property-short-term/

31 City of Philadelphia. (2023, July 13). *Unlicensed short-term rental properties delisting process begins*. Retrieved August 1, 2024, from https://www.phila.gov/2023-07-13-unlicensed-short-term-rental-properties-delisting-process-begins/. Murray, J. (2023, January 9). Philadelphia's new vacation rental rules, explained. *Axios*. Retrieved September 2, 2024, from https://www.axios.com/local/philadelphia/2023/01/09/philadelphia-airbnb-vacation-rental-rules

Figure 5: Actual and predicted quarterly guest-nights stayed in Philadelphia



Source: Analysis of Airbnb data. Vertical dashed red lines denote significant regulatory events while the gray line marks the beginning of the Covid-19 pandemic.

2.6. Summary of impact across cities

32. Table 1 summarizes the impact of STR restrictions in terms of the reduction in number of STR guest-nights stayed by city between September 2023 and August 2024.[32] One reason why the impacts in NYC, Boston and New Orleans are greater than in Philadelphia is that their STR regulations have been in place for a longer duration. The impact of STR regulations accumulates over time and therefore the longer they are in place, the greater the cumulative impact.

32 We are confident that our model produces estimates which are statistically significant, i.e., not due to "noise" in the data. To test this, we conducted "placebo" tests where we estimated the impact in cities with "light" regulations. As expected, these tests produced small estimated impacts of +5% on average relative to actual guest-nights stayed, with an inter-quartile range of -8% to +15%. By contrast, the impacts in the four regulated cities we consider were much higher and ranged between +41% and +466%.

Table 1: Lost guest-nights stayed due to STR regulations, Sept 2023-Aug 2024

	Medium-Regulation Benchmark		Light-Regulation Benchmark	
	Lost Guest-Nights Stayed (millions)	As % of Actual Guest Nights Stayed[33]	Lost Guest-Nights Stayed (millions)	As % of Actual Guest Nights Stayed
NYC (incremental effect of LL18) *	3.68	128%		
NYC (cumulative impact)	6.84	238%	13.4	466%
Boston	1.08	132%	2.09	256%
New Orleans	1.62	74%	3.19	145%
Philadelphia	0.36	30%	0.49	41%

Source: Analysis of Airbnb data. * This estimate does not rely on the model prediction and therefore there are not different estimates for medium- and light-regulation benchmarks; instead, it is the impact as measured by the loss in guest-nights stayed between Sep'22-Aug'23 and Sep'23-Aug'24.

3. IMPACT ON HOSTS AND THIRD PARTIES SERVING HOSTS

33. In this section, we convert the estimates of lost guest-nights stayed into the dollar amount lost by the potential hosts of these foregone stays. When hosts have fewer STR bookings, their demand for goods and services that help them facilitate STRs such as cleaning services is reduced, so we also looked at the reduction in demand for these services.

3.1. Reduction in host earnings

34. We estimate the reduction in STR host earnings in two steps. First, we multiply the number of guest-nights stayed lost due to STR regulations from the previous section by average STR gross host earnings per guest-night[34] over the same period. Second, we deduct our estimate of hosts' cleaning expenses and taxes to calculate net host earnings. We focus on cleaning expenses because cleaning accounts for a large proportion of the incremental costs hosts incur.[35] Table 2 summarizes the results.

33 This expresses the lost guest-nights stayed as a percentage of actual guest-nights stayed. For example, there were 2.88 million guest-nights stayed in NYC between September 2023-August 2024. The estimated incremental impact of LL18 was to reduce guest-nights stayed by 3.68 million, which is 128% of 2.88 million.

34 Obtained from Airbnb data.

35 Other costs include maintenance and repairs from increased wear and tear, higher utility bills from increased usage, and supplies such as toiletries. Such costs are harder to estimate but are also likely to be smaller. A host may also pay a third party to manage their STR, but not all hosts do. In addition, hosts may have to pay federal income taxes.

Table 2: Reduction in host earnings due to STR regulations, September 2023–August 2024[36]

(USD millions)	Gross Host Earnings [1]	Cleaning Expenses [2]	Direct tax on STR [3]	State Income Tax [4]	Net Host Earnings [5]
NYC (incremental effect of LL18) *	351	84	60	10	197
Medium-Regulation Benchmark					
NYC (cumulative impact)	652	156	111	19	366
Boston	100	17	-	4	79
New Orleans	115	11	-	3	101
Philadelphia	20	5	-	0.4	14
Light-Regulation Benchmark					
NYC (cumulative impact)	1,278	306	217	38	718
Boston	195	34	-	8	153
New Orleans	226	22	-	6	198
Philadelphia	27	7	-	0.6	19

Source: Analysis of Airbnb data. * This estimate does not rely on the model prediction; see Table 1 notes.

35. Many residents shared this aggregate cost. A challenge in estimating how many (as well as how much each lost on average) is that the burden fell on two distinct groups: would-be hosts who chose not to list on Airbnb and those that did list but rented for a fewer number of nights (perhaps because conforming to the regulations made their rental unit less attractive). Since we expect that the primary effect of the regulations was to force would-be hosts off Airbnb, we estimate the number of additional listings that would have been needed to host our estimate of the aggregate guest-nights lost assuming that they accounted for the entire effect. Table 3 shows the number of additional listings needed to accommodate the reduction in guest-nights stayed that we estimate the restrictions to have caused and the cost to each of them based on the average net earnings (after expenses and taxes) per listing. The median number of listings per host is one listing in each of these cities, so this serves as a proxy for the number of hosts and cost to each based on the median host.

Table 3: Cost per listing, September 2023–August 2024

City	Average net earnings per listing (USD)	Additional listings needed to accommodate reduction in guest-nights stayed	
		Medium-Regulation Benchmark	Light-Regulation Benchmark
NYC (incremental effect of LL18) *	$7,859	25,094	
NYC (cumulative impact)		46,592	91,329
Boston	$27,116	2,899	5,633
New Orleans	$26,598	3,786	7,443
Philadelphia	$14,553	969	1,330

Source: Analysis of Airbnb data. * This estimate does not rely on the model prediction; see Table 1 notes.

36. One of the benefits of STRs is that they tend to be more geographically dispersed within a metropolitan area than are hotels. As a result, not only do restrictions on STRs force visitors

36 [1] Lost guest-nights stayed from previous section multiplied by each city's average gross host earnings per guest-night stayed from Airbnb data.

to accept less conveniently located accommodations, but the costs they impose are also geographically dispersed. This is particularly the case in NYC, where the lost earnings are spread across all five boroughs. Figure 6 shows the proportion of Airbnb (left panel) and hotel (right panel) listings by borough in NYC. The darker color represents a higher concentration of Airbnb or hotel listings, respectively, in a borough relative to the rest of NYC. Whereas 82% of hotels are in Manhattan, only 47% of Airbnb listings are situated in Manhattan. The boroughs of Brooklyn and Queens house a significant share of Airbnb listings at 37% and 13% (vs. 7% and 8% of hotels) respectively.[37] [38] In addition, lost earnings harm thousands of ordinary hosts while the ownership of hotels, the main beneficiaries of STR restrictions, is highly concentrated, with 70% of hotel rooms in the US being affiliated to brands owned by large corporations.[39]

[2] Based on desk research on the typical fee charged by cleaning service providers for short-term and other rentals to clean a two-bedroom apartment ($200 in NYC, $125 in Boston, $80 in New Orleans, and $95 in Philadelphia). We divide this fee by each city's average gross host earnings per stay from Airbnb data and multiply by lost gross host earnings.

[3] In NYC, hosts are responsible for paying direct taxes on STRs, consisting of the NYC Hotel Room Occupancy Tax (5.875% plus $0.05-$2.00 per night per room), City Sales Tax (4.50%), State Sales Taxes (4.38%), and State Hotel Unit Fee ($1.50 per night). This translates to around 17% of gross host earnings. In the other three cities, Airbnb collects and remits direct taxes on STRs so the tax is not included in gross host earnings.

[4] Airbnb's 2023 survey of hosts shows that the median host falls within the $75,000-$149,000 household income bracket. Based on ADP's Paycheck Calculator, the applicable state income average tax rate is around 5% for NYC and Boston and 3% for New Orleans and Philadelphia. We multiply this tax rate by lost gross host earnings net of cleaning expenses and direct tax on STR.

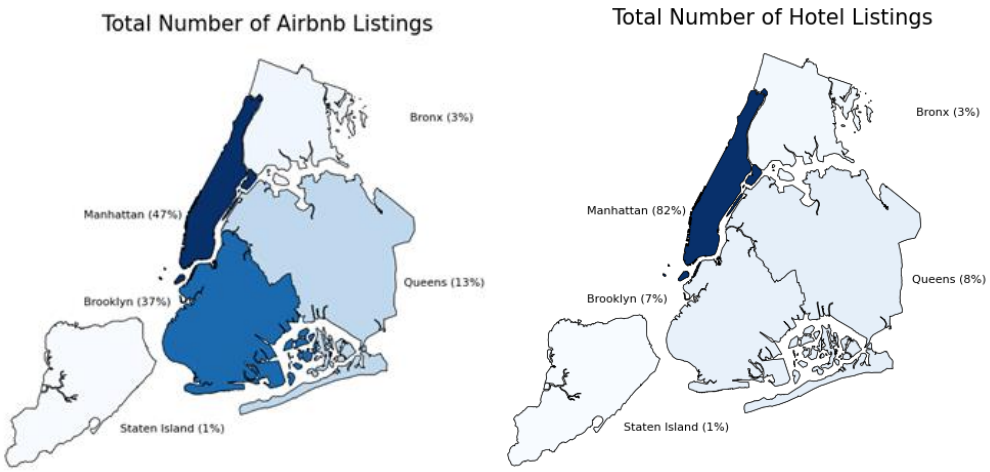
[5] Equals lost gross host earnings [1] minus cleaning expenses [2], direct tax on STR [3] and income tax [4].

37 See section 5.4 of Salinger, M. (2022). *Economic analysis of proposed rules on STRs in New York City*. Retrieved September 2, 2024, from https://news.airbnb.com/wp-content/uploads/sites/4/2022/12/2022.12.03-Expert-report-of-Professor-Michael-Salinger-for-Airbnb.pdf

38 It is documented in the literature that showing that the availability of peer-to-peer (P2P) accommodations allowed tourists to stay in neighborhoods outside of tourist areas. See Tussyadiah, I. P., & Pesonen, J. (2015). Impacts of peer-to-peer accommodation use on travel patterns. *Tourism Management*, *47*, 142–150. https://doi.org/10.1177/0047287515608505

39 CoStar. (2023, October 25). Half of US economy-class hotel rooms are unbranded. Retrieved September 10, 2024, from https://www.costar.com/article/1112230909/half-of-us-economy-class-hotel-rooms-are-unbranded

Figure 6: Geographic distribution of hotel and Airbnb listings



Source: Salinger (2022), based on 2019 Airbnb data and 2020 data on hotel locations from data.cityofnewyork.us. Figures may not sum to 100% due to rounding. Includes both active and inactive listings.

37. It is possible that STR hosts may have replaced some of the lost earnings by renting out their property long-term. However, we do not think this is an option that many hosts would have taken. Over 80% of listings on Airbnb could earn more by renting out on a long-term basis.[40] Therefore, these hosts presumably have non-pecuniary reasons for renting out listings on a short-term basis and are unlikely to switch to long-term rentals post-regulation.

3.2. Reduction in income of third parties serving hosts

38. When hosts have fewer STR bookings, their demand for goods and services that help them facilitate STRs such as cleaning services is reduced. In this section, we estimate the magnitude of the reduction in demand for third parties serving hosts. We focus on cleaning services as before given it is likely to be the main third-party service that hosts depend on to facilitate STRs.

39. Table 4 shows that the reduction in demand for cleaning services by STR hosts due to regulations ranges from $84 million in NYC following the enforcement of LL18 to $156-$306 million when taking into account the cumulative impact of additional STR regulations, between September 2023-August 2024. The corresponding reduction over the same period is estimated at $17-$34 million in Boston, $11-$22 million in New Orleans, and $5-$7 million in Philadelphia. All else equal, lower demand means lower income for businesses that offer cleaning services and fewer jobs for their employees.

40 See section 4.2 of Salinger (2022).

Table 4: Reduced demand for cleaning services by STR hosts, September 2023-August 2024

	Medium-Regulation Benchmark *(USD millions)*	Light-Regulation Benchmark *(USD millions)*
NYC (incremental effect of LL18) *	84	
NYC (cumulative impact)	156	306
Boston	17	34
New Orleans	11	22
Philadelphia	5	7

Source: Analysis of Airbnb data. * This estimate does not rely on the model prediction; see Table 1 notes.

4. IMPACT ON GUESTS AND THIRD PARTIES SERVING GUESTS

40. Some travelers who would have liked to book an STR in a particular city, but were not able to do so because of the restrictions, may have still made their trip by arranging other accommodations. For example, some STR guests might have booked a hotel,[41] an STR in a neighboring city with fewer restrictions on STRs,[42] or stayed with family and friends. This does not affect our estimates of the impact on hosts or the providers of services to hosts because in all these cases, the STR host (and service providers) would not have received any earnings. However, the possibility of such substitution does affect how much the regulatory restrictions cost providers of services to guests and tax authorities. In this section, we estimate the reduction in visitors accounting for the possibility of substitution before estimating the impact on guests and third parties serving guests.

4.1. Reduction in visitors

41. An important consequence of restricting STRs is that consumers have fewer accommodation options to choose from. As a result, some travelers may never make the trip when a city restricts STRs or may end up paying inflated prices when hotels are almost at capacity. We quantify this channel of consumer harm by estimating what proportion of STR guest-nights stayed lost due to STR restrictions do *not* occur through alternative accommodations, and are therefore entirely foregone.

42. Farronato and Fradkin (2022) estimated the share of Airbnb travelers who would have booked a hotel room instead if STRs were not an option.[43] The paper found that 70% of Airbnb travelers in NYC would *not* have booked a hotel room if STRs were not an option.

41 A traveler who, because of the regulatory restrictions, books a hotel room instead may result in some other traveler choosing not to visit the city. The restrictions on STRs reduces the available short-term lodging in a city.

42 When, for example, restrictions on STRs in NYC cause a traveler to book an STR in Jersey City rather than in NYC, the income of a would-be NYC host ends up benefiting a Jersey City host. But that benefit to a Jersey City host does not alter the cost that a NYC regulation imposes on a NYC resident. When a traveler originally intending to visit NYC chooses instead to travel to Chicago and book an STR there, the indirect beneficiary of the cost NYC regulations impose on one of its residents is not even a regional neighbor.

43 Farronato, C., & Fradkin, A. (2022). The welfare effects of peer entry: The case of Airbnb and the accommodation industry. *American Economic Review*, *112*(6), 1782–1817. https://www.aeaweb.org/articles?id=10.1257/aer.20180260. See Table E19 in the Online Appendix, retrieved from: https://andreyfradkin.com/assets/airbnb_welfare_paper_appendix.pdf. We use the estimates under the "No Airbnb" column because that scenario accounts for hotels' capacity constraint and price response.

The corresponding share is 60% for Boston, and because there are no city-specific estimates for New Orleans and Philadelphia, we take the US average which is 62%.

43. Importantly, the paper accounted for hotels' capacity constraint and price response, which has two implications. First, it means that the estimate accounts for the fact that, facing less competition from STRs, hotels may increase their prices, which may price out some travelers. Second, it means that the estimate accounts for the fact that a would-be STR guest staying at a hotel instead when STRs are not available may crowd out a would-be hotel guest if the hotel is at capacity. The crowding out effect could result in net fewer visits even if the would-be STR guest still makes the visit.[44]

44. These estimates are consistent with survey evidence and the economics literature. In a 2023 Airbnb survey, 65% of respondents said that they were less likely to visit NYC due to the recent increase in hotel prices following LL18.[45] The figures are also consistent with a paper by Schaefer and Tran (2020) who estimate that only 28% of Airbnb travelers in Paris would book a hotel option if Airbnb were not available, implying that 72% of STR stays are incremental and would be lost if STRs were not an option.[46] Research by Dogru et al. (2020) further suggests that Airbnb draws additional travelers into the market rather than solely diverting demand away from traditional hotels.[47]

45. Limited substitution from STRs to hotels is supported by hotel occupancy data, which shows no material increase in NYC hotel occupancy rates following LL18. Figure 7 plots NYC hotel occupancy rates in the weeks following the enforcement of LL18 (orange line) and the same weeks a year earlier (blue line), using a 12-week centered moving average.[48] If the STR ban led to significant substitution towards hotels, we would expect occupancy rates to be materially higher post-LL18 than a year earlier, especially given tourism levels in 2023 are almost back to 2019 (pre-Covid) levels.[49] However, while hotel occupancy increased by 3% post-LL18, visitor volume was expected to grow by 4% in 2024.[50] The

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44 There are other accommodation options besides STRs and hotels, such as staying with family or friends, or in a neighboring city. We are not able to account for this explicitly but expect substitution to these other options to be small. In particular, many guests choose to stay in an STR rather than a hotel because they are a large group or family with young children, which makes it harder to find other accommodation options.

45 Airbnb. (2023, December 8). New survey finds strict short-term rental rules deter visitors to NYC. *Airbnb News*. Retrieved August 5, 2024, from https://news.airbnb.com/new-survey-finds-strict-short-term-rental-rules-deter-visitors-to-nyc/

46 Schaefer, M., & Tran, K. D. (2020). Airbnb, hotels, and localized competition. *DIW Berlin Discussion Paper No. 1889*. Retrieved August 1, 2024, from http://dx.doi.org/10.2139/ssrn.3676907

47 Dogru, T., Mody, M., Line, N., Suess, C., Hanks, L., & Bonn, M. (2020). Investigating the whole picture: Comparing the effects of Airbnb supply and hotel supply on hotel performance across the United States. *Tourism Management*, *79*, 104094. https://doi.org/10.1016/j.tourman.2020.104094

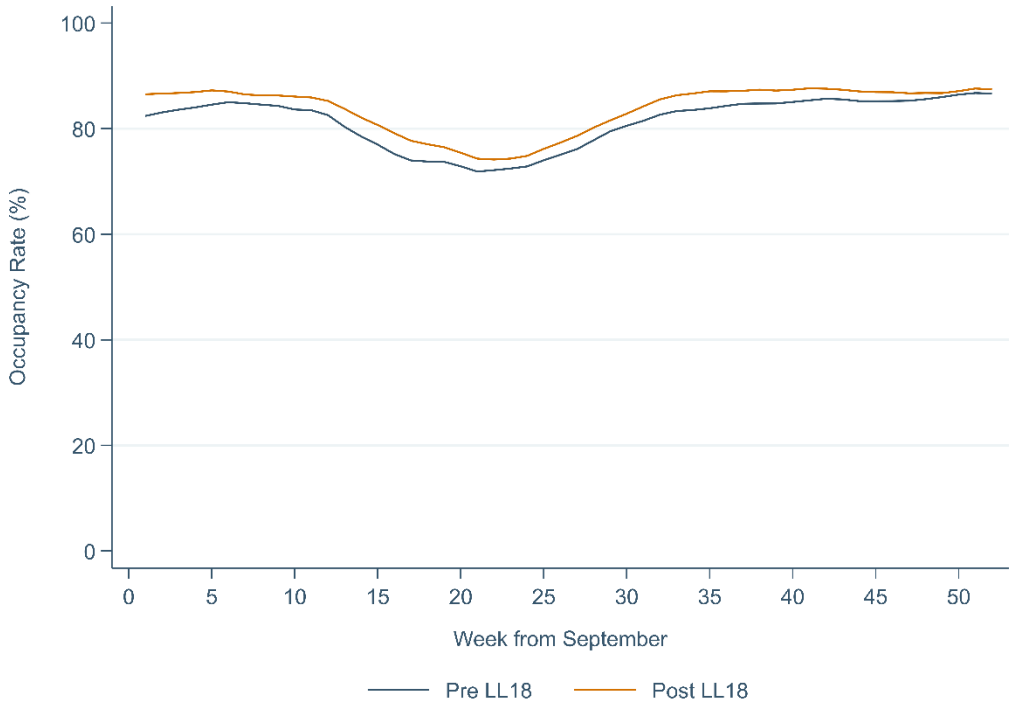
48 This means that the data point for each week will be the average hotel occupancy rate over a 12-week period centered around that week (i.e., six weeks before and six weeks after). Data will be missing for the first and last six weeks of the period as there is not sufficient data for the "before" and "after" periods.

49 Office of the New York State Comptroller. (2024, May). *Tracking the return: The tourism industry in New York City* (p. 1). Retrieved September 2, 2024, from https://www.osc.ny.gov/files/reports/pdf/report-04-2025.pdf

50 The average increase in occupancy rate post-LL18 is 2.4 percentage point, which represents an increase of around 3% on average occupancy rates of 81.5%. By contrast, visitor volume is expected to grow by 4% in 2024 according to New York City Tourism + Conventions. See New York City Tourism + Conventions. (2023). *2023 annual report*. Retrieved October 20, 2024, from https://corporate.nyctourism.com/annual-report/2024#cover

modest increase in occupancy rates relative to visitor volumes suggests hotel occupancy was barely keeping up with increasing visitor volumes, let alone replacing a significant share of the lost STR stays.[51]

Figure 7: Hotel occupancy rates in weeks following LL18, compared to same weeks a year earlier



Source: Analysis of Smith Travel Research data. Plot shows the 12-week centered moving average.

46. Table 5 presents the estimate of STR guest-nights stayed lost due to STR restrictions, accounting for potential substitution to other accommodations. This is obtained by multiplying the lost STR guest-nights stayed we estimated previously by 70% for NYC, 60% for Boston, and 62% for New Orleans and Philadelphia. We estimate that NYC had 2.6 million fewer guest nights stayed following the enforcement of LL18 or 4.8-9.4 million when taking into account the cumulative impact of additional STR regulations, between September 2023-August 2024. The net reduction in guest-nights stayed over the same period is estimated at 0.6-1.3 million in Boston, 1.0-2.0 million in New Orleans, and 0.2-0.3 million in Philadelphia.

51 One important case when guests may prefer STRs over hotels is when they are traveling in large groups or as a family with young children. Having a kitchen and multiple rooms in the same unit makes STRs more economical and convenient in such cases. This may explain why substitution to hotels is low. The same would also explain why STR guests are unlikely to substitute to other accommodation options besides hotels such as staying with family or friends, or in a neighboring city.

Table 5: Reduction in number of guest-nights stayed after accounting for substitution to other accommodations, September 2023-August 2024

	Medium-Regulation Benchmark *(millions)*	Light-Regulation Benchmark *(millions)*
NYC (incremental effect of LL18) *	2.6	-
NYC (cumulative impact)	4.8	9.4
Boston	0.6	1.3
New Orleans	1.0	2.0
Philadelphia	0.2	0.3

Source: Analysis of Airbnb data. * This estimate does not rely on the model prediction; see Table 1 notes.

4.2. Reduction in income of third parties serving guests

47. When travelers forego trips entirely because STRs are restricted, the money they would have spent on goods and services other than accommodations, including restaurants, groceries, shopping, entertainment, and transportation, is also foregone. We take the estimates of trips not taken due to STR restrictions from Section 4.1 and multiply by guests' average expenditure to estimate the reduction in income of third parties providing goods and services.

48. Table 6 illustrates the analysis in the case of the incremental effect of LL18 on NYC. The table reports Airbnb's estimates of average daily expenditure per guest by category in NYC based on a survey of guests in 2023. We calculate the pre-tax average expenditure and multiply that by the number of guest-nights stayed that were lost due to the incremental effect of LL18 (and did not switch to hotels).[52] According to these estimates, between September 2023-August 2024, NYC businesses missed out on an estimated $638 million in expenditure from travelers that did not visit due to LL18, including expenditure of $182 million on restaurants, $62 million on groceries, $124 million on shopping, $128 million on entertainment, $85 million on transportation and $57 million on other expenditure.

Table 6: Reduction in guest expenditure on goods and services in NYC due to LL18, September 2023-August 2024

Category	Expenditure per person per day (inc. tax)	Tax Rate	Expenditure per person per day (before tax)	Guest-nights stayed lost due to restrictions	Expenditure lost due to restrictions (before tax)
Restaurants	$77	8.875%	$71	2.4M	$182M
Groceries	$24	0%	$24		$62M
Shopping[53]	$48	0%	$48		$124M
Entertainment	$54	8.875%	$50		$128M
Transport[54]	$33	0%	$33		$85M
Other	$24	8.875%	$22		$57M
Total	**$261**		**$247**	**2.4M**	$638M

Source: Airbnb survey of guests in NYC from January 1, 2023 to December 31, 2023. Expenditure figures are averages across 1,250 responses.

52 We use pre-tax expenditure to avoid double-counting tax revenue, which we discuss separately in the next section.

53 Clothing and footwear are normally subject to 8.875% sales tax; however, purchases under $110 are exempt. Given average spend is below that threshold, we assume 0% tax on shopping. See City of New York. (n.d.). *New York State sales tax for businesses*. Retrieved July 30, 2024, from https://www.nyc.gov/site/finance/business/business-nys-sales-tax.page

54 We assume that visitors mostly use public transport, which is not subject to tax. Other modes of transport may be subject to tax (e.g., ridesharing and car rentals).

49. In 2023, tourism in NYC generated over $48 billion in visitor expenditure, according to New York's Office of the State Comptroller (OSC).[55] Therefore, the lost annual tourism spend due to LL18 represents around 1.3% of total tourism expenditure. Losses compound quickly: an annual loss of 1.3% would result in tourism expenditure being 6% lower in 5 years and 12% lower in 10 years compared to what it would have been absent LL18.

50. Because STRs are dispersed across different boroughs, the lost annual tourism spend will also be dispersed throughout the city. Visitors are likely to spend money on local vendors within the food & beverages, retail, and recreational industries, which are often determined by proximity to a tourist's lodging location. As of 2019, there were 60,800 businesses in the city providing a service in support of tourism, directly or indirectly. Of these, 25.3% and 22.5% were in Brooklyn and Queens, respectively.[56] These businesses will likely suffer a large share of the loss in revenue from regulatory restrictions, especially given the majority of hotels (the natural alternative to STRs) are concentrated in Manhattan.

51. In Table 7 below, we report the results using the same methodology for the cumulative impact of additional STR regulations in NYC, as well as Boston, New Orleans, and Philadelphia over the period September 2023-August 2024.[57] We estimate $1.2-$2.3 billion in lost expenditure in NYC due to the cumulative impact of additional STR regulations, $162-$314 million in Boston, $241-$474 million in New Orleans, and $55-$76 million in Philadelphia.

55 Office of the New York State Comptroller. (2024, May). *Tracking the return: The tourism industry in New York City* (p. 1). Retrieved August 1, 2024, from https://www.osc.ny.gov/files/reports/pdf/report-04-2025.pdf

56 Office of the New York State Comptroller. (2021, April). *The tourism industry in New York City: Reigniting the return* (p. 8). Retrieved August 1, 2024, from https://www.osc.state.ny.us/reports/osdc/tourism-industry-new-york-city

57 Based on Farronato and Fradkin (2022), the share of Airbnb travelers who would not have booked a hotel is 60% for Boston and 51% for Los Angeles. For Philadelphia and New Orleans, we use the average of all cities which is 62%.

Table 7: Reduction in guest expenditure on goods and services, September 2023-August 2024

(USD millions)	NYC (cumulative impact)		Boston		New Orleans		Philadelphia	
	Medium-Reg.	Light-Reg.	Medium-Reg.	Light-Reg.	Medium-Reg.	Light-Reg.	Medium-Reg.	Light-Reg.
Restaurants	338	663	46	90	71	139	16	22
Groceries	115	225	16	30	24	48	5	7
Shopping	230	450	31	60	44	87	11	15
Entertainment	237	465	33	64	50	98	11	15
Transport	158	310	21	41	30	60	7	10
Other	105	207	15	28	22	43	5	7
Total	1,184	2,320	162	314	241	474	55	76

Source: Average spend figures for all cities use Airbnb survey of guests in NYC from January 1, 2023 to December 31, 2023. Expenditure figures are averages across 1,250 responses. Assumed sales tax rates based on desk research: 7% for restaurants and 6.25% for entertainment and other expenditure in Boston (groceries, shopping and transport assumed to be exempt); 9.45% for all expenditure, except groceries which is assumed to be exempt, in New Orleans; and 8% for restaurants, entertainment and other expenditure in Philadelphia (groceries, shopping and transport assumed to be exempt).

4.3. Increased hotel prices for consumers

52. STRs also benefit the economy and consumers by imposing competitive constraints on hotel prices. In addition to offering travelers a more affordable and diverse set of lodging alternatives, they benefit those who stay (or would stay) in hotels by limiting hotels' power to raise prices. Those who stay in hotels despite the higher prices benefit from lower prices. The would-be visitors who forego a trip to NYC because they find the hotels to be too expensive benefit by being able to afford to visit NYC. This effect is most important during periods of peak demand, as STRs provide surge capacity to accommodate visitors. Both by adding to short-term lodging capacity and making hotels more affordable, STRs stimulate tourism to the city.

53. The higher hotel prices place a particularly high burden on lower-income visitors, who get priced out of a NYC visit, and to families traveling with children. The latter might find an STR of an apartment with multiple bedrooms, a living area, and a kitchen to be a more affordable and enjoyable lodging alternative than a hotel. But then, left with a hotel as their only option, they face the double whammy of paying inflated prices for multiple rooms or a suite.

54. After the enforcement of LL18 took effect on September 5, 2023, there were reports in the media of hotel prices in NYC increasing and at least some of this increase was attributed to the number of STR listings in NYC plummeting. For example, the New York Times reported that the *"average daily rate for a hotel stay in NYC increased to US$301.61 in 2023, up 8.5 per cent from US$277.92 in 2022, according to CoStar, a provider of commercial real estate data and analysis."* May 2024 analysis by CoStar Group, a real-estate data firm, found that hotel prices grew at twice the rate of inflation between the first quarters of 2023 and 2024.[58] Several factors were cited to explain this increase: increased demand for hotels to house migrants and therefore a reduction in supply of hotel rooms to

58 Rosenberg, Z. (2024, April 25). 'Must love dogs and rude roommates': The scramble to get around New York's Airbnb crackdown. *The Guardian*. Retrieved September 3, 2024, from https://www.theguardian.com/us-news/2024/apr/25/new-york-airbnb-short-term-rentals-sublets

tourists;[59] tourist demand returning to pre-pandemic levels; general inflation; and a sharp reduction in the number of available STRs.[60]

55. But the actual price increases after the enforcement of LL18 took effect was considerably more dramatic. Marsella et al. (2024) estimated the causal impact of LL18 on hotels' average daily rates by comparing the change in hotel prices in NYC to other cities that did not have major STR regulations. The authors found that hotels' average daily rates increased by 14.4%. Importantly, this is the increase attributed to the impact of LL18, separately from other effects such as the impact of housing migrants.[61]

56. Concurrently, there is also a large body of literature showing significant price reductions in the hotel industry due to the emergence of STRs.[62] Curtailing STRs could then result in the opposite effect with higher prices and limited choices for travelers. Zervas et al. (2017)[63] found that an increased penetration of STR listings reduces both hotel prices and revenues in Texas with the most significant impact on lower-tier hotels that do not cater to business travelers.[64] Evidence from Lane and Woodworth (2016),[65] Li and Srinivasan (2019),[66]

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59 Nahmias, L., & Cattan, N. (2024, August 6). New York City paid $2 million for empty hotel rooms meant for migrants. *Bloomberg*. Retrieved August 16, 2024, from https://www.bloomberg.com/news/articles/2024-08-06/nyc-migrant-contract-audit-finds-2-million-paid-for-empty-hotel-rooms

60 Ferré-Sadurní, L. (2024, May 25). Why N.Y.C. hotel rooms are so expensive right now. *The New York Times*. Retrieved August 1, 2024, from https://www.nytimes.com/2024/05/25/nyregion/hotels-prices-migrants-nyc.html

61 The paper noted that the use of some hotels to house migrants is unlikely to significantly bias this result for three reasons. First, only a relatively small proportion of hotel rooms (8.6%) were dedicated to housing migrants. Second, the timing of when the City started hosting migrants in hotels (pre-March 2023) does not coincide with the enforcement of Local Law 18 (September 2023), so the impact of housing migrants should have already been baked into hotel prices prior to the enforcement of Local Law 18. Finally, some of the control cities will have also received migrants. As such, the impact of housing migrants cannot explain why prices rose in September 2023 in NYC more than in control cities.

62 Although there is also a body of literature showing this effect in cities outside the United States, we have focused on the literature analyzing cities in the United States. International studies include, for example, Schaefer and Tran (2020) and Roma, P., Panniello, U., & Lo Nigro, G. (2019). Sharing economy and incumbents' pricing strategy: The impact of Airbnb on the hospitality industry. *International Journal of Production Economics*, *214*, 17–29. https://doi.org/10.1016/j.ijpe.2019.03.023

63 Zervas, G., Proserpio, D., & Byers, J. W. (2017). The rise of the sharing economy on the hotel industry: Estimating the impact of Airbnb on the hotel industry. *Journal of Marketing Research*, *54*(5), 687–705. https://doi.org/10.1509/jmr.15.0204

64 This is also consistent with Xie and Kwok (2017) who provided additional evidence from Austin that an increase in Airbnb supply resulted in a reduction in revenue per available room for local hotels. On the other hand, Dogru et al. (2017) found that the impact of STRs was particularly significant for midscale hotels; however, even luxury hotels saw a notable decrease. See Xie, K. L., & Kwok, L. (2017). The effects of Airbnb's price positioning on hotel performance. *International Journal of Hospitality Management*, *67*, 174–184. https://doi.org/10.1016/j.ijhm.2017.08.011; Dogru, T., Mody, M., & Suess, C. (2017). The hotel industry's Achilles' heel? Quantifying the negative impacts of Airbnb on Boston's hotel performance. *Boston Hospitality Review*, *5*(3), 1-11. https://www.bu.edu/bhr/files/2017/10/The-hotel-industrys-Achilles-Heel-Quantifying-the-negative-impacts-of-Airbnb-on-Bostons-hotel-performance_PDF-1.pdf

65 Lane, J., & Woodworth, R. M. (2016). The sharing economy checks in: An analysis of Airbnb in the United States. *CBRE Hotel's Americas Research*. Retrieved August 20, 2024, from https://www.hospitalitynet.org/file/152006083.pdf

66 Li, H., & Srinivasan, K. (2019). Competitive dynamics in the sharing economy: An analysis in the context of Airbnb and hotels. *Marketing Science*, *38*(3), 365–391. https://doi.org/10.1287/mksc.2018.1143

Dogru et al. (2019),[67] and Farronato and Fradkin (2022) also shows a negative effect of STRs on hotel prices across different areas in the US, with more pronounced benefits to consumers during peak seasons where hotels are near capacity.[68]

5. IMPACT ON TAX REVENUE

57. There are at least three main sources of state and city tax revenue arising from STRs. First, there are direct taxes on STRs, such as occupancy and bed taxes, which may be levied by states, cities and other local authorities. Second, hosts will have to pay state income tax on their STR net earnings. Third, guest expenditure on goods and services during their visit will raise additional tax revenue for city and state e.g., through sales tax.[69] In this section, we present estimates of the lost tax revenue from these three main sources, after accounting for potential replacement (i.e., that would-be STR guests may have still made the trip through non-STR accommodations, which would have generated tax revenue). Some of this lost tax revenue was already estimated in previous sections in order to identify the impact on hosts, guests, and third parties excluding tax to avoid double-counting with the figures presented here.

58. Table 8 shows that the state and city authorities of NYC, Boston, New Orleans, and Philadelphia are missing out on substantial amounts of tax revenue by restricting STRs. Specifically, we estimate that NYC and New York State missed out on $82 million in potential tax revenue as a result of LL18 and $152-$297 million when considering the cumulative impact of additional STR regulations, between September 2023-August 2024. Our estimates further suggest that, over the same period, Boston and Massachusetts lost $20-$38 million, New Orleans and Louisiana lost $37-$72 million, and Philadelphia and Pennsylvania lost $5-$6 million.

67 Dogru, T., Mody, M., & Suess, C. (2019). Adding evidence to the debate: Quantifying Airbnb's disruptive impact on ten key hotel markets. *Tourism Management*, *72*, 27–38. https://doi.org/10.1016/j.tourman.2018.11.008

68 This is also consistent with Farronato and Fradkin (2022) who use data from major US cities and quantify welfare effects of Airbnb on travelers, hosts and hotels. They find welfare gains are concentrated in locations and times when hotels are capacity constrained.

69 There will be other sources of tax revenue arising from STRs, such as the tax paid on goods and services provided to hosts to facilitate STRs (e.g., cleaning). We focus on quantifying the largest sources of tax revenue.

Table 8: Reduction in tax revenue for states and cities, September 2023-August 2024[70]

(USD millions)	**Direct STR taxes** [1]	**State income tax on host earnings** [2]	**Taxes on guest expenditure** [3]	**Total** [4]
NYC (incremental effect of LL18) *	42	7	33	82
Medium-Regulation Benchmark				
NYC (cumulative impact)	78	13	60	152
Boston	11	2	6	20
New Orleans	14	2	21	37
Philadelphia	2	0.3	3	5
Light-Regulation Benchmark				
NYC (cumulative impact)	152	26	119	297
Boston	21	5	12	38
New Orleans	28	4	40	72
Philadelphia	2	0.4	4	6

Source: Analysis of Airbnb data. * This estimate does not rely on the model prediction; see Table 1 notes.

6. CONCLUSIONS

59. STRs are not a new phenomenon, nor are the services to support them. Platforms such as Airbnb, VRBO and others provide an online marketplace that includes home-sharing in the hospitality space. In addition to providing consumers with more lodging choices and lower prices, STRs provide supplemental income to local property owners. Further, they have: 1) increased accessibility to an array of communities, many with limited hotels; 2) provided employment for local businesses who sell goods and services to both homeowners and guests; 3) generated tax revenue; and 4) enabled access to travel for more individuals.

60. However, STRs compete with entrenched incumbents like hotels. NYC is a prime example of how incumbents' interests have steered local governments to severely restrict STRs. These excessive restrictions allow hotels to maintain pricing power. Hotel revenue increased by roughly $2.5 billion per year in NYC following the date that LL18 took effect.[71] As we have shown, when state and local governments pass stringent STR laws that suppress competition, they undermine the city's financial interests and impose far-reaching, substantial costs on the everyday members of their communities.

70 [1] For NYC, see note [3] of footnote 36. For other cities, this was inferred from Airbnb data on the difference between gross booking value (total dollar value of bookings paid by the guest, including the nightly rental rate, cleaning fee, Airbnb service fee and taxes) on the one hand and gross host earnings and Airbnb fees on the other hand. For example, if gross host earnings and Airbnb fees represented 75% and 15% of gross booking value respectively, this implies the remaining 10% are direct STR taxes collected and remitted by Airbnb.

[2] See note [4] of footnote 36.

[3] Estimated using the same average expenditure and tax rates as in Table 6 and Table 7.

[4] The sum of columns [1] to [3].

All numbers are adjusted downwards by 70% in NYC, 60% in Boston and 62% in New Orleans and Philadelphia to account for potential substitution to other accommodations.

71 Marsella et al. (2024).