

# Baltimore Police Challenge

## 911 Calls Services



Name:

Luke Zheng

Qianyu Liu

Scott Lai

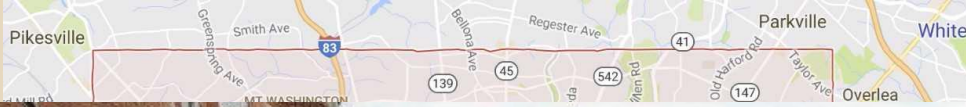
Sicheng Chu

Xi He

Instructor:

Karl Rohe

# Baltimore City



- Baltimore is the largest city in Maryland state.
- The population of the Baltimore metropolitan area is estimated around 2.8 million.
- Baltimore Police Department is the eighth-largest police force in the US.
- One of the 10 most dangerous cities in U.S.

# Baltimore Football Team



- Baltimore Ravens
  - Professional American football team based in Baltimore, Maryland
  - Established in 1996
  - Home Stadium: M&T Bank Stadium, Baltimore
  - Headquartered: Owings Mills, Baltimore
  - The 24th-most valuable sports franchise in the world
  - Currently is the only team in the NFL to hold a perfect record in multiple Super Bowl and Thanksgiving Day appearances.
- Maryland Terrapins
  - The college football team of University of Maryland
  - Established in 1892
  - Home Stadium: Maryland Stadium, College Park, MD
  - Secured two NCAA-recognized national championships, nine ACC championships, two Southern Conference championships, eleven consensus All-America honors, and twenty-four bowl game appearances.





# Our Purpose and Goal

## **Purpose:**

The city of Baltimore, is infamous for its very high crime rate, including a violent crime rate that ranks high above the national average. The purpose of this project is to find out some useful tips to help Baltimore police department, in order to reduce the crime rate if possible.

## **Goal:**

After the research, we are interesting in the big events at Baltimore, in particular, the Football games, will related with the crime rate in the Baltimore city. So our goal is to find out the relationship between the crime rate change in before, during, and after the football games happened.

# Date Setup

## Set up:

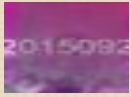
1. We did the research of two football teams in Baltimore area, which are Baltimore Ravens and Maryland Terrapins. This two teams are famous in Baltimore area, and own thousands of supporters. We dig out the game schedules and game results of this two teams from 2015-Today (11/03/2017), which contains 75 game days with start time to the accuracy to minutes, attendance, and game results with score gap.
2. In order to compare the schedule summary with the, we cleaned up the **Calls for Service** date set from the Police Date Initiative. We removed about 17% invalid calling include “No voice”, “Hang up” etc. We also identity the calls happened outside of Baltimore city geographical boundary and split the latitude and longitude. 48000 “incident Location” called “100”. This may due to some misconducting of phone call. Unfortunately, when generating heat plot for before game, during game and after game, some data is not available in the police call.



**Crime area**

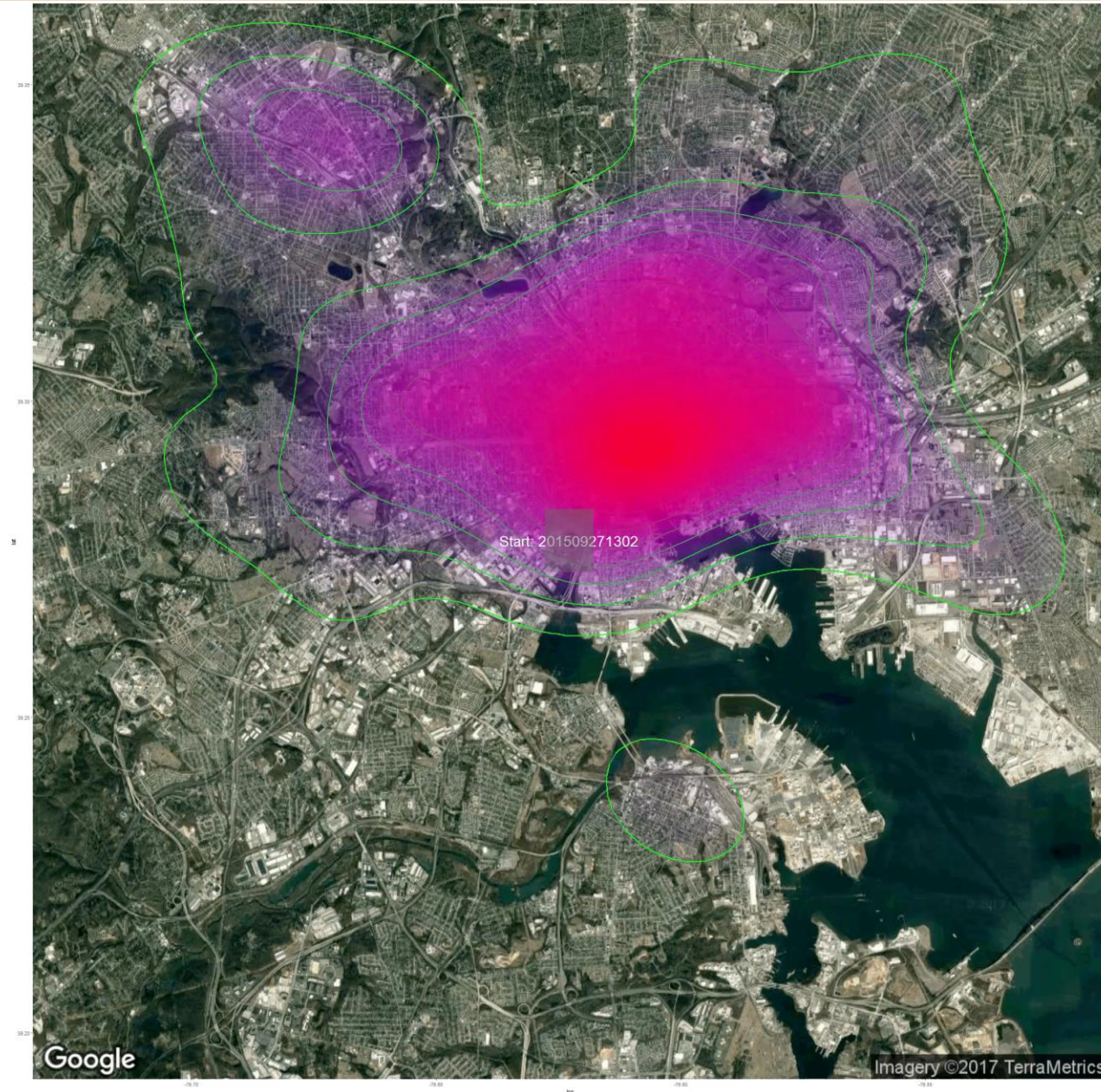


**Game area**



**Home playing with two hours before game start.**

The crime rate is increasing when the color red goes dark.

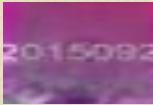




Crime area

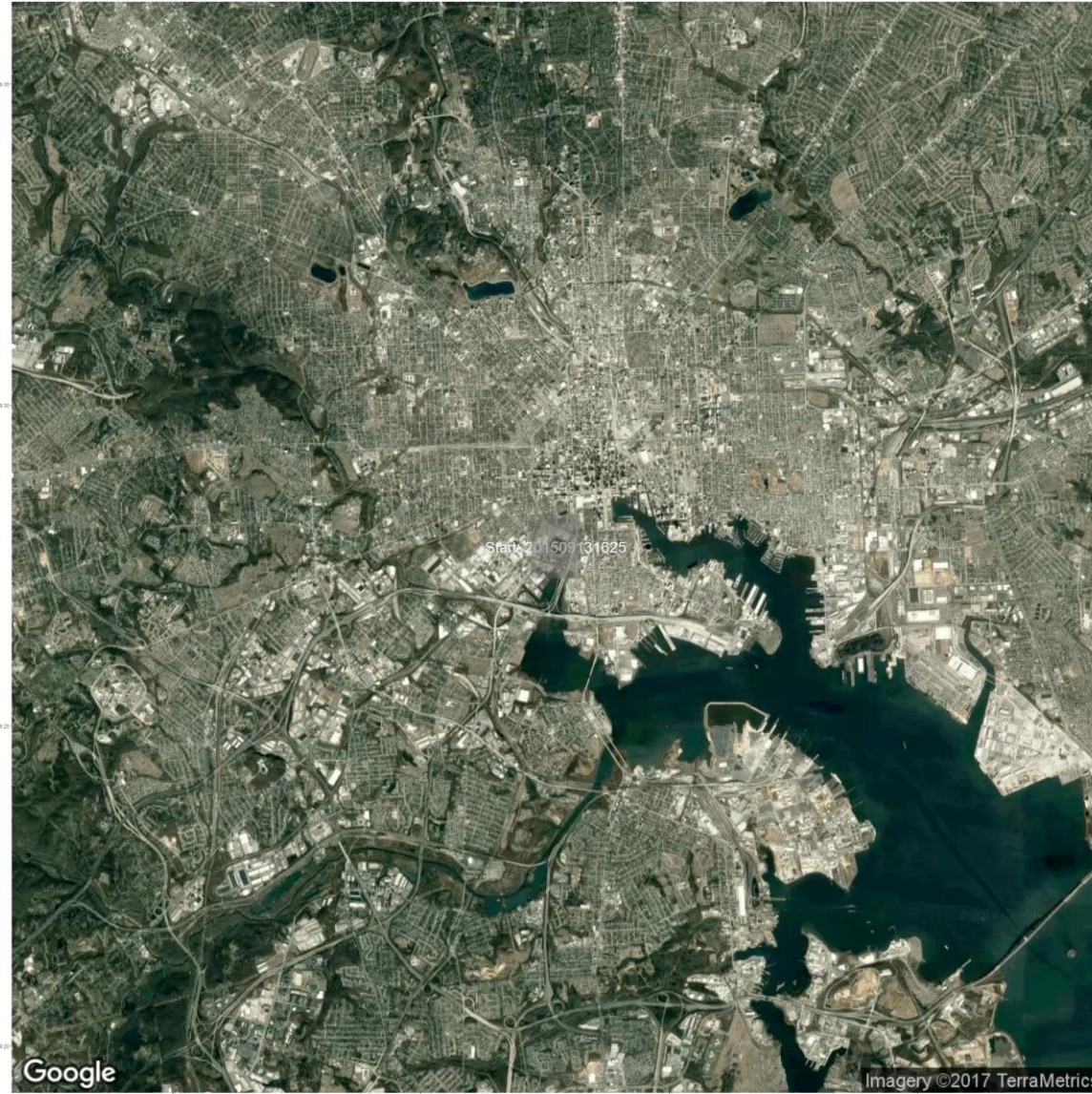


Game area



Away playing two hour  
before game started.

\*This graph is with some  
unrecorded calls.  
The crime rate is increasing  
when the color red goes dark







	callNumber	incidentLocation	location	Latitude	Longitude	ID
192	150010024:	1 1000 EDISON HY : 11021	(39.3018365,-76.6515506): 12941	Min. : -76.56	Min. : -149.90	Min. : 2
cracter	150010036:	1 600 E FAYETTE ST : 9345	(39.3029101,-76.5728709): 10169	1st Qu.: 39.29	1st Qu.: -76.65	1st Qu.: 683555
cracter	150010040:	1 700 POPLAR GROVE ST: 8523	(,) : 9615	Median : 39.30	Median : -76.61	Median :1386762
	150010047:	1 3800 W BELVEDERE AV: 8263	(39.2956120,-76.6653450): 8476	Mean : 39.30	Mean : -76.62	Mean :1412169
	150010049:	1 3000 DRUID PARK DR : 7743	(39.2903848,-76.6121893): 8395	3rd Qu.: 39.32	3rd Qu.: -76.59	3rd Qu.:2096904
	150010056:	1 200 FRANKFURST AV : 7545	(39.3452130,-76.6825420): 7809	Max. : 61.20	Max. : 39.35	Max. :2980811
	(other) :517186	(other) :464752	(other) :459787	NA's :9616	NA's :9616	

## Things we find out interesting:

There are 11021 calls from the same location.(1000 Edison HY)  
After we did research, it's a Highway address.

## Question?

Why all the calls are from the same location at a 1.4 miles highway?

## Our tip:

If the police station can record the calling location more accurate, we can find more details about the road, and decided how many police force we need to set up into it.



**Thank You!**

# References

## Football:

### Baltimore Ravens

2017 game schedule & results: <https://www.pro-football-reference.com/teams/rav/2017.htm>

2016 game schedule & results: <https://www.pro-football-reference.com/teams/rav/2016.htm>

2015 game schedule & results: <https://www.pro-football-reference.com/teams/rav/2015.htm>

2016 game schedule details: [https://www.pro-football-reference.com/teams/rav/2016\\_games.htm](https://www.pro-football-reference.com/teams/rav/2016_games.htm)

2015 game attendance: <http://www.baltimoreravens.com/team/history/all-time-results-and-statistics.html>

[https://en.wikipedia.org/wiki/2015\\_Baltimore\\_Ravens\\_season](https://en.wikipedia.org/wiki/2015_Baltimore_Ravens_season)

2016 game attendance: <https://www.pro-football-reference.com/years/2016/attendance.htm>

2017 game attendance: <https://www.pro-football-reference.com/years/2017/attendance.htm>

### Maryland Terrapins

2015 game schedule & results: <http://www.fbschedules.com/ncaa-15/big-ten/2015-maryland-terrapins-football-schedule.php>

2016 game schedule & results: <http://www.fbschedules.com/ncaa-16/2016-maryland-terrapins-football-schedule.php>

2017 game schedule & results: <http://www.fbschedules.com/ncaa-17/2017-maryland-terrapins-football-schedule.php>

2017 attendance: [https://en.wikipedia.org/wiki/2017\\_Maryland\\_Terrapins\\_football\\_team](https://en.wikipedia.org/wiki/2017_Maryland_Terrapins_football_team)

2016 attendance: [https://en.wikipedia.org/wiki/2016\\_Maryland\\_Terrapins\\_football\\_team](https://en.wikipedia.org/wiki/2016_Maryland_Terrapins_football_team)

2015 attendance: [https://en.wikipedia.org/wiki/2015\\_Maryland\\_Terrapins\\_football\\_team](https://en.wikipedia.org/wiki/2015_Maryland_Terrapins_football_team)

Bars map: <http://data.baltimoresun.com/maps/baltimores-best/>

## Other source:

Bars map: <http://data.baltimoresun.com/maps/baltimores-best/>

R package list: see the comments bar.