



AirBNB

Dallas Revenue Preservation & Growth

Team



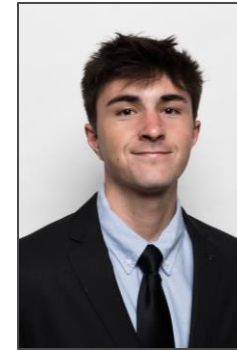
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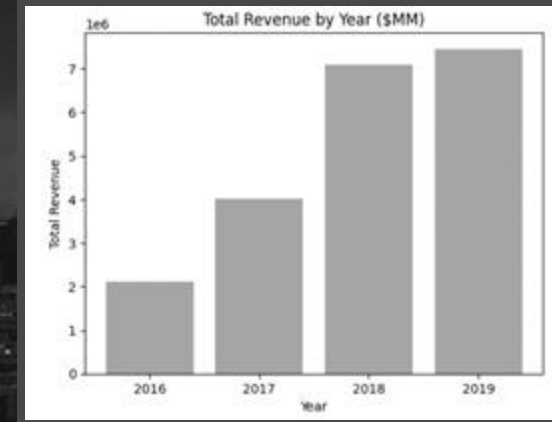
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■ Headwinds in Dallas

- Stagnant revenue growth in 2019
 - 2019 growth slowed to 5%



- Nationwide movement to legislate short term rentals (STRs)

■ STR Political Landscape

- Popular forms of local legislation
 - Non-primary residence restrictions
 - Neighborhood specific bans
 - STR registrations and limitations (see Arlington, Texas article)
- June 2023 Dallas ban on STRs in residential areas that are not the owner's primary residence
- Outlook: impact on listings and future revenue growth



Moving Forward

Problem

Revenue growth is slowing as is, and local legislation will hinder growth even further

What if we do nothing?

AirBNB's revenue growth will stay at a plateaued level, and revenue may even start to decrease as legislation makes the STR market less attractive to potential and current hosts

Objective

How does AirBNB mitigate legislative risk and continue to preserve and grow revenue?

Data Deep Dive

- 2016 to 2020 previous scrape data in Dallas Market
- 111 Variables. 48,711 rows of data.

Summary Statistics for key factors leveraged:

Revenue Statistics	
Count	48,711.00
Mean	2,049.27
STD	3,745.62
Min	-
25%	-
50%	787.00
75%	2,759.00
Max	134,209.00

Max Guests Statistics	
Count	48,711.00
Mean	3.94
STD	2.57
Min	-
25%	2.00
50%	4.00
75%	5.00
Max	16.00

Nightly Rate Statistics	
Count	48,711.00
Mean	157.17
STD	169.89
Min	1.00
25%	69.00
50%	107.50
75%	185.13
Max	1,900.00

Neighborhood Statistics	
Count	48,711.00
Unique	18.00
Top	Central Dallas
Freq	25,470.00

■ Modeling

Goal: Develop a linear regression model to predict listing revenue for a given period

Desired Results: Balancing accuracy and the inclusion important variables to arrive at a highly interpretable model

Strategic Pre-Processing

- Null imputation
- Z-score based outlier removal (revenue & rate)
- Generating “Year Adjusted” variable for true annual values without duplicate
- Decile segmentation (overall rating)
- One-hot encoded categorical variables
- Value exclusions:
 - Available days less than 20
 - Hotel room listing types

Assumptions

- Looking at “Active” Hosts
 - 20+ Available Days posted in a year
- Outlier removal
- Excluding Hotel Rooms
 - Diving into specific STR within Dallas Market

■ Model Investigation

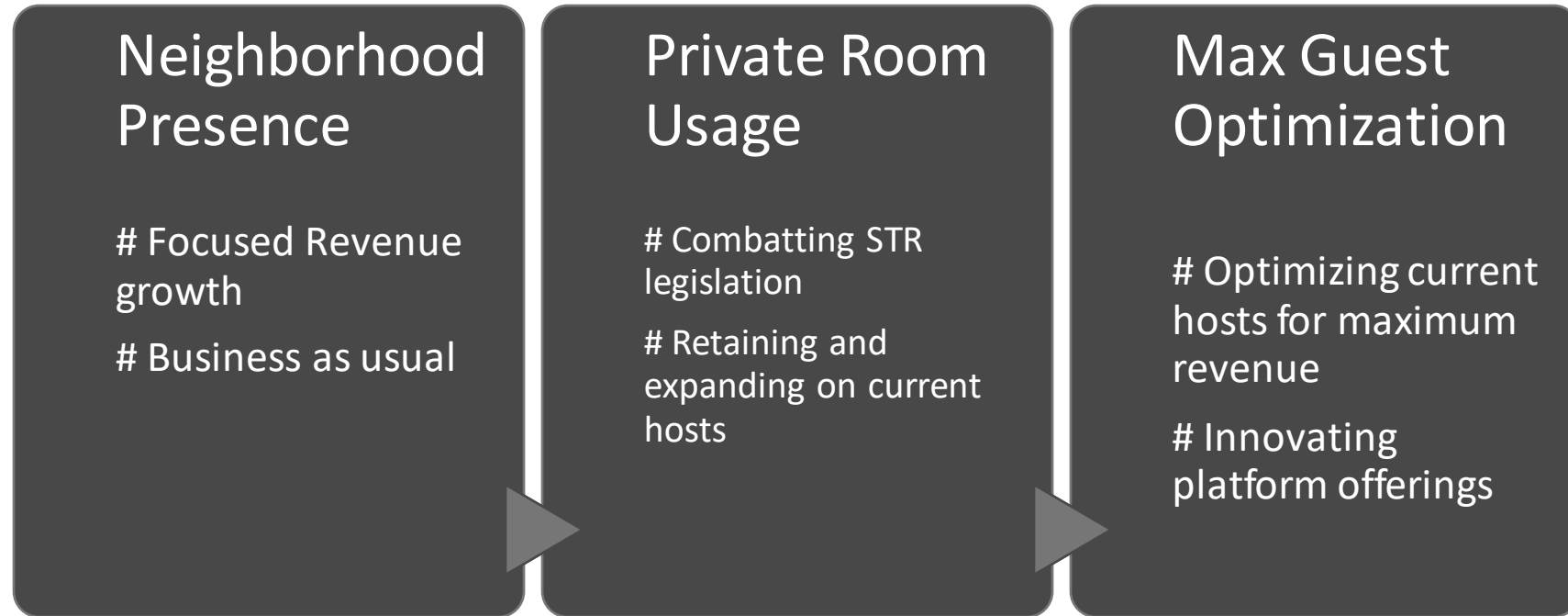
Linear Regression 1	Linear Regression 2	Linear Regression 3
All variables included	Interaction terms	Backwards selection model
Performance		Performance
▪ Training $R^2 = 0.849$	▪ Neighborhood * Max Guests	▪ Training $R^2 = 0.875$
▪ Validation $R^2 = 0.845$	▪ Neighborhood * Listing Type	▪ Validation $R^2 = 0.871$
	Manually removed high P-val variables	
	Performance	
	▪ Training $R^2 = 0.849$	
	▪ Validation $R^2 = 0.845$	

Objective Attainment:

- Consistently explains a substantial proportion of the variation across the training and validation datasets indicating robust performance
- Balances accuracy with the inclusion of strategically important variables

Interpretations of the model outputs and business recommendations that accompany them are discussed in the following slides

Target Areas

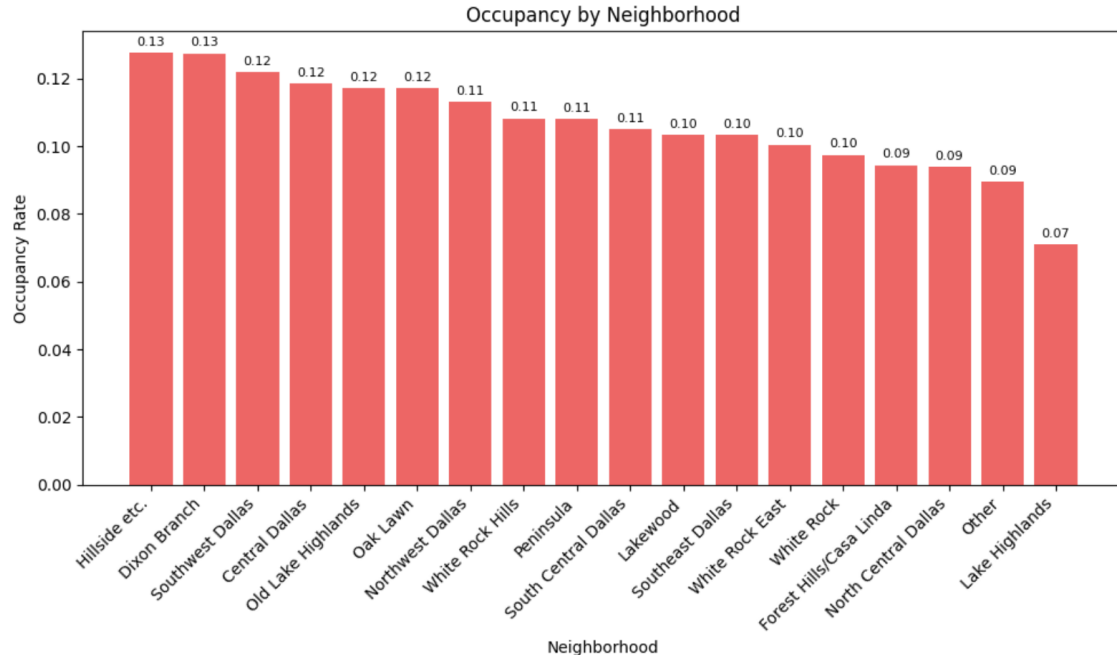


Neighborhood Performance Analysis

18 different neighborhoods (17 unique neighborhoods, 1 attribute for other)

Occupancy Rate (Baseline ~ 0.11):

- Occupancy Rate is highest for: Hillside, Dixon Branch, Southwest Dallas
- Occupancy Rate is lowest for: Lake Highlands, Other, North Central Dallas



Neighborhood effect on Revenue:

- Coefficients highest for: White Rock, Old Lake Highlands, Peninsula
- Coefficients lowest for: White Rock Hills, Dixon Branch, South Central Dallas

Variable	Coefficient
Neighborhood_White Rock	972.5184328081552
Neighborhood_Old Lake Highlands	679.3901146848355
Neighborhood_Peninsula	307.3084581177221
Neighborhood_Other	238.59393122265868
Neighborhood_Northwest Dallas	94.39146162930639
Neighborhood_White Rock East	88.35868141227695
Neighborhood_Southeast Dallas	50.46038563660255
Neighborhood_Hillside etc.	-7.449423582750953
Neighborhood_Forest Hills/Casa Linda	-27.4314739012936
Neighborhood_Lake Highlands	-46.00443677069339
Neighborhood_Oak Lawn	-53.04974500909967
Neighborhood_North Central Dallas	-62.025420695740195
Neighborhood_Lakewood	-73.09424750491016
Neighborhood_Southwest Dallas	-171.74310502877393
Neighborhood_South Central Dallas	-276.5353188924348
Neighborhood_Dixon Branch	-511.8337896355841
Neighborhood_White Rock Hills	-2460.6696634953814

■ Solution 1: Neighborhood Expansion



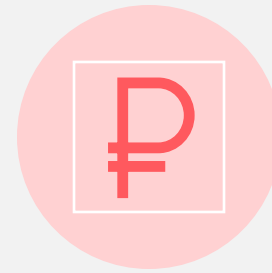
IMPLEMENT MARKETING
CAMPAIGN TO BRING IN NEW
LISTINGS



ONE-YEAR REDUCTION
IN AIRBNB FEE FOR NEW
LISTINGS (8% FEE) FOR GROUP 1



ONE-YEAR REDUCTION
IN AIRBNB FEE FOR NEW
LISTINGS (8% FEE) FOR GROUP 2



ONE-YEAR REDUCTION
IN AIRBNB FEE FOR NEW
LISTINGS (9% FEE) MARKETWIDE

Group 1: Old Lake Highlands, Peninsula, and Northwest Dallas

Group 2: Hillside, Dixon Branch, Southwest Dallas, Central Dallas and Oak Lawn

■ Neighborhood & Private Room Analysis

Occupancy Rate (Baseline ~ 0.09):

- Occupancy Rate is highest for: Dixon Branch, Old Lake Highlands, Hillside etc.
- Occupancy Rate is lowest for: Peninsula, White Rock, Lake Highlands

Neighborhood	Occupancy Rate
Dixon Branch	0.2217
Old Lake Highlands	0.1217
Hillside etc.	0.1212
Southeast Dallas	0.1177
White Rock Hills	0.114
Southwest Dallas	0.1067
Central Dallas	0.1016
Oak Lawn	0.0957
Northwest Dallas	0.0948
South Central Dallas	0.0888
Other	0.087
North Central Dallas	0.0817
White Rock East	0.0807
Forest Hills/Casa Linda	0.0799
Lakewood	0.0738
Lake Highlands	0.0478
White Rock	0.0333
Peninsula	0.0

Neighborhood/Shared room effect on Revenue:

- Coefficients highest for: White Rock Hills, Dixon Branch, Peninsula
- Coefficients lowest for: Lake Highlands, Northwest Dallas, White Rock

Variable	Coefficient
Neighborhood_White Rock Hills_Listing Type_Private room	2041.92095951474
Neighborhood_Dixon Branch_Listing Type_Private room	475.96540073952855
Neighborhood_Peninsula_Listing Type_Private room	407.1559589692336
Neighborhood_Lakewood_Listing Type_Private room	341.10501077217924
Neighborhood_Lake Highlands_Listing Type_Private room	268.60724287679386
Neighborhood_South Central Dallas_Listing Type_Private room	146.72820639732424
Neighborhood_Forest Hills/Casa Linda_Listing Type_Private room	108.23396930601797
Neighborhood_North Central Dallas_Listing Type_Private room	74.14481471201259
Neighborhood_Oak Lawn_Listing Type_Private room	21.33917231835386
Neighborhood_White Rock East_Listing Type_Private room	11.387016667505804
Neighborhood_Southeast Dallas_Listing Type_Private room	-32.605437875077826
Neighborhood_Other_Listing Type_Private room	-56.36999664013814
Neighborhood_Hillside etc._Listing Type_Private room	-67.23137343957343
Neighborhood_Southwest Dallas_Listing Type_Private room	-88.87132819355065
Neighborhood_White Rock_Listing Type_Private room	-99.31864154492598
Neighborhood_Northwest Dallas_Listing Type_Private room	-256.9472979656332
Neighborhood_Old Lake Highlands_Listing Type_Private room	-577.1752555137649

■ Solution 2: Private Room Expansion

Inform hosts on the benefits of listing their property as a private room during their non-available days.

Implement marketing campaign to bring in new listings

One-year reduction in AirBnB fee for new listings (8% fee) for Group 1

One-year reduction in AirBnB fee for new listings (8% fee) for Group 2

One-year reduction in AirBnB fee for new listings (9% fee) Marketwide

Group 1: Dixon Branch, White Rock Hills, Central Dallas, Oak Lawn and South Central Dallas

Group 2: Old Lake Highlands, Southeast Dallas, Southwest Dallas and Northwest Dallas, Hillside etc.

Number of Listings Below Regulated Maximum Capacity = 6,404

Max Guests Policy

- To comply with Dallas regulations, each bedroom in a listing can accommodate no more than 3 guests, as per the city's code.
- Listings below the maximum capacity represent untapped and easily accessible revenue

Max Guests & Occupancy Analysis

Count of listings below regulated maximum capacity by neighborhood:

- Count is highest for: Central Dallas, North Central Dallas, Southwest Dallas
- Count is lowest for: Peninsula, White Rock, Dixon Branch

Neighborhood	Count
Central Dallas	2515
North Central Dallas	802
Southwest Dallas	771
Oak Lawn	618
Other	520
Northwest Dallas	333
Lake Highlands	205
Southeast Dallas	174
South Central Dallas	133
Forest Hills/Casa Linda	68
Hillside etc.	50
Lakewood	50
White Rock East	39
Old Lake Highlands	37
White Rock Hills	36
Dixon Branch	35
White Rock	12
Peninsula	6

Max Guests/Occupancy effect on Revenue:

- Significantly positive effect on revenue when a host with a high occupancy rate increases their max guests

Variable	Coefficient
Max_Guests_Occupancy_Rate	554.893678300699

Solution 3: Max Guest Optimization

1

Inform hosts on their capabilities based on the Dallas regulation

2

Partner with Wayfair to subsidize the purchase of pull-out couches or air mattresses for hosts.

3

Roll-out program to hosts in Group 1.

4

Roll-out program to hosts in Group 2.

5

Full market implementation.

Group 1: Central Dallas, Southwest Dallas, Oak Lawn, Northwest Dallas, South Central Dallas

Group 2: North Central Dallas, Other, Lake Highlands, Southeast Dallas

Projections & Expected Revenues (Annually)

Solution 1: Old Lake
Highlands

- Expected Revenue Increase:
\$20,772.00

Solution 2: Private
Rooms in South Cental
Dallas

- Expected Revenue Increase:
\$44,304.75

Solution 3: Max Guest
Optimization in Central
Dallas

- Expected Revenue Increase:
\$184,440.96

Solution Summary

Targeted Neighborhood Expansion	Private Room Expansion	Max Guest Optimization
Goal: Acquire new hosts in top neighborhoods	Goal: Acquire new private room listings in top neighborhood, expand current hosts to adjust to private room	Goal: Achieve optimal listings in terms of max guests allowed in a property within the market
Action Steps: Marketing campaign to incentivize bringing in new hosts	Action Steps: Marketing campaign alongside the neighborhood expansion campaign (specifically targeting private room listings) & communication to hosts	Action Steps: Communication to hosts on what their true availability is & roll-out of a partnership to provide low-cost options for hosts to supply more sleeping options to guests
Benefit: Estimated 33% increase in annual revenue for neighborhoods in Group 1	Benefit: Estimated 48.3% increase in annual revenue for private rooms in Group 1	Benefit: An increase of max guests by 2 will generate 33% more revenue annually for Group 1 neighborhoods

Limitations for Further Investigation

- Missing data/null values
- Undefined neighborhoods
- Additional datapoints that would be useful:
 - Quality ratings of properties
 - Number of bookings (not just booked days)



THANK YOU.



Appendix

1. Selected Model Summary
2. Variables/Coefficients 1
3. Variables/Coefficients 2
4. Variables/Coefficients 3
5. Variables/Coefficients 4
6. Variables/Coefficients 5
7. Unduplicated Year Adjusted Code (Assumes data is based on previous 365 days)
8. Dallas City Council Regulation
9. Dallas STR Clamp Down
10. 2022 Trends in STR Market
11. Neighborhood Expansion Calculations for Solution 1 (Old Lake Highlands)
12. Private Room Analysis for Solution 2 (South Central Dallas)
13. Max Guest Optimization for Solution 3 (Central Dallas)

Exhibit 1: Selected Model Summary

Training Set Model Summary:

OLS Regression Results

```
=====
Dep. Variable:          revenue    R-squared:                0.856
Model:                  OLS        Adj. R-squared:           0.853
Method:                 Least Squares    F-statistic:             321.2
Date:                  Thu, 07 Dec 2023    Prob (F-statistic):       0.00
Time:                  03:48:33          Log-Likelihood:          -57847.
No. Observations:      7216            AIC:                    1.160e+05
Df Residuals:          7084            BIC:                    1.169e+05
Df Model:              131
Covariance Type:       nonrobust
```

Validation Set R-squared: 0.8550

Training Set Mean Squared Error (MSE): 537753.3451

Validation Set Mean Squared Error (MSE): 563213.5523

Exhibit 2: Variables/Coefficients 1

	coef	std err	t	P> t	[0.025	0.975]
const	-73.1813	10.508	-6.964	0.000	-93.781	-52.582
superhost_observed_in_period	0.0688	0.061	1.122	0.262	-0.051	0.189
rating_ave_pastYear	-13.0069	21.540	-0.604	0.546	-55.232	29.218
numReviews_pastYear	0.0152	0.193	0.079	0.937	-0.362	0.393
num_5_star_Rev_pastYear	0.1593	0.210	0.758	0.448	-0.253	0.571
prop_5_StarReviews_pastYear	133.3608	108.054	1.234	0.217	-78.458	345.180
prev_rating_ave_pastYear	1.4209	6.954	0.204	0.838	-12.210	15.052
prev_numReviews_pastYear	-0.1236	0.127	-0.969	0.332	-0.373	0.126
numReservedDays_pastYear	0.0038	0.005	0.699	0.484	-0.007	0.014
numReserv_pastYear	-0.0150	0.013	-1.124	0.261	-0.041	0.011
available_days	3.6835	0.281	13.106	0.000	3.133	4.234
available_days_aveListedPrice	-0.6776	0.185	-3.657	0.000	-1.041	-0.314
booked_days	68.6749	0.879	78.126	0.000	66.952	70.398
booked_days_avePrice	5.8534	0.165	35.568	0.000	5.531	6.176
prev_available_days	-1.6980	0.315	-5.386	0.000	-2.316	-1.080
prev_available_days_aveListedPrice	0.1384	0.344	0.402	0.688	-0.537	0.813
prev_booked_days	-13.1126	1.324	-9.908	0.000	-15.707	-10.518
prev_booked_days_avePrice	-0.4067	0.197	-2.064	0.039	-0.793	-0.020
Bedrooms	82.1168	22.086	3.718	0.000	38.822	125.412
Bathrooms	67.4952	24.838	2.717	0.007	18.805	116.185
Max Guests	6.1197	9.452	0.647	0.517	-12.408	24.648
Cleaning Fee (USD)	0.1369	0.311	0.441	0.659	-0.472	0.746
Minimum Stay	0.3544	0.437	0.811	0.417	-0.502	1.211
Number of Photos	1.6898	0.687	2.459	0.014	0.343	3.037
Nightly Rate	1.9792	0.213	9.299	0.000	1.562	2.396
prev_Nightly Rate	-0.1473	0.065	-2.272	0.023	-0.274	-0.020
Number of Reviews	-2.0352	0.918	-2.217	0.027	-3.835	-0.235
prev_Number of Reviews	2.0754	0.962	2.159	0.031	0.191	3.960
prev_revenue	0.1501	0.007	22.692	0.000	0.137	0.163
prev_occupancy_rate	-154.7192	149.238	-1.037	0.300	-447.271	137.833
prev_year_superhosts	-0.9675	9.119	-0.106	0.916	-18.843	16.908
booked_days_period_city	-0.3254	0.023	-14.086	0.000	-0.371	-0.280

Exhibit 3: Variables/Coefficients 2

revenue_period_city	0.0026	0.000	13.823	0.000	0.002	0.003
host_is_superhost_in_period_1	2.2128	11.812	0.187	0.851	-20.942	25.367
prev_host_is_superhost_in_period_1	23.7654	13.628	1.744	0.081	-2.949	50.480
Superhost_1	2.2128	11.812	0.187	0.851	-20.942	25.367
prev_host_is_superhost_1	23.7654	13.628	1.744	0.081	-2.949	50.480
superhost_change_1	7.1439	19.168	0.373	0.709	-30.431	44.719
superhost_change_lose_superhost_1	14.3483	14.049	1.021	0.307	-13.192	41.888
superhost_change_gain_superhost_1	-7.2044	12.491	-0.577	0.564	-31.691	17.282
Property Type_Bed & Breakfast	337.5458	240.961	1.401	0.161	-134.811	809.902
Property Type_Boutique hotel	16.3562	287.155	0.057	0.955	-546.553	579.265
Property Type_Bungalow	127.8990	92.900	1.377	0.169	-54.213	310.011
Property Type_Cabin	-1.036e-12	2.44e-12	-0.424	0.671	-5.82e-12	3.75e-12
Property Type_Camper/RV	-192.7363	217.273	-0.887	0.375	-618.657	233.185
Property Type_Chalet	666.2164	795.198	0.838	0.402	-892.610	2225.042
Property Type_Condominium	-14.0683	35.475	-0.397	0.692	-83.610	55.473
Property Type_Cottage	-54.7022	175.614	-0.311	0.755	-398.958	289.553
Property Type_Guest suite	3.3485	76.203	0.044	0.965	-146.032	152.729
Property Type_Guesthouse	-11.8689	53.738	-0.221	0.825	-117.211	93.473
Property Type_Home/apt	966.6999	742.564	1.302	0.193	-488.948	2422.348
Property Type_Hotel	-445.6820	761.551	-0.585	0.558	-1938.550	1047.186
Property Type_House	43.5643	32.092	1.357	0.175	-19.345	106.474
Property Type_Loft	70.7391	64.953	1.089	0.276	-56.589	198.067
Property Type_Other	-774.4033	526.174	-1.472	0.141	-1805.861	257.055
Property Type_Place	300.2662	429.767	0.699	0.485	-542.205	1142.738
Property Type_Private room	-50.0041	526.318	-0.095	0.924	-1081.744	981.736
Property Type_Private room in apartment	191.1216	178.311	1.072	0.284	-158.422	540.665
Property Type_Private room in condominium	70.8752	525.964	0.135	0.893	-960.172	1101.922
Property Type_Private room in guest suite	-1064.6448	526.470	-2.022	0.043	-2096.682	-32.607
Property Type_Private room in house	2.0866	143.475	0.015	0.988	-279.166	283.340
Property Type_Private room in townhouse	75.4618	529.882	0.142	0.887	-963.265	1114.189
Property Type_Serviced apartment	-60.7277	93.919	-0.647	0.518	-244.837	123.382
Property Type_Shared room in apartment	-341.3489	238.827	-1.429	0.153	-809.520	126.823
Property Type_Shared room in house	47.4499	393.347	0.121	0.904	-723.627	818.527
Property Type_Tent	-414.9962	530.169	-0.783	0.434	-1454.287	624.294
Property Type_Tiny house	-172.6698	147.889	-1.168	0.243	-462.576	117.236
Property Type_Townhouse	73.5764	42.799	1.719	0.086	-10.322	157.475
Property Type_Treehouse	3715.9032	755.169	4.921	0.000	2235.546	5196.261
Property Type_Villa	743.9877	753.819	0.987	0.324	-733.723	2221.698

Exhibit 4: Variables/Coefficients 3

Property Type_Windmill	-558.4563	742.848	-0.752	0.452	-2014.660	897.748
Listing Type_Private room	-180.1177	46.474	-3.876	0.000	-271.221	-89.015
Listing Type_Shared room	48.6562	150.074	0.324	0.746	-245.535	342.847
Neighborhood_Dixon Branch	-511.8338	571.516	-0.896	0.371	-1632.177	608.509
Neighborhood_Forest Hills/Casa Linda	-27.4315	267.565	-0.103	0.918	-551.938	497.075
Neighborhood_Hillside etc.	-7.4494	275.075	-0.027	0.978	-546.678	531.779
Neighborhood_Lake Highlands	-46.0044	146.379	-0.314	0.753	-332.950	240.941
Neighborhood_Lakewood	-73.0942	264.413	-0.276	0.782	-591.422	445.233
Neighborhood_North Central Dallas	-62.0254	81.001	-0.766	0.444	-220.812	96.761
Neighborhood_Northwest Dallas	94.3915	117.777	0.801	0.423	-136.487	325.270
Neighborhood_Oak Lawn	-53.0497	82.285	-0.645	0.519	-214.353	108.254
Neighborhood_Old Lake Highlands	679.3901	674.512	1.007	0.314	-642.855	2001.635
Neighborhood_Other	238.5939	96.347	2.476	0.013	49.725	427.463
Neighborhood_Peninsula	307.3085	708.510	0.434	0.664	-1081.584	1696.201
Neighborhood_South Central Dallas	-276.5353	205.605	-1.345	0.179	-679.583	126.513
Neighborhood_Southeast Dallas	50.4604	190.837	0.264	0.791	-323.638	424.559
Neighborhood_Southwest Dallas	-171.7431	73.890	-2.324	0.020	-316.589	-26.897
Neighborhood_White Rock	972.5184	2163.846	0.449	0.653	-3269.267	5214.304
Neighborhood_White Rock East	88.3587	238.358	0.371	0.711	-378.893	555.611
Neighborhood_White Rock Hills	-2460.6697	914.589	-2.690	0.007	-4253.538	-667.802
Pets Allowed_True	54.9215	25.450	2.158	0.031	5.032	104.811
prev_host_is_superhost1_1	4.4965	31.954	0.141	0.888	-58.144	67.137
prev_host_is_superhost2_1	-29.2294	27.548	-1.061	0.289	-83.231	24.772
Year_Adjusted_2017	184.5310	32.636	5.654	0.000	120.555	248.507
Year_Adjusted_2018	85.0968	14.900	5.711	0.000	55.888	114.305
Year_Adjusted_2019	-116.1422	15.776	-7.362	0.000	-147.067	-85.217
Neighborhood_Dixon Branch_Max_Guests	24.5914	89.985	0.273	0.785	-151.807	200.990
Neighborhood_Forest Hills/Casa Linda_Max_Guests	-17.3655	67.761	-0.256	0.798	-150.196	115.465
Neighborhood_Hillside etc._Max_Guests	-50.0699	51.942	-0.964	0.335	-151.892	51.753
Neighborhood_Lake Highlands_Max_Guests	-36.6406	24.760	-1.480	0.139	-85.178	11.896
Neighborhood_Lakewood_Max_Guests	-23.2655	50.358	-0.462	0.644	-121.982	75.451
Neighborhood_North Central Dallas_Max_Guests	-32.4513	15.794	-2.055	0.040	-63.413	-1.490
Neighborhood_Northwest Dallas_Max_Guests	-43.3587	20.758	-2.089	0.037	-84.050	-2.668
Neighborhood_Oak Lawn_Max_Guests	4.3251	17.700	0.244	0.807	-30.373	39.023
Neighborhood_Old Lake Highlands_Max_Guests	-213.3779	195.269	-1.093	0.275	-596.163	169.408
Neighborhood_Other_Max_Guests	-82.1513	19.247	-4.268	0.000	-119.881	-44.422
Neighborhood_Peninsula_Max_Guests	-3.6485	137.983	-0.026	0.979	-274.136	266.839
Neighborhood_South Central Dallas_Max_Guests	-32.8695	27.171	-1.210	0.226	-86.132	20.393

Exhibit 5: Variables/Coefficients 4

Neighborhood_Southeast Dallas_Max_Guests	-60.0383	22.576	-2.659	0.008	-104.295	-15.782
Neighborhood_Southwest Dallas_Max_Guests	1.2354	12.211	0.101	0.919	-22.701	25.172
Neighborhood_White Rock_Max_Guests	-207.4122	262.598	-0.790	0.430	-722.182	307.358
Neighborhood_White Rock East_Max_Guests	-64.4314	28.144	-2.289	0.022	-119.603	-9.260
Neighborhood_White Rock Hills_Max_Guests	114.0165	85.283	1.337	0.181	-53.164	281.197
Neighborhood_Dixon Branch_Listing Type_Private room	475.9654	498.387	0.955	0.340	-501.022	1452.953
Neighborhood_Dixon Branch_Listing Type_Shared room	-2.126e-13	2.2e-13	-0.968	0.333	-6.43e-13	2.18e-13
Neighborhood_Forest Hills/Casa Linda_Listing Type_Private room	108.2340	279.452	0.387	0.699	-439.576	656.044
Neighborhood_Forest Hills/Casa Linda_Listing Type_Shared room	3.069e-14	2.05e-13	0.150	0.881	-3.71e-13	4.33e-13
Neighborhood_Hillside etc._Listing Type_Private room	-67.2314	332.384	-0.202	0.840	-718.803	584.341
Neighborhood_Hillside etc._Listing Type_Shared room	-1.324e-12	2.68e-13	-4.938	0.000	-1.85e-12	-7.98e-13
Neighborhood_Lake Highlands_Listing Type_Private room	268.6072	142.965	1.879	0.060	-11.648	548.862
Neighborhood_Lake Highlands_Listing Type_Shared room	302.2793	381.029	0.793	0.428	-444.651	1049.210
Neighborhood_Lakewood_Listing Type_Private room	341.1050	334.323	1.020	0.308	-314.267	996.477
Neighborhood_Lakewood_Listing Type_Shared room	-1.414e-13	1.5e-13	-0.941	0.347	-4.36e-13	1.53e-13
Neighborhood_North Central Dallas_Listing Type_Private room	74.1448	81.483	0.910	0.363	-85.586	233.876
Neighborhood_North Central Dallas_Listing Type_Shared room	-904.5685	548.071	-1.650	0.099	-1978.951	169.814
Neighborhood_Northwest Dallas_Listing Type_Private room	-256.9473	123.888	-2.074	0.038	-499.806	-14.089
Neighborhood_Northwest Dallas_Listing Type_Shared room	-766.7064	213.134	-3.597	0.000	-1184.512	-348.901
Neighborhood_Oak Lawn_Listing Type_Private room	21.3392	94.848	0.225	0.822	-164.592	207.270
Neighborhood_Oak Lawn_Listing Type_Shared room	-79.9242	320.075	-0.250	0.803	-707.367	547.518
Neighborhood_Old Lake Highlands_Listing Type_Private room	-577.1753	408.786	-1.412	0.158	-1378.518	224.168
Neighborhood_Old Lake Highlands_Listing Type_Shared room	7.788e-13	1.69e-13	4.621	0.000	4.48e-13	1.11e-12
Neighborhood_Other_Listing Type_Private room	-56.3700	101.769	-0.554	0.580	-255.867	143.127
Neighborhood_Other_Listing Type_Shared room	128.6349	227.260	0.566	0.571	-316.862	574.132
Neighborhood_Peninsula_Listing Type_Private room	407.1560	884.212	0.460	0.645	-1326.163	2140.475
Neighborhood_South Central Dallas_Listing Type_Private room	146.7282	183.367	0.800	0.424	-212.726	506.182
Neighborhood_South Central Dallas_Listing Type_Shared room	9.9984	400.113	0.025	0.980	-774.344	794.340

Exhibit 6: Variables/Coefficients 5

Neighborhood_Southeast Dallas_Listing Type_Private room	-32.6054	174.597	-0.187	0.852	-374.867	309.656
Neighborhood_Southeast Dallas_Listing Type_Shared room	-297.1016	275.623	-1.078	0.281	-837.404	243.201
Neighborhood_Southwest Dallas_Listing Type_Private room	-88.8713	83.256	-1.067	0.286	-252.079	74.336
Neighborhood_Southwest Dallas_Listing Type_Shared room	-592.0360	181.420	-3.263	0.001	-947.672	-236.400
Neighborhood_White Rock_Listing Type_Private room	-99.3186	1739.375	-0.057	0.954	-3509.013	3310.376
Neighborhood_White Rock East_Listing Type_Private room	11.3870	278.421	0.041	0.967	-534.401	557.175
Neighborhood_White Rock Hills_Listing Type_Private room	2041.9210	770.819	2.649	0.008	530.886	3552.956
Neighborhood_White Rock Hills_Listing Type_Shared room	2426.1285	1125.270	2.156	0.031	220.262	4631.995
Max_Guests_Occupancy_Rate	554.8937	24.000	23.120	0.000	507.846	601.942

Exhibit 7: Unduplicated Year Adjusted Code (Assumes data is based on previous 365 days)

```
#ADJUST YEARS FOR TIME SERIES

def adjust_year(row):
    if row['Quarter'] == 'Q4':
        if row['Year'] == 2017:
            return 2017
        elif row['Year'] == 2016:
            return 2016
        elif row['Year'] == 2018:
            return 2018
        elif row['Year'] == 2019:
            return 2019
        elif row['Year'] == 2020:
            return 2020
    return 0 # Return 0 if conditions are not met

# Apply the function to create the new column 'Year_Adjusted'
df['Year_Adjusted'] = df.apply(adjust_year, axis=1)

# Filter to keep rows where 'Year_Adjusted' is not equal to 0
df = df[df['Year_Adjusted']!=0]
```

Exhibit 8: Dallas City Council Regulation

The first option weighed by the council resembles Miami's approach to the issue. In this scenario, non-owner occupied rentals, such as cases in which owners have several Airbnbs but live off site, would be completely banned in areas zoned for single family homes. Owner occupied short-term rentals, regardless of zoning, would still be permitted as long as the space is not used for commercial or recreational purposes.

<https://therealdeal.com/texas/2022/06/02/dallas-city-council-struggles-to-reach-consensus-with-airbnb-rules/>

Exhibit 9: Dallas STR Clamp Down

BY THE NUMBERS

Dallas is the latest city to clamp down on short-term rentals ✓

This week, the Dallas City Council voted to ban short-term rentals from residential zones, with no exceptions for existing STRs.

<https://www.realestatenews.com/2023/06/17/dallas-is-the-latest-city-to-clamp-down-on-short-term-rentals>

Exhibit 10: 2022 Trends in STR Market

Looking ahead to 2023

The trends that marked the industry in 2022 will no doubt continue in 2023, with communities continuing to grapple with how best to manage STRs and hosts seeking to have their input included in new regulations — then adjusting once they're passed.

At this point, many states and larger cities now have STR laws that are well-established, and regulation activity should slow down in many of these areas (with some exceptions, such as Hawaii). However, many smaller communities where STR activity flew under the radar for years are now starting to look at how to manage the industry, as well as benefit from STR tax revenue, and this will be a hot spot for regulation.

Moving forward, extreme positions on STR regulation — from total STR bans on the government side to a complete lack of rules on the operators' side — will not be the norm. Instead, many communities will find that a more balanced approach will likely achieve the most success. In this best-case scenario, communities will be able to take advantage of the many benefits STRs bring, while having mechanisms in place to effectively curb any negative effects and giving all sides an opportunity to contribute.

<https://www.avalara.com/mylodgetax/en/blog/2022/12/2022-trends-in-str-regulation-and-what-to-expect-in-2023.html>

Exhibit 11: Neighborhood Expansion Calculations for Solution 1 (Old Lake Highlands)

Old Lake Highlands Neighborhood Expansion		
Average Revenue for Listings	\$ 2,308.00	\$ 62,316.00
Number of listings	27	
20% increase (Worst Case)	\$ 74,779.20	
30% increase (Middle Case)	\$ 81,010.80	
50% increase (Best Case)	\$ 93,474.00	
Average Revenue	\$ 83,088.00	
Average Increase in Revenue	\$ 20,772.00	

Exhibit 12: Private Room Analysis for Solution 2 (South Central Dallas)

Revenue Increases for adding a private room in South Central Dallas		
Average revenue per private room	\$ 945.00	\$ 91,665.00
Number of Listings	97	
20% increase in private rooms (Worst Case)	\$ 109,998.00	
50% increase in private rooms (Middle Case)	\$ 137,497.50	
75% increase in private rooms (Best Case)	\$ 160,413.75	
New Average Revenue	\$ 135,969.75	
Increase in Revenue	\$ 44,304.75	

Exhibit 13: Max Guest Optimization for Solution 3 (Central Dallas)

Central Dallas Max Guest Solution (Best Case)		Current Max Guest Policy for Central Dallas	
Listings below regulated maximum	2300	Listings below regulated maximum	2300
Max_Guests_Occupancy_Rate Coef	562.32	Max_Guests_Occupancy_Rate Coef	562.32
Occupancy Rate	0.12	Occupancy Rate	0.12
New Max Guest Limit	6	Average Max Guests	4
Revenue	\$ 931,201.92	Revenue	\$ 620,801.28
Increase in Revenue	\$ 310,400.64		
Central Dallas Max Guest Solution (Middle Case)		Current Max Guest Policy for Central Dallas	
Listings below regulated maximum	1300	Listings below regulated maximum	1300
Max_Guests_Occupancy_Rate Coef	562.32	Max_Guests_Occupancy_Rate Coef	562.32
Occupancy Rate	0.12	Occupancy Rate	0.12
New Max Guest Limit	6	Average Max Guests	4
Revenue	\$ 526,331.52	Revenue	\$ 350,887.68
Increase in Revenue	\$ 175,443.84		
Central Dallas Max Guest Solution (Worst Case)		Current Max Guest Policy for Central Dallas	
Listings below regulated maximum	500	Listings below regulated maximum	500
Max_Guests_Occupancy_Rate Coef	562.32	Max_Guests_Occupancy_Rate Coef	562.32
Occupancy Rate	0.12	Occupancy Rate	0.12
New Max Guest Limit	6	Average Max Guests	4
Revenue	\$ 202,435.20	Revenue	\$ 134,956.80
Increase in Revenue	\$ 67,478.40		
Average Revenue	\$ 553,322.88	Average Revenue	\$ 368,881.92
		Increase in Revenue	\$ 184,440.96