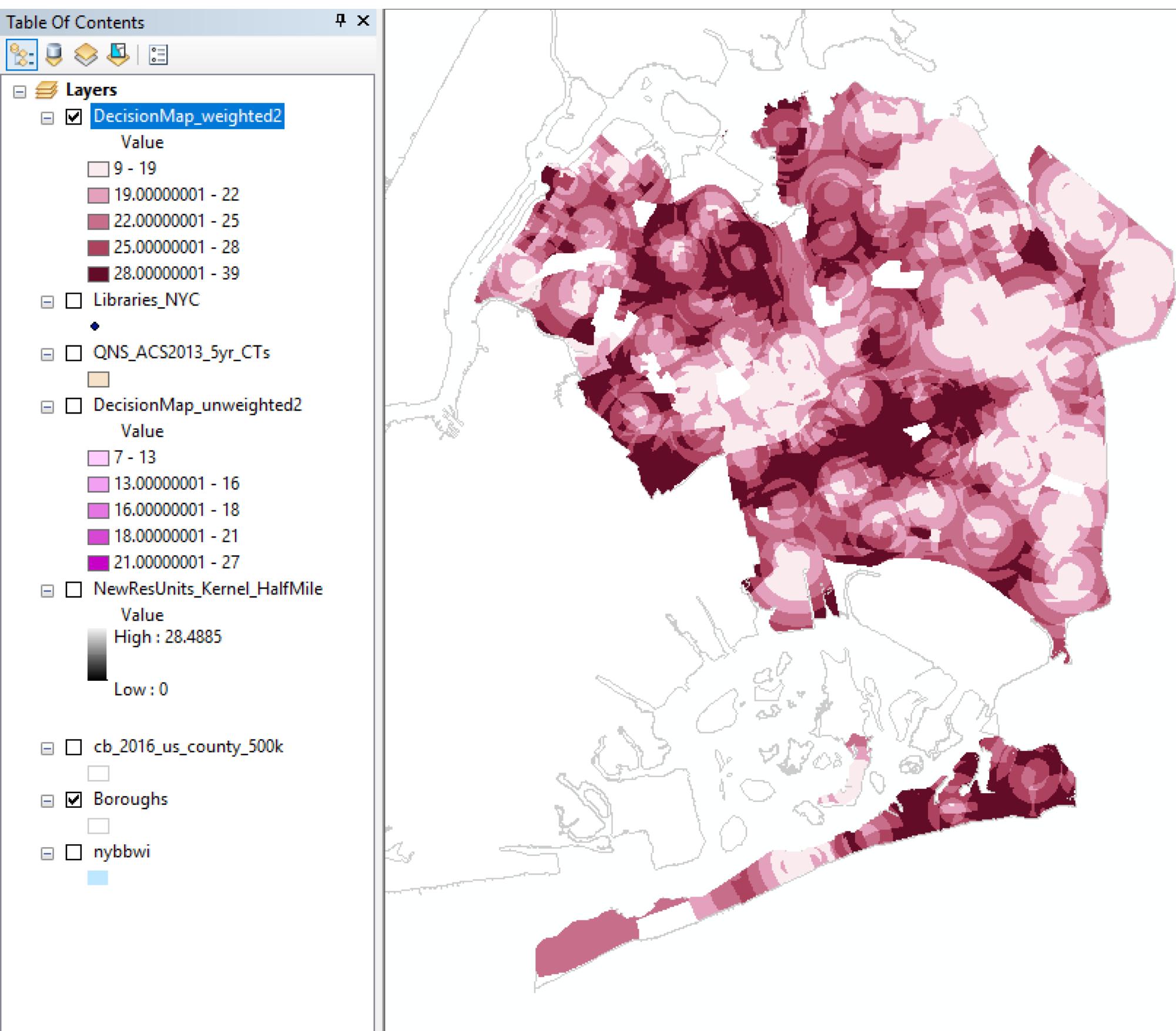


TUTORIAL 1 | AUTOMATION

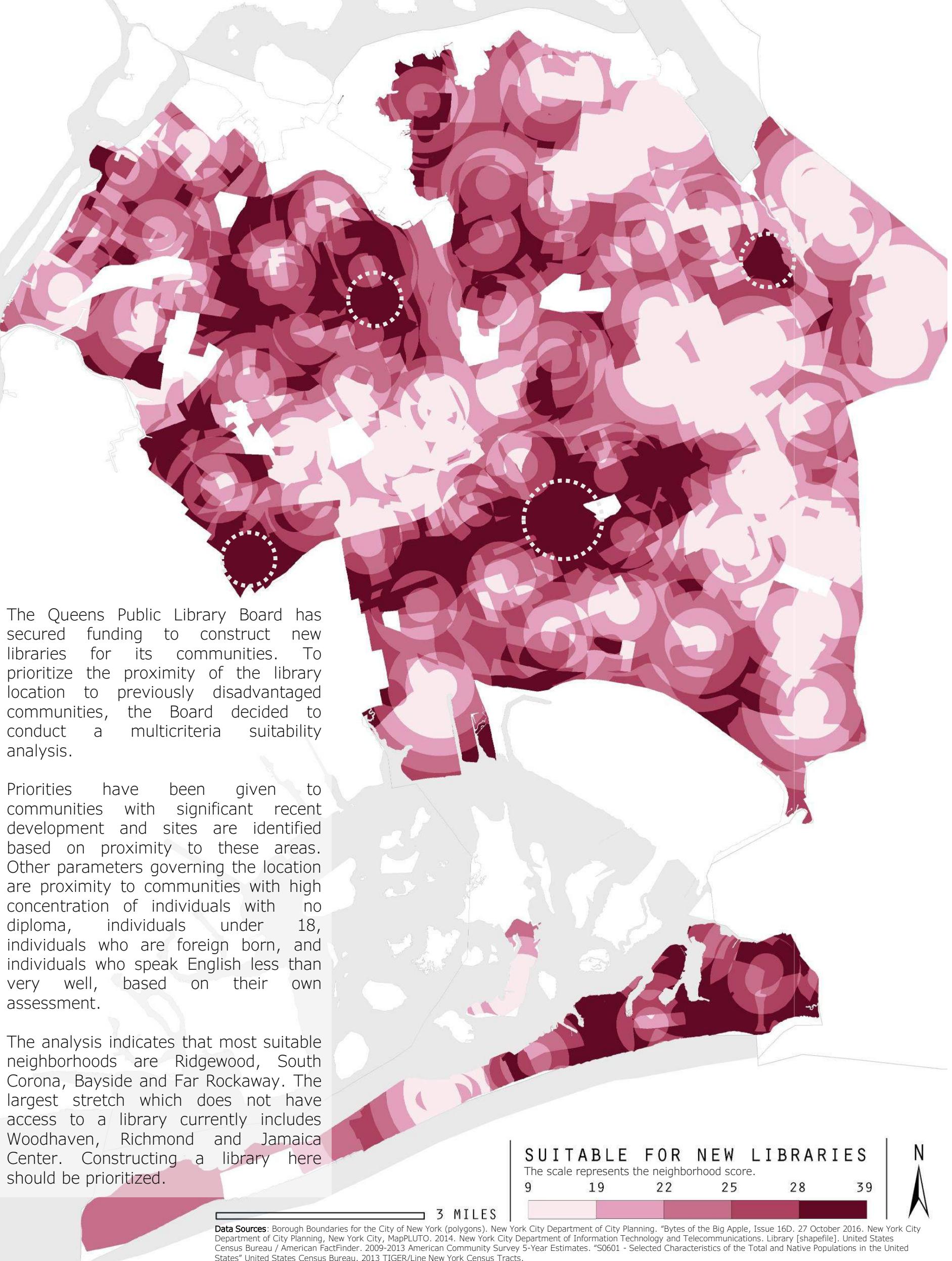
- Shruti Shubham



The mean weighted decision score per cell observed is 23.21 and the number of raster cells in the upper quintile are 1303086.

LIBRARIES FOR NEW COMMUNITIES IN QUEENS , NEW YORK

QUEENS PUBLIC LIBRARY BOARD



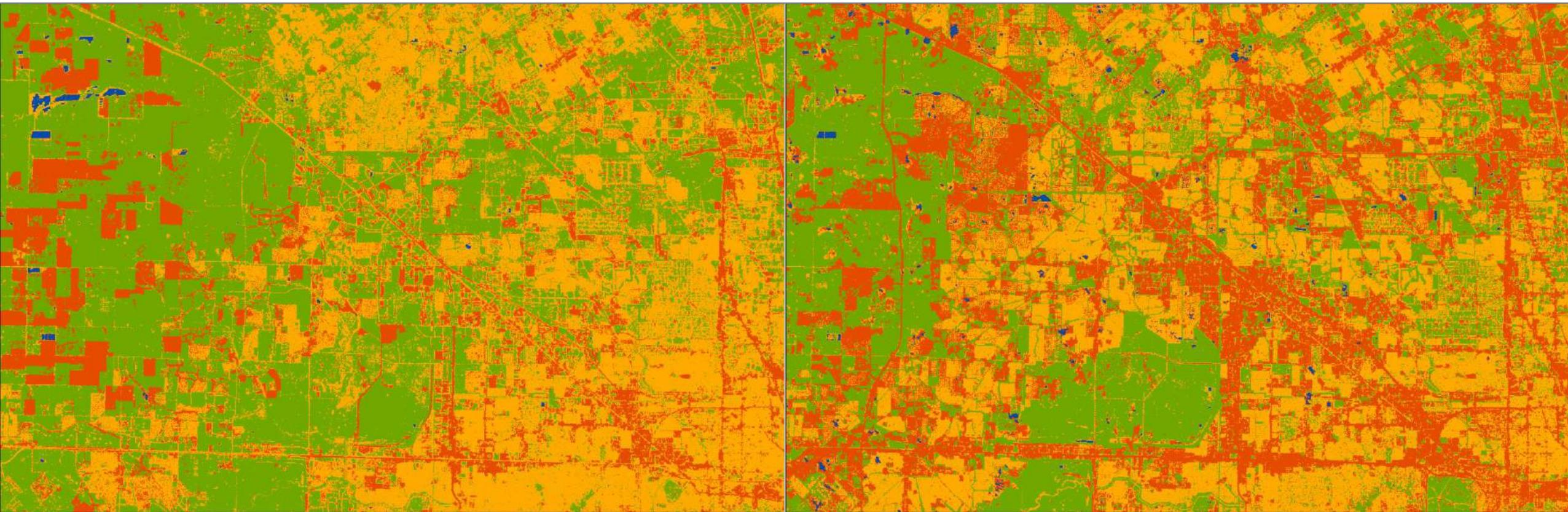
TUTORIAL 2 | REMOTE SENSING

SUBMITTED BY: SHRUTI SHUBHAM – SS5127

Through this exploration, we explored the area transformed from wetland to developed in the north-west part of the city of Houston. The Landsat imagery acquired from the usgs website was classified into the four categories (represented in the following map), mixed wetlands, residential, commercial and water based on image samples. They were further reclassified into categories representing development and open areas. Once the areas were identified, the area was calculated by generating a shapefile which captured the change in developed land and wetlands observed.

BEFORE (1897)

AFTER (2017)



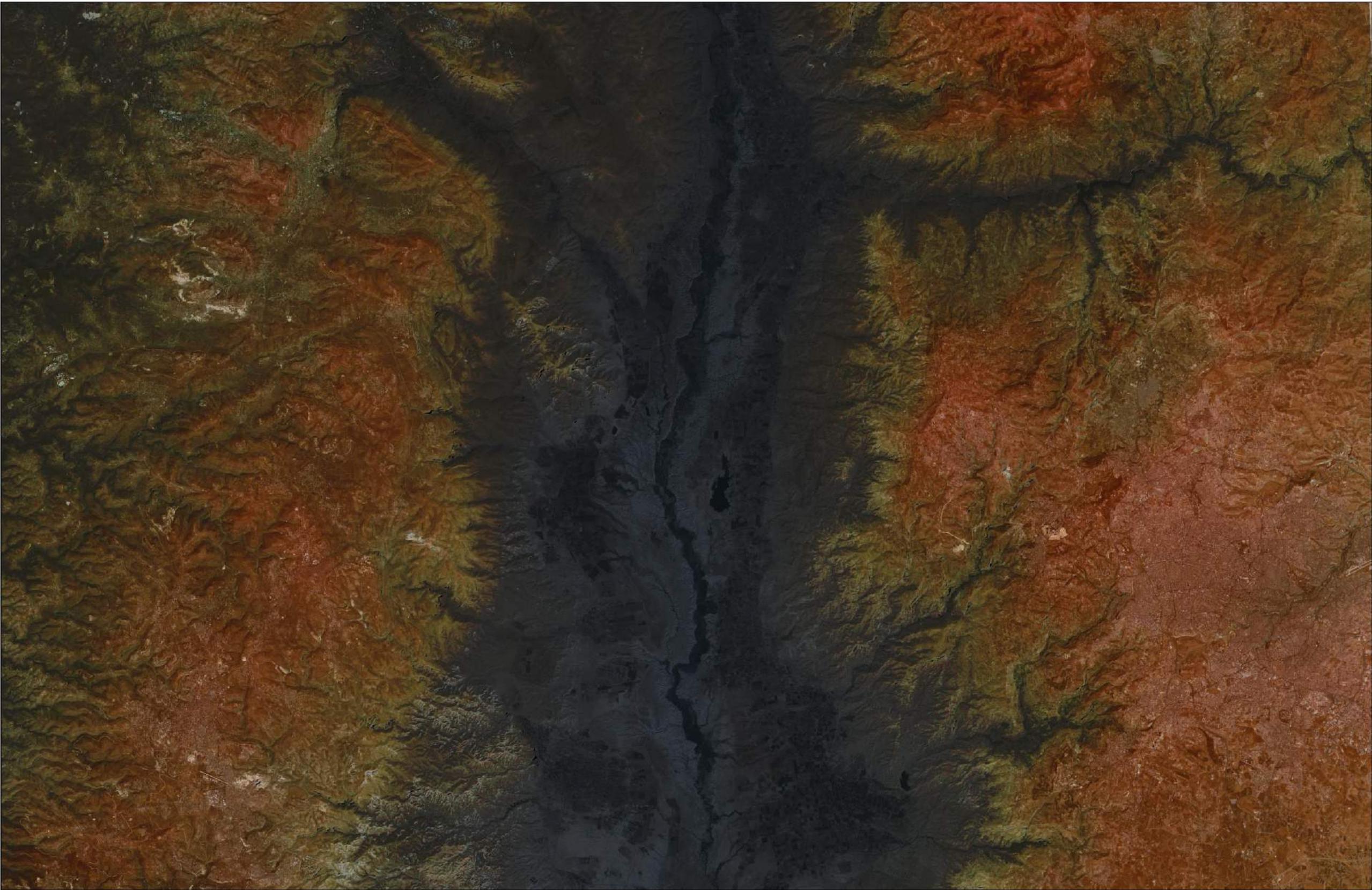
19,648 ACRES OF LAND HAS BEEN TRANSFORMED FROM WETLAND TO DEVELOPED BETWEEN 1987-2017.

DATA SOURCE: Image courtesy of the U.S. Geological Survey. *LANDSAT_8*. 2017-03-29 , Image courtesy of the U.S. Geological Survey. *LANDSAT_5*. 1987-04-04

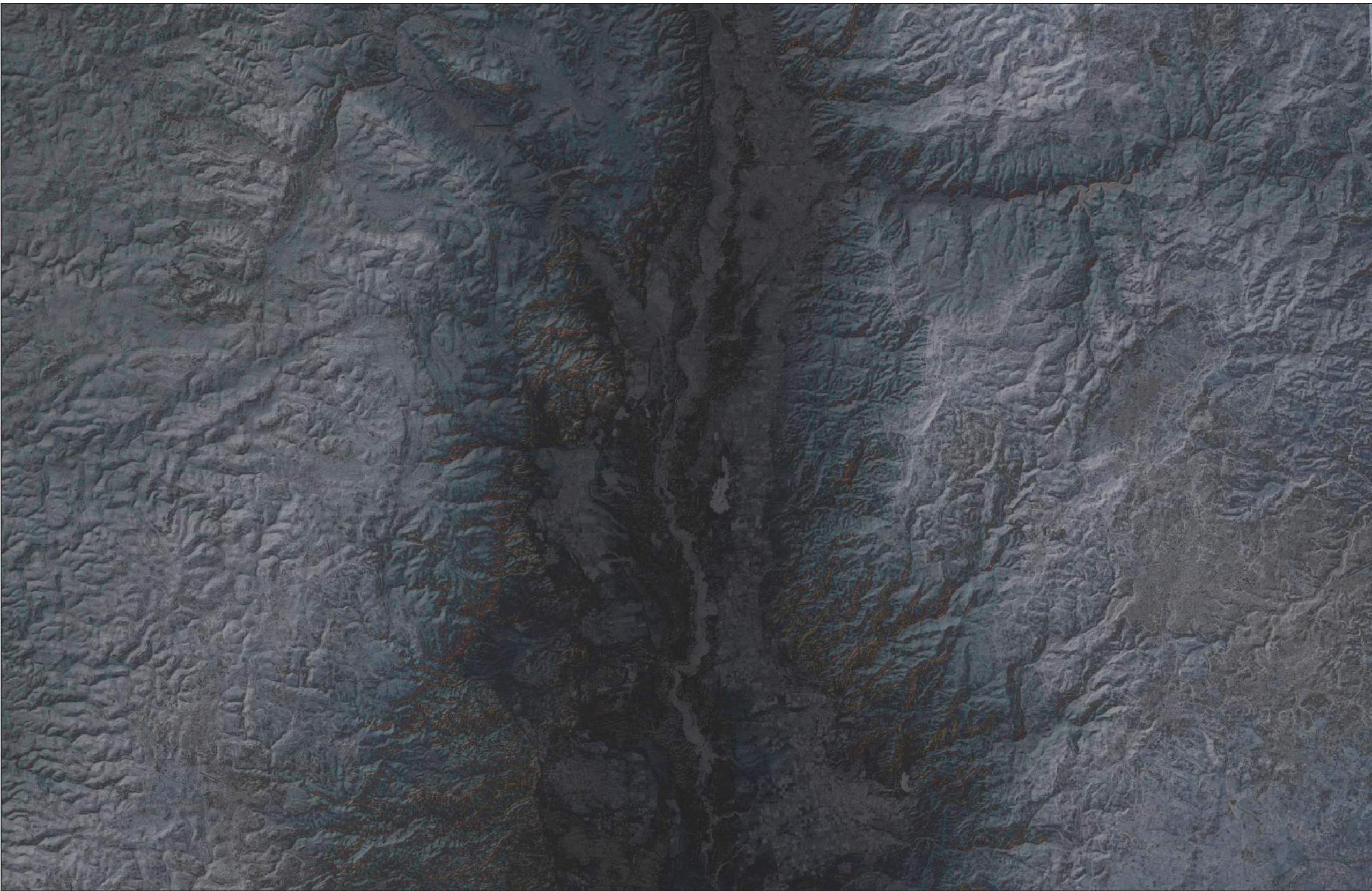
VISUALIZING TOPOGRAPHY - JORDAN

DATA SOURCE: NASA/GSFC/METI/ERSDAC/JAROS, and U.S./Japan ASTER Science Team. *Aster Global Digital Elevation Model*. 2009-06-29

VISUALIZATION - 01



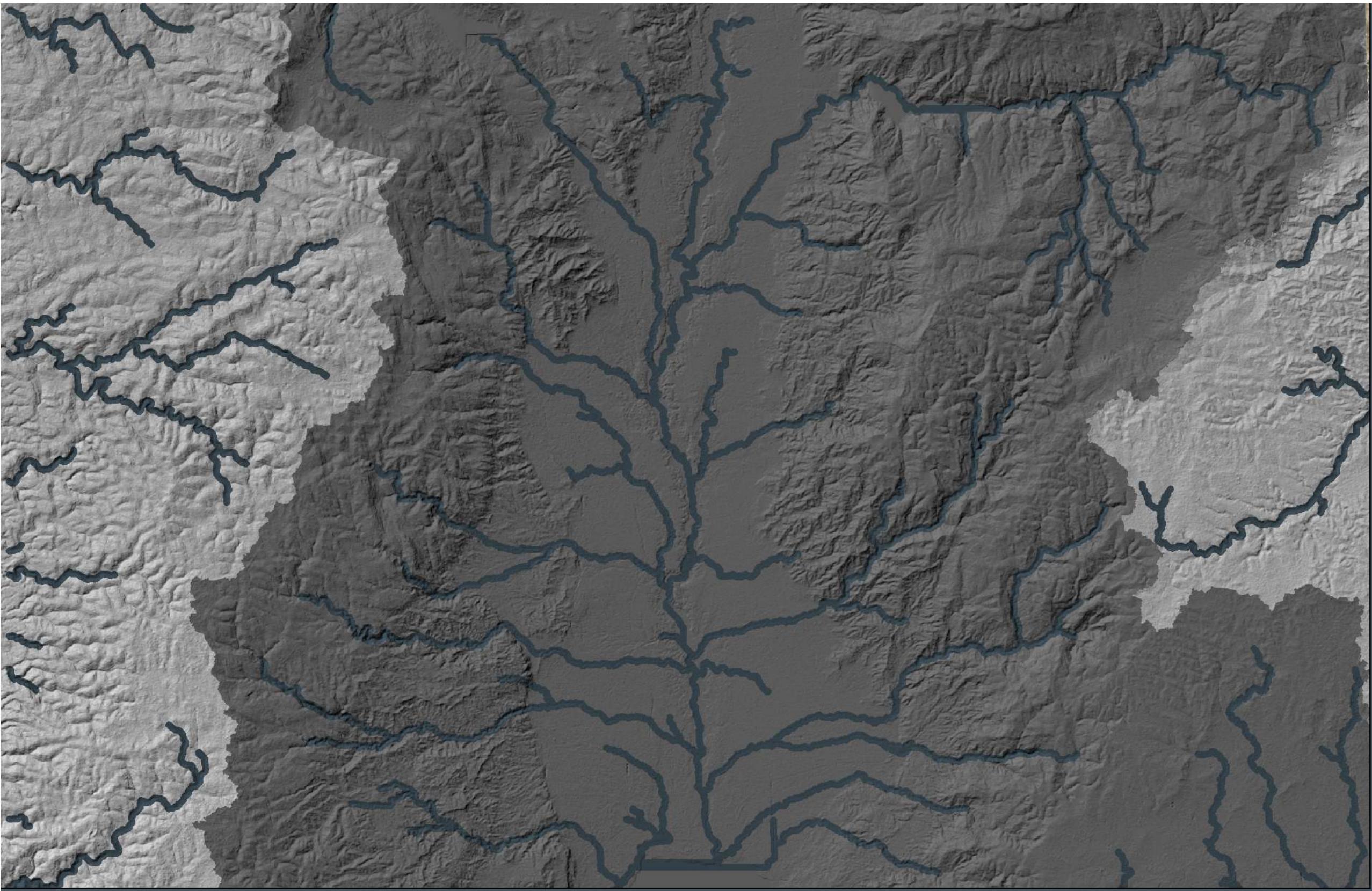
VISUALIZATION - 02



VISUALIZATION - 03



WATER STREAMS AND BASIN

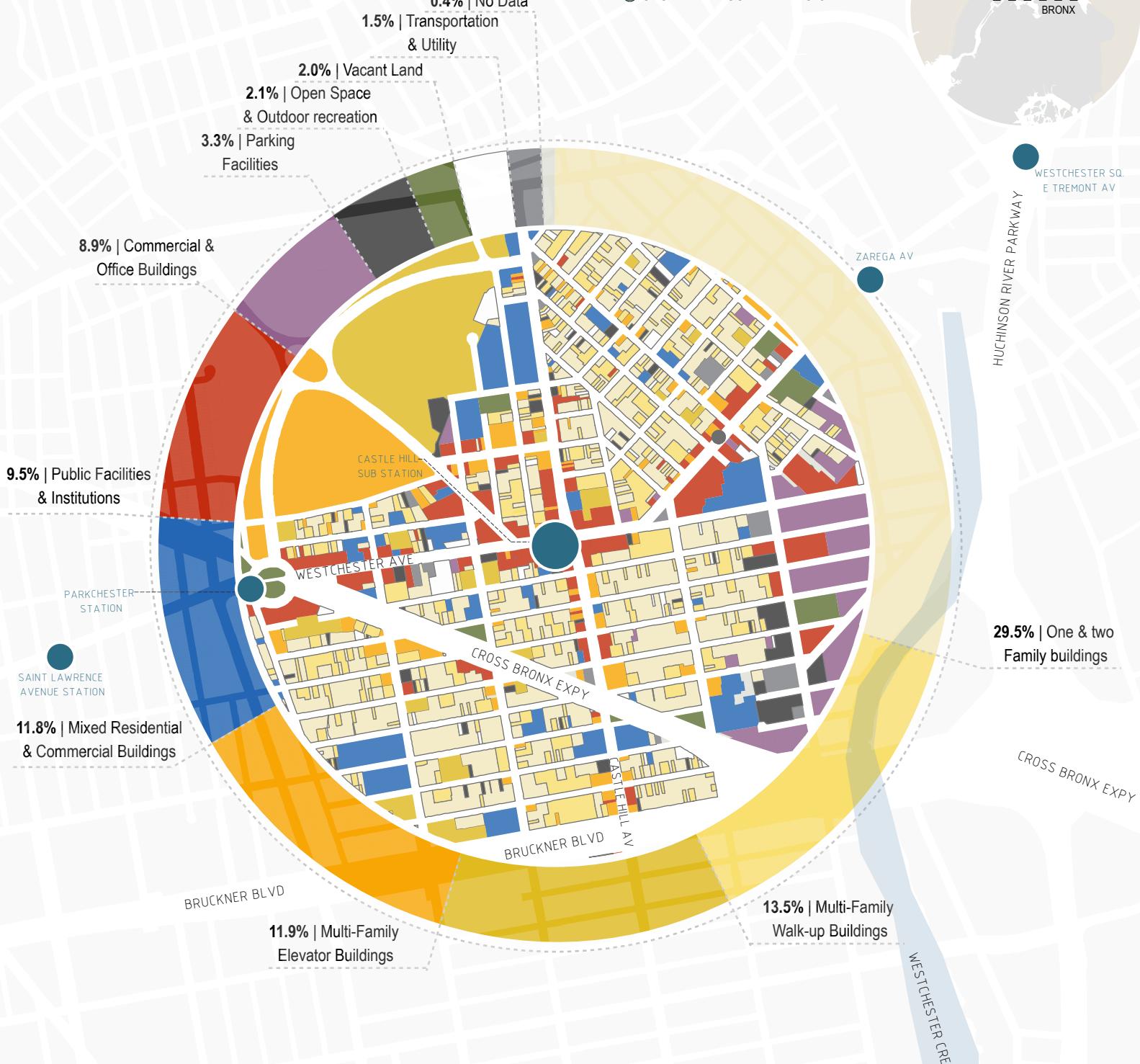


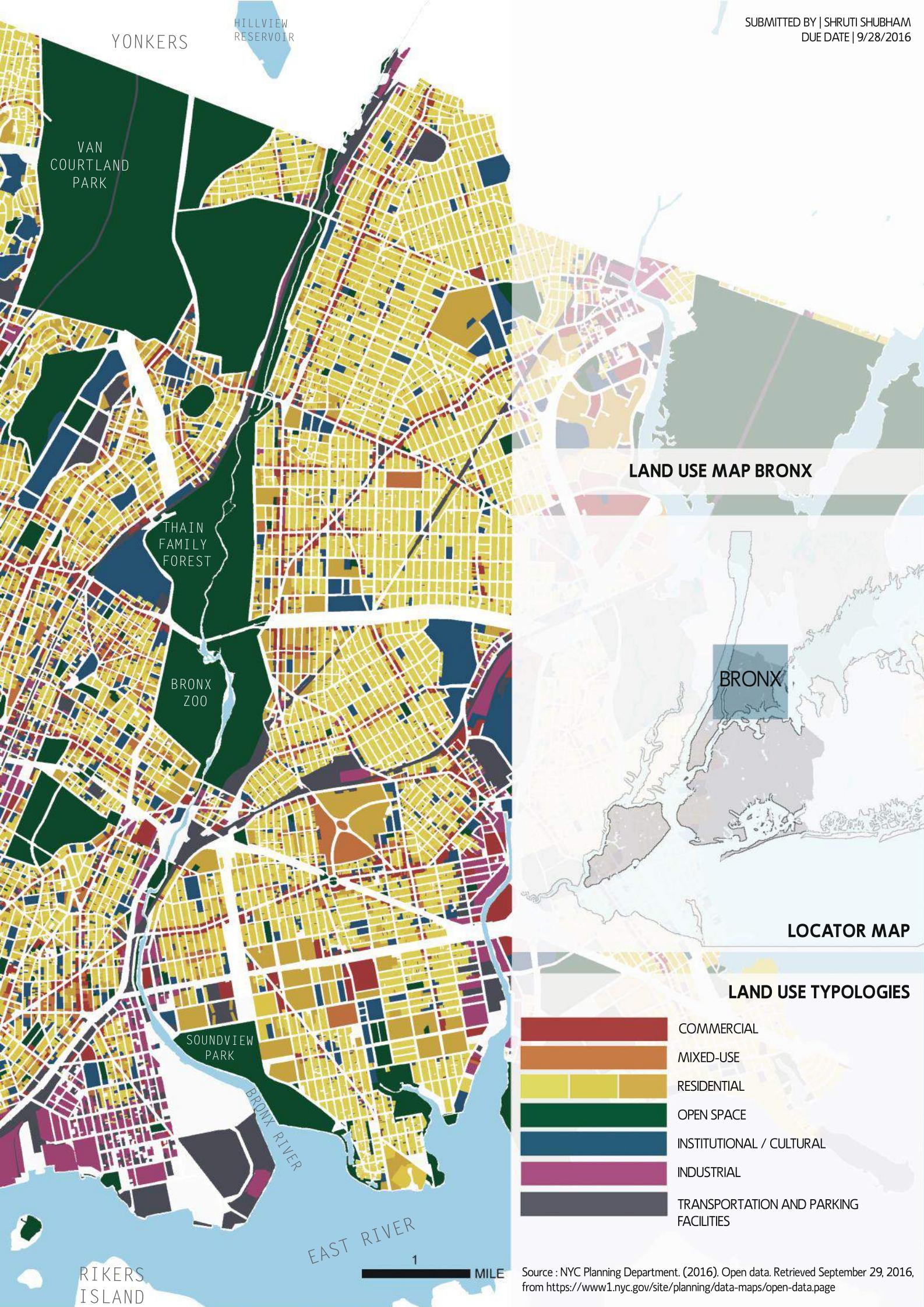
BRONX PARK EAST

CASTLE HILL SUBWAY REGION (1/2 MILE RADIUS AROUND THE STATION)

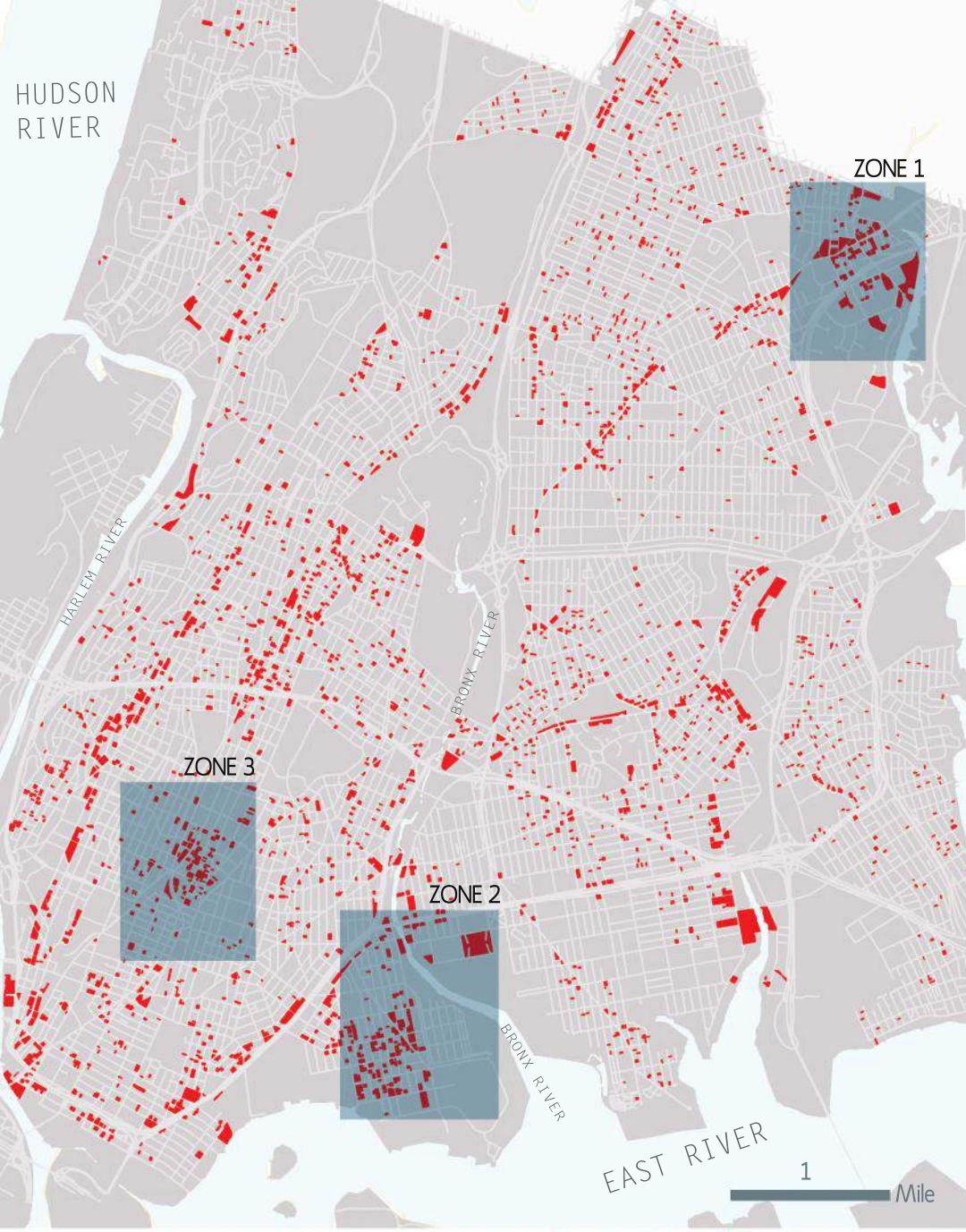
1 MILE SOURCE | NYC DEPARTMENT OF PLANNING - PLUTO DATASET

● SUBWAY STATIONS
● CASTLE HILL SUBWAY REGION





HUDSON
RIVER



VISUALIZING LOCAL GARAGES AND GASOLINE STATIONS

The following map provides the location of local automotive shops, garages and gasoline stations and is instrumental in identifying clusters of the land use in the Bronx.



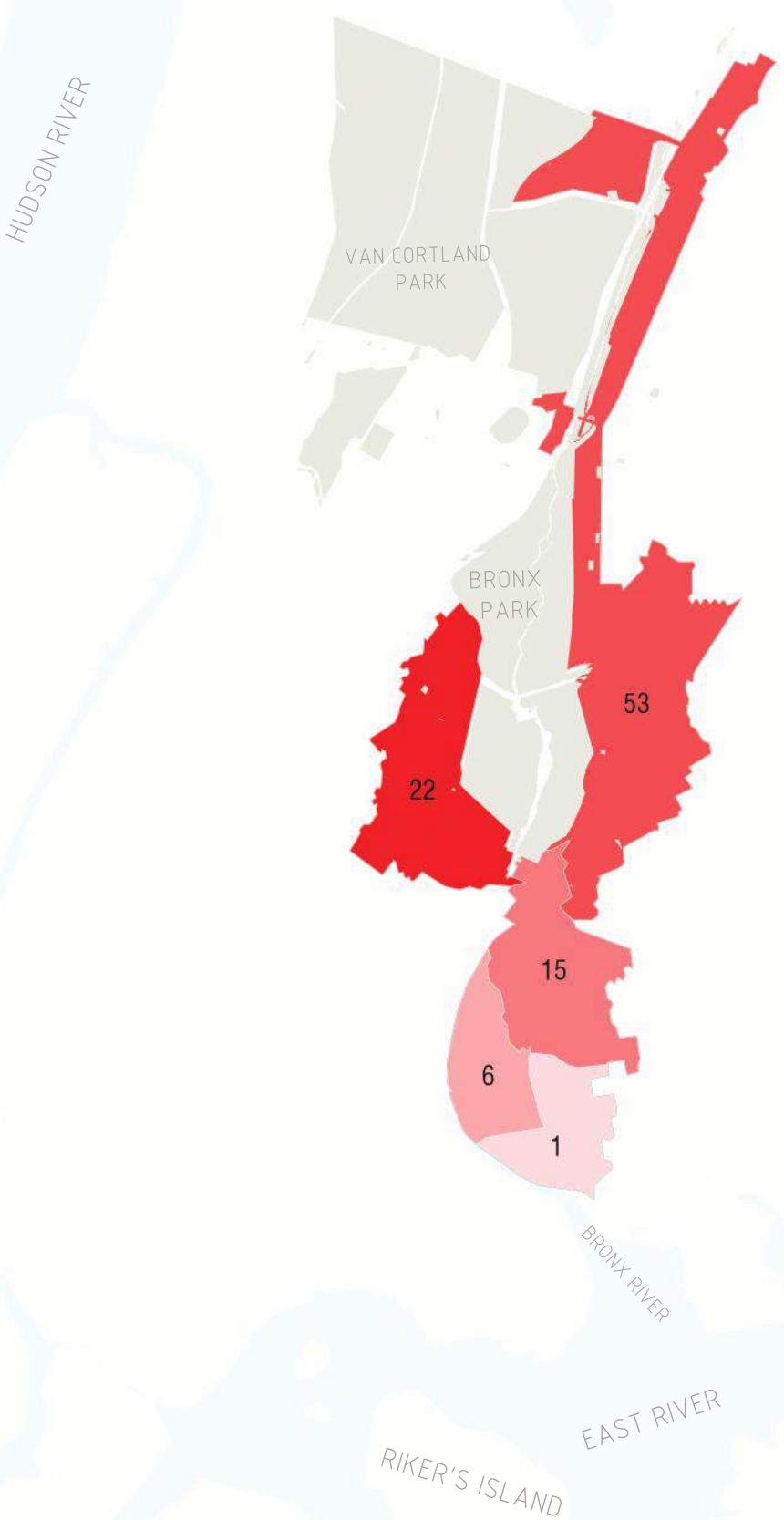
LOCATOR MAP

■ Garages and Gasoline stations
— Streets

Source : NYC Planning Department. (2016). Open data.
Retrieved September 29, 2016, from
<https://www1.nyc.gov/site/planning/data-maps/open-data.page>



2 MILE



DENSITY OF LAUNDROMATS PER 10 ACRES

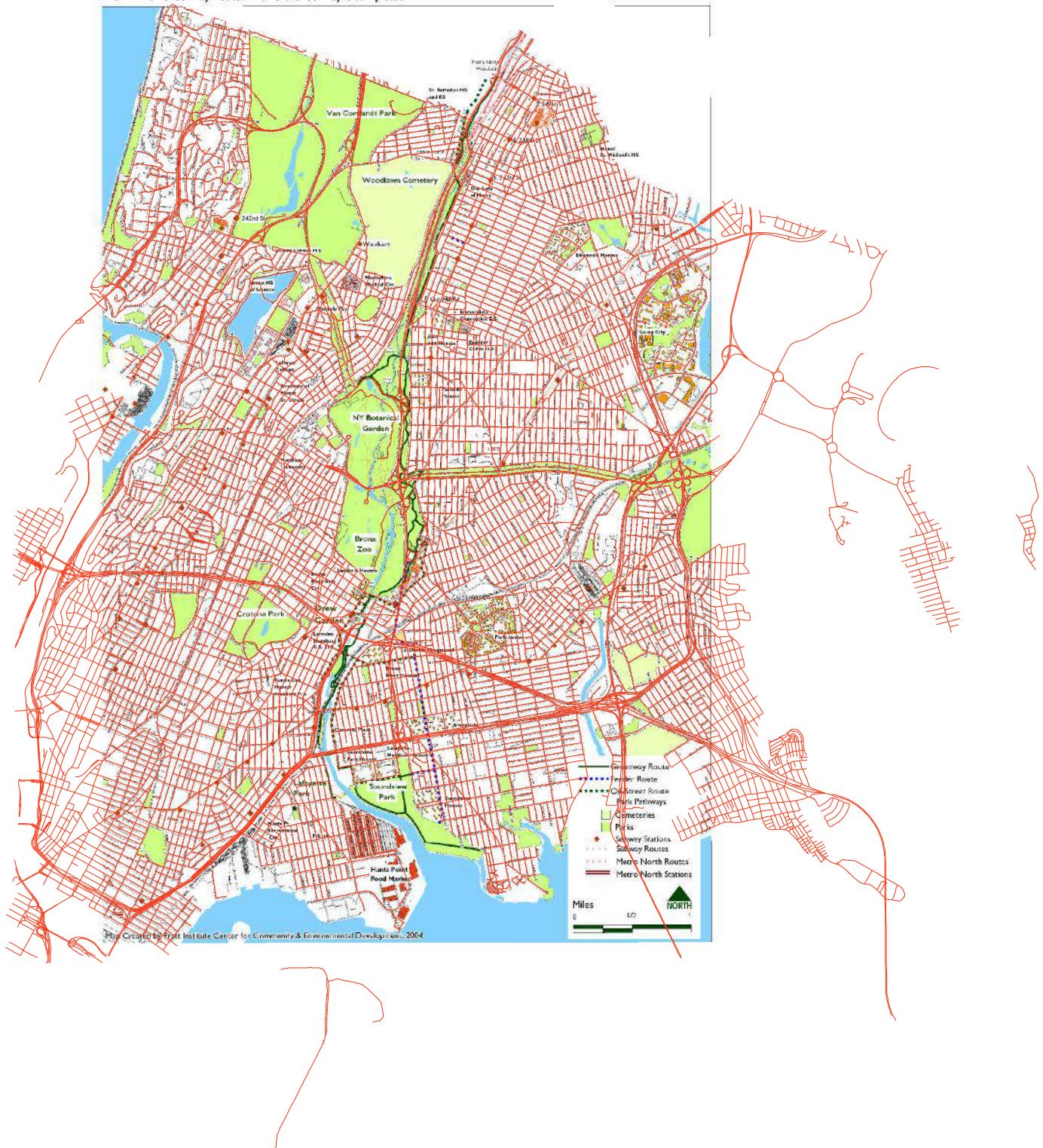
PELHAM BAY & SPLIT ROCK GOLF COURSE	4.59
	4.59 - 28.44
	28.45 - 37.22
	37.23 - 39.57
	39.58 - 43.48

(THE NUMBERS INDICATE THE NUMBER OF LAUNDROMATS PRESENT IN THE AREA)

THIS MAP HAS BEEN MADE TO IDENTIFY THE NUMBER OF LAUNDROMATES AND THE DENSITY OF LAUNDROMATES IN FEW REGIONS ALONG THE RIVER BRONX. IT IS TO ENABLE THE POPULATION IN THESE REGIONS TO BE ABLE TO LOCATE THE NEAREST LAUNDROMATS.

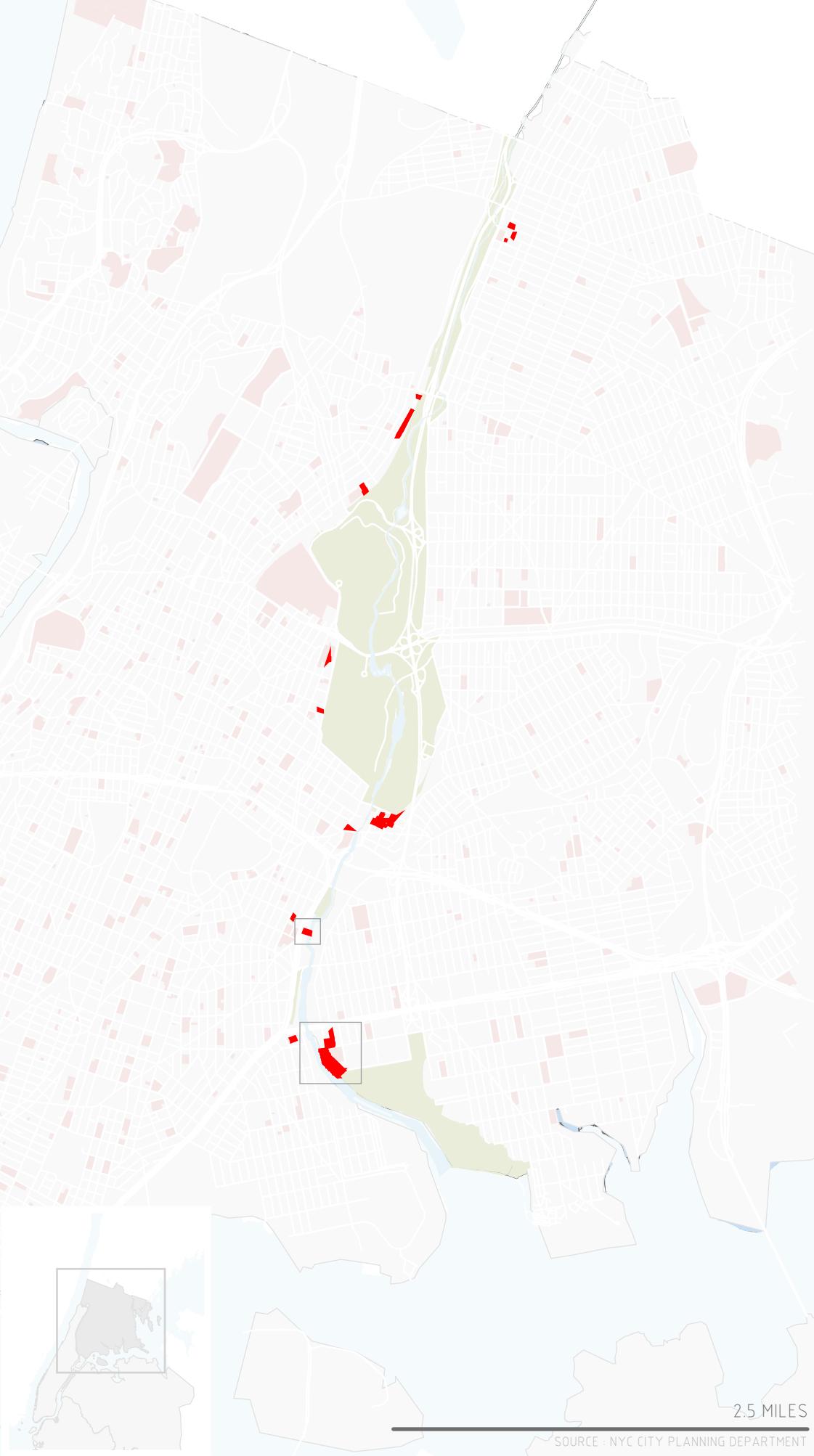


Bronx River Greenway Route: when the Greenway is completed

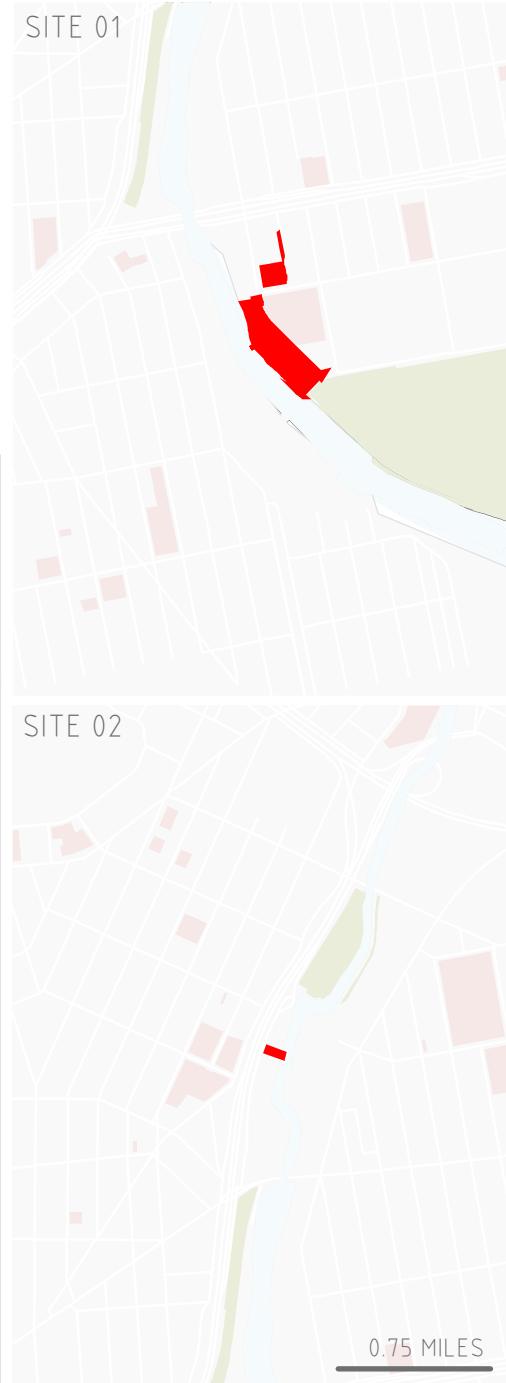


THE BRONX WATERSHED PROJECT

IDEAL SITE LOCATIONS FOR ENVIRONMENTAL EDUCATION CENTER



SITE 01



SITE 02



THE SITES LOCATED IN THE MAP ARE DEEMED IDEAL FOR AN ENVIRONMENTAL EDUCATION CENTER DUE TO THEIR PROXIMITY TO AN EDUCATIONAL FACILITY WHICH WILL BE ABLE TO TAKE OWNERSHIP OF THE SCHOOL AND THE GREENWAY WHICH WILL PROVIDE AN IDEAL ENVIRONMENT.

THE SITES 01 AND 02 ARE HAVE MINIMUM SIDES OPENING TO THE STREETS, THEY HAVE A BOUNDARY ATTACHED TO THE RIVER AND/OR THE GREENWAY. THIS WILL PROVIDE OPEN SPACE AND ALSO DIMINISHES A POSSIBILITY OF A BUILDING GETTING CONSTRUCTED AND POSSIBLY BLOCKING AND HAMPERING THE ACTIVITIES OF THE SCHOOL IN THE FUTURE.

IN ORDER TO ASSESS THE AREA WE CAN ALSO TAKE INTO CONSIDERATION OTHER LAND USES THAT SURROUND THE SITES. OTHER CRITERIA TO LOCATE THE SCHOOL COULD BE THE PRESENCE OF INDUSTRIES, PRESENCE OF COMMERCIAL AND PROXIMITY TO SUBWAY STATION.



DIVIDE?

EXECUTIVE SUMMARY

This project illustrates the effects of a large scale urban development when placed in the Urban fabric such as the densely populated Manhattan. This project presumed to uplift the neighborhood, however there might be an adverse side of such development.

ACKNOWLEDGEMENT

I would like to thank our professor Jeremy D. White, our teaching assistant Jacqueline for immense helping me pull it together in times of stress and Celine and Patrick for their guidance and support through this project.

HIGHLINE AN ECONOMIC SUCCESS

The High Line Isn't Just a Sight to See; It's Also an Economic Dynamo

By PATRICK MCGEEHAN JUNE 5, 2011



A decade ago, so many moneyed interests were united against saving the elevated freight tracks that cut through the West Side of Manhattan that the idea appeared to be doomed. Owners of land and buildings throughout Chelsea wanted the decaying [High Line](#) viaduct razed, and the administration of Mayor Rudolph W. Giuliani supported their feelings.



RELATED COVERAGE

[More Room to Roam on the High Line](#)

JULY 26, 2011

High Line Park An Economic Powerhouse For Meatpacking District

© 06/08/2011 08:53 am ET | Updated Aug 06, 2011

Luxury Project Along the High Line Reaches for New Heights

Six Senses Hotels Resorts Spas is joining HFZ Capital Group's plans in Manhattan's West Chelsea

Air rights on the High Line are selling at huge prices

By Steve Cuozzo

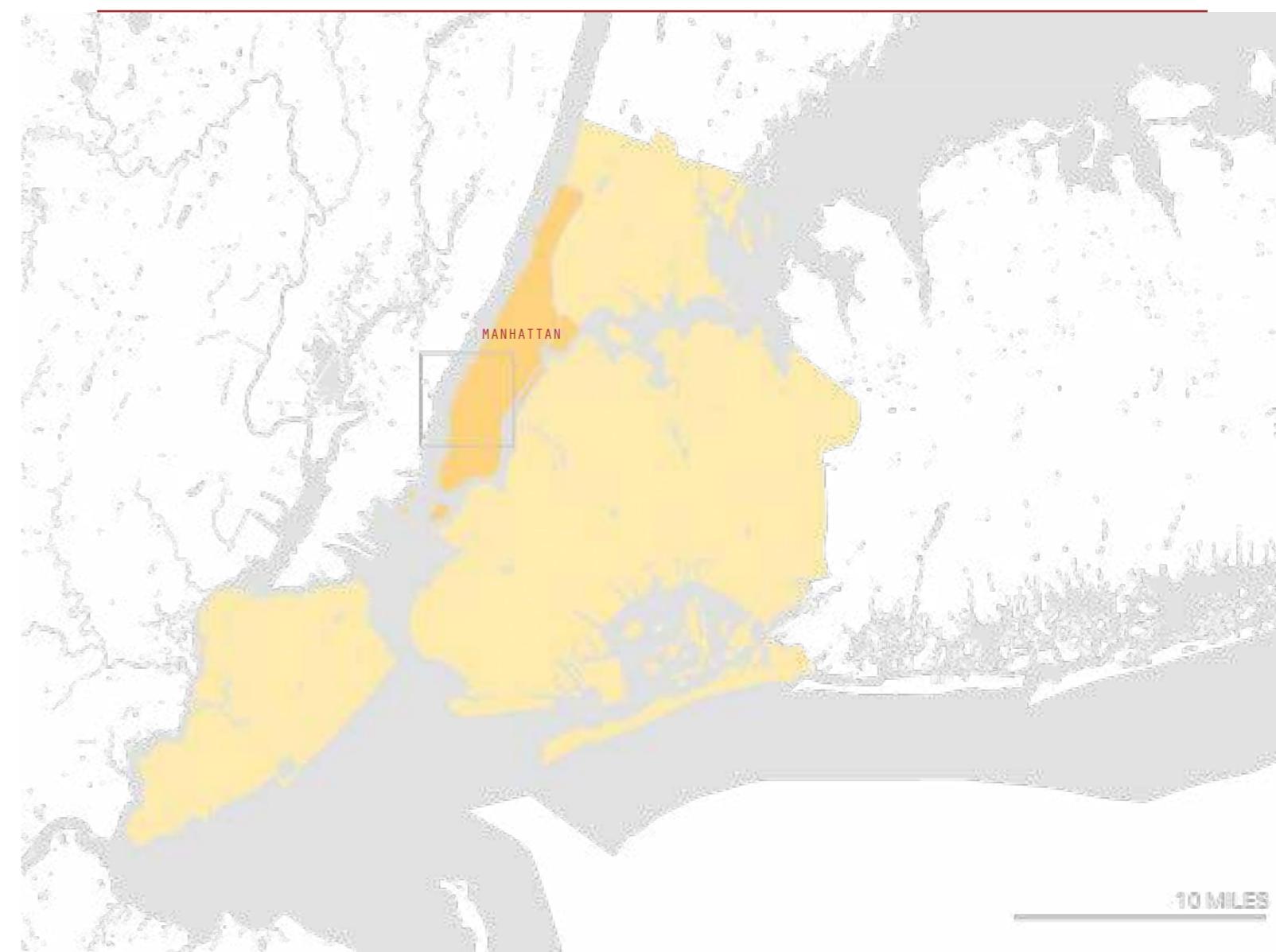
November 29, 2016 | 2:22am

LITERATURE REVIEW

The inspiration of this research was drawn from the documentary by Mark Levin, called the "Class Divide" which elaborated the coexistence of people from different stratas of society within the vicinity of each other. I witnessed the same by visiting the highline and observing how it changed the pattern of movement. It is interesting to see how the activities being carried out under and over the highline strongly dependent on the activities happening along it. For instance, there are signboards on the buildings (address plates) which are placed on the line of sight of people moving on the highline, rather than below.

I also had a chance to speak to H R & A who are the financial consultants behind the highline. Other sources of information included the NYC planning website, which shed light on the inclusionary housing program and the revised west chelsea rezoning. Furman centre's reports on 'The Challenge of Rising Rents' and 'Creating Affordable Housing Out of Thin Air' contain some of the ideas projected in the project.

LOCATION



INTRODUCTION

The area around the Highline has come a long way from a 'gritty' neighborhood from one of the most sought after addresses in Manhattan. This change has been attributed largely to an Urban Design endeavor which has been perceived to be economically beneficial. This change has also led to a level of unaffordability by the community living there. This unaffordability is not only a factor of rising apartment rents, but also as the affordability of the community has increased in general due to gentrification, the price of simple things such as groceries have increased. Thus this difference in affordability which can be perceived as a divide between the rich and the poor have lead people to leave their homes and move out of the area.



CONTEXT

THE RAILWAY TRACK WAS NON-FUNCTIONAL
1950'S ONWARDS

FRIENDS OF HIGHLINE FORMED
(NON PROFIT ORGANISATION)
1999

REPURPOSING BEGAN
2006

POPULATION
38,242

Avg Household
Size

1.7

NEW YORK
2.7

AVERAGE NUMBER OF CARS/ OTHER VEHICLES

0.1

NEW YORK: **0.4**

MAJORITY: WHITE, FOLLOWED BY HISPANIC,
THEN BLACKS, ASIANS, AND OTHER

The highline is situated along the Hudson river along the west of Manhattan. Its location alone is attributable to the high return on investment on the real estate deals made here, however this was not the case until very recently. In 2005 along with the commissioning of the highline, the West Chelsea area was rezoned in order to attract more mixed use development and the permissible F.A.R. was increased. Inclusive housing was incentivised however was not made mandatory. Thus industrial buildings were converted in commercial and residential. This lead to a real estate boom along the highline.

RESEARCH QUESTION

Through this research I would like to examine to what extent is the highline an income generator and an agent which leads to an economic divide.

INDICATORS



-98%

CONDOMINIUM
BUILDINGS



-27%

WALKUPS



+24%

ELEVATOR
APARTMENTS

+156%

HEAVY MANUFACTURING

+172 %

OFFICE BUILDINGS

-62%

RELIGIOUS BUILDINGS

OTHER
INTERESTING
STATISTICS

+156%

HEAVY MANUFACTURING

+172 %

RELIGIOUS BUILDINGS

In order to investigate if the highline actually created a divide, or is it just a belief rumored to be true we hypothesize the following. Null hypothesis: highline has created an income divide. Alternate hypothesis: the income divide was prevalent from before and introduction of an urban design project such as the highline has no effect on it.

I analysed some indicators of economic divide (furman centre , 2013) such as the increase in number of elevator buildings in the area. The results indicated that there are positive growth in percentages of these indicators thus reinforcing our beliefs.

LITERATURE REVIEW

The inspiration of this research was drawn from the documentary by Mark Levin, called the “Class Divide” which elaborated the coexistence of people from different stratas of society within the vicinity of each other. I witnessed the same by visiting the highline and observing how it changed the pattern of movement. It is interesting to see how the activities being carried out under and over the highline strongly dependent on the activities happening along it. For instance, there are signboards on the buildings (address plates) which are placed on the line of sight of people moving on the highline, rather than below.

I also had a chance to speak to H R & A who are the financial consultants behind the highline. Other sources of information included the NYC planning website, which shed light on the inclusionary housing program and the revised west chelsea rezoning. Furman centre's reports on 'The Challenge of Rising Rents' and 'Creating Affordable Housing Out of Thin Air' contain some of the ideas projected in the project.

SOURCES OF INFORMATION

www.census.gov

ACS Data - 2009 , 2011, 2014 census tract level
ACS Data - 2014 block group level

www.nyc.gov
Land use data. 2007, 2010, 2012, 2014, 2016
Block group data.
water shape file

NYC planning department.
parks and greenways data

METHODOLOGY

Aim | to create a more inclusive and cohesive community along the highline.

Observe macrodata for economic variables median income and rent for 2 time periods.

Observe data for one mile radius and half mile radius from the highline at the block group level.

Observe the index of dissimilarity.

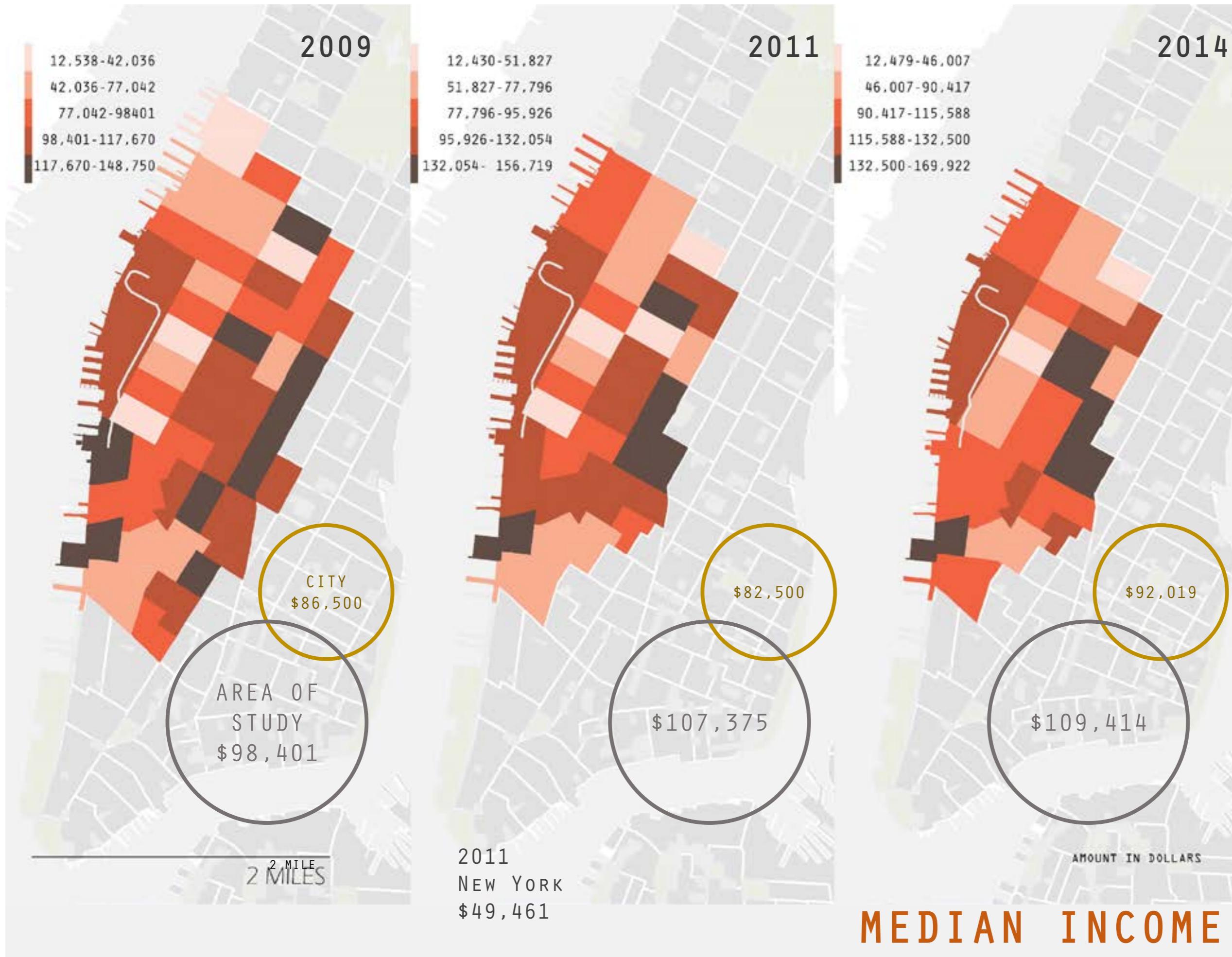
Formulate recommendations on the basis of dissimilar land-use / vacant areas.

LIMITATIONS

Only variables regarding income and rent have been analysed. To profile the economic condition of a place, more variables should be analysed.

There can be high margin of errors in the ACS 5 year data. This has been corrected by using the recommended method on the census.gov site.

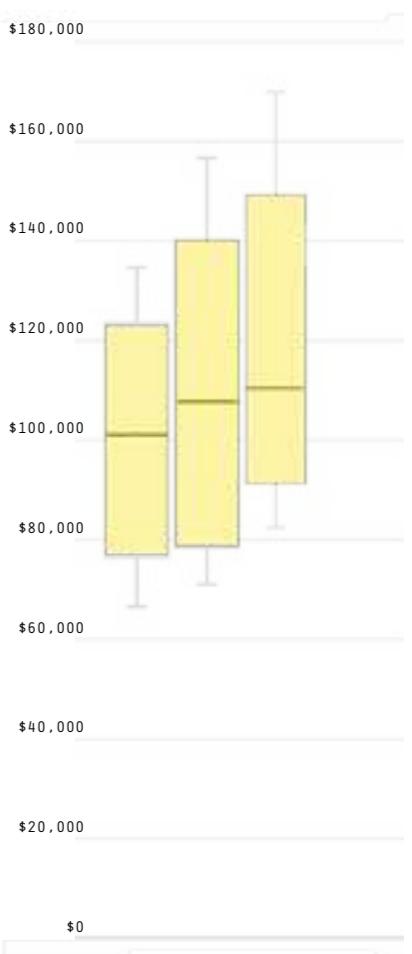
The census 10 year data sets or the ACS datasets for 2009 and 2011 could not be analysed as the block group level data was not available.

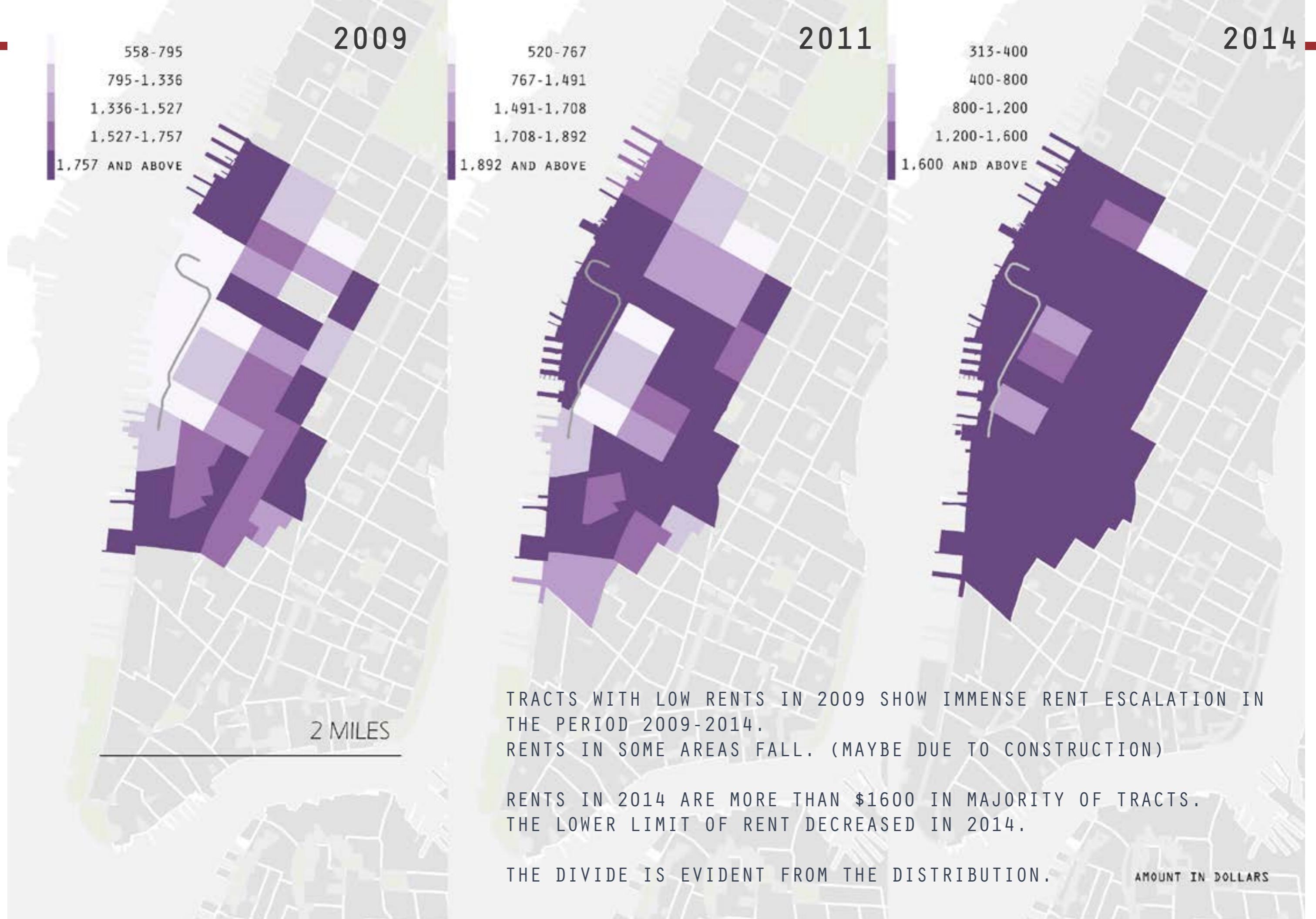


Further I studied the median income and the gross median rents that intersect the one mile radius around the highline and compared it with the median income of Manhattan and New York City.

The income divide is evident. The top 50 percent got richer over the time periods analysed and the bottom 50 percent got poorer. This is made evident from the box plot below.

As we look at the rents more and more areas around the highline becomes unaffordable as the asking price in most of these areas rise over \$2,000.





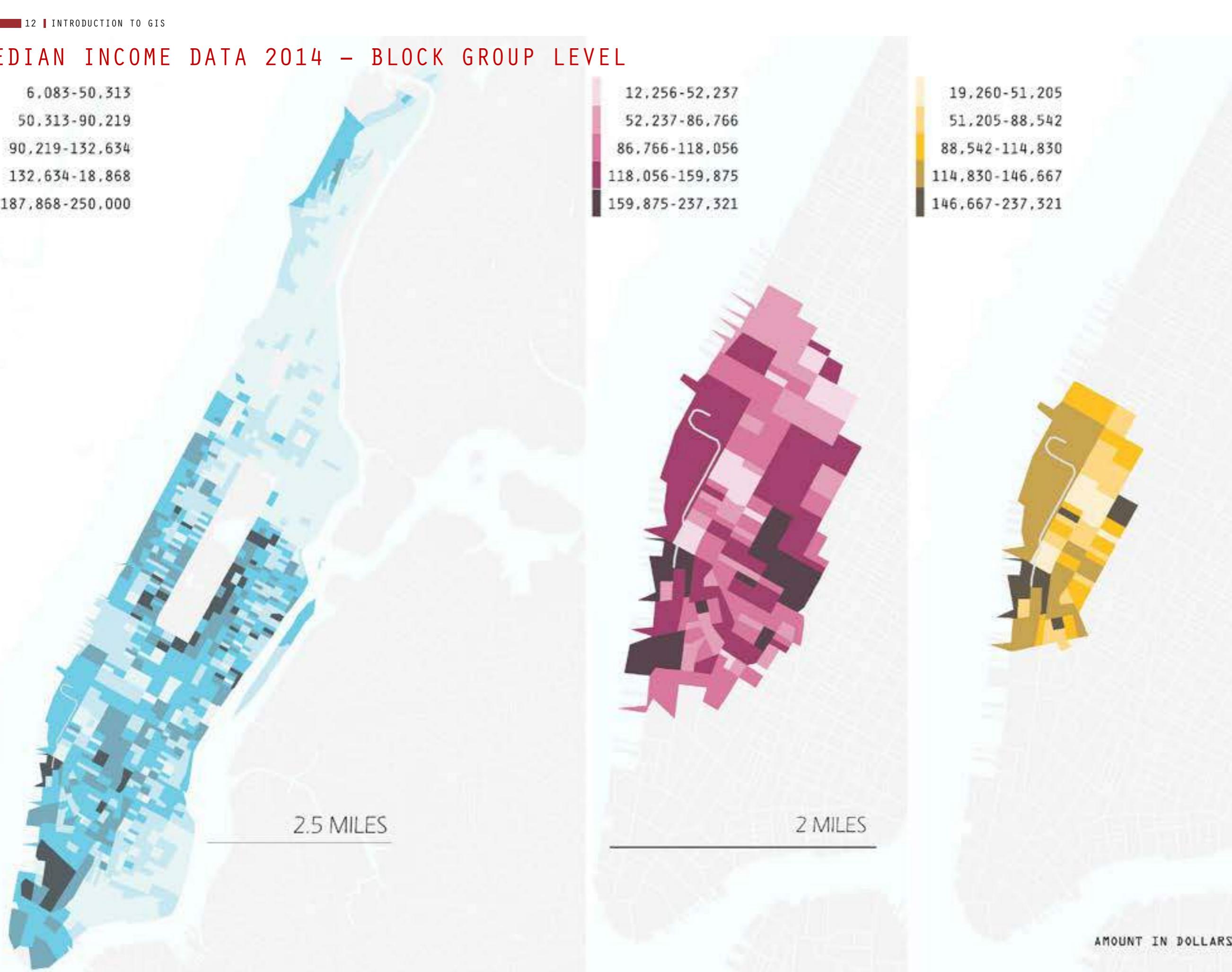
LETS LOOK AT THE **GROSS MEDIAN RENT**

MEDIAN INCOME DATA 2014 – BLOCK GROUP LEVEL

6.083-50.313
50.313-90.219
90.219-132.634
132.634-18.868
187.868-250.000

12.256-52.237
52.237-86.766
86.766-118.056
118.056-159.875
159.875-237.321

19.260-51.205
51.205-88.542
88.542-114.830
114.830-146.667
146.667-237.321



Further we investigate the wealth distribution of the area at the census block level.

The median income is larger than the other blocks in Manhattan, however, the number of people obtaining the salary below median income level has increased.

Further when we look at a similar analysis regarding rent. It is one of the highest in the entire Manhattan area.

GROSS MEDIAN RENT DATA 2014 – BLOCK GROUP LEVEL

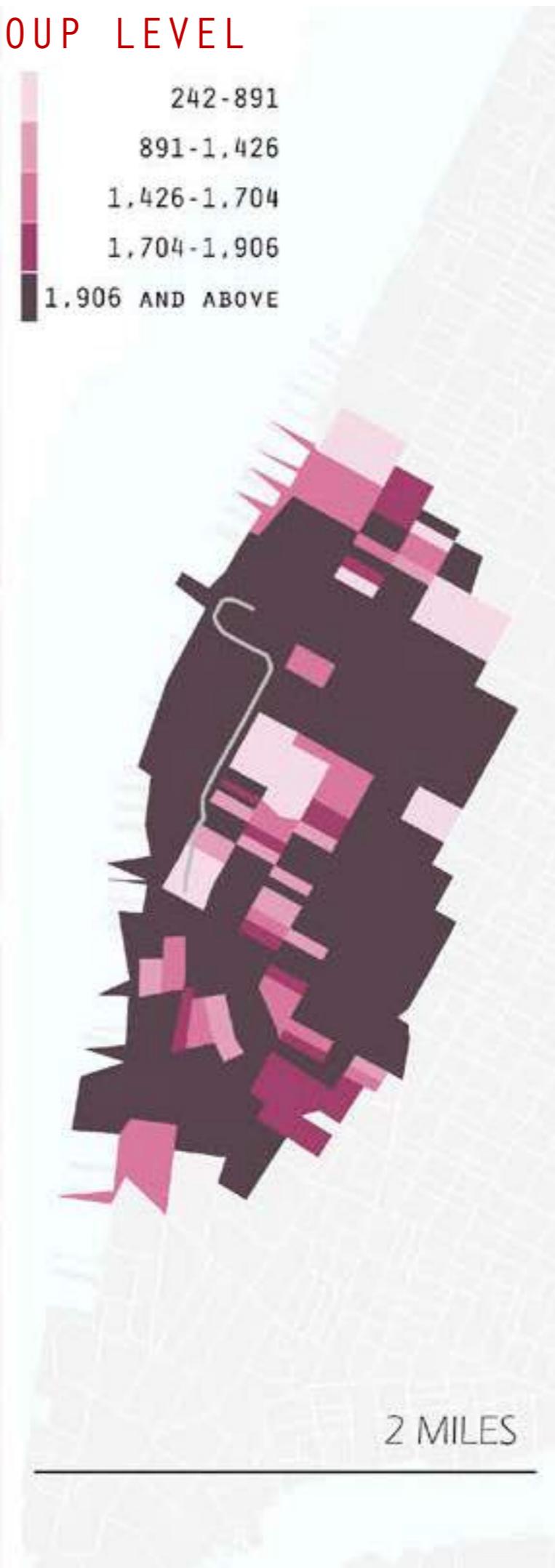
239-689
689-1,069
1,069-1,427
1,427-1,801
1.801 AND ABOVE

242-891
891-1,426
1,426-1,704
1,704-1,906
1.906 AND ABOVE

521-858
858-1,293
1,293-1,426
1,426-1,830
1.830 AND ABOVE



2.5 MILES



2 MILES



Some analysis the rise/fall in parameters indicated earlier that highline did increase an income divide. This is further supported by the analysis of the amount of rent that is paid in this region. The inhabitants here generally pay more rent. There are project housing in the half mile radius area, however, the minimum rent in these projects are also higher than what 4 percent of manhattan pays. The rents in the one mile radius is lower than the half mile radius. This shows that it is more affordable to stay away from the highline.

2016

2014

2012

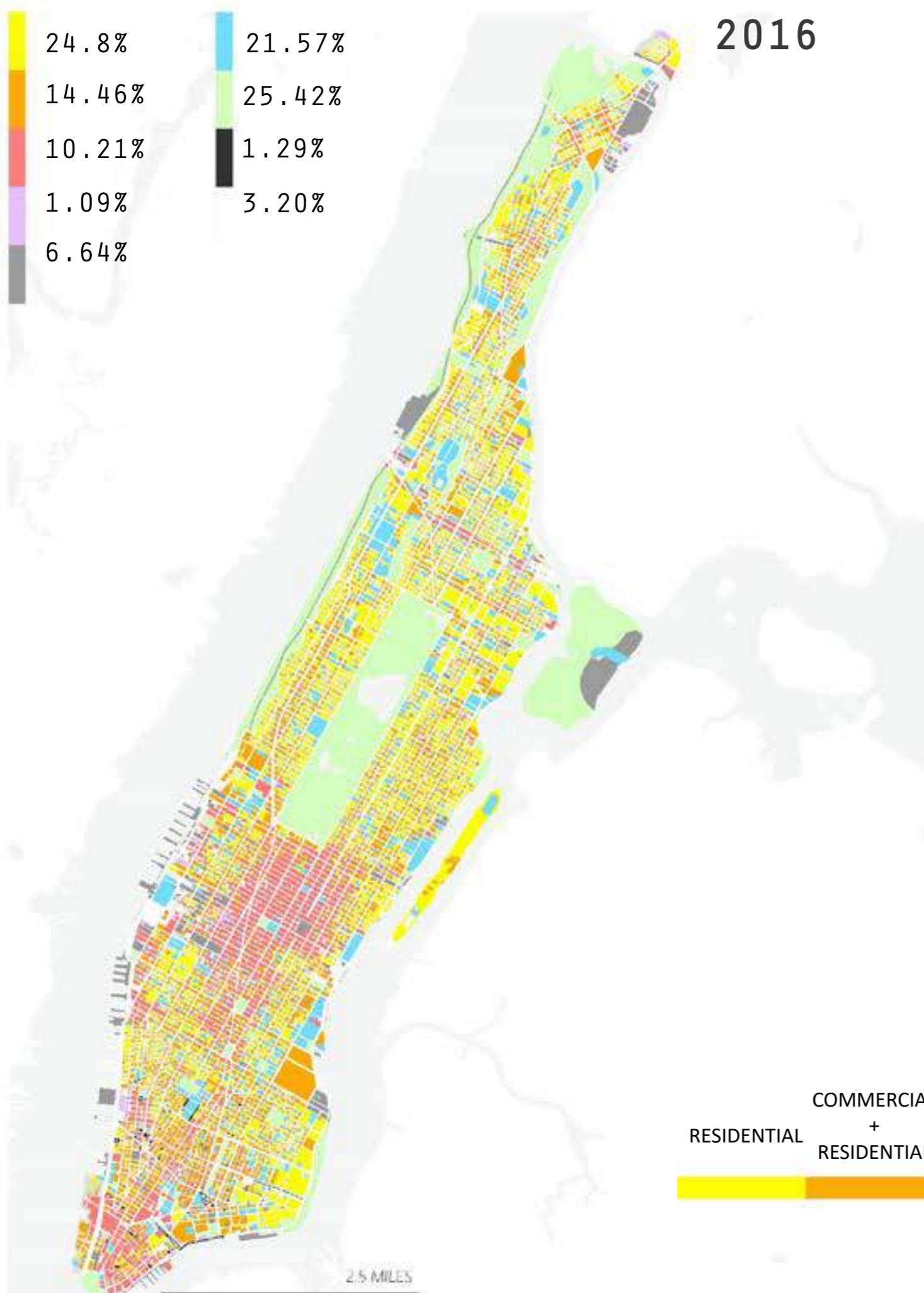


2010



2007





WE OBSERVE MINIMAL CHANGES PER UNIT TIME

CONTRARY TO EXPECTED OUTCOME NEGATIVE GROWTH OBSERVED IN COMMERCIAL UNITS AND POSITIVE GROWTH OBSERVED IN INDUSTRIAL UNITS

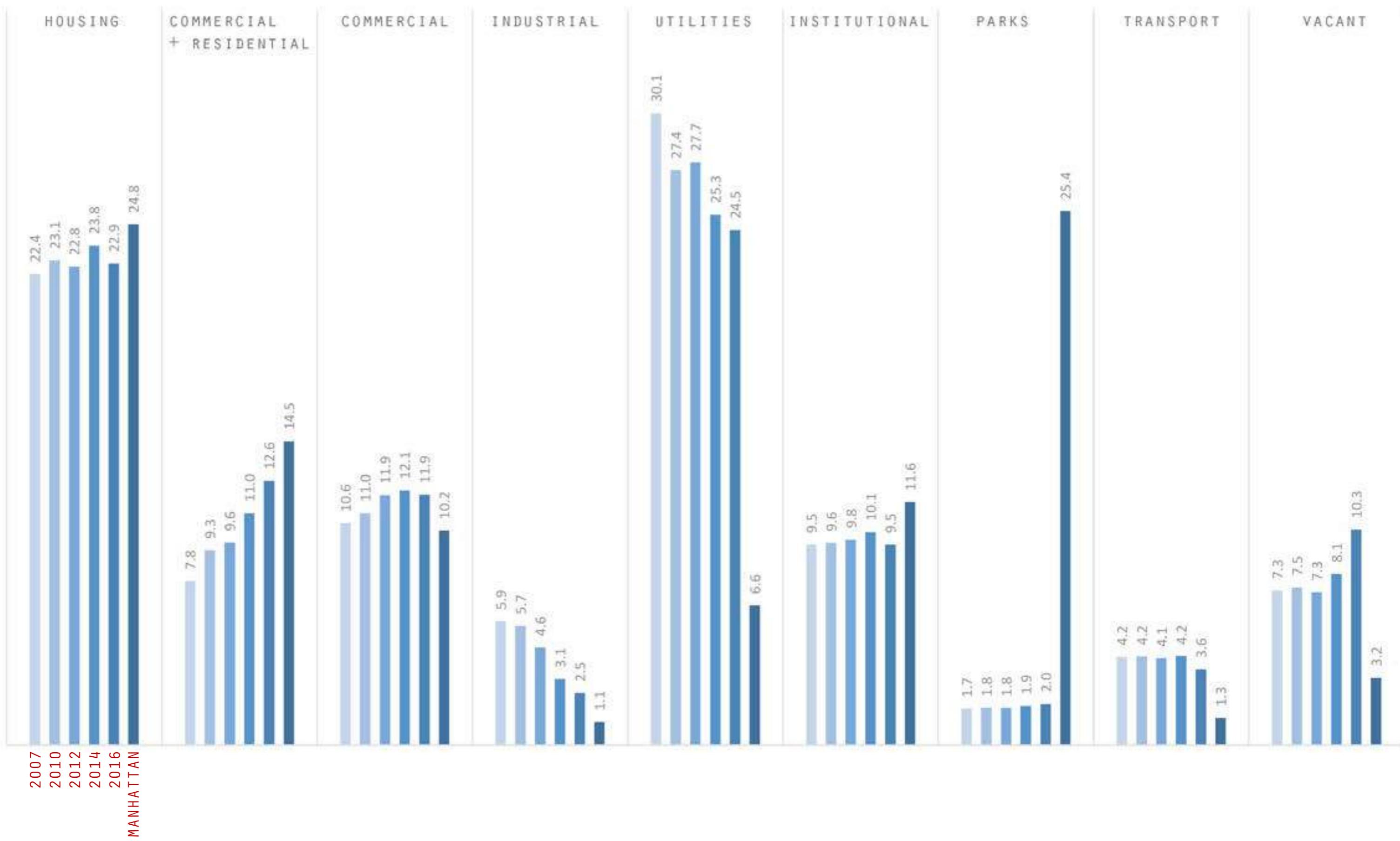
The index of dissimilarity is a measure of the evenness with which a certain land use is distributed across component geographic areas that make up a larger area.

It is presumed that upon rezoning the commercial and residential landuse of the area has increased, however the land use study indicates an outcome different than this.

The results show that the commercial peaked in 2014, however it declined over the next two years. The industrial landuse, against all expectations increased.

In the following trends table the index of dissimilarity is clearly visualised.

LAND USE TRENDS



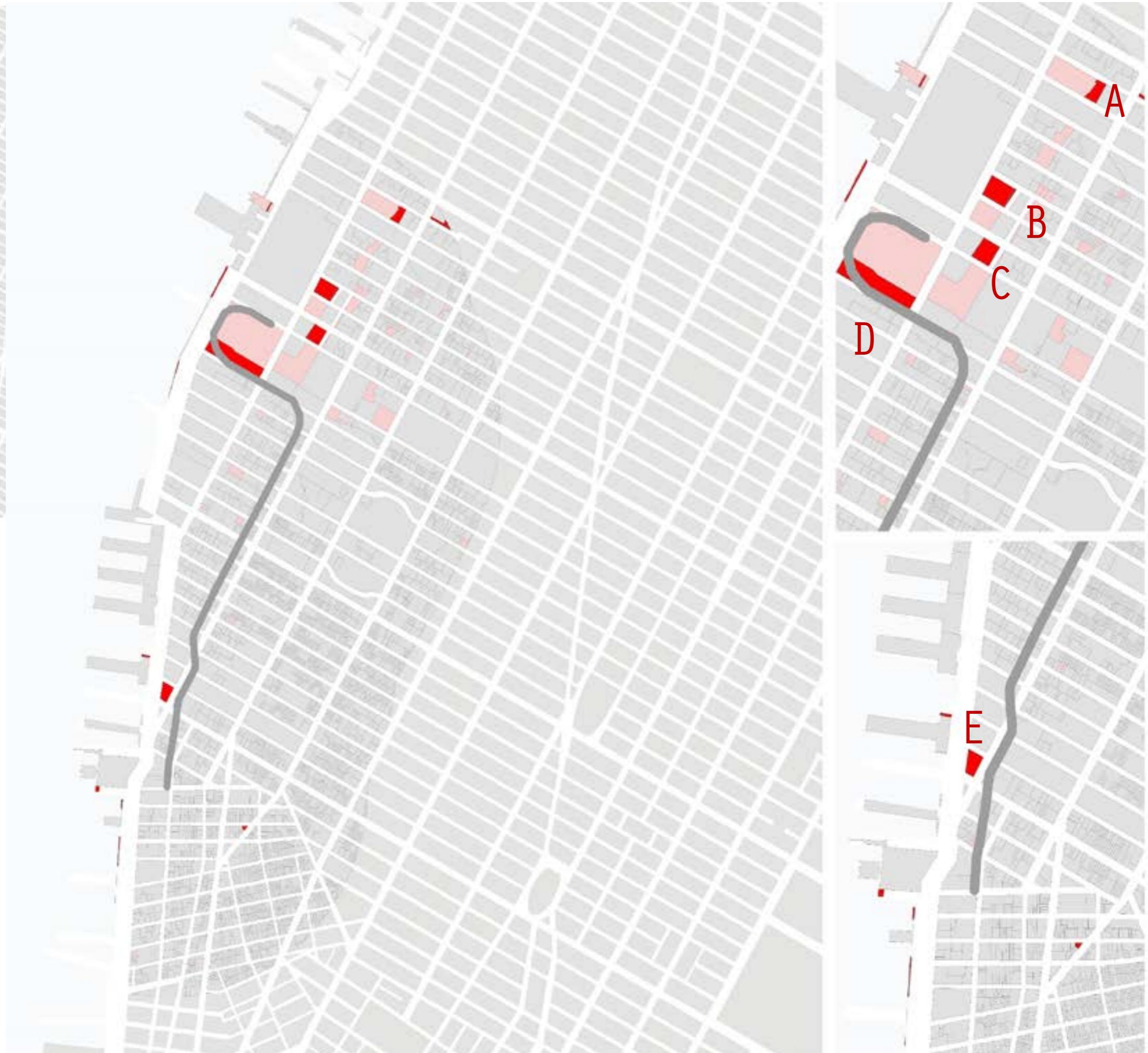
VACANT LOT ANALYSIS

PUBLIC OWNED
VACANT LOTS

SITES A,B,C,D,E

This analysis shows that the area has a large number of vacant lots as compared to Manhattan. This indicates that it is going to be a commercially viable area for real estate developers. In order to propagate inclusive development of the community, we propose community spaces (institutional or commercial development) for all strata of society in these vacant lots that are available through government agencies.

ALL VACANT
LOTS WITHIN
HALF MILE
RADIUS OF
HIGHLINE



HUDSON YARDS DEVELOPMENT

Hudson Yards is the single biggest development happening around the highline. Upon conducting this study we find out the index of dissimilarity between the area and Manhattan and hence we know that there is a need to increase the residential and commercial in order to create more housing units and avenues for small businesses. This study can be kept in mind whilst developing the Hudson Yards. This if done can prevent occurrence of such an income divide within the development and Manhattan can be a place where everyone can live.

CONCLUSION

Rising rents and stagnating incomes have led to an unprecedented affordable housing shortage in New York City. To address these challenges, we need to rethink inclusive cohabitation and build or preserve affordable housing. We should look to increase the existing number of housing units, and keep in mind the needs of the city while developing large scale projects.