

Nashville Theft Analysis



Using 2019 Call for Service data to analyze calls for theft

The Dataset - “Metro Nashville Police Department Calls for Service (2019)”

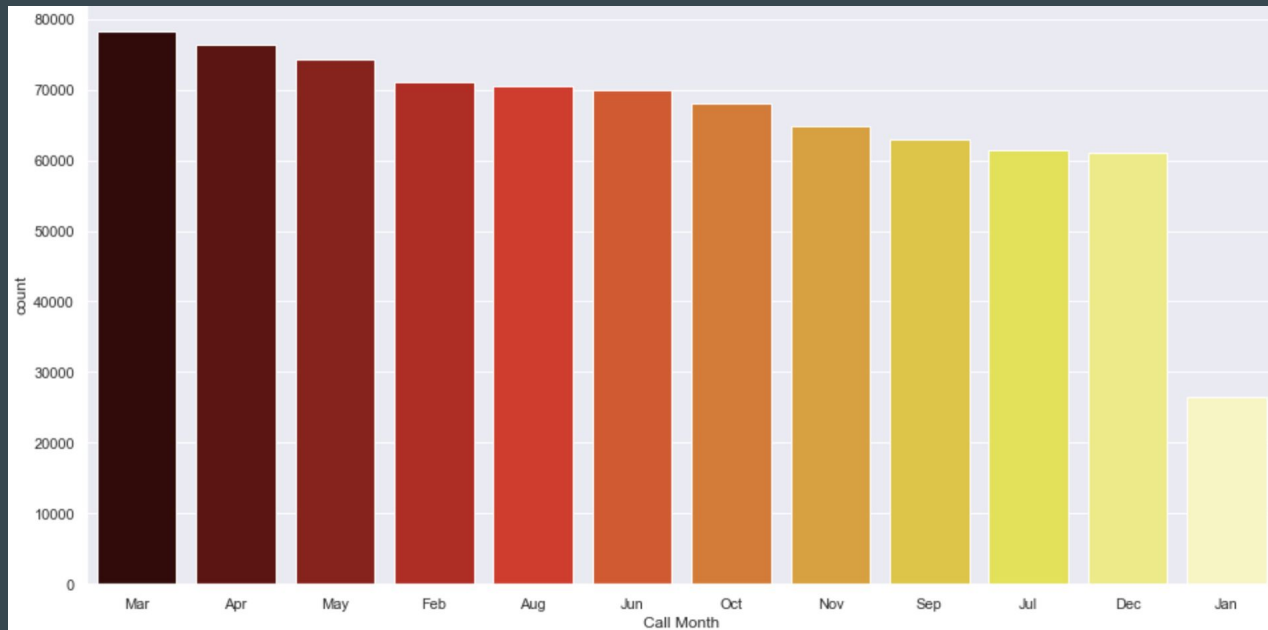
785k+ rows, each representing one call for service in 2019

18 columns

Note: Recorded data is missing for Jan 1, 2019 - Jan 12, 2019

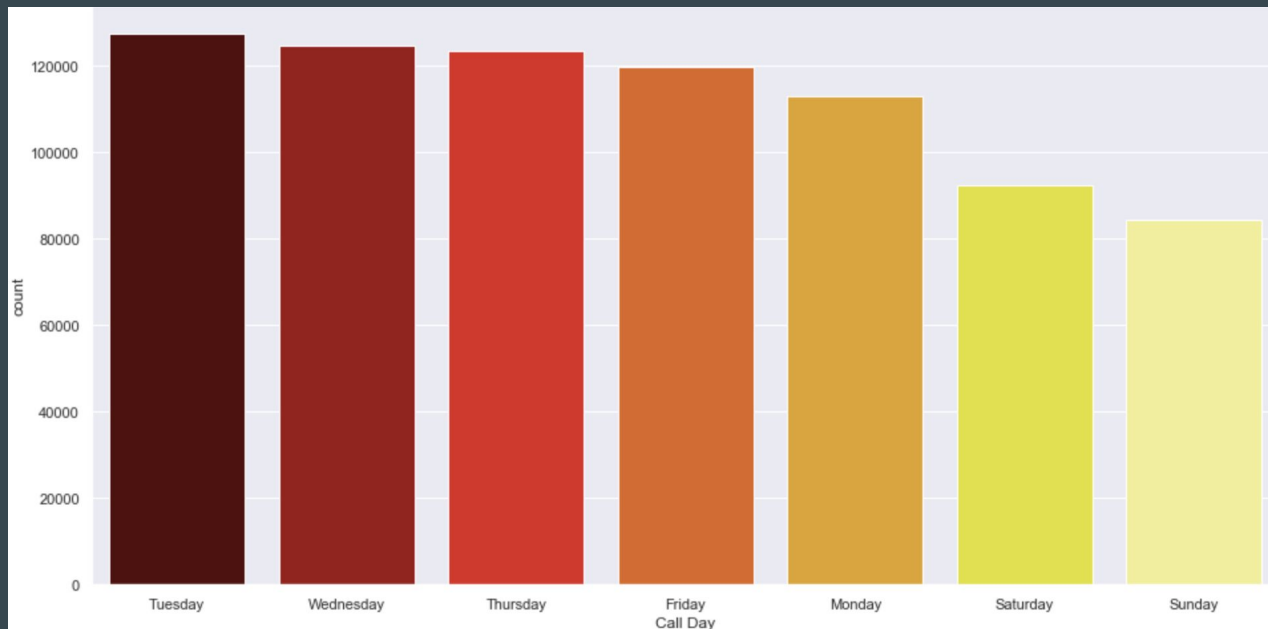
Event Number	Call Received	Call Time	Call Day	Call Time of Day	Call Month	Tencode Description	Disposition Description	Mapped Location	Latitude	Longitude
PD201900037508	2019-01-13 15:28:00	15:28:00	Sunday	Afternoon	Jan	Theft	M.P.D. REPORT COMPLE	NaN	NaN	NaN
PD201900044710	2019-01-15 20:04:00	20:04:00	Tuesday	Evening	Jan	Burglary - Residence	DISREGARD / SIGNAL 9	(36.151, -86.759)	36.151	-86.759
PD201900051874	2019-01-17 23:23:00	23:23:00	Thursday	Night	Jan	Disorderly Person	ASSISTED OTHER UNIT	(36.14, -86.821)	36.140	-86.821
PD201900053991	2019-01-18 14:50:01	14:50:01	Friday	Afternoon	Jan	Theft	M.P.D. REPORT COMPLE	NaN	NaN	NaN
PD201900054328	2019-01-18 16:59:00	16:59:00	Friday	Afternoon	Jan	Theft	M.P.D. REPORT COMPLE	NaN	NaN	NaN

Exploring the Data - Total Call Volume by Month



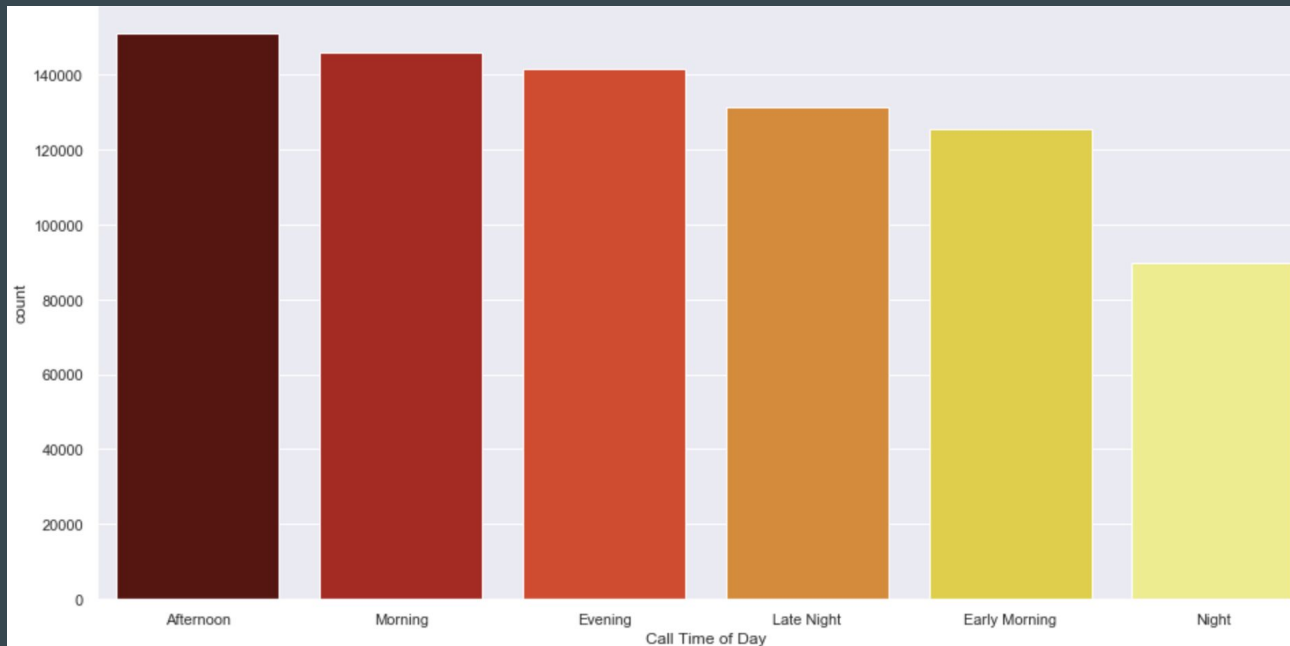
Top 3 call months were March, April, and May.

Exploring the Data - Total Call Volume by Day



Top 3 call days were Tuesday, Wednesday, and Thursday

Exploring the Data - Total Call Volume by Time of Day



Top 3 call times were
Afternoon, Morning,
and Evening

Late Night: 12a - 4a

Early morning: 4a - 8a

Morning: 8a - 12p

Afternoon: 12p - 4p

Evening: 4p - 8p

Night: 8p - 12a

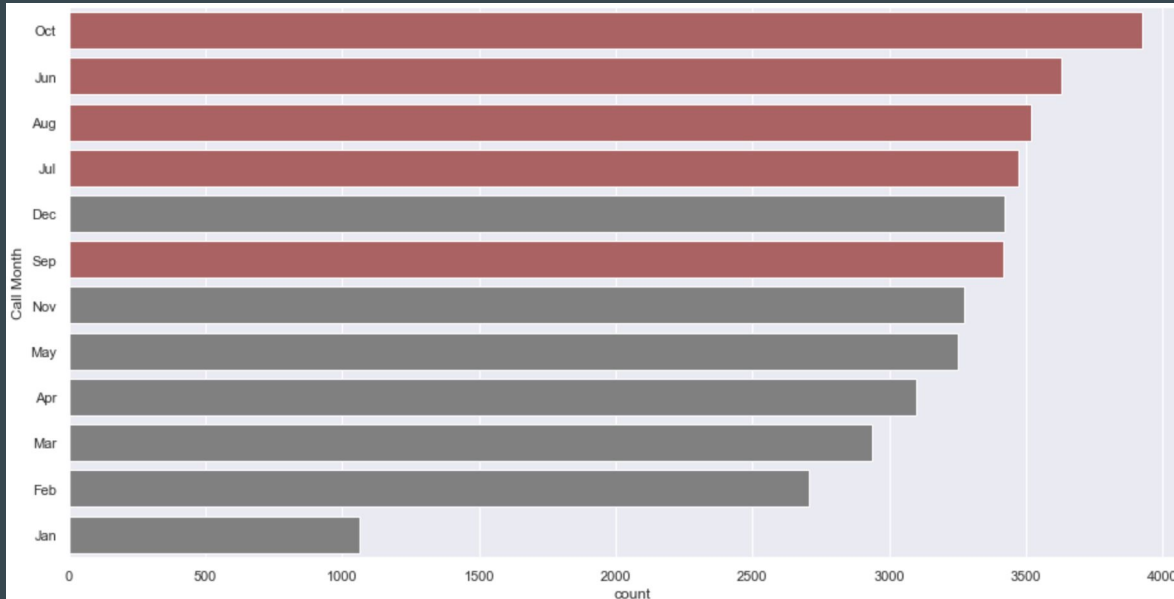
Theft Calls - General Exploration

'Theft' calls accounted for 4.8%, or 37,715 of all calls for service in 2019

After filtering the original dataset for only these calls, the new dataset contains 37,715 rows and 11 columns

Do theft calls occur around the same time (month, day, time of day) as all other calls?

Theft Calls by Month



The top 3 total calls for service by month were March - May. For theft calls, the top 3 months were October, June, and August.

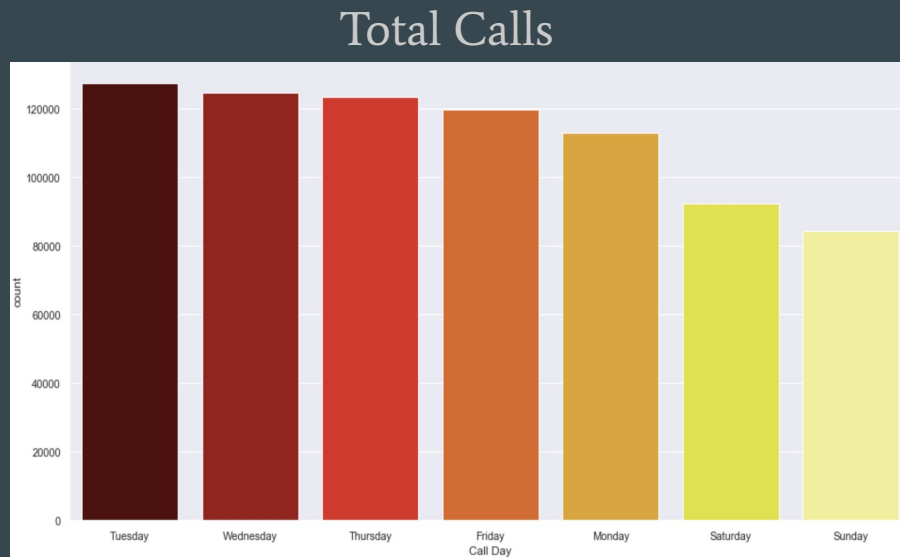
Over 47% of all theft calls occurred in the Summer and Fall months from **June to October**.

Theft Calls by Day



46.2% of theft calls happened in the first half of the week (Monday - Wednesday).

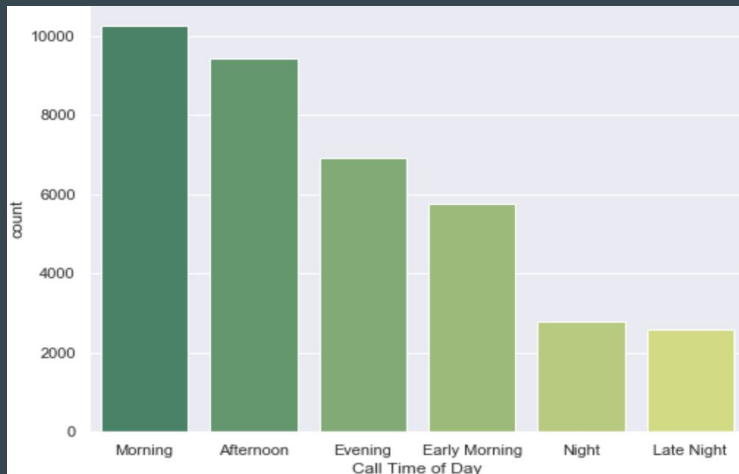
Vs.



The total calls for service volume was higher Tues - Thurs rather than Mon - Wed for theft calls.

Theft Calls by Time

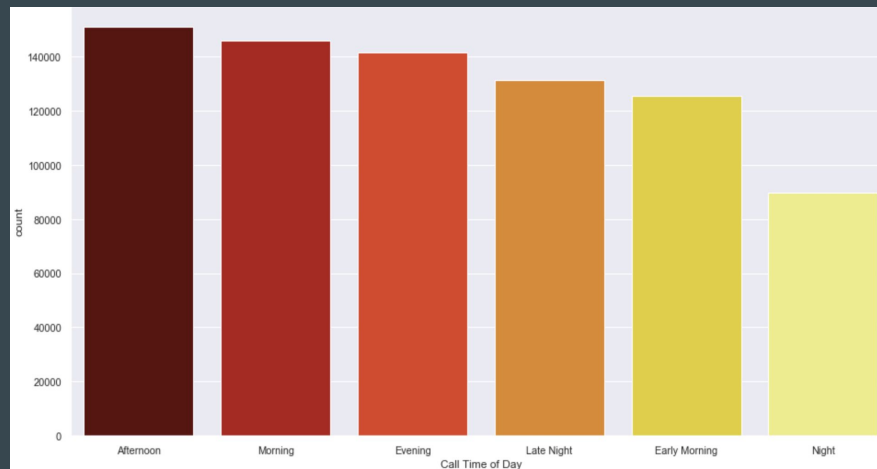
Theft Calls



Over half (52.7%) of theft calls happened between the hours of 8a - 4p.

Vs.

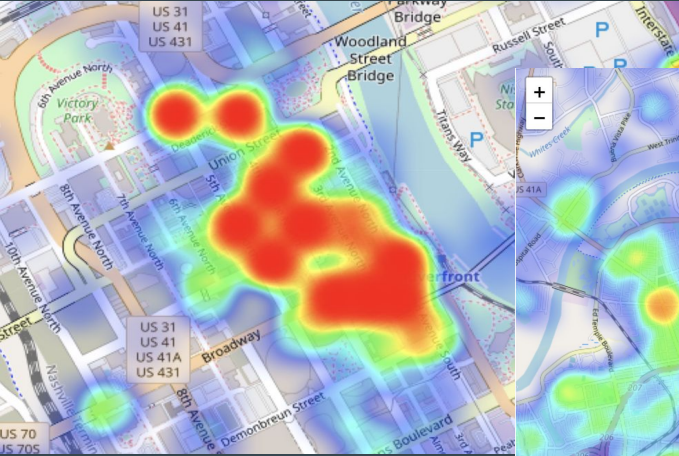
Total Calls



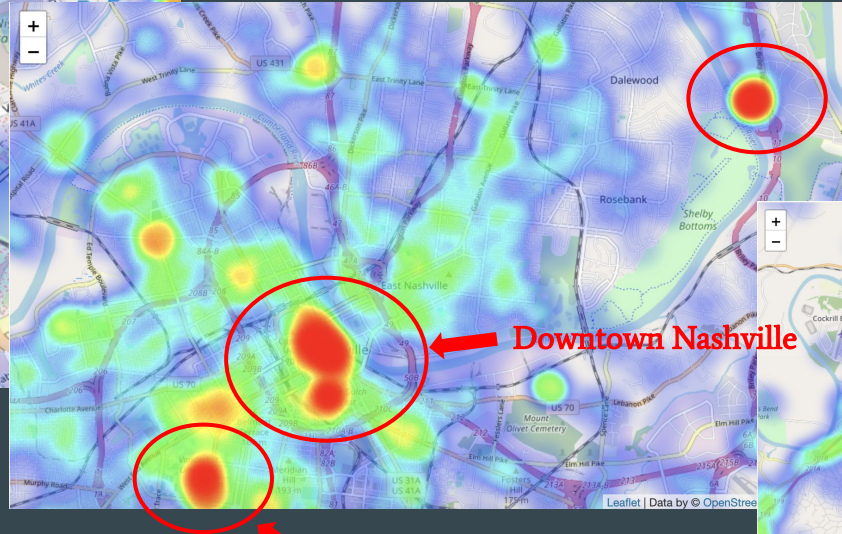
The total calls for service volume is higher during the afternoon compared to the morning for theft calls.

Theft Calls - Where do they happen?

Most theft calls appeared to happen in **Downtown Nashville** near the river (between Charlotte Ave and Demonbreun St), **Vanderbilt University**, and at the **Opry Mills mall**.



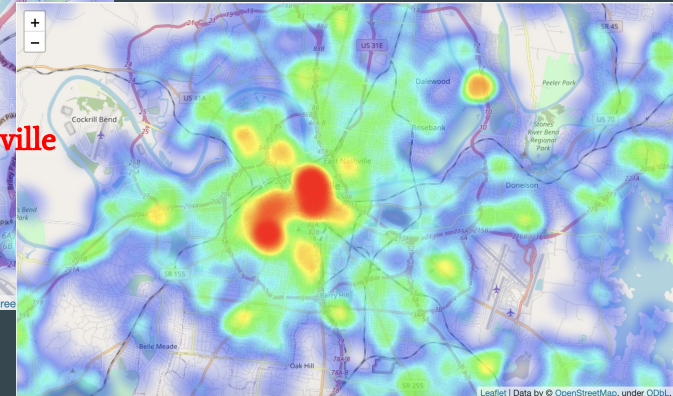
Downtown Nashville near the river (between Charlotte Ave and Demonbreun St)



Downtown Nashville

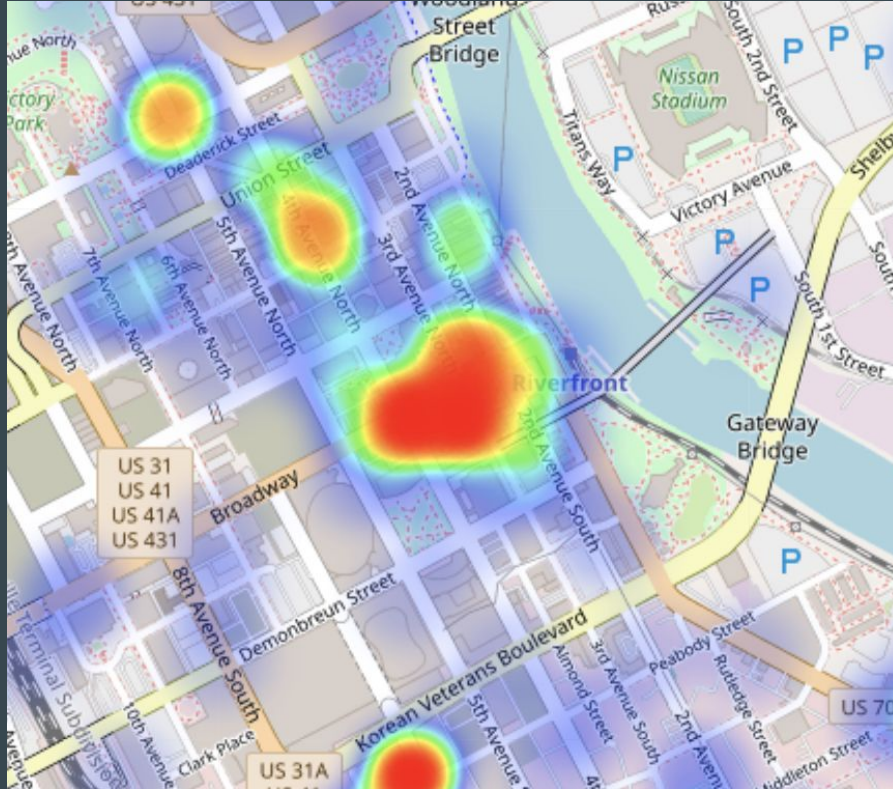


Opry Mills mall



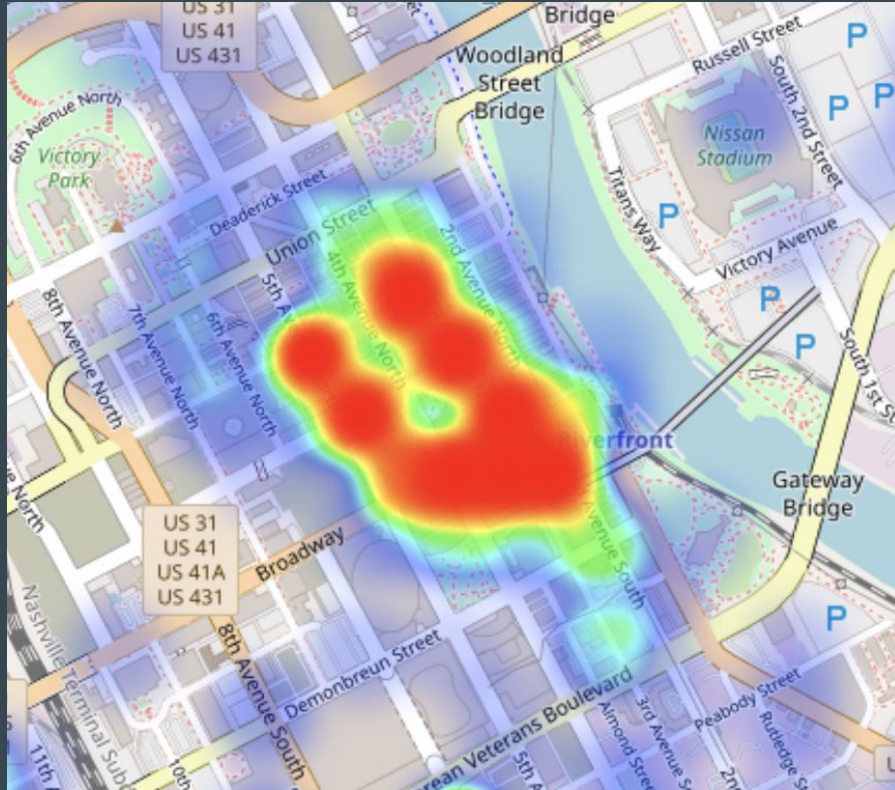
Vanderbilt University

Theft Calls During Business Hours



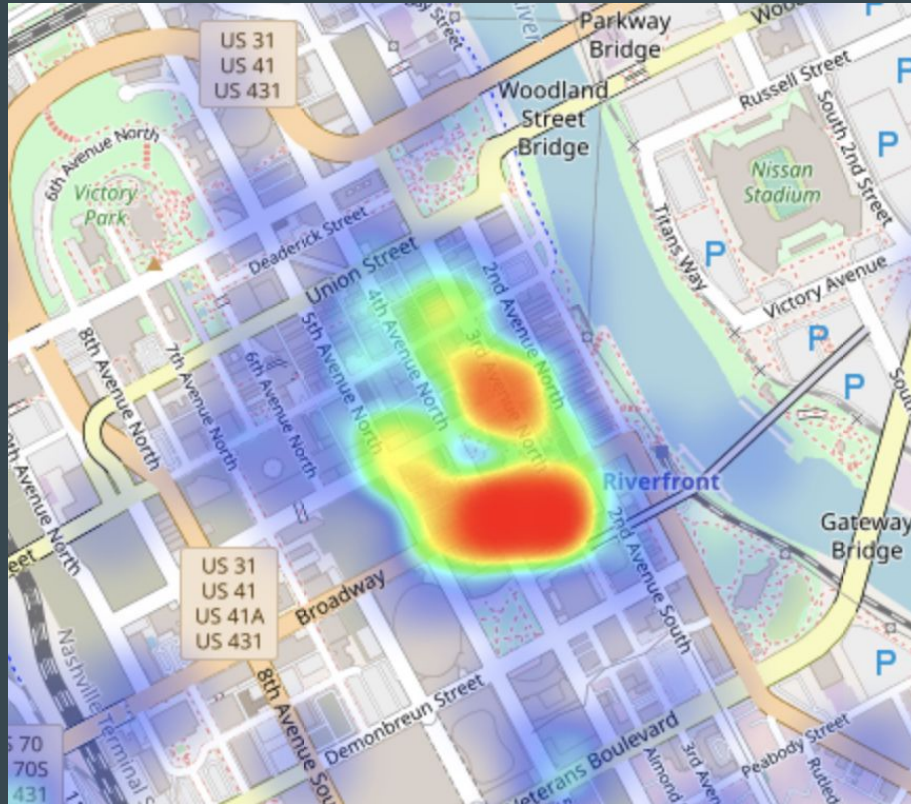
Theft calls between the hours of 8a - 4p occurred most frequently in the downtown area between Demonbreun Street and Commerce Street.

Theft Calls Outside Business Hours

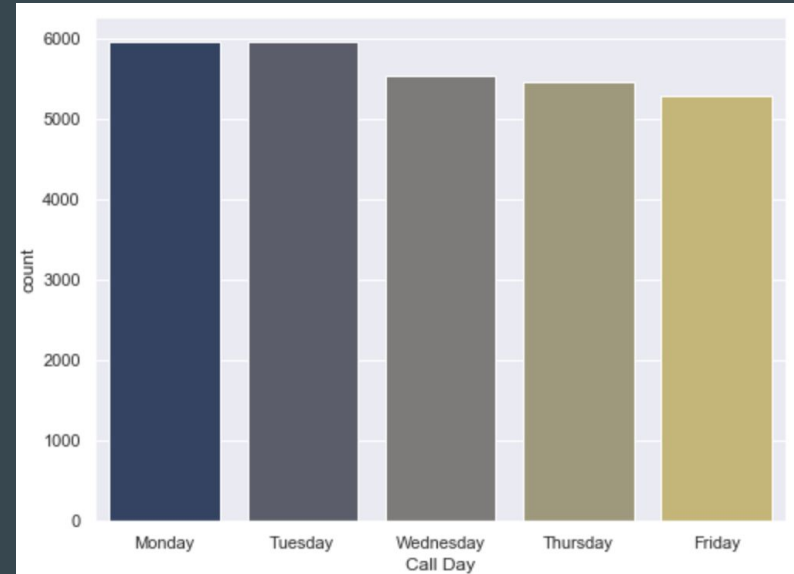


Outside of business hours, theft calls expanded to a wider area and were contained mostly on the streets of Broadway, 5th Avenue South, Church Street, and 2nd Avenue North.

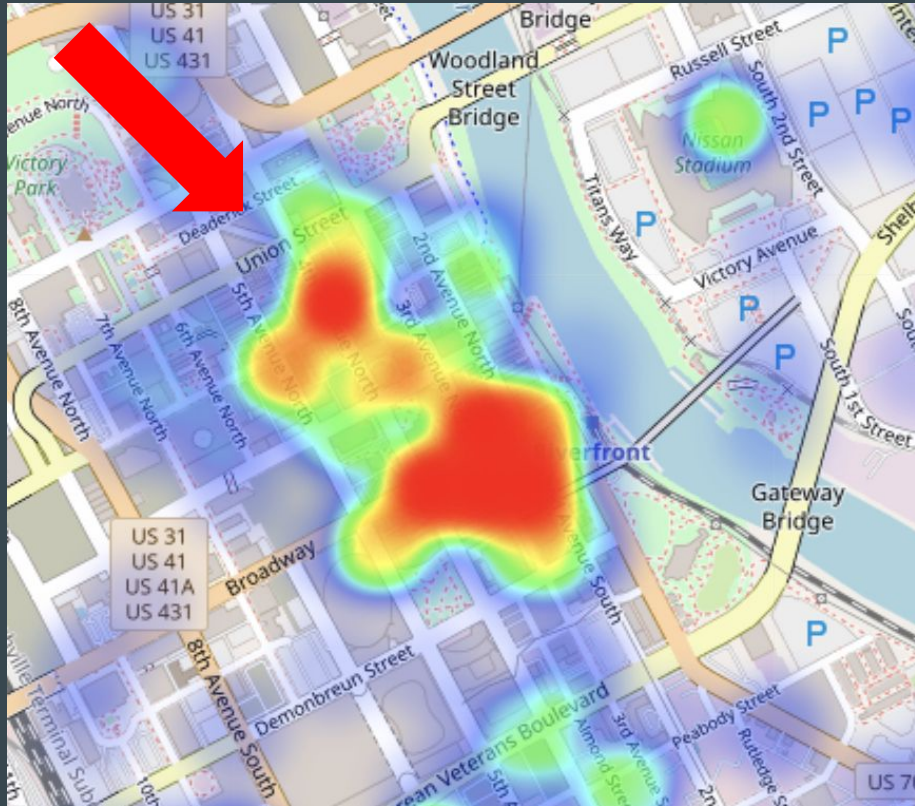
Theft Calls - Weekday vs Weekend



During the weekdays, theft calls were mostly reported along Broadway Street and were earlier in the week.



Theft Calls - Weekday vs Weekend



However, theft calls on the weekends occurred further north near the intersection of Union Street and Fourth Ave N. Nearby businesses include The Arcade, a shopping mall, and Bourbon Street Blues and Boogie Bar.

Could there be a correlation between major tourism times of year and theft calls?

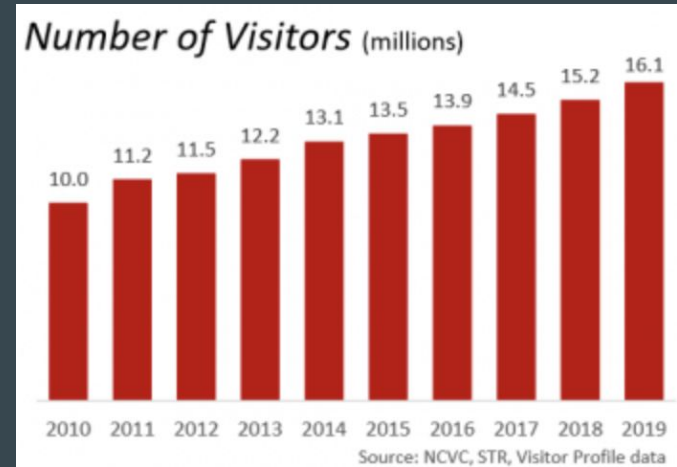
Nashville Tourism and Theft

“The **best time to visit Nashville** is from **April through October**, when the warm weather brings this music city to life.” - [U.S. News & World Report](#)

A record **16.1 million visitors in 2019** (+6% over 2018) - [Nashville Convention and Visitors Corporation](#)

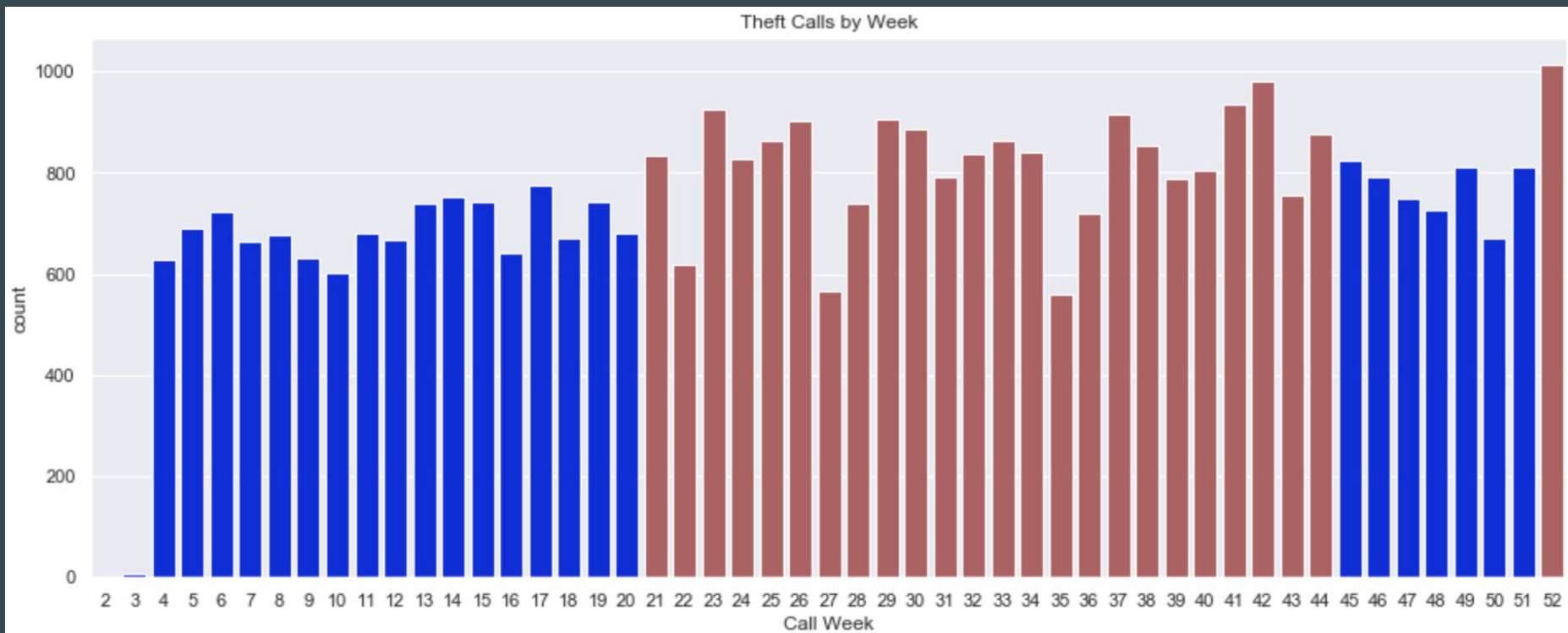
There were **over 12,000 weddings in 2019** for the Nashville metropolitan area, which ranks 36 out of 933 in metro areas for number of weddings - [The Wedding Report Inc.](#)

“**Fall weddings**, particularly in the month of **October**, are **most popular in Nashville**, and couples host an average of 120 guests per Nashville wedding.” - [Wedding Wire](#)



Source

Is there a relationship between theft calls and major events?



Top 3 Weeks for Theft Calls

The last week of 2019 (Christmas and New Years Eve) saw the highest number of theft calls with over 1000 calls.

Weeks 41 and 42 (Oct 7 - Oct 20) contained roughly 10%, or 1,917, theft calls.

Could there be a correlation between major events happening during these three weeks and spikes in theft calls?

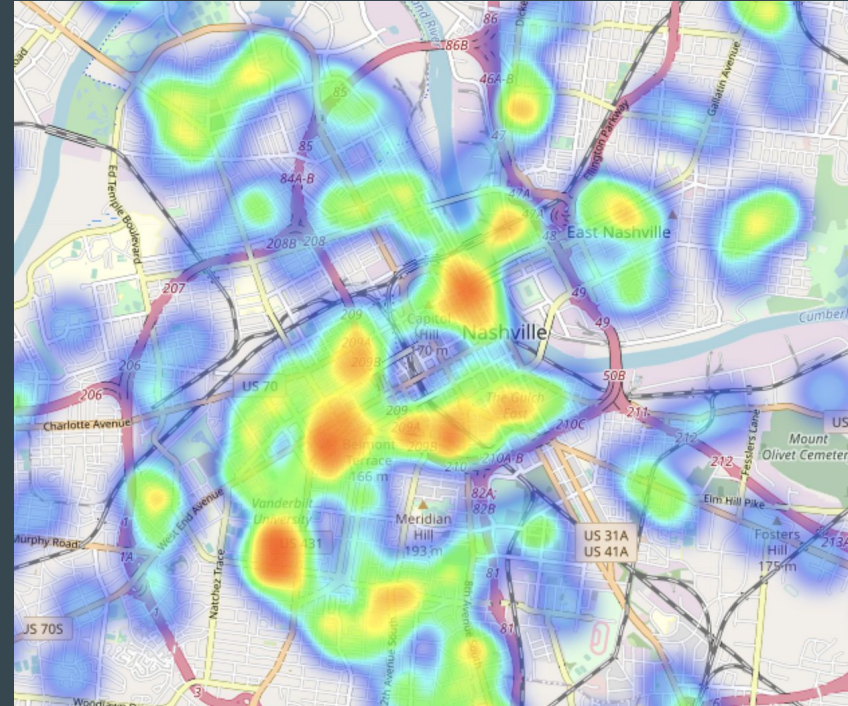
Christmas and New Years - Highest Theft Call Week of 2019

1000+ theft calls were reported during this week.

25% increase from the week before (week 51).

55.6% of calls happened between 8a - 4p.

Theft calls during this time tended to be less location-specific and more spread out around the downtown area

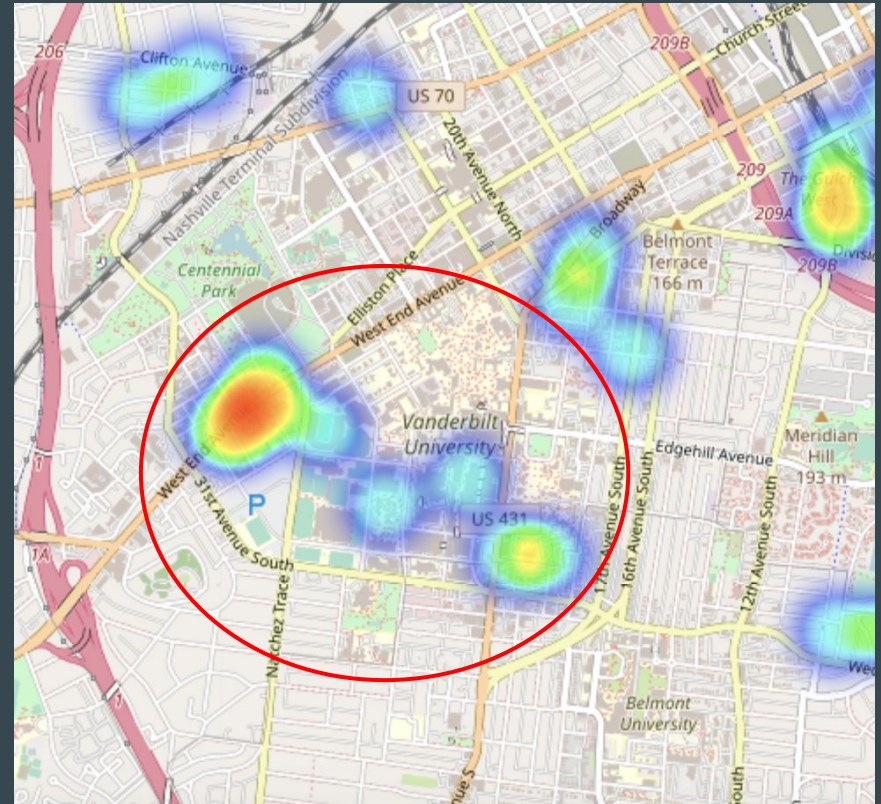


Week 42 - Vanderbilt Homecoming - Second Highest Call Week

Vanderbilt homecoming weekend was Friday, October 18, 2019, where the “Commodore Quake” festival happened on campus.

During the 4 days from Thursday - Sunday, 367 theft calls occurred, with a cluster occurring near campus.

22% of calls on Friday and Saturday occurred between the hours of 12a - 4a.

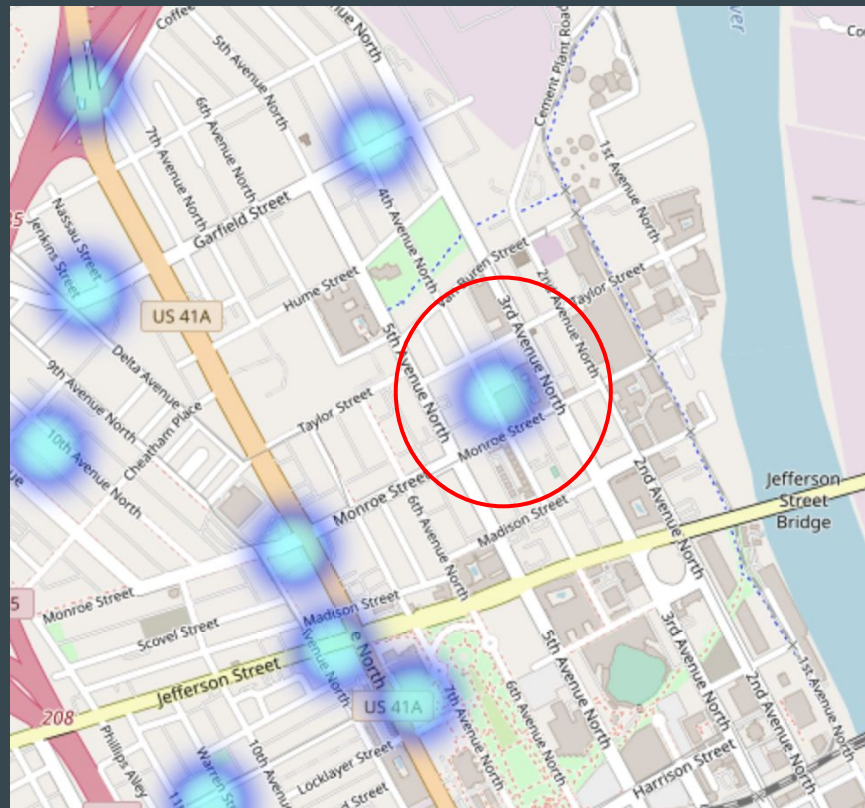


Week 41 - Nashville Oktoberfest - Third Highest Call Week

Nashville Oktoberfest is a huge party weekend that fills the streets with citizens and tourists. For the 2019 celebration, Oktoberfest took place on October 10 - 13, the 41st week of the year.

This week saw a 16.5% increase from the prior week.

The weekend alone reported 393 calls of theft, with some concentration near the event site and surrounding areas.



Christmas Eve and Day

90 total theft calls.

The most calls occurred in the morning, followed by the afternoon, near downtown, East Nashville, and Vanderbilt/Belmont area.



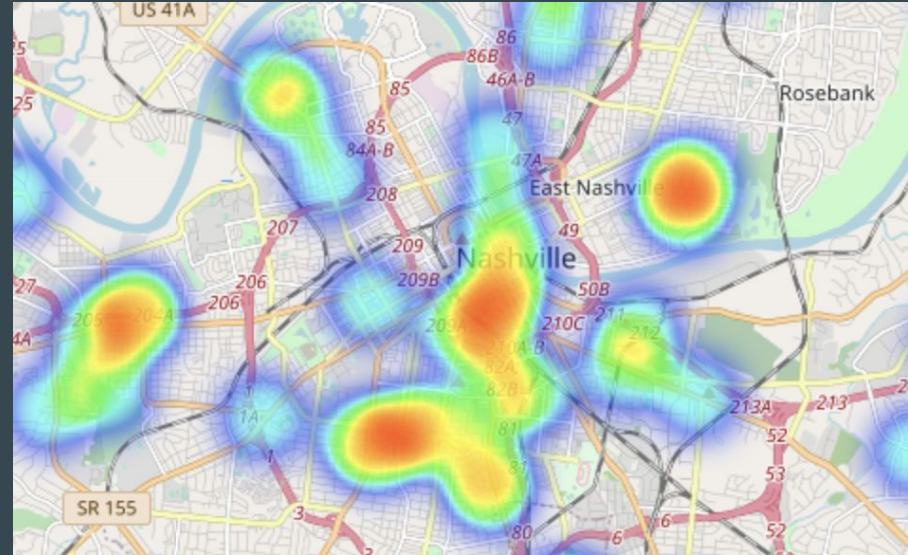
New Years Eve

126 calls.

58% between 8a - 4p.

Similar to Christmas Eve and Day, the hot spots were in downtown, near universities, and east Nashville.

Increase in theft calls in West Nashville.



Key Stats from Analysis

While Nashville saw a 6% increase in tourism from 2018 to 2019, it also saw a staggering 37% increase in theft calls from 2018 - 27,392 to 37,715. (Sourced from [2018 Calls for Service Data](#)).

46.2% of theft calls occurred between Monday - Wednesday.

52.7% occurred during business hours, from 8a - 4p.

47% happened in the summer and fall months from June - October.

Areas most affected were Downtown Nashville along Broadway Street, East Nashville, and near Vanderbilt and Belmont.

Spikes in theft calls appear to be consistent with major events such as festivals and holidays.

Conclusion

While 2020 may be an outlier year for tourism nationwide due to COVID-19, Nashville's tourism has increased consistently over the last few years. There is no direct proof that increased tourism causes theft, but there does appear to be a correlation between the amount of rising tourism in conjunction with major events and the amount of calls to the police reporting theft.

Based on popular theft call locations, downtown goers and business owners, East Nashville residents, and residents near colleges appear to be the most at risk for being near a reported theft. From these findings, we could suggest added security measures and increased awareness, specifically year-round during business hours, between the months of June - October and December, and during major events.

Additional Work

On top of the work and findings from this report, additional work could be done to further support or refute the analysis findings. Additional data from 2013-2018 could be analyzed to support the proposition that rising tourism is positively correlated with rising theft calls. Additionally, other major events such as sporting playoff events, the Country Music Awards, Bonaroo Music Fest, Halloween, and others could be analyzed to check for consistent spikes in theft calls. Further research into the most popular wedding venues and dates could be done to also check for consistency in theft calls. Data on Nashville arrests could be cross-referenced with call for service data to check for any insights regarding theft calls and actual theft arrests, as well as how time and location of calls and arrests are correlated.

Github Repository Link

<https://github.com/zachcornelison/Nashville-Call-Service>