# SETTING UP A SHOPPING MALL

## MUMBAI

## MAHARASHTRA

COURSERA CAPSTONE

IBM APPLIED DATA SCIENCE CAPSTONE

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# Business Problem

▶ Location of the Shopping Mall is one of the mail aspects which will determine whether the mall will be a success or not.

▶ Objective: To analyze and select the best locations for setting a mall in the city of Mumbai, Maharashtra.

▶ Business question

  ▶ In the city of Mumbai, Maharashtra, if a property developer is looking to set up a new shopping mall, where would you recommend that they open it?

# Data

▶ Data required

1. List of neighborhoods in Mumbai, Maharashtra
2. A Population and Density(population) data set
3. Latitude and Longitude of the neighborhoods
4. Venue data with respect to all neighborhoods

▶ Sources of data

1. https://en.wikipedia.org/wiki/List_of_neighborhoods_in_Mumbai
2. Geocoder package in python
3. https://en.wikipedia.org/wiki/List_of_neighborhoods_in_Mumbai
4. Foursquare API with Sandbox account

# Methodology

- Web Scraping Wikipedia page for list of neighborhoods
- Web Scraping online forums and websites for the population data
- Using Foursquare API to get venue details
- Grouping data by Suburb and neighborhood and taking out the mean of all the venues in each neighborhood
- Filtering venue by shopping mall
- Visualizing correlation between number of Shopping malls and population and density/sq. km.
- Performing Clustering on the data using K-Means clustering
- Visualizing clusters on map using Folium
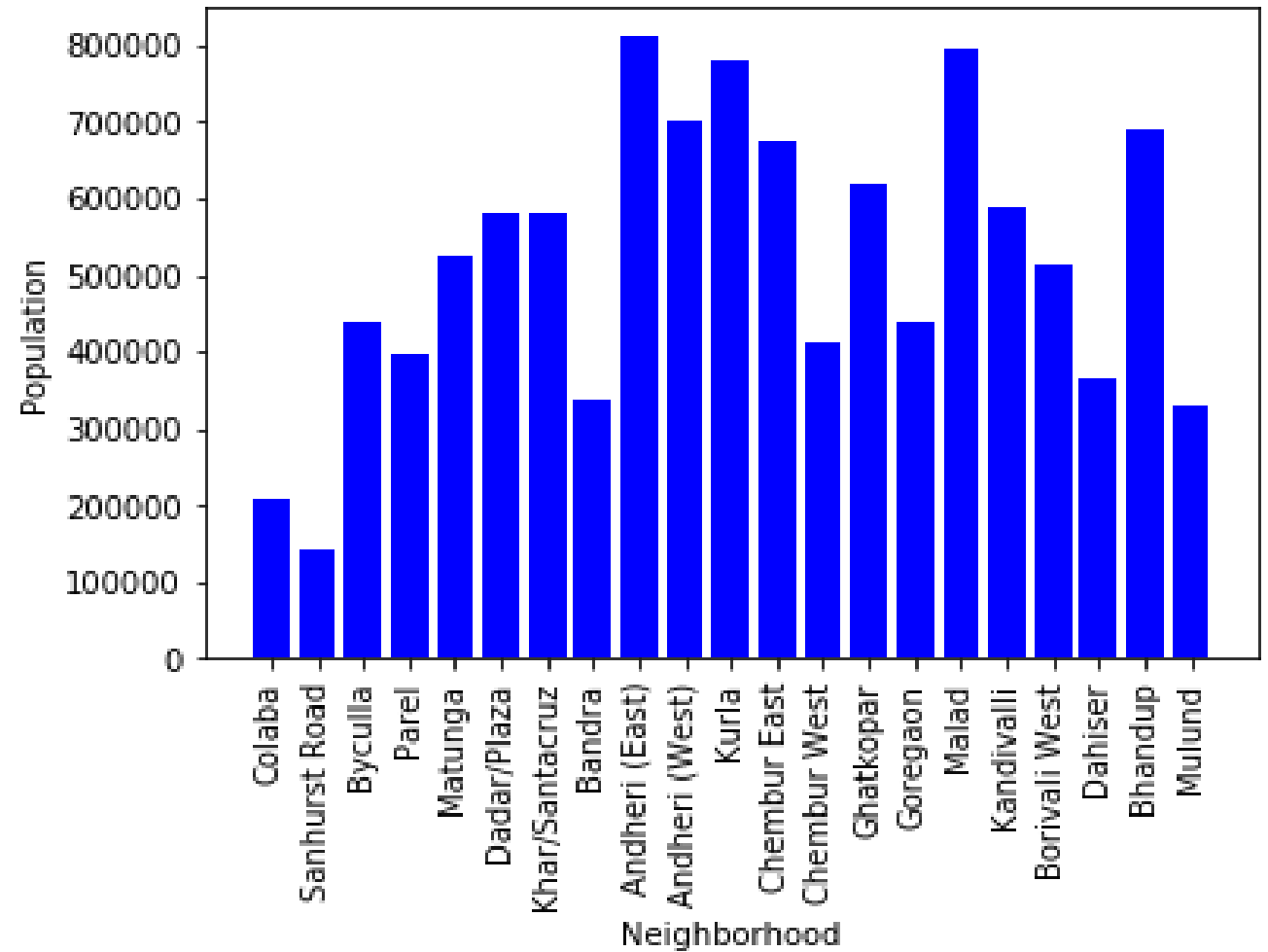
# Results

## Result-1

Data regarding which neighborhoods already have shopping malls and what is the number variation of shopping malls in the said neighborhoods.
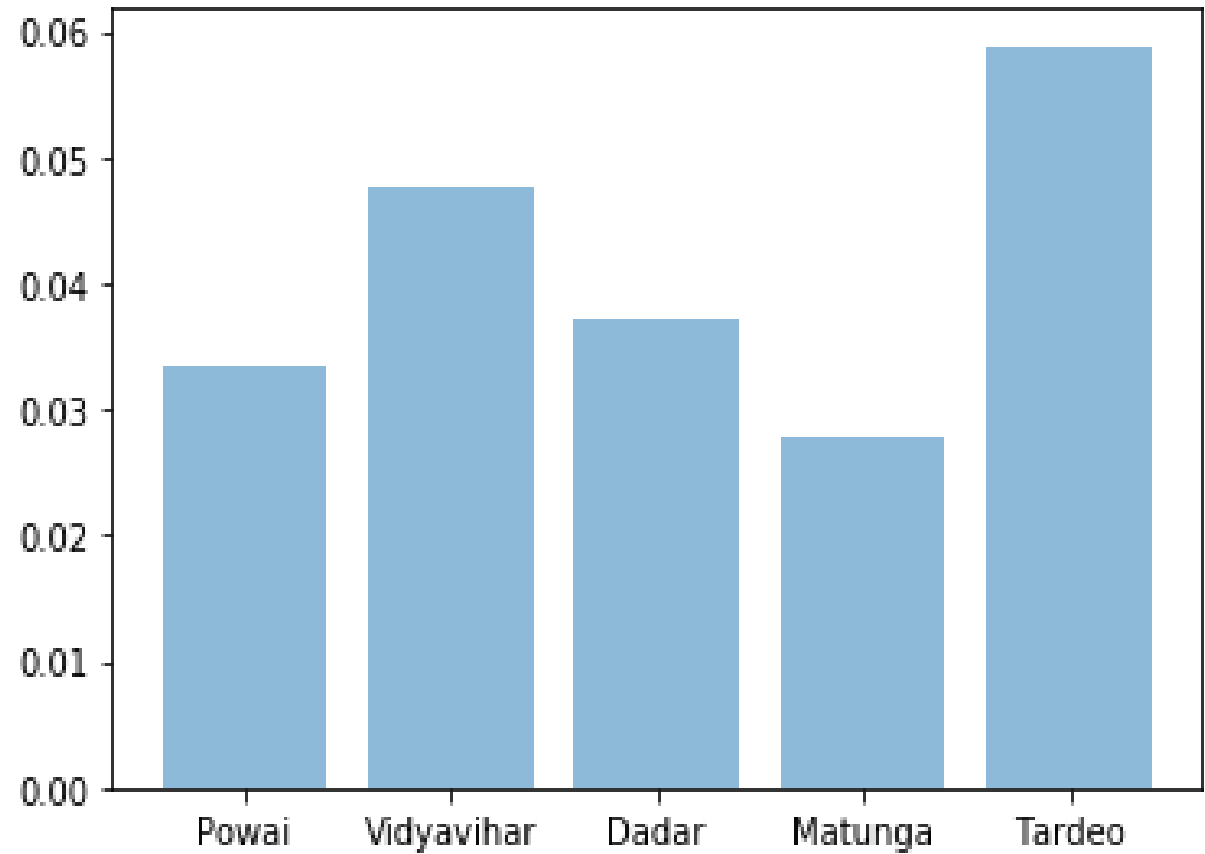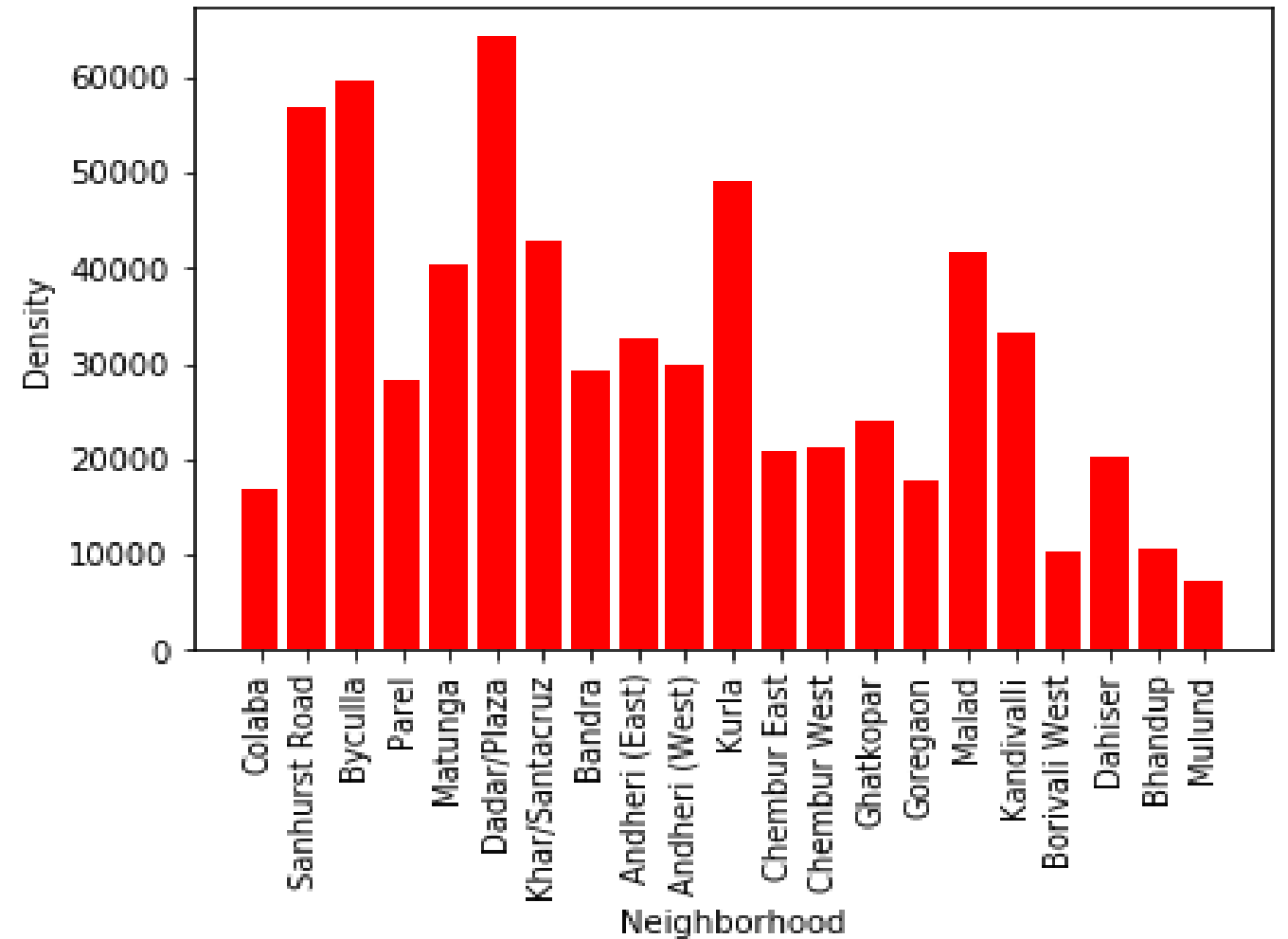
# Result-2

The population data in each neighborhood in the city of Mumbai, Maharashtra
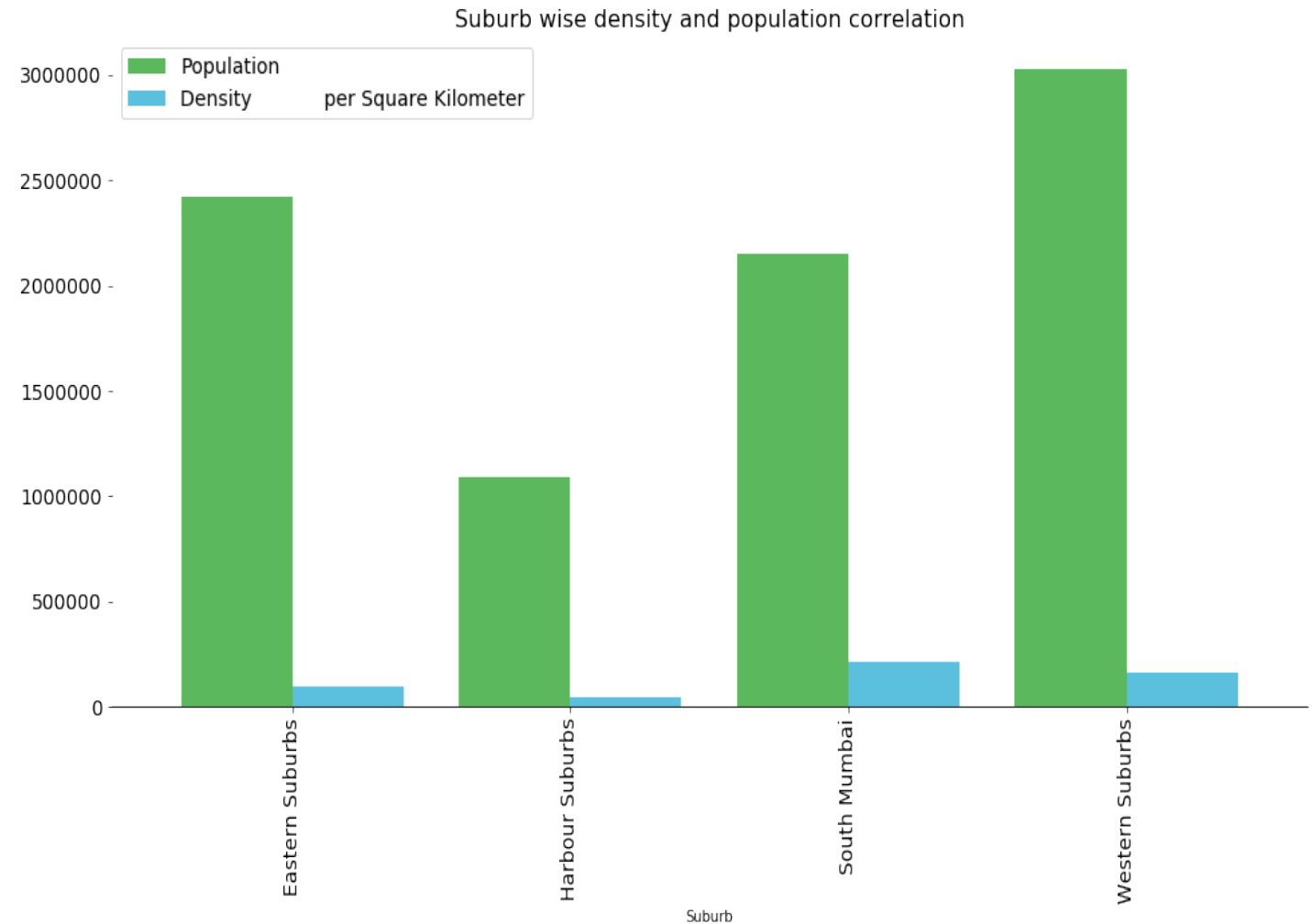
# Result-3

The visualization regarding density/sq.km for each neighborhood

# Result-4

Data consisting of the population and density comparison for different suburbs in Mumbai, Maharashtra
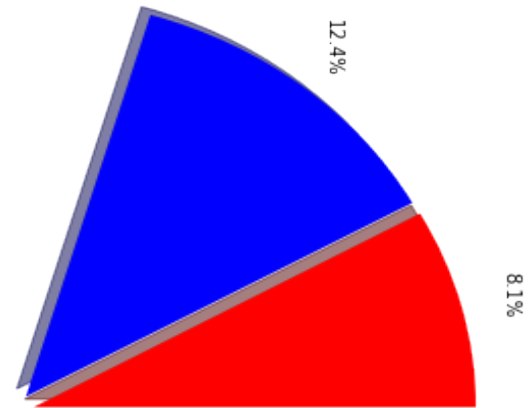


Suburb wise density and population correlation

# Results-5

Pie chart visualizing the percentage of malls in different suburbs.

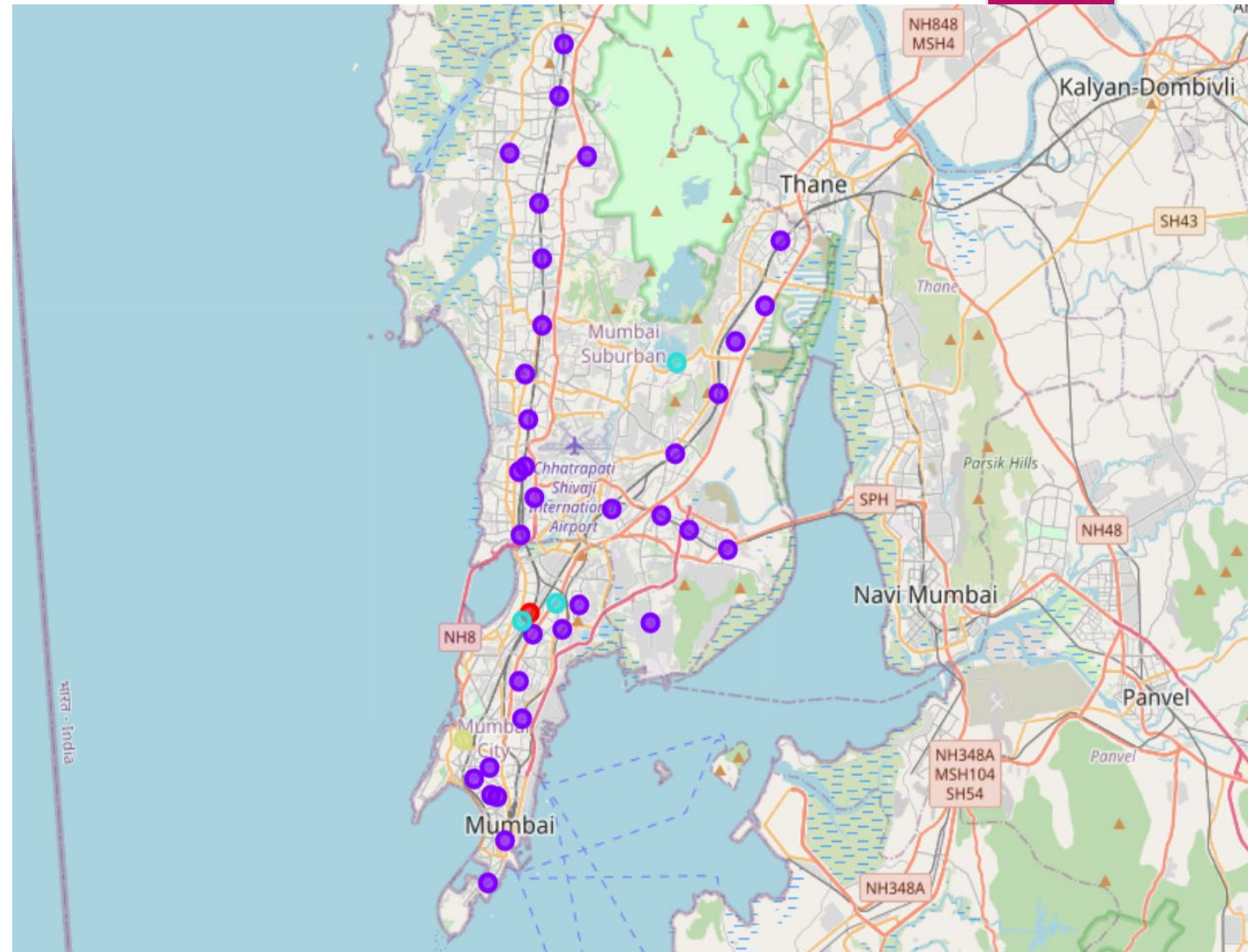Red - Eastern Suburb

Blue – South Mumbai

Shopping Mall

12.4%

8.1%

# Result-6

Categorized neighborhoods into 4 clusters:

- Cluster 0: Min or 0 malls in the neighborhood

- Cluster 1: High number of shopping malls

- Cluster 2: High to moderate number of shopping malls

- Cluster 3: Moderate to low number of shopping malls

# Discussion

- Most of the Shopping Malls are clustered in South Mumbai

- There are a lot of neighborhoods which do not have shopping malls, one cannot set up a shopping mall there as the population is quite low and those areas are in the outskirts of the city, so low reachability.

- Cluster 2 and Cluster 1 show good amount of shopping malls but there is a chance of competition in Cluster 1

# Recommendations

- The most apt location for setting up a new shopping mall would be
    1. Powai – Eastern Suburb
    2. Matunga – South Mumbai
- One should avoid opening a new mall in cluster 0 due to geographical circumstances.

# Conclusion

- ▶ Answer to the business question: The neighborhood Powai in cluster 2 is the most suitable location followed by Matunga in cluster 1.

- ▶ It is also suitable for setting up a shopping mall in neighborhoods of Cluster 2 but it will definitely some issues.

- ▶ Findings of this project will help the relevant stakeholders to capitalize on the opportunities on high potential locations while avoiding over crowded areas in decisions to set up a new Shopping Mall

# Thank you!