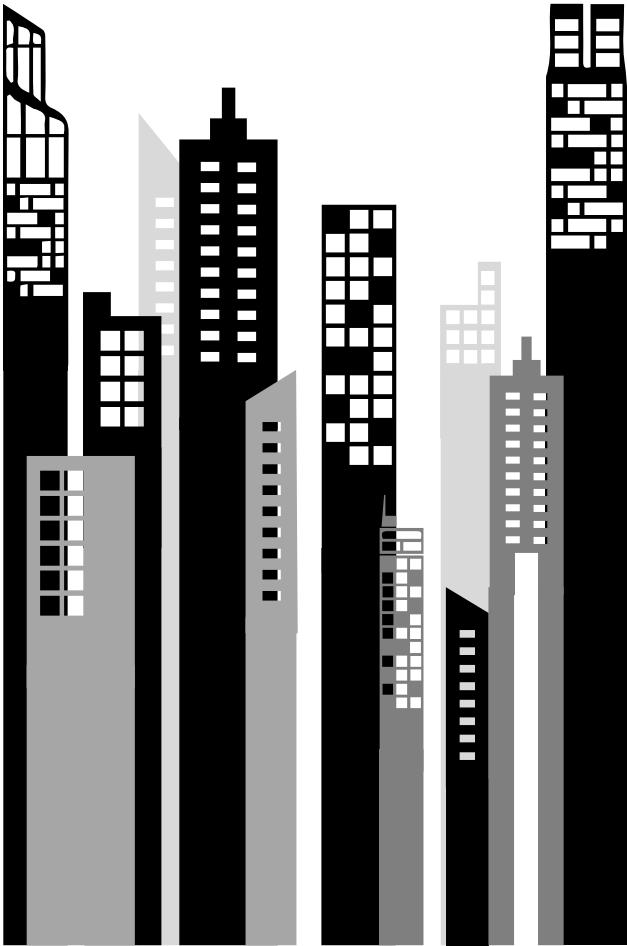




Condo Pricing in Bangkok

BADS 7108 Spatio and Temporal Data Analysis



Agenda

01

Overview

02

Data sources

03

Feature importance

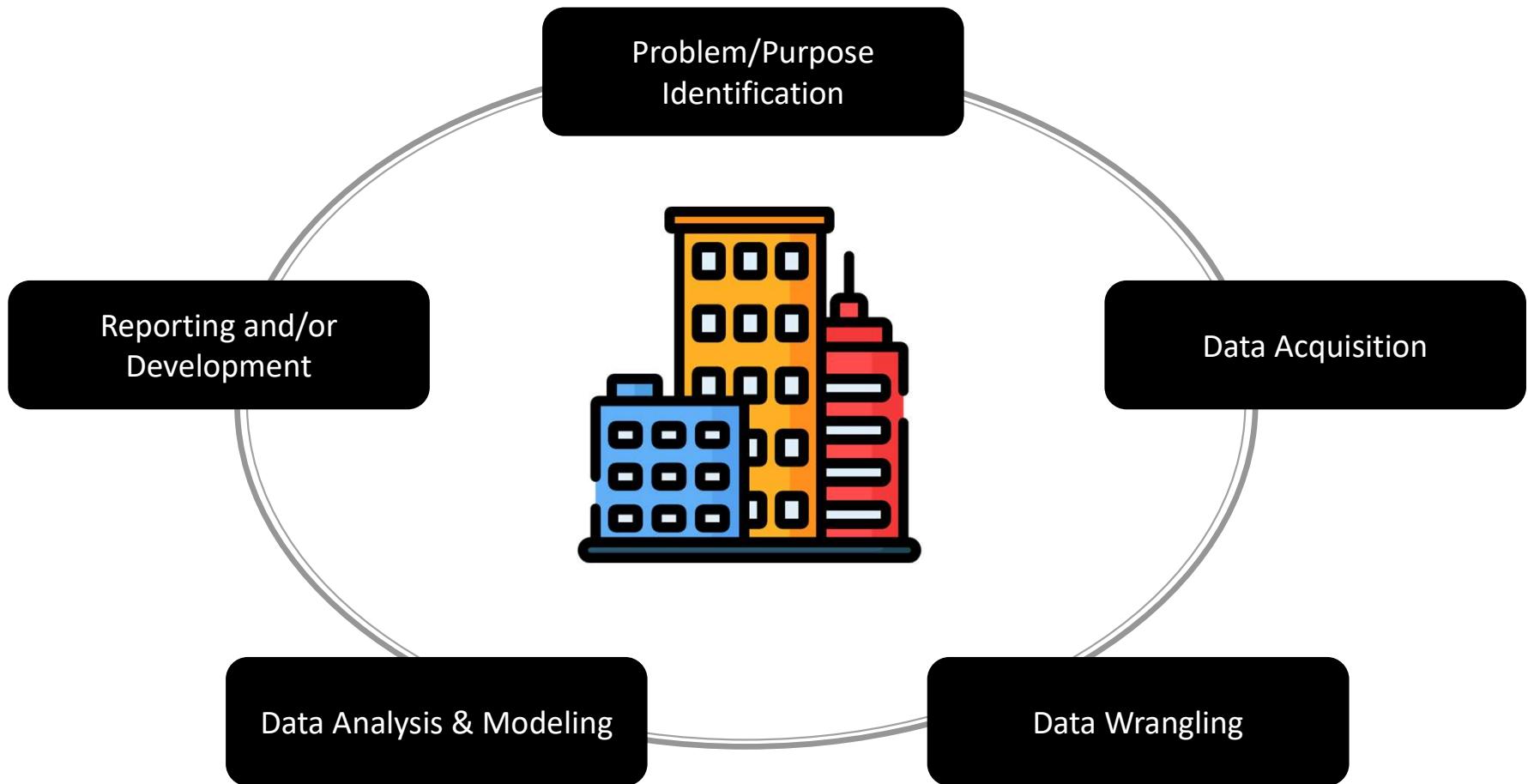
04

Applications for condo buyer
and seller

05

Other applications and future
projects

Project Overview



Project Objectives



To identify **factors** that affect the condominium prices.



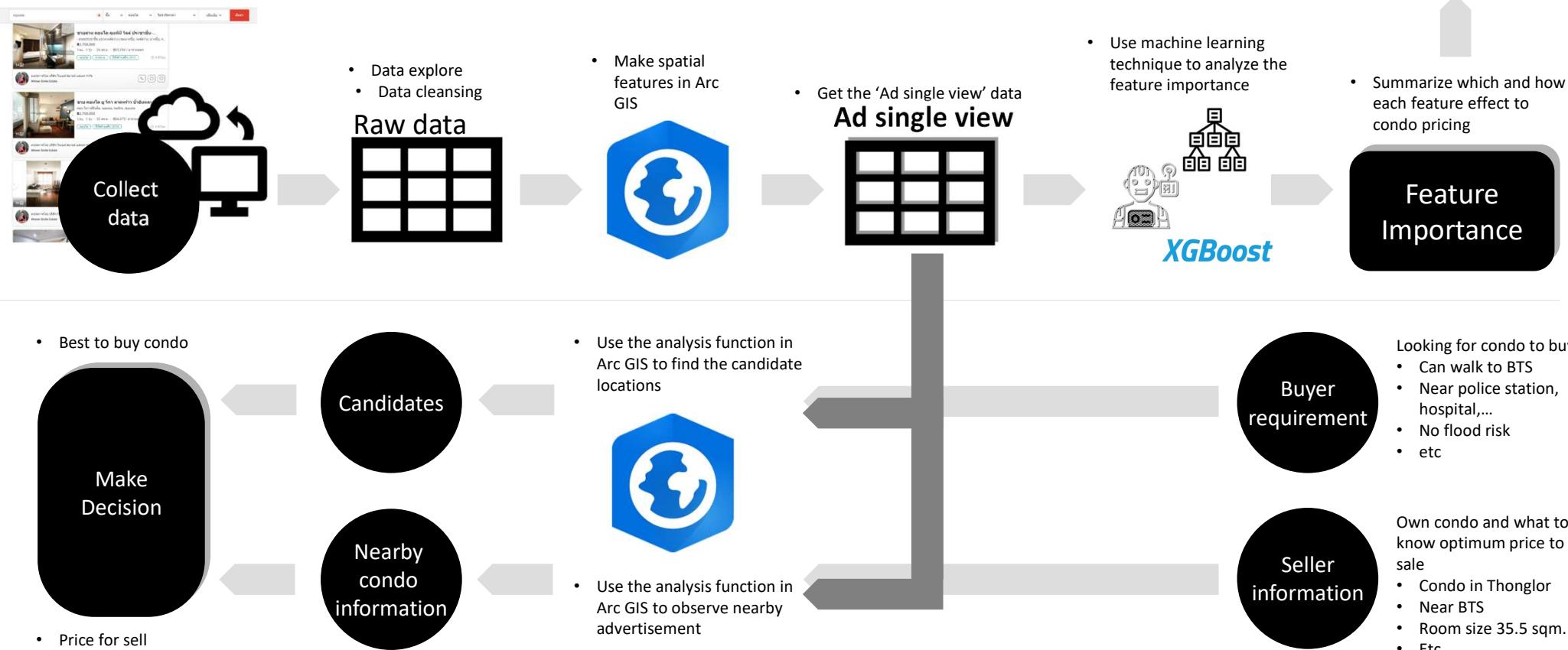
For helping **buyers** to find optimal condominium to buy based on buyers needs.



For helping **sellers** to pricing their condominium for each location.

Scope of work

Exploratory
Data Analysis





Data Sources



Condo Advertisement
Website



Bangkok GIS



Department of City Planning
and Urban Development, BMA

Condo Advertisement Data

- Scrape the data of condo advertisement from websites
 - Price
 - Number of bed room and bath room
 - Floor size
 - Price per square meter
 - Developer
 - Built year
 - Furnishing
 - Floor level
 - Condominium name
 - Total units of this condominium
 - Location
 - Latitude
 - Longitude
 - Advertisement link



The screenshot shows a real estate listing for a condo. The listing includes a photo of the interior, a price of 1,700,000 THB, and details such as 1 bedroom, 1 bathroom, 26.08 sqm, and a developer name L.P.N. Development.

The Jupyter Notebook displays Python code for web scraping. It imports libraries like selenium, pandas, and csv, and uses them to read CSV files and concatenate them. The code also includes logic to handle alerts and scroll through a page.

```
In [1]:  
1 from selenium import webdriver  
2 import time  
3 from selenium.webdriver.chrome.options import Options  
4 import pandas as pd  
5 from csv import writer  
6 import csv  
  
In [2]:  
1 df1=pd.read_csv("link_1.csv")  
2 df2=pd.read_csv("link_2.csv")  
3 df3=pd.read_csv("link_3.csv")  
4 df4=pd.read_csv("link_4.csv")  
  
In [3]:  
1 df=pd.concat([df1,df2,df3,df4])  
  
In [4]:  
1 my_ls=df["unique"]  
  
In [5]:  
1 len(my_ls)  
Out[5]:  
305586  
  
In [6]:  
1 list_revise=[x for x in my_ls if "contact-agent" not in x]  
  
In [7]:  
1 len(list_revise)  
Out[7]:  
152793  
  
In [8]:  
1 initial_row  
2 i=129515  
  
In [9]:  
1 while i<130000:  
2     url="https://www.propertyguru.com.my/property-listings/condos-for-sale/for-rent/price-1700000+/-?page=" + str(i)  
3     url=url.replace(" ","%20")  
4     url=url.replace(" ","%20")  
5     url=url.replace(" ","%20")  
6     browser=webdriver.Chrome('C:/Users/Ulm/Desktop/Freitag_hunter/chromedriver')  
7     browser.implicitly_wait(5) # seconds  
8     browser.get(url)  
9     browser.implicitly_wait(5) # seconds  
10    alert=browser.find_element_by_class_name("alert.alert-danger.listing-unavailable")  
11    if alert.is_displayed():  
12        pass  
13    else:  
14        try:  
15            topic=browser.find_element_by_xpath("//html/body/div[1]/div/div/section[1]/div/div[1]/div/h1").text  
16        except:  
17            topic=None  
18        try:  
19            topic=browser.find_element_by_xpath("//html/body/div[1]/div/div/section[1]/div/div[1]/div/h1").text  
20        except:  
21            topic=None
```

Condo Advertisement Data

- Web scraping : 127,080 advertisements
- Data cleansing
 - Remove unusable rows (e.g. null in pricing, latitude, longitude, year, etc)
 - Clean bedroom: <= 5 bedrooms
 - Impute bathroom where nulls
 - Clean space column to numeric value
 - Clean floor to numeric value
 - Clean price per square meter to numeric value
 - Final price per square meter range [50,000 to 300,000]
- Final advertisement count: 98,208 advertisements → **98,067 advertisements**



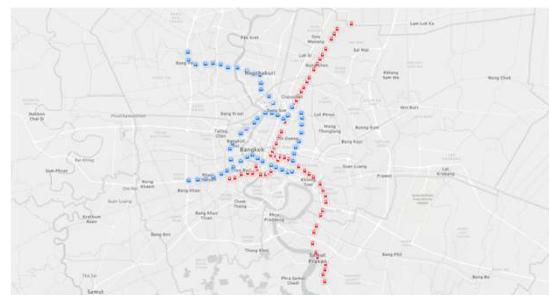
Bangkok GIS

- From 'www.bangkokgis.com'

- Airport
- Church
- Critical junction
- Department store
- Fire station
- Police station
- Flood point
- Golf course
- Gas/Oil stations
- Market
- Mosque
- University
- Temple
- Private hospital
- Slaughterhouse
- Waste center

- Web scrape

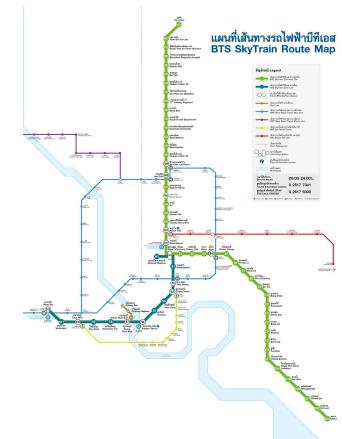
- BTS station
- MRT station
- Toll plaza



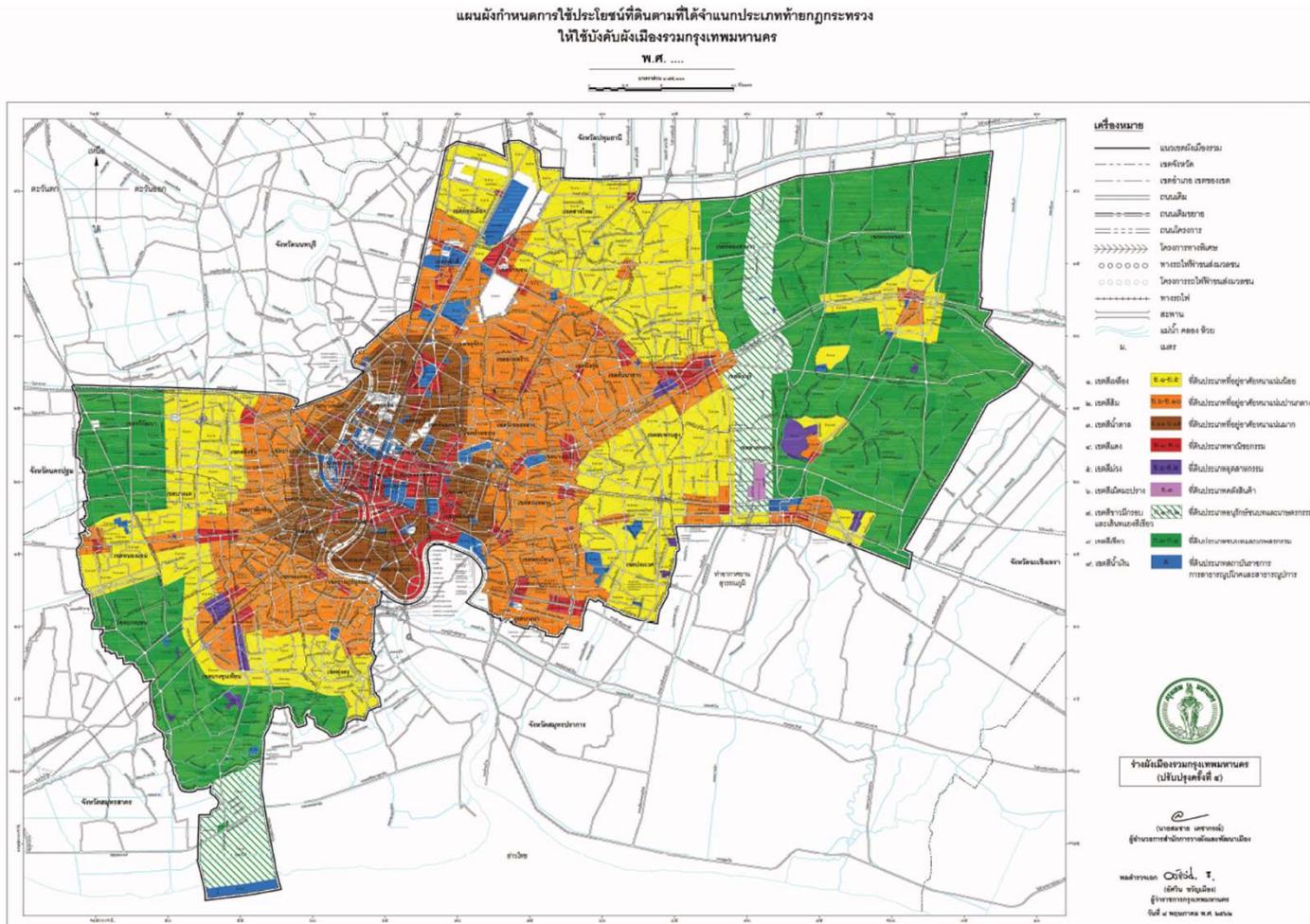
ShapeFile ข้อมูลการเดินทางท่องเที่ยวในกรุงเทพมหานคร (Vector) แบบที่บันทึกไว้สำหรับการสำรวจ (1:20,000)				
ลักษณะการเดินทางท่องเที่ยว	ลักษณะของพิกัด	ลักษณะที่ต้องการ	ลักษณะของจุดที่ต้องการ	ลักษณะของเส้นทางท่องเที่ยว
พื้นที่ที่ไม่ใช่ทางเดินทางท่องเที่ยว (แม่น้ำแม่น้ำเจ้าพระยา)	Polygon	180 เมตร	DOWNLOAD	
เส้นทางเดินทางท่องเที่ยว (แม่น้ำแม่น้ำเจ้าพระยา)	Line	180 เมตร	DOWNLOAD	
ที่ดินที่ต้องการเดินทางท่องเที่ยว	Point	59 เมตร	DOWNLOAD	
พื้นที่ที่ไม่ใช่ทางเดินทางท่องเที่ยวและสถานที่ท่องเที่ยว	Polygon	50 เมตร	DOWNLOAD	
กิจกรรมทางการค้าและสถานที่ท่องเที่ยว	Polygon	6 กิโลเมตร	DOWNLOAD	
ที่ดินอุดมสมบูรณ์และสถานที่ท่องเที่ยว	Point	1 เมตร	DOWNLOAD	
ที่ดินอุดมสมบูรณ์และสถานที่ท่องเที่ยว	Point	73 เมตร	DOWNLOAD	
พื้นที่ที่ไม่ใช่ทางเดินทางท่องเที่ยว	Polygon	14 กิโลเมตร	DOWNLOAD	
ที่ดินอุดมสมบูรณ์ที่ไม่ใช่ทางเดินทางท่องเที่ยว	Point	14 เมตร	DOWNLOAD	
ที่ดินอุดมสมบูรณ์และสถานที่ท่องเที่ยว	Point	153 เมตร	DOWNLOAD	
พื้นที่ที่ไม่ใช่ทางเดินทางท่องเที่ยวและสถานที่ท่องเที่ยว	Polygon	15 กิโลเมตร	DOWNLOAD	
ที่ดินอุดมสมบูรณ์และสถานที่ท่องเที่ยวและสถานที่ท่องเที่ยว	Point	13 เมตร	DOWNLOAD	
ที่ดินอุดมสมบูรณ์และสถานที่ท่องเที่ยว	Point	88 เมตร	DOWNLOAD	
เขตบริการท่องเที่ยว (BMA Express)	Point	4 เมตร	DOWNLOAD	
พื้นที่ที่ไม่ใช่ทางเดินทางท่องเที่ยว	Polygon	9 ไร่	DOWNLOAD	

Latest Update 24 มิถุนายน 2562

<www.bangkokgis.com>



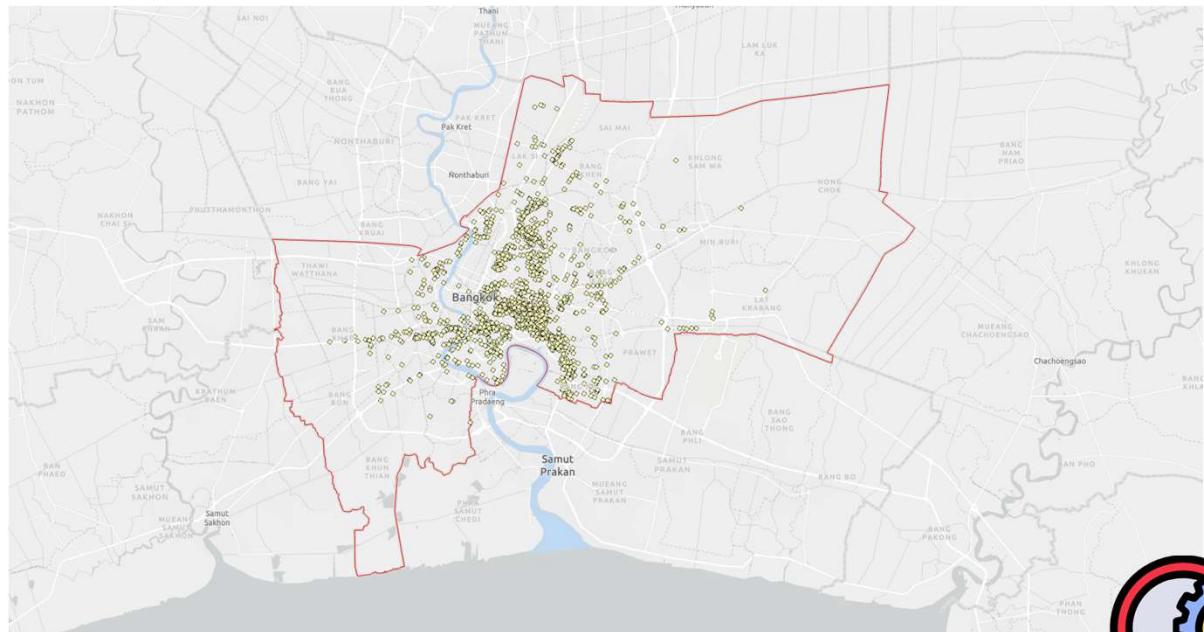
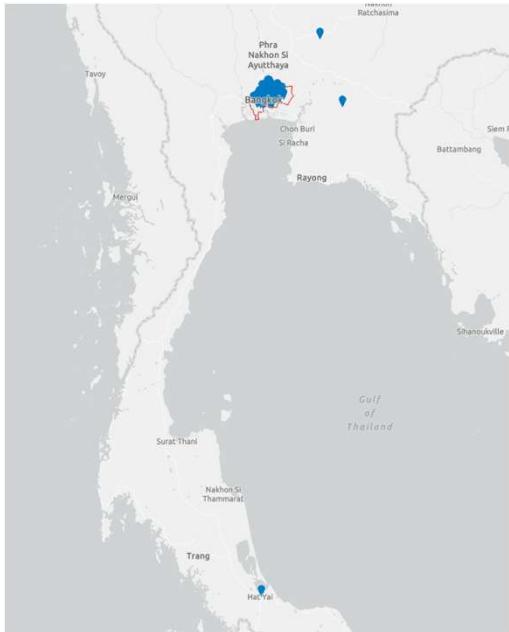
Department of City Planning and Urban Development, BMA



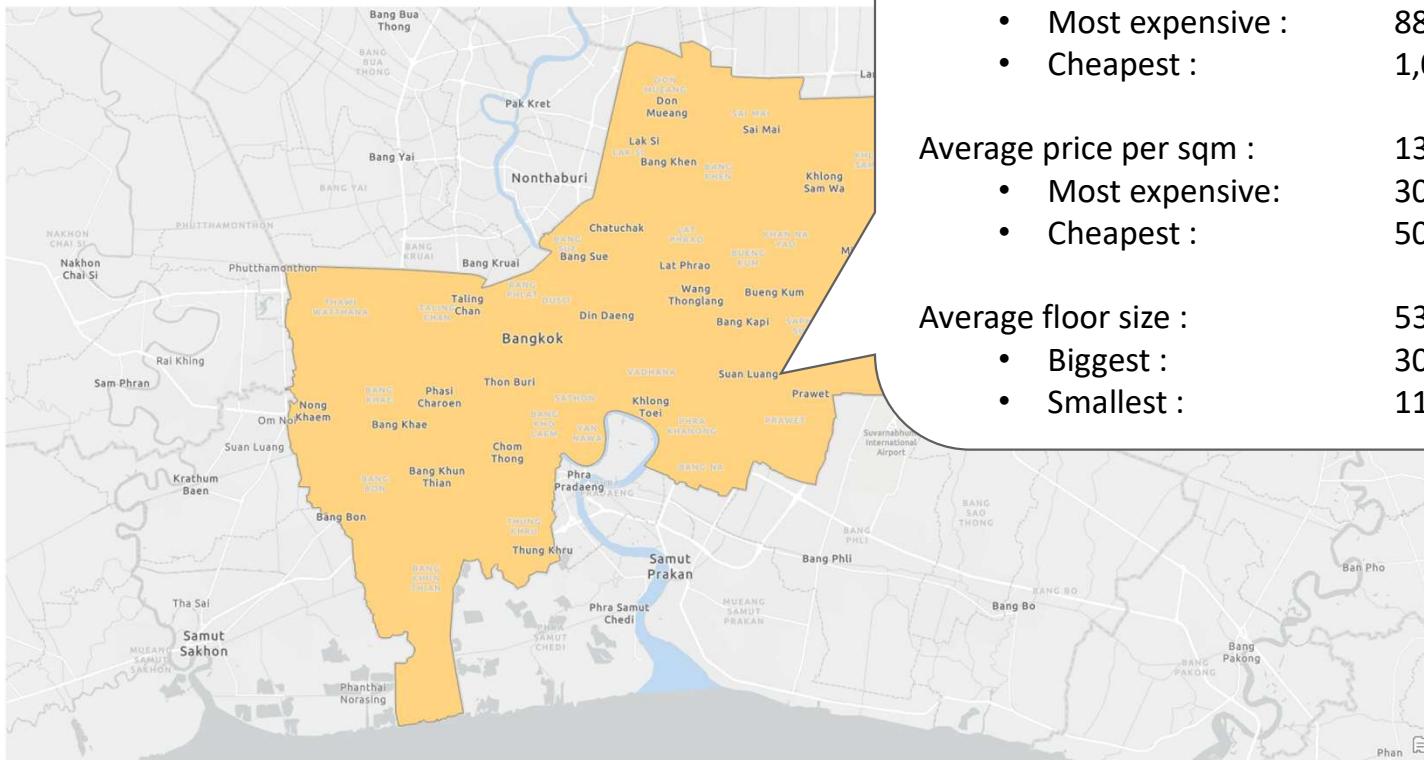


Data Exploration

Data exploration



Overview



Total number of ads : 98,067 ads

Average sale price : 7,744,321 THB

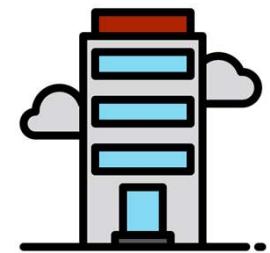
- Most expensive : 88,000,000 THB
- Cheapest : 1,090,000 THB

Average price per sqm : 135,318 THB/sqm

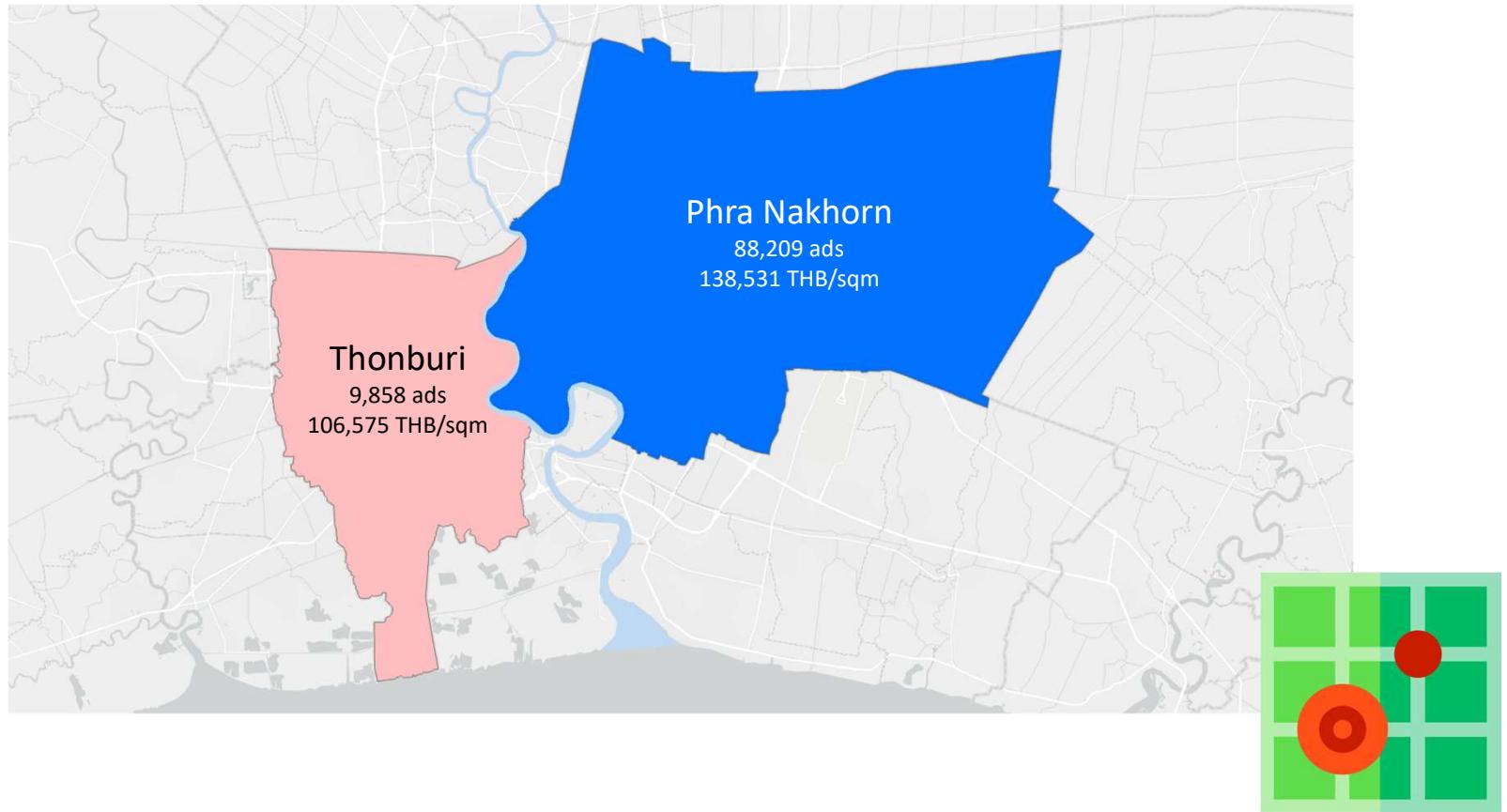
- Most expensive: 300,000 THB/sqm
- Cheapest : 50,000 THB/sqm

Average floor size : 53.6 sqm.

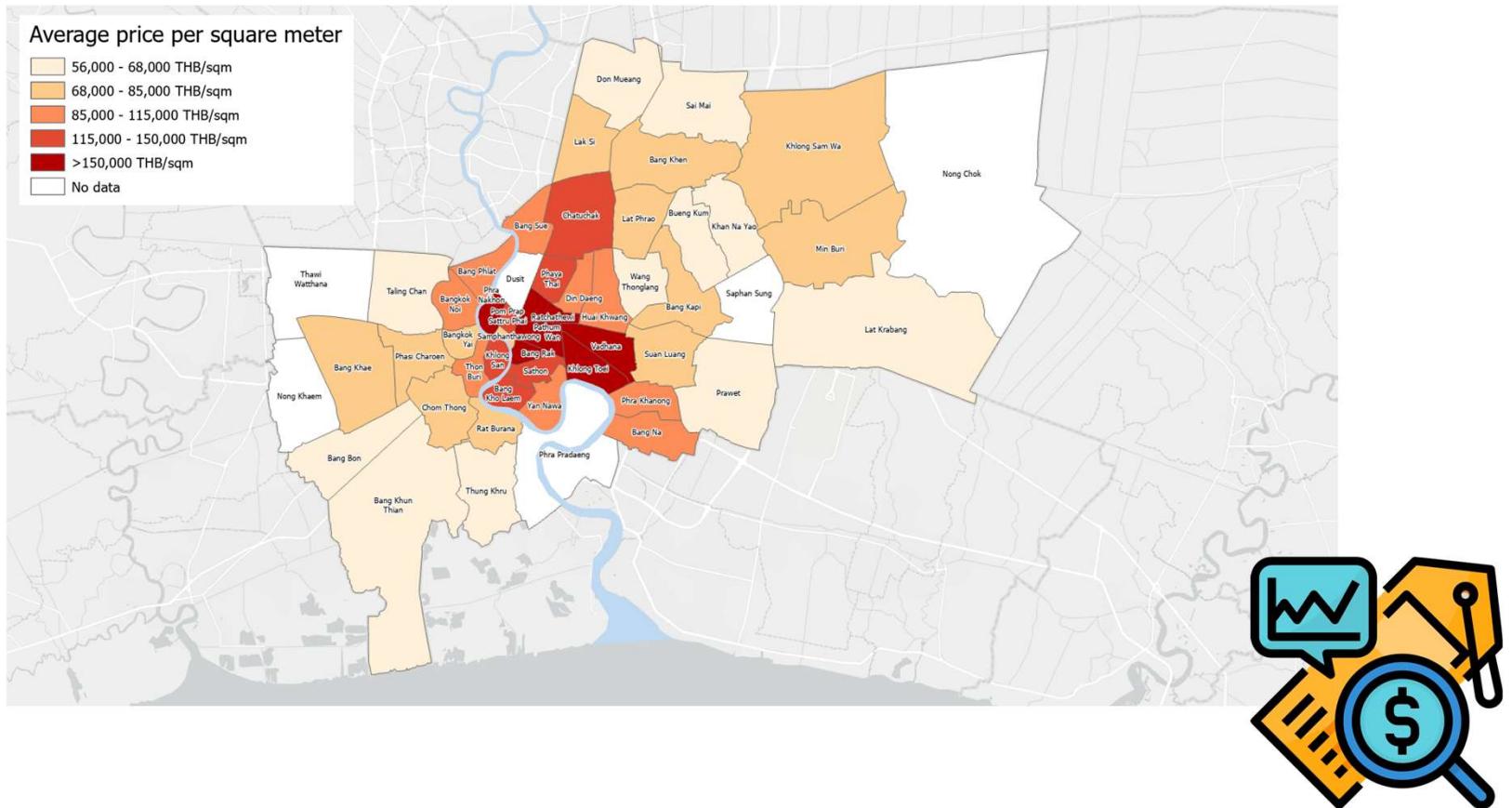
- Biggest : 300.0 sqm.
- Smallest : 11.0 sqm



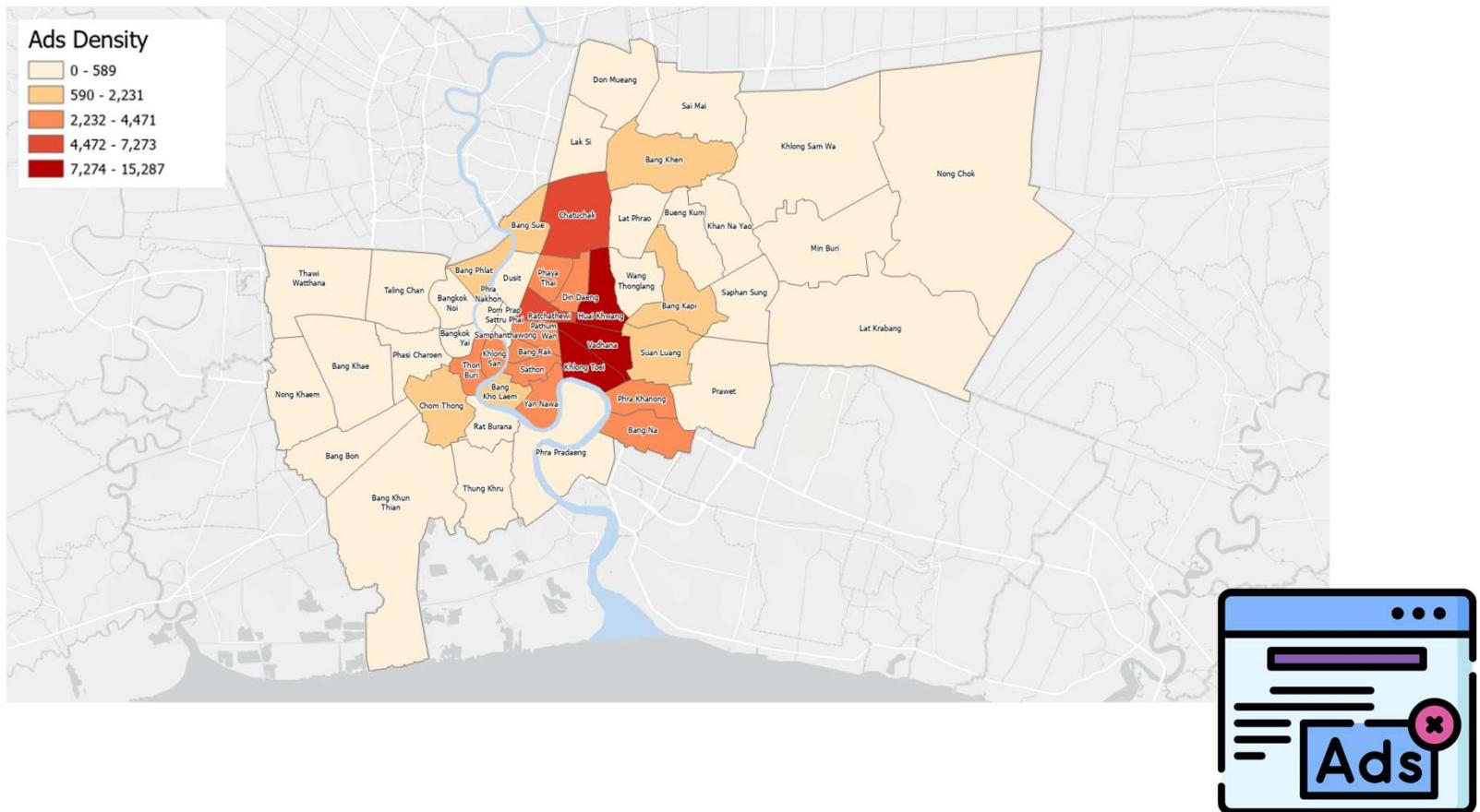
Overview



Average price of each district



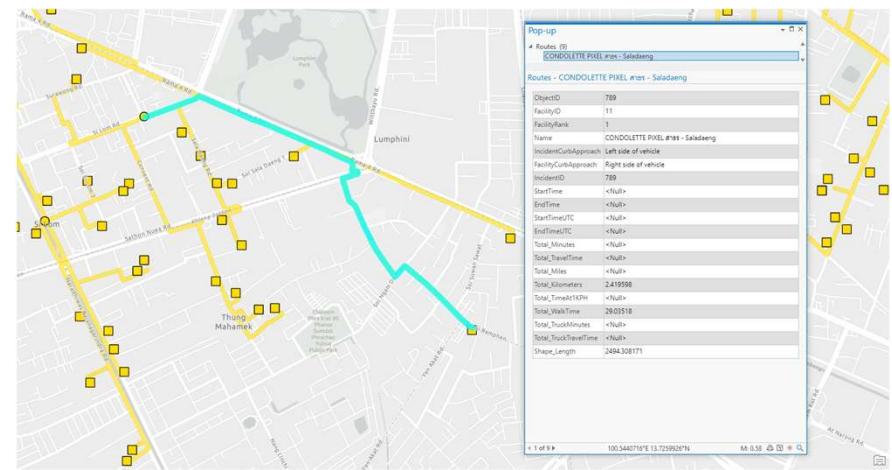
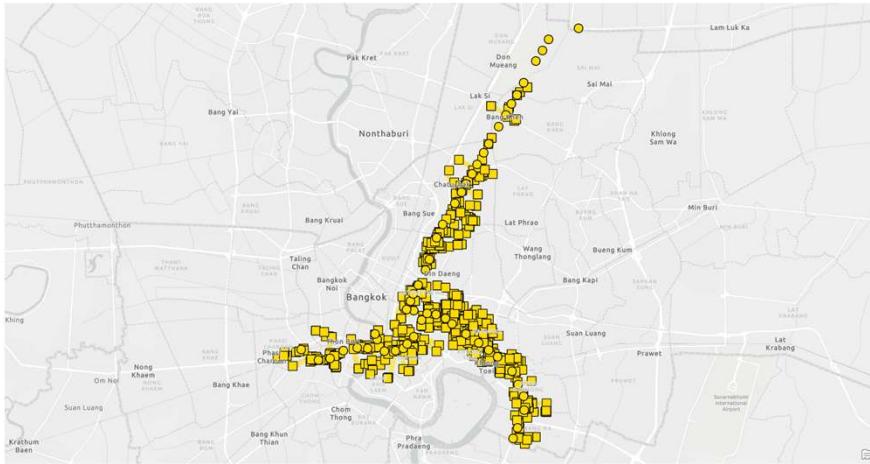
Ads density on each district





Features

Closest facilities



Nearest BTS station



Nearest MRT station

Buffer area

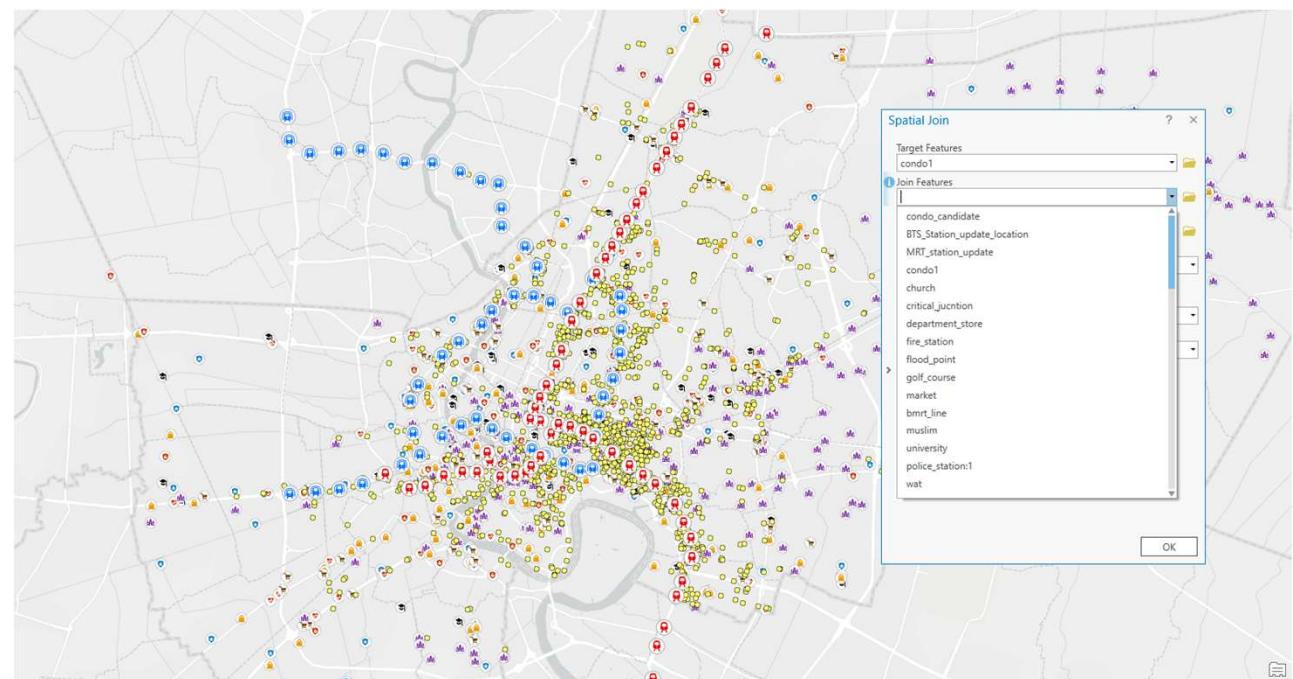


- Identify condo in River's buffer area



Spatial join

- Number of nearby facilities
 - Department store
 - Market
 - Etc.
- Other nearby ads
 - Density
 - Average price
 - Etc.



Single ad view data

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC
1	No.	price	bed_room	bath_room	space	space	price_per_sqm	brand	year_fin	furniture	floor	name	unit_num	latitude	longitude	topic	age	ad_1km_count	price_avg	per_sqm_avg	price_med	space_med	per_sqm_med	price_sd	space_sd	nearest_MRT	distance_MRT	nearest_BTS_2km	BTS_walk_distance	nearest_BTS	distance_BTS	number_BTS_2km	number_MRT_2km	number_inter_2km	number_airport_5km	river_500m	church	department_store	market	muslim	police	hospital	park	university	temple	fire_station	golf	oil_station	waste_center	slaughter_house	toll	cluster_id	premium_khet		
2	1 ####	1	1	34 ####	Anank	2017	มีนาคม	30 ชั้น	Ashto	783	13.7	101	Ashto	4	5044 ####	73.5 ####	58.6 ####	49.3 ####	5.61	Sukhu.	0.61	Asok	0.6	Asok	0.6	Asok	0.6	4	ω	1	0	0	4	1	4	0	0	0	1	1	0	3	0	0	1	0	14	0	0	26	5	1	1		
3	3 ####	1	1	32 ####	AP Th:	2020	ไม่ระบุ	10 ชั้น	Life a	2248	13.8	101	###	1	6503 ####	47.4 ####	37 ####	24.9 ####	PhraR	0.68	Asok	2.27	Asok	2.27	1	4	0	0	0	1	1	0	0	3	0	0	1	0	0	1	0	0	1	0	14	0	0	26	5	2	1				
4	4 ####	1	1	32 ####	AP Th:	2020	ไม่ระบุ	41 ชั้น	Life a	2248	13.8	101	Life a	1	6503 ####	47.4 ####	37 ####	24.9 ####	PhraR	0.68	Asok	2.27	Asok	2.27	1	4	0	0	0	1	1	0	0	3	0	0	1	0	0	1	0	0	1	0	14	0	0	26	5	2	1				
5	9 ####	2	2	74.9 ####	AP Th:	2012	ไม่ระบุ	1 22 ชั้น	THE A	99	13.7	101	###	9	7212 ####	64.3 ####	54 ####	38.2 ####	Sukhu.	3.41	Ekkan	0.57	Ekkan	0.57	4	0	0	0	0	2	0	0	0	0	0	1	0	0	1	0	11	3	0	27	0	1	1								
6	11 ####	3	3	127 ####	Grand	2014	มีนาคม	2 ชั้น	Hyde	455	13.7	101	###	7	5040 ####	73.2 ####	59 ####	48.5 ####	Sukhu.	0.88	Nana	0.4	Nana	0.4	5	3	1	0	0	4	3	0	0	0	2	0	0	0	0	10	4	0	27	5	1	1									
7	12 ####	2	2	110 ####	Grand	2014	มีนาคม	2 ชั้น	Hyde	455	13.7	101	###	7	5040 ####	73.2 ####	59 ####	48.5 ####	Sukhu.	0.88	Nana	0.4	Nana	0.4	5	3	1	0	0	4	3	0	0	0	2	0	0	0	10	4	0	27	5	1	1										

Raw data

1. Sale price
2. Number of bed room
3. Number of bath room
4. Floor size in square meter
5. Price per square meter
6. Developer name
7. Built year
8. Furnishing
9. Floor level
10. Condo project name
11. Total units of condo
12. Latitude
13. Longitude
14. Advertisement topic name
15. Age of condo

Nearby ads

16. Density of advertisement in 1km
17. Average price of condo which advertised in 1km distance
18. Average size of condo which advertised in 1km distance
19. Average price per square meter of condo which advertised in 1km distance
20. Average price of condo which advertised in 1km distance
21. Median of price of condo which advertised in 1km distance
22. Median of space of condo which advertised in 1km distance
23. Median of price per square meter of condo which advertised in 1km distance
24. Standard deviation of price of condo which advertised in 1km distance
25. Standard deviation of space of condo which advertised in 1km distance
26. Standard deviation of price per square meter of condo which advertised in 1km distance

Facilities

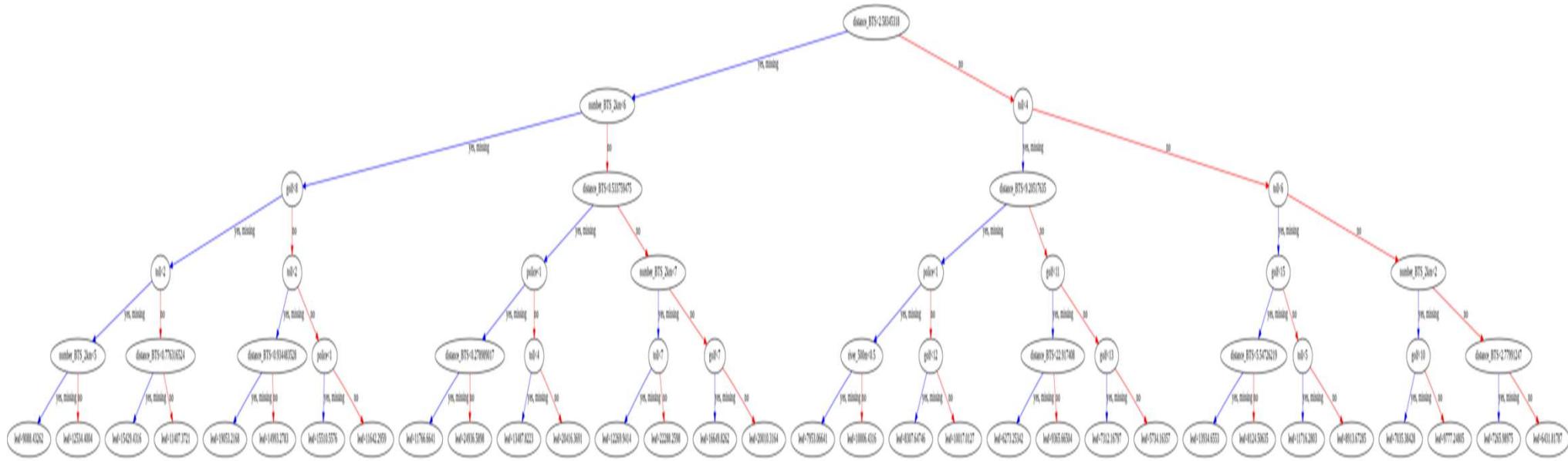
27. Nearest MRT station
28. Distance to nearest MRT station
29. Nearest BST station
30. Distance to nearest BTS station
31. Number of MRT station in 2km
32. Number of BTS station in 2 km
33. Number of airport in 5km
34. In 500m. Buffer area of river or not (1-yes,0-no)
35. Number of church in 1km
36. Number of department store in 1km
37. Number of market in 1km
38. Number of mosque in 1km
39. Number of police station in 1km
40. Number of private hospital in 1km
41. Number of park in 1 km
42. Number of university in 1 km
43. Number of temple in 1km
44. Number of fire station in 1km
45. Number of golf course in 1km
46. Number of oil station in 1km
47. Number of waste center in 1km
48. Number of slaughter house in 1km
49. Number of toll plaza in 1km



Feature Importance

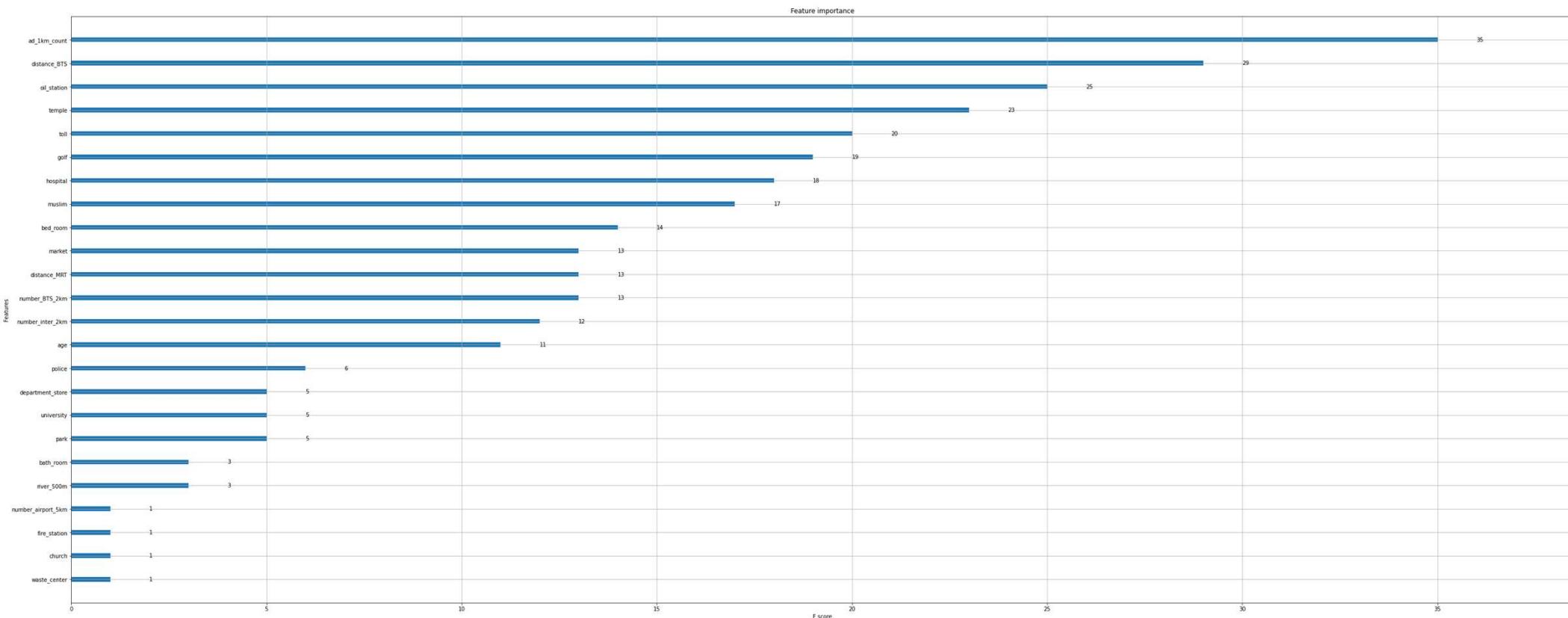
- XGBoost Regressor
- Decision Tree

XGBoost Regressor



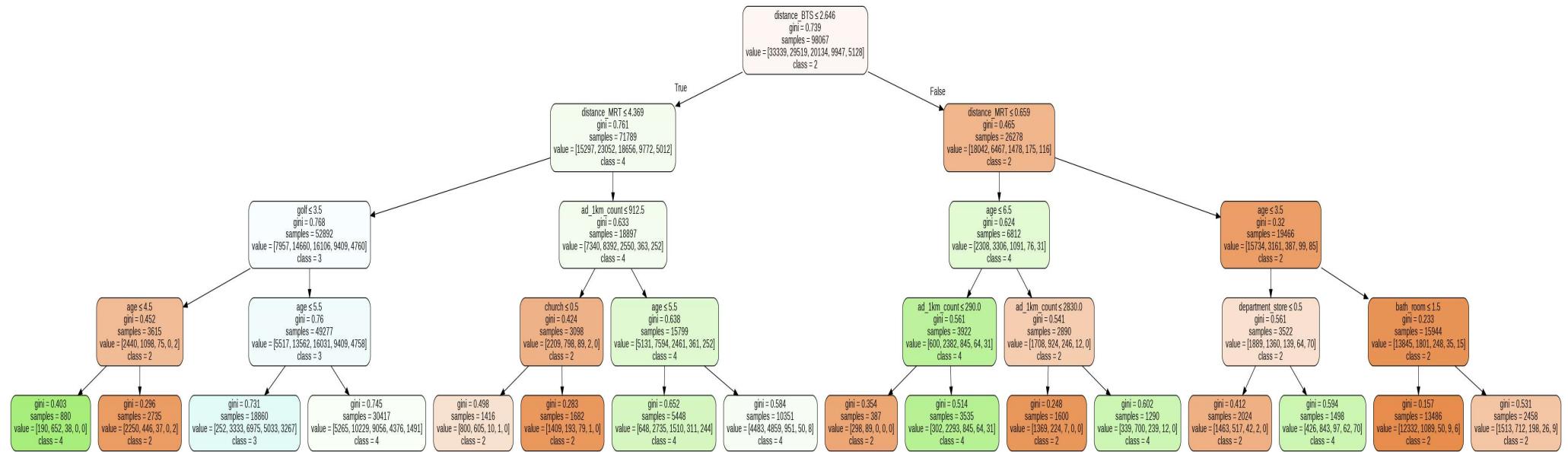
XGBoost

XGBoost Regressor

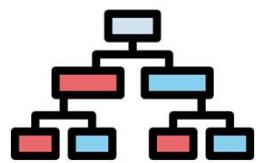


XGBoost

Decision Tree



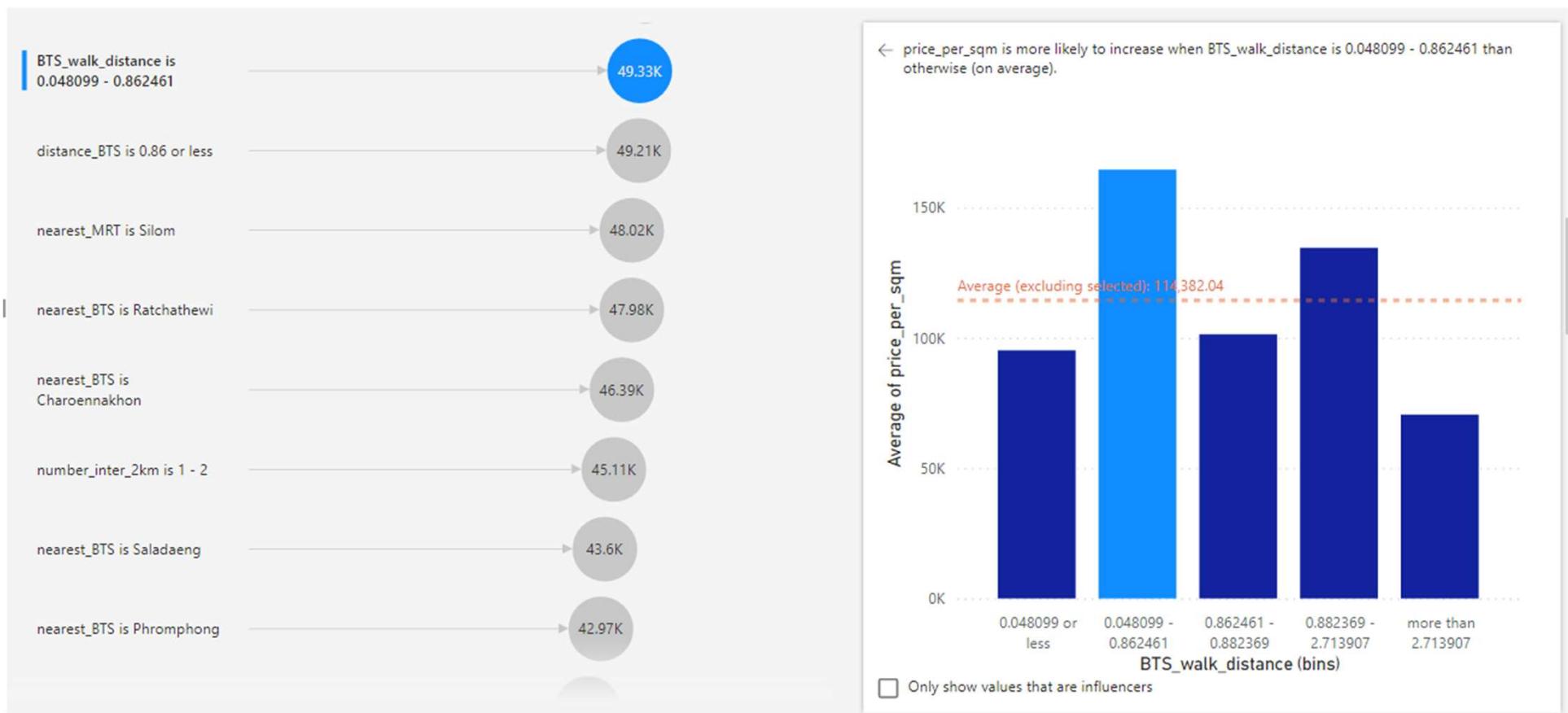
Decision Tree



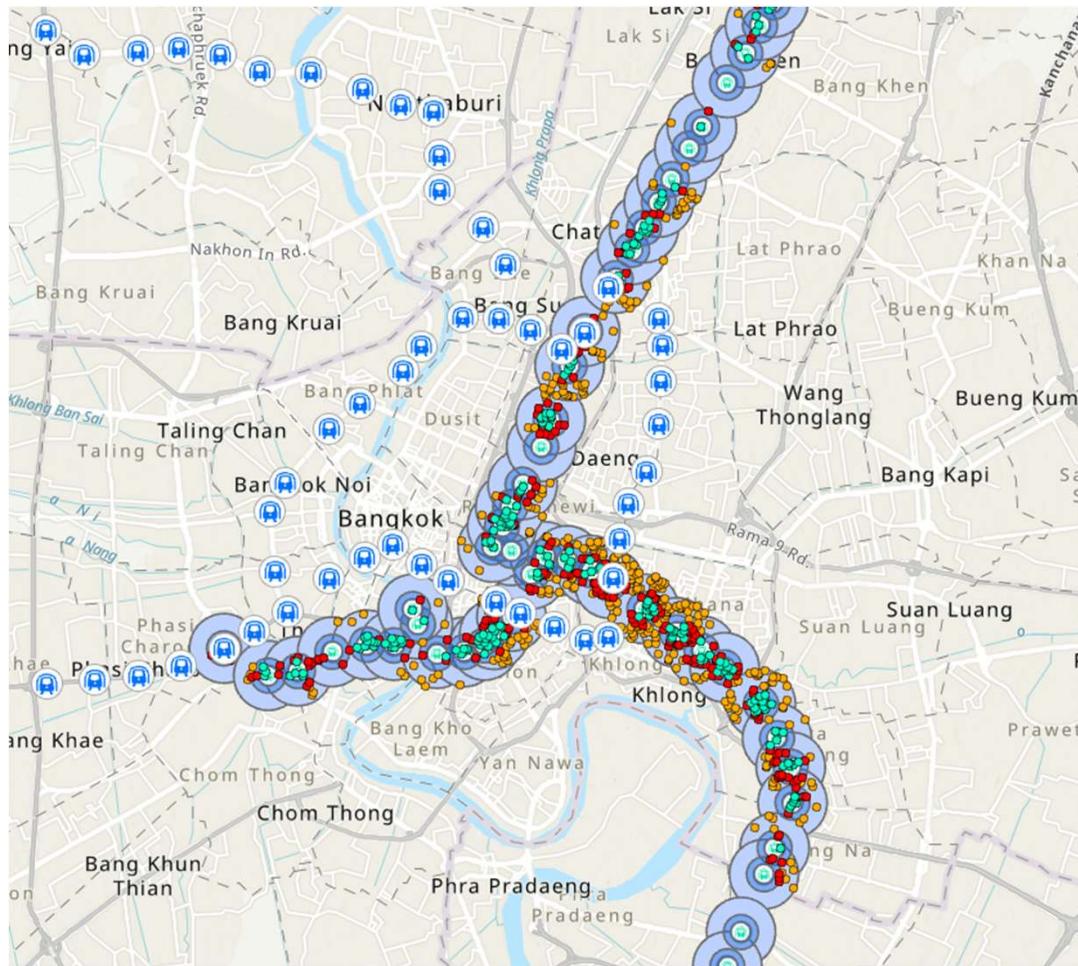
	Column	Feature Importance
1	distance_BTS	14.45
2	distance_MRT	11.22
3	ad_1km_count	10.64
4	age	10.42
5	number_BTS_2km	5.55
6	slaughter_house	4.61
7	bed_room	4.60
8	golf	4.45
9	toll	3.59
10	number_inter_2km	3.47
11	bath_room	3.46
12	oil_station	3.21

	Column	Feature Importance
13	church	2.62
14	department_store	2.45
15	temple	2.44
16	hospital	2.26
17	number_MRT_2km	2.06
18	market	1.82
19	muslim	1.57
20	fire_station	1.32
21	police	1.31
22	park	1.15
23	university	0.93
24	river_500m	0.26

Distance to BTS



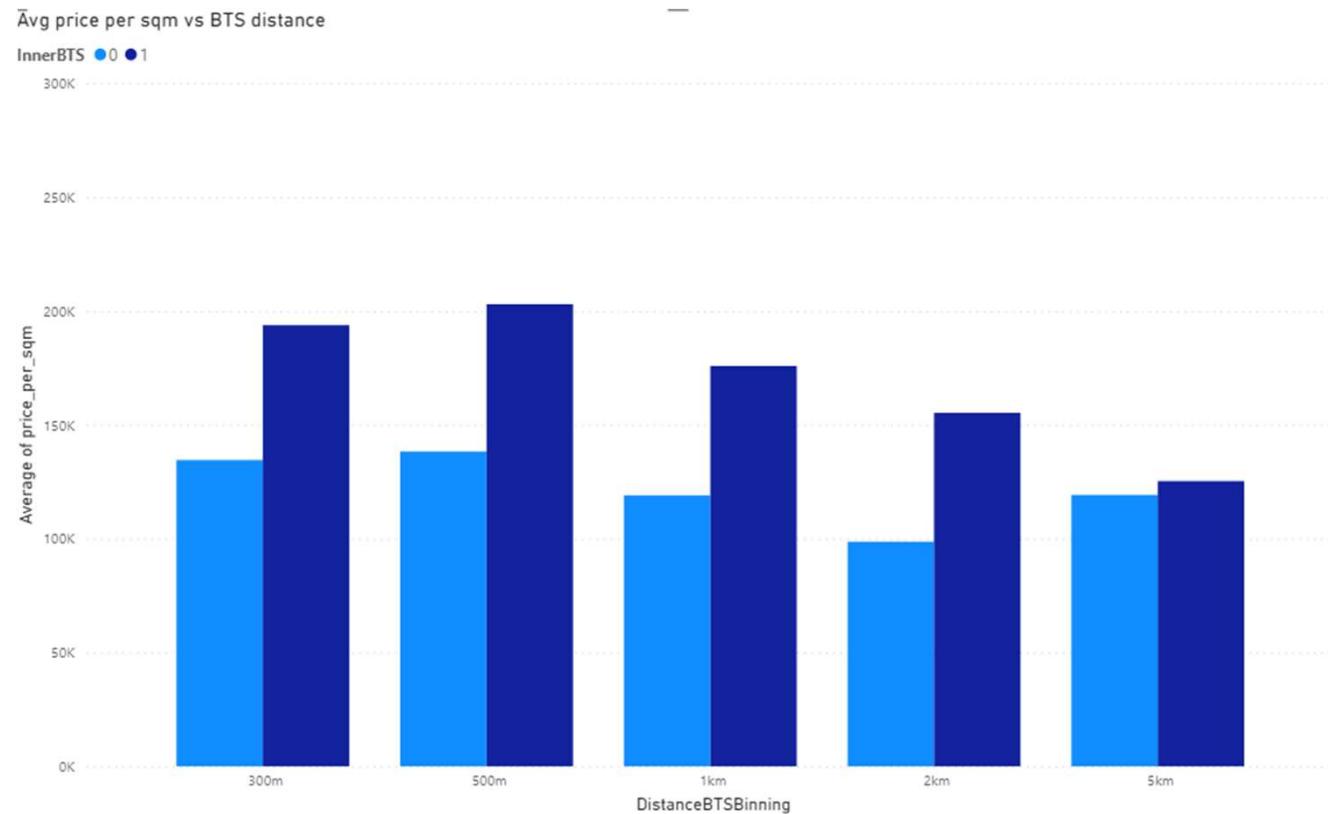
Distance to BTS



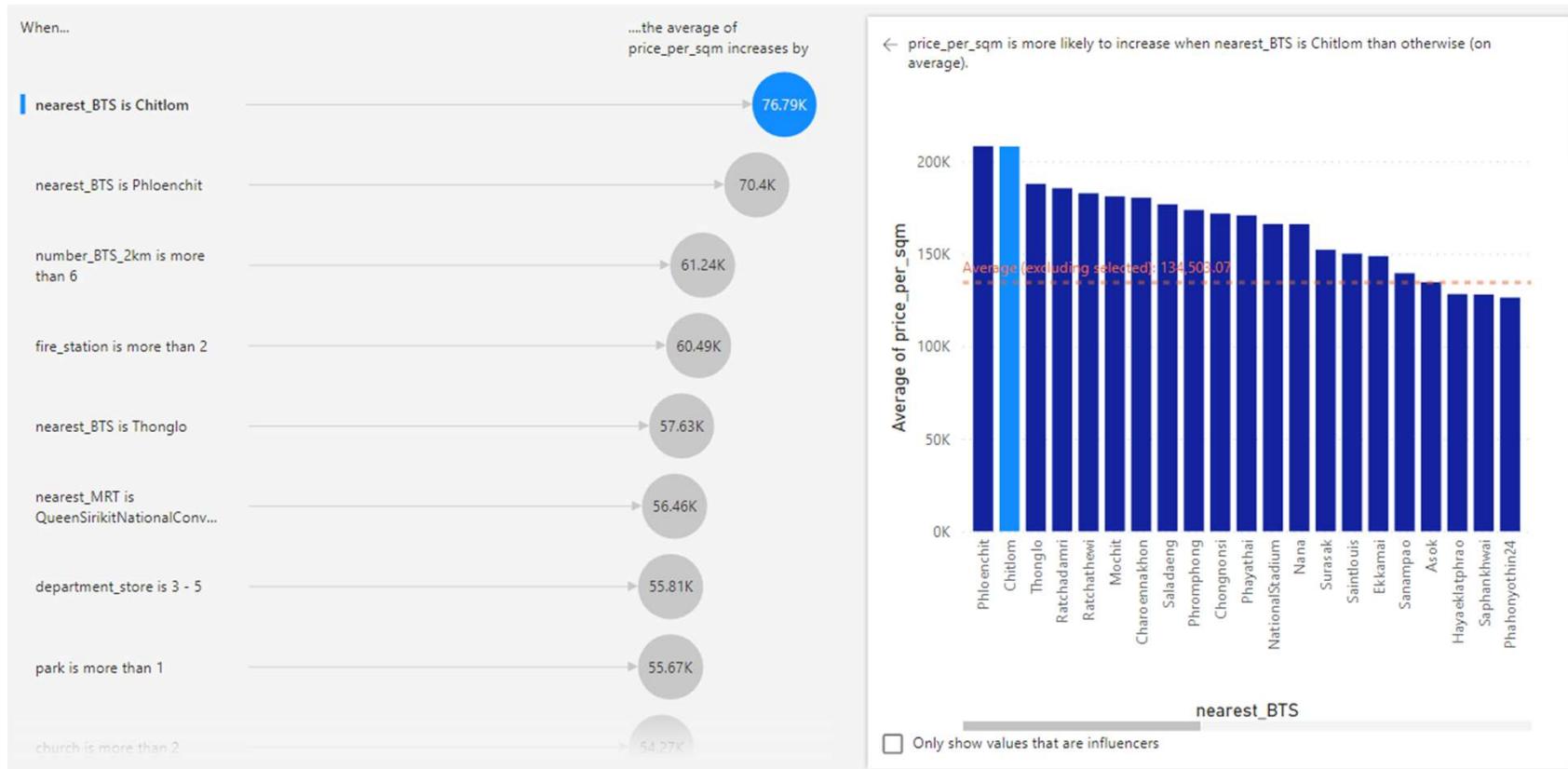
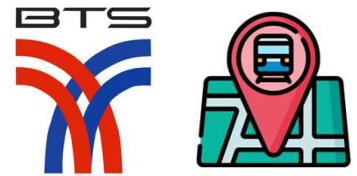
Distance to BTS



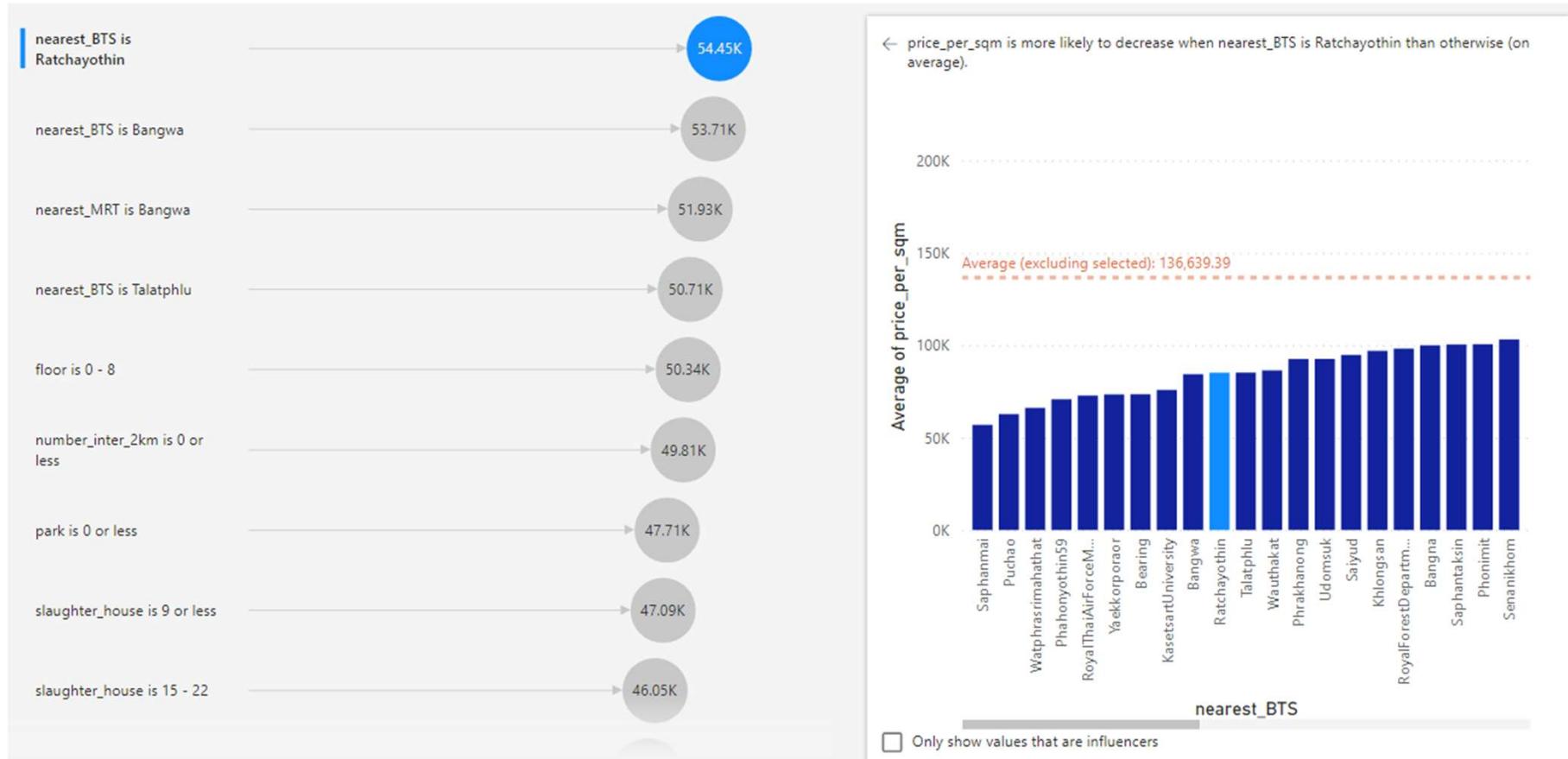
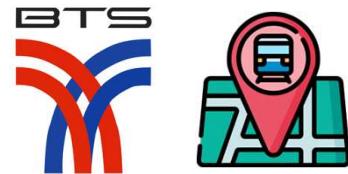
- Inner city vs Outer



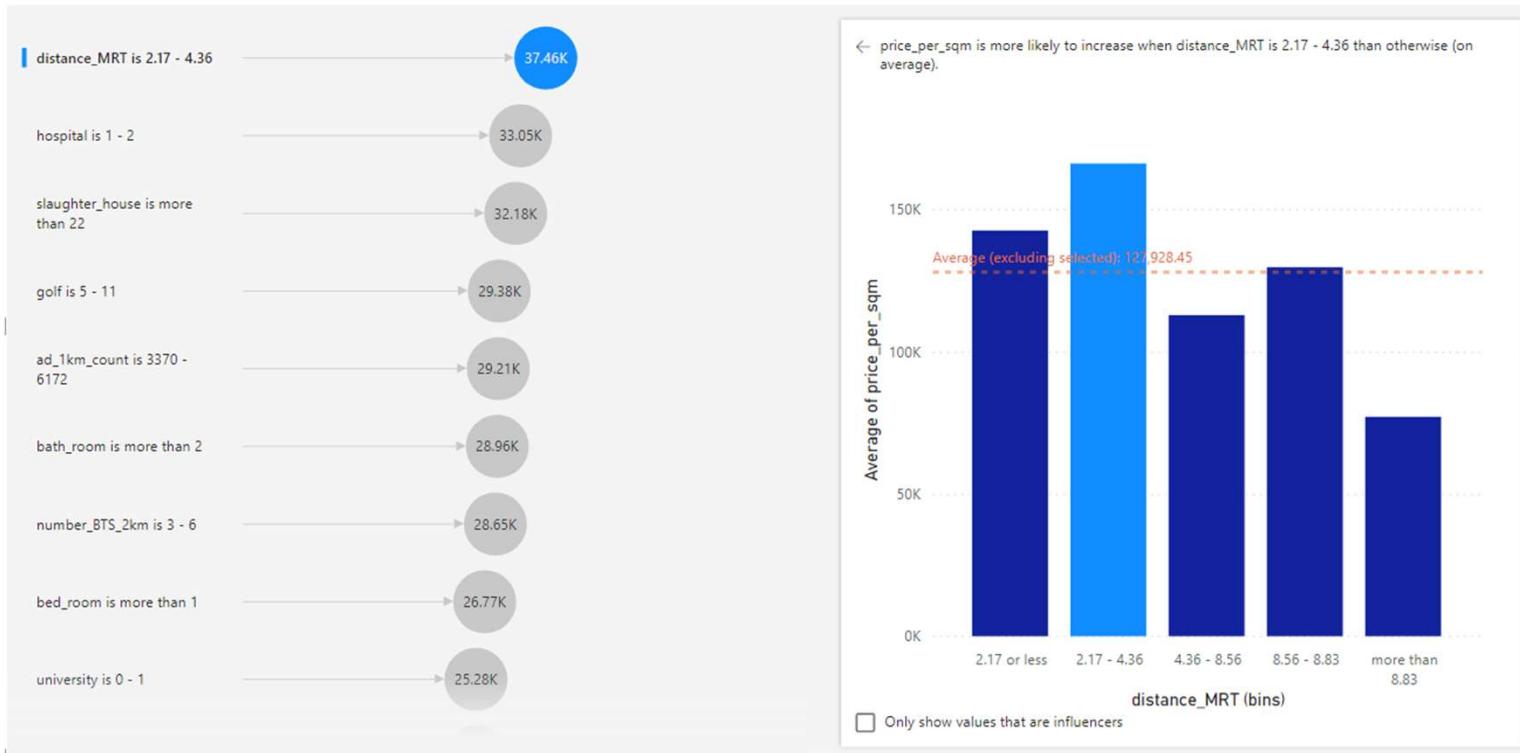
BTS Stations



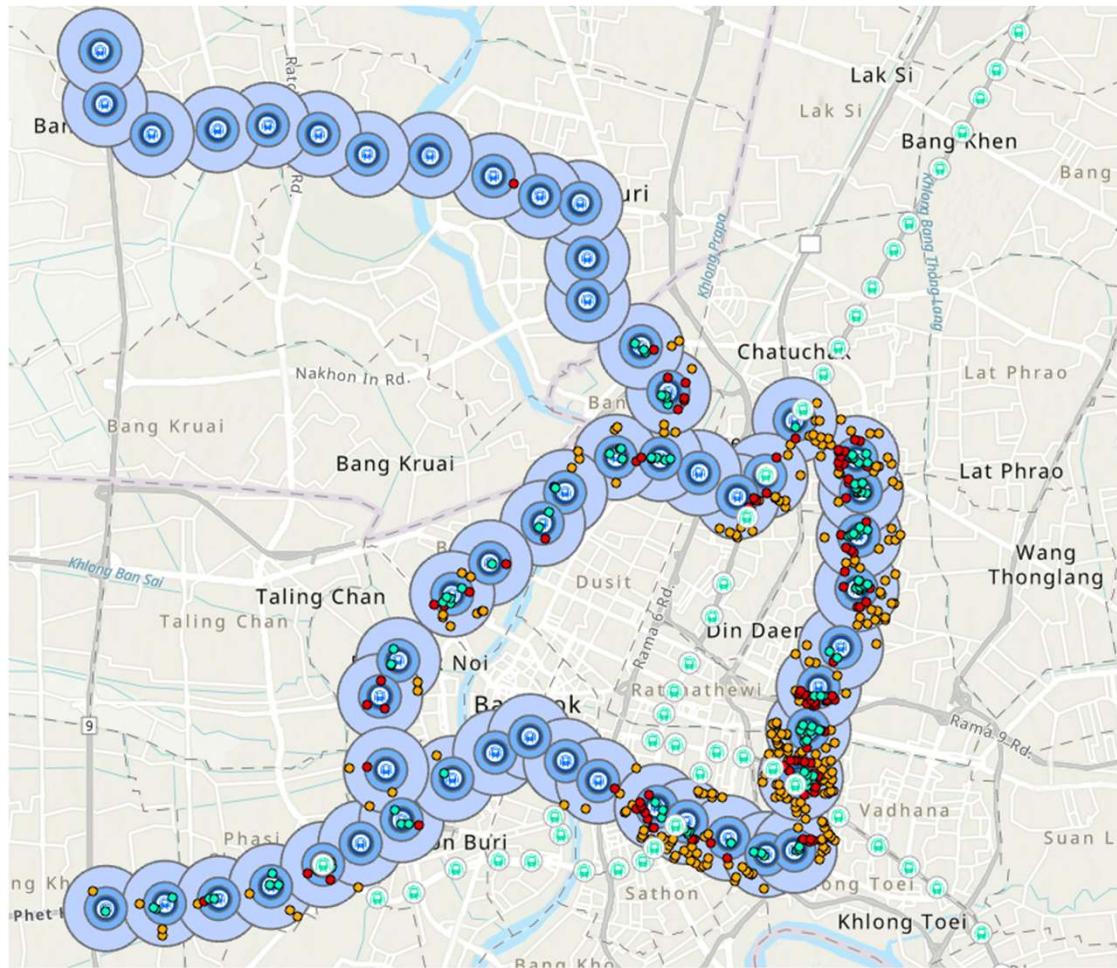
BTS Stations



Distance MRT



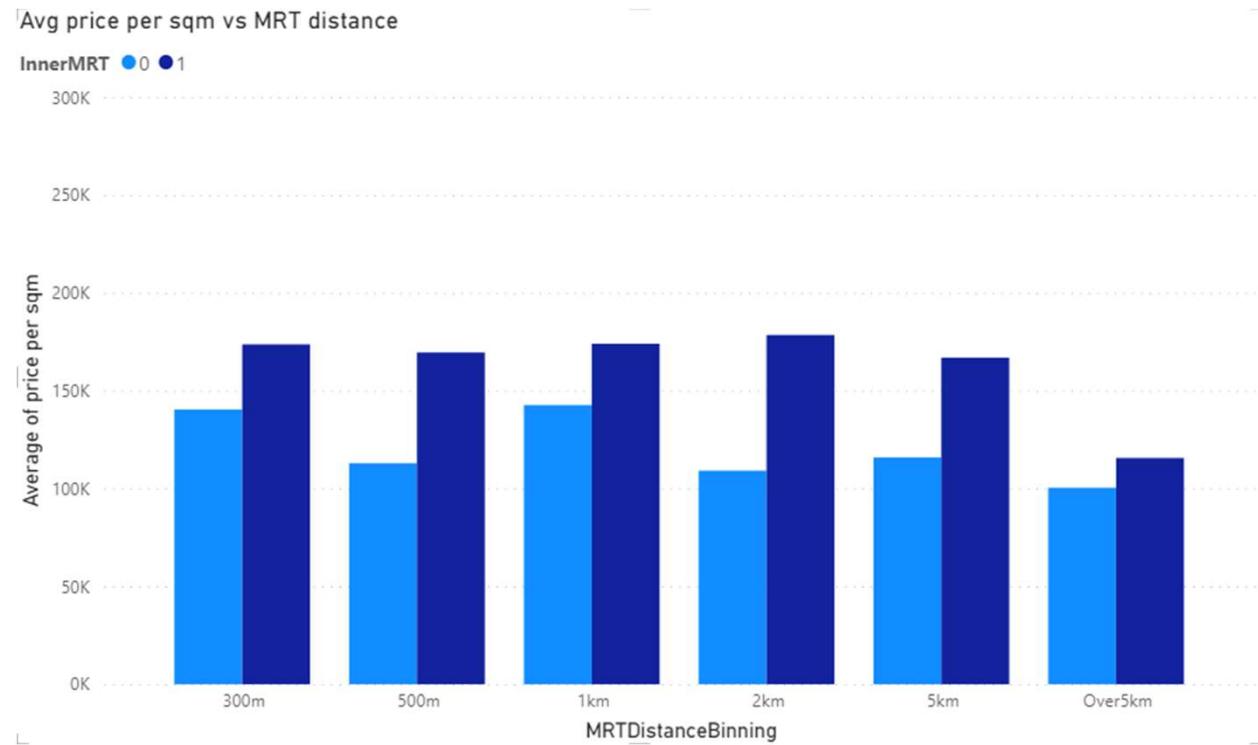
Distance MRT



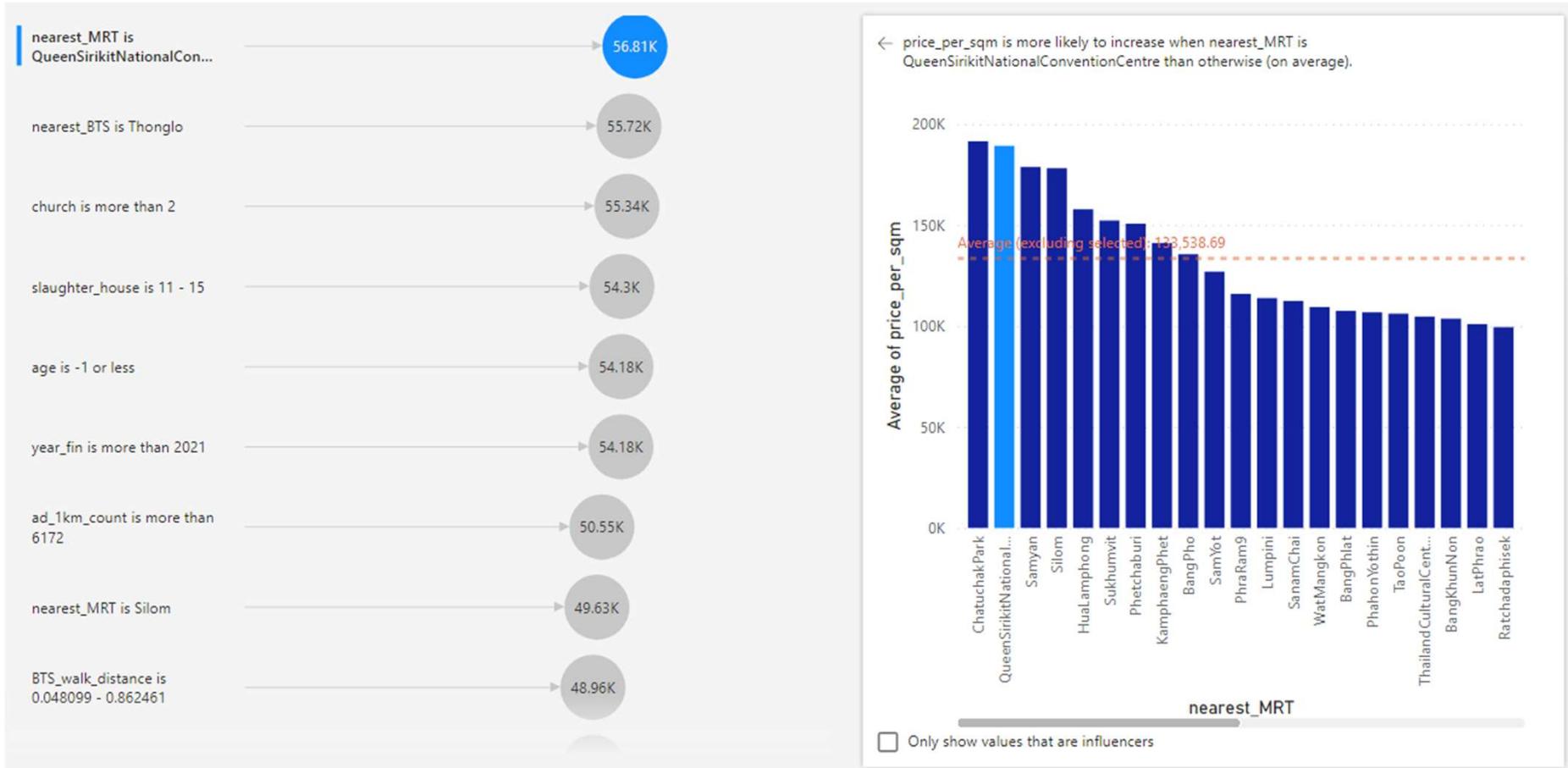
Distance MRT



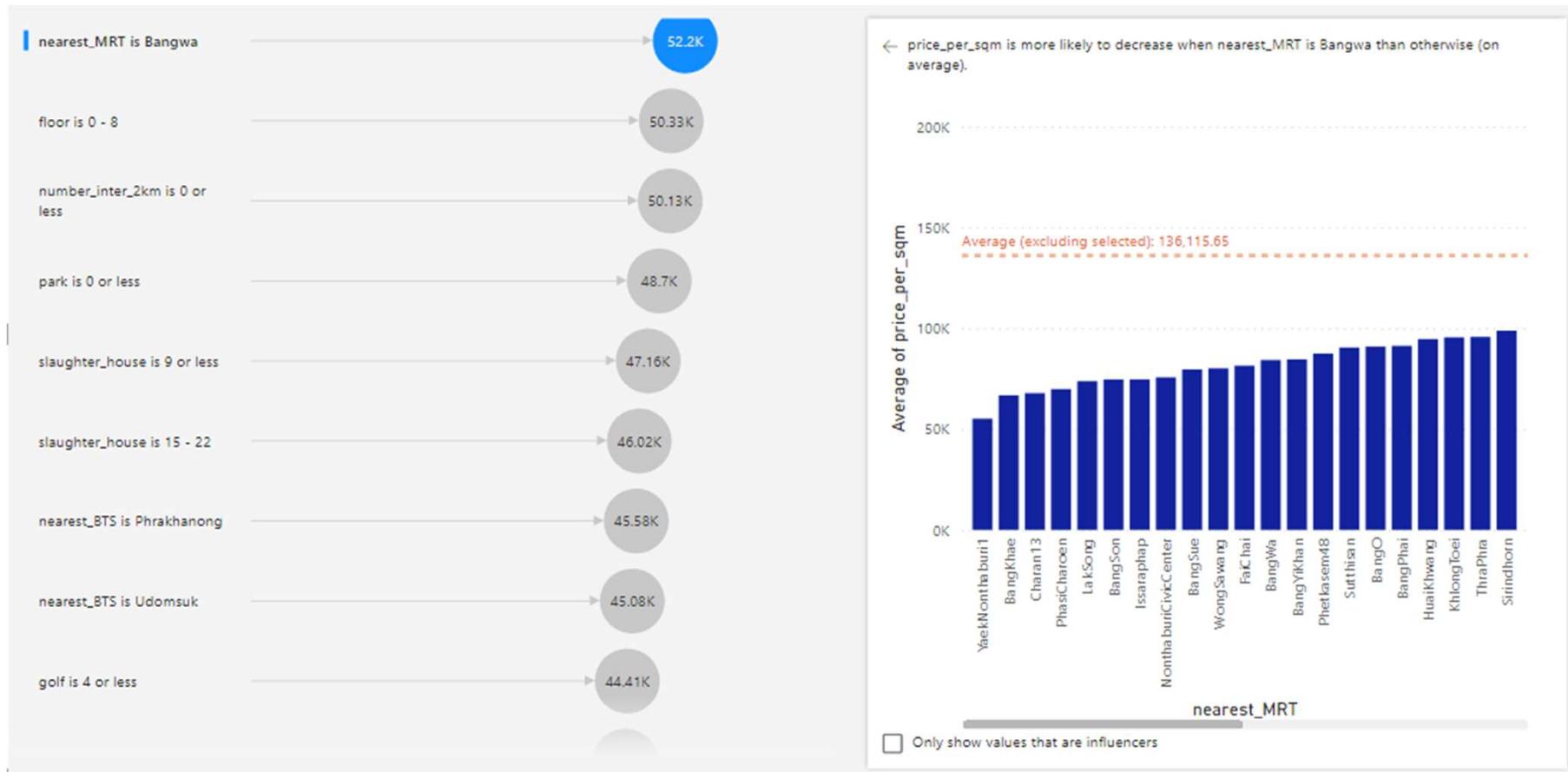
- Inner city vs outer



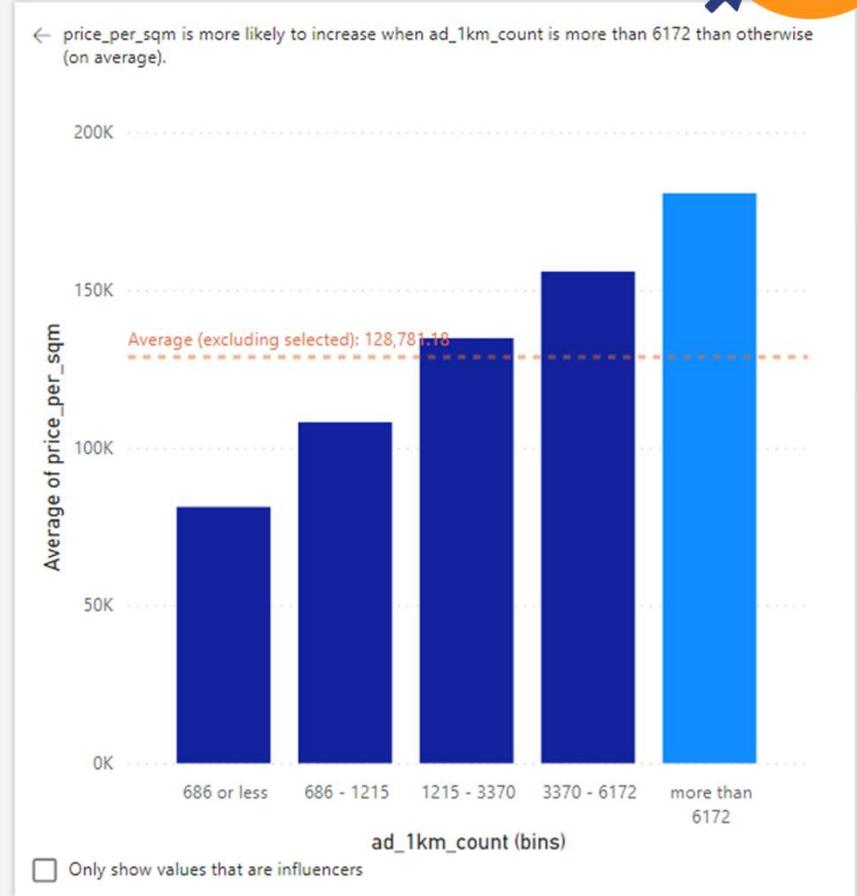
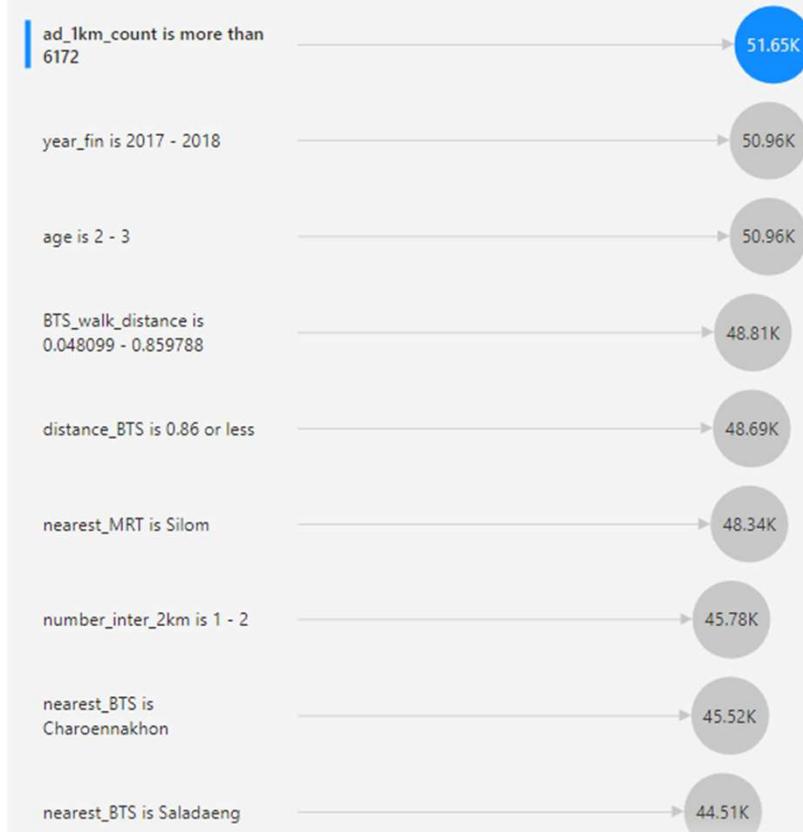
MRT Stations



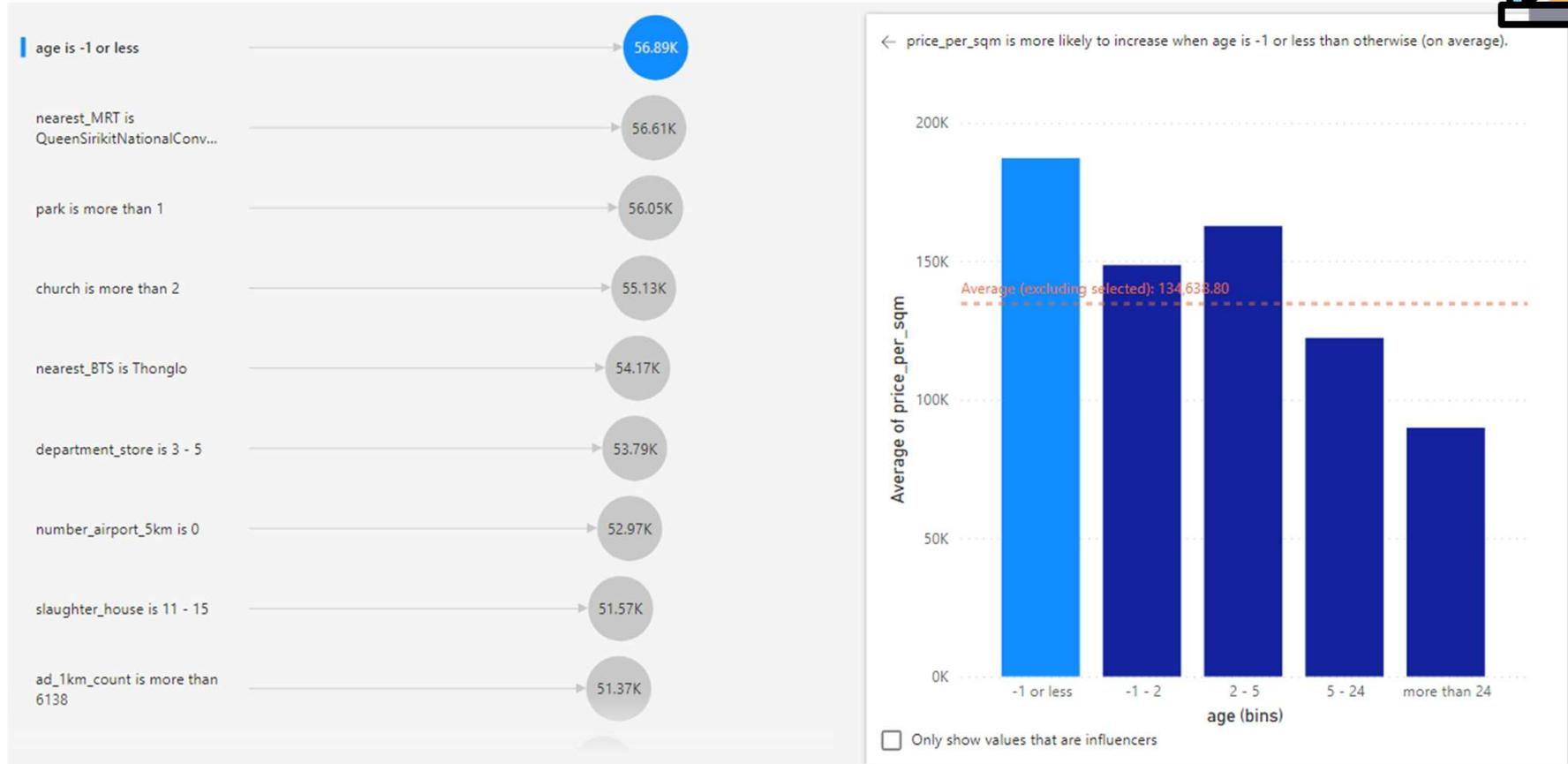
MRT Stations



Ad Count

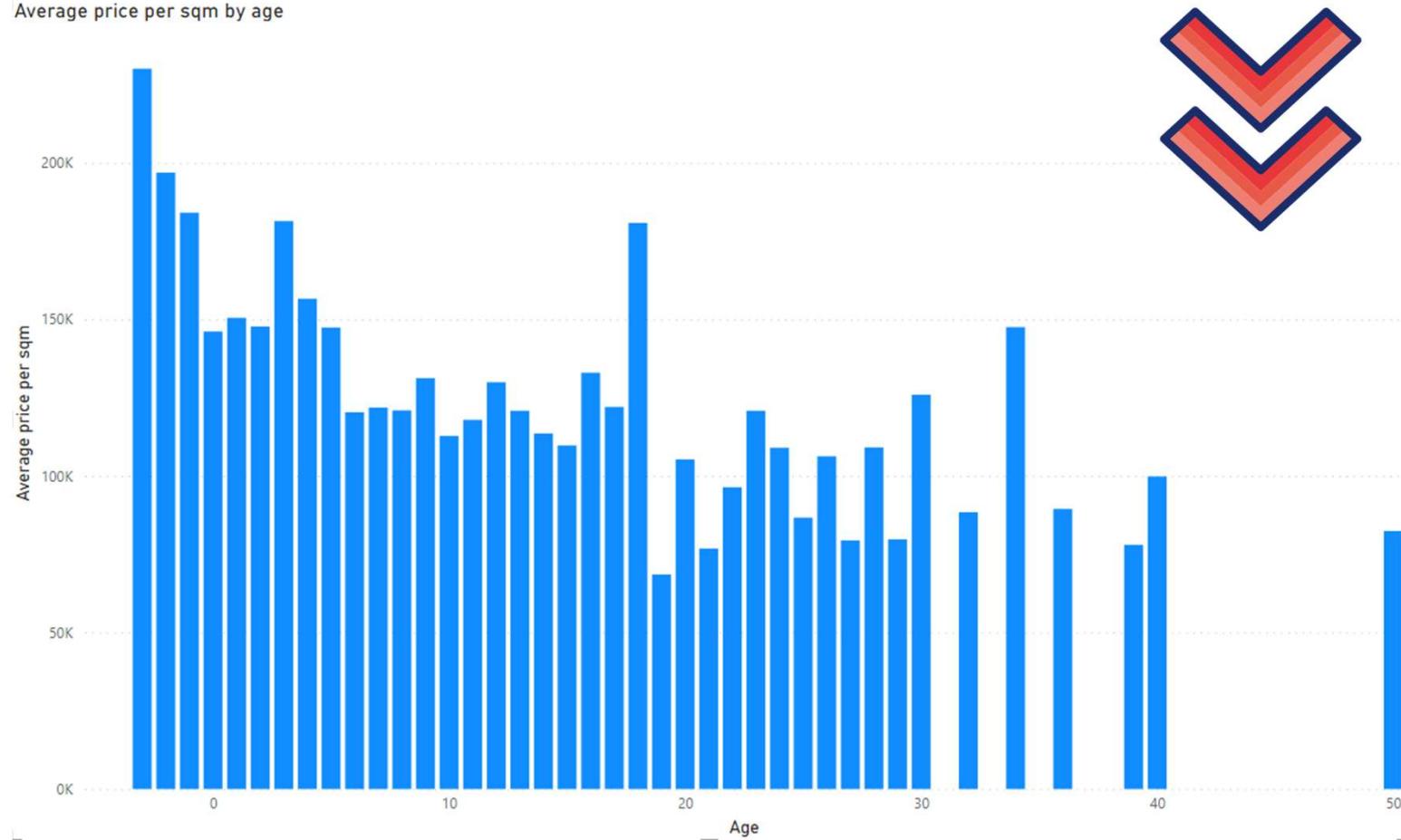


Age

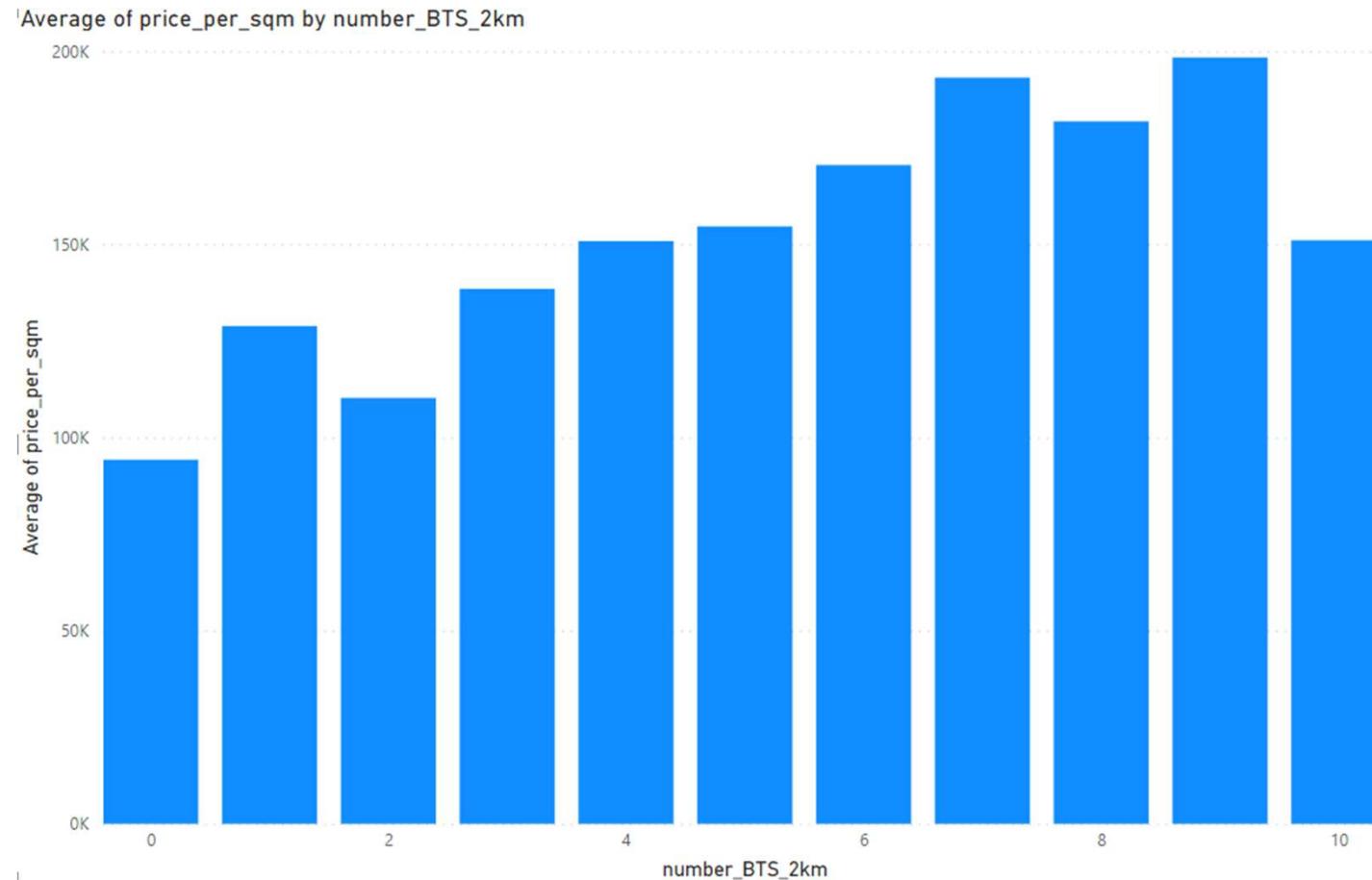


Age

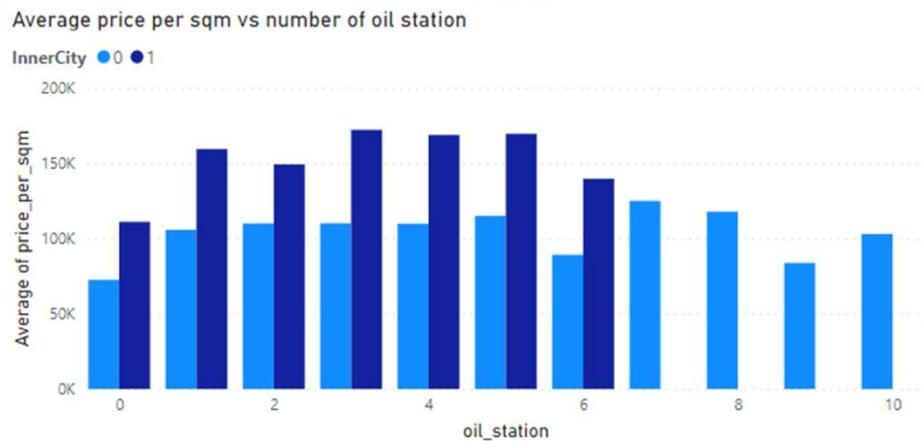
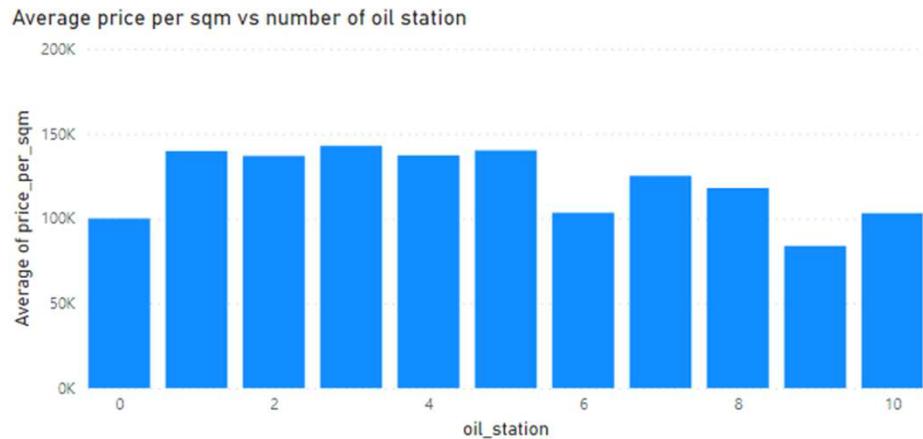
Average price per sqm by age



Number of BTS in 2km



Number of Oil Stations



Applications for condo buyer





Buyer Details

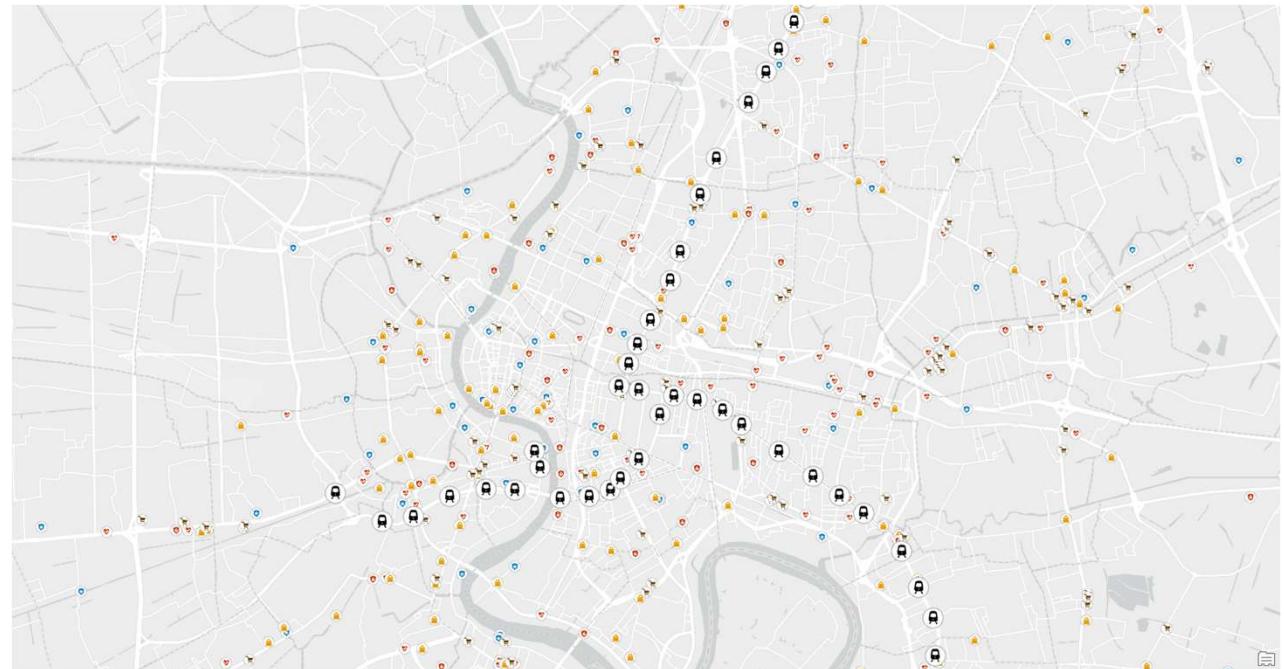
Customer persona

- Age : 25-35 years
- Occupation : Short-term contract based
- Office location : Near BTS
- Family : None
- Number of bed room : Studio or 1 bed room
- Budget : 6,000,000 THB



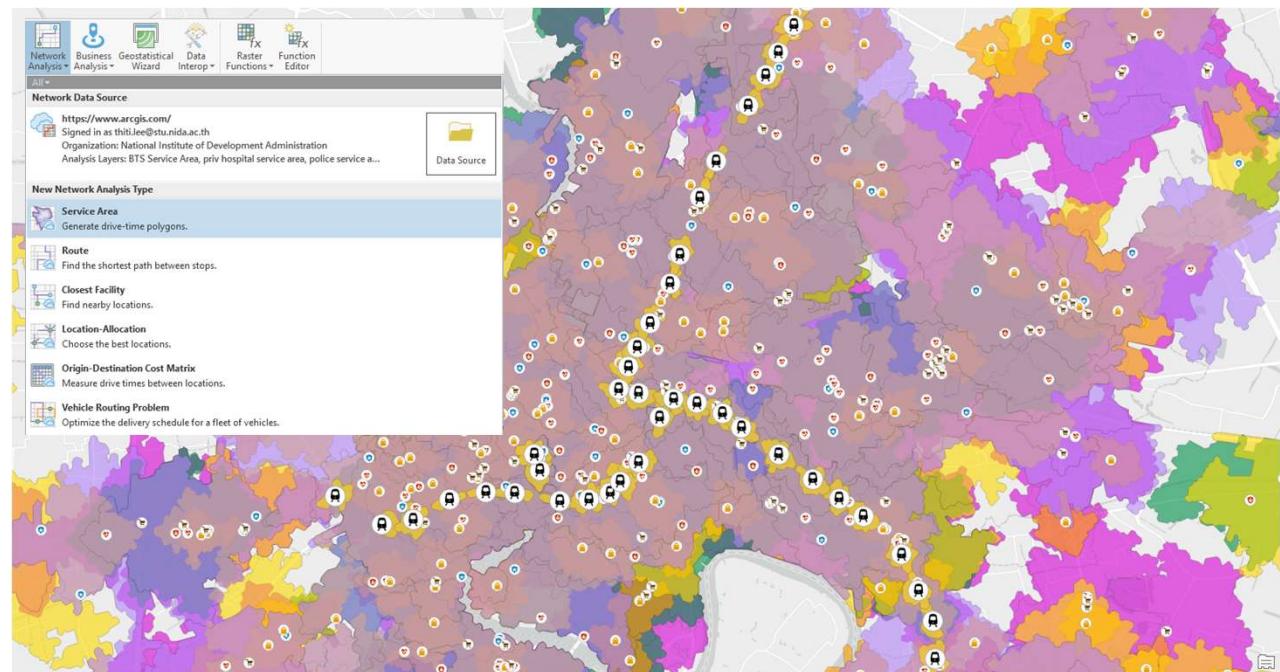
Finding optimum candidate location

- Within 3km service area of :
 - Police station
 - Fire station
 - Private hospital
 - Department store
- Within 1km service area of :
 - Market
- Within 500m from BTS station

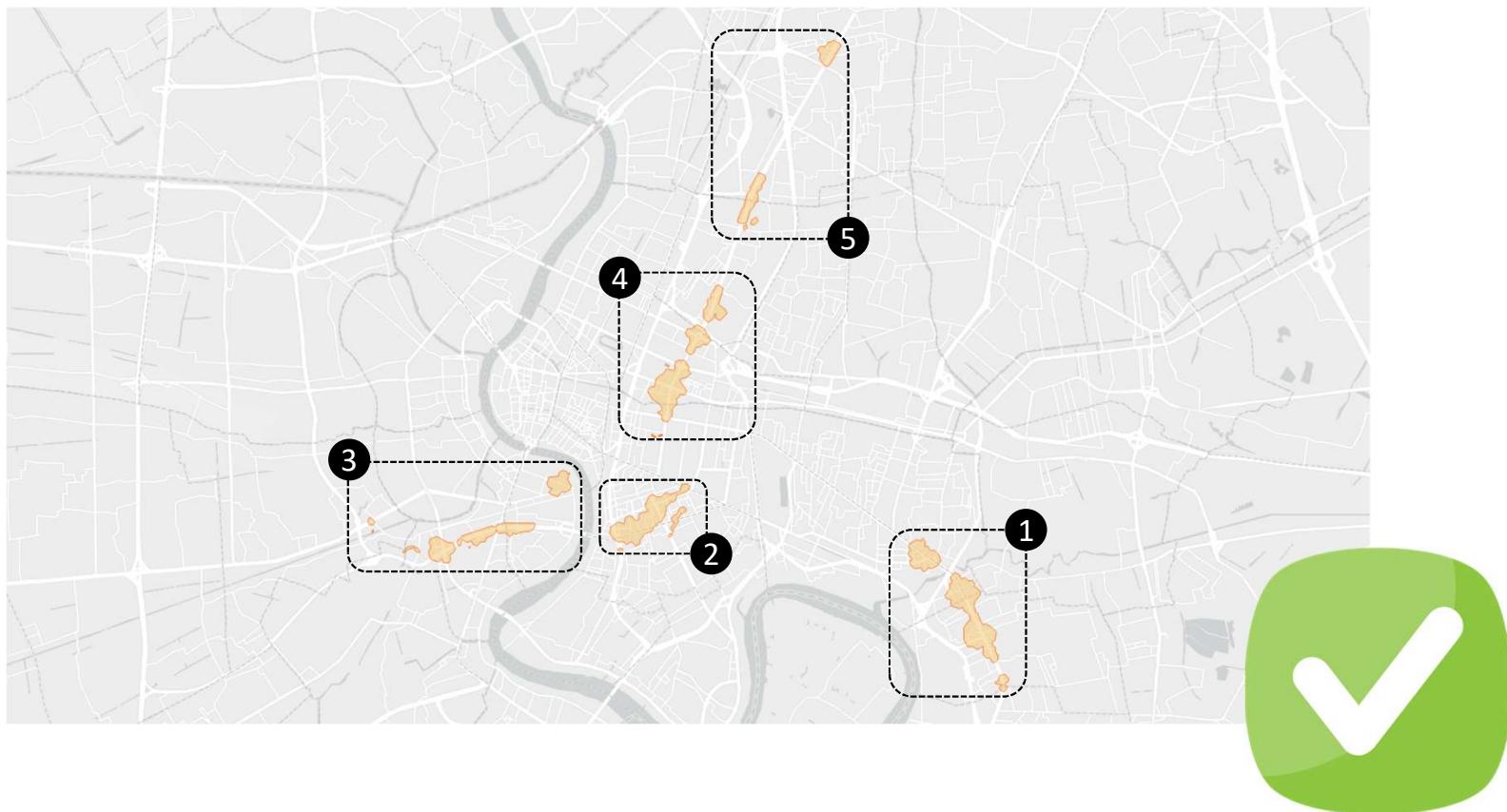


Finding optimum candidate location

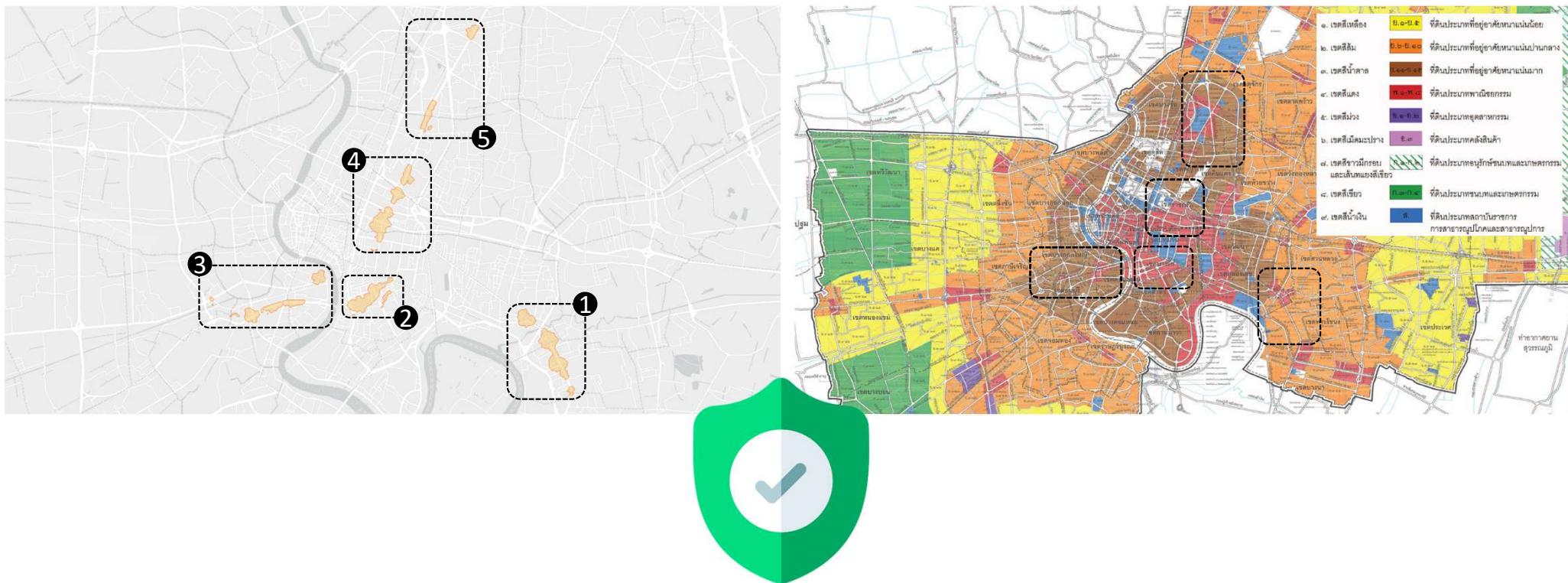
- Use the ‘Service Area’ function of Arc GIS to find the service area of each facilities then find the intersect area.



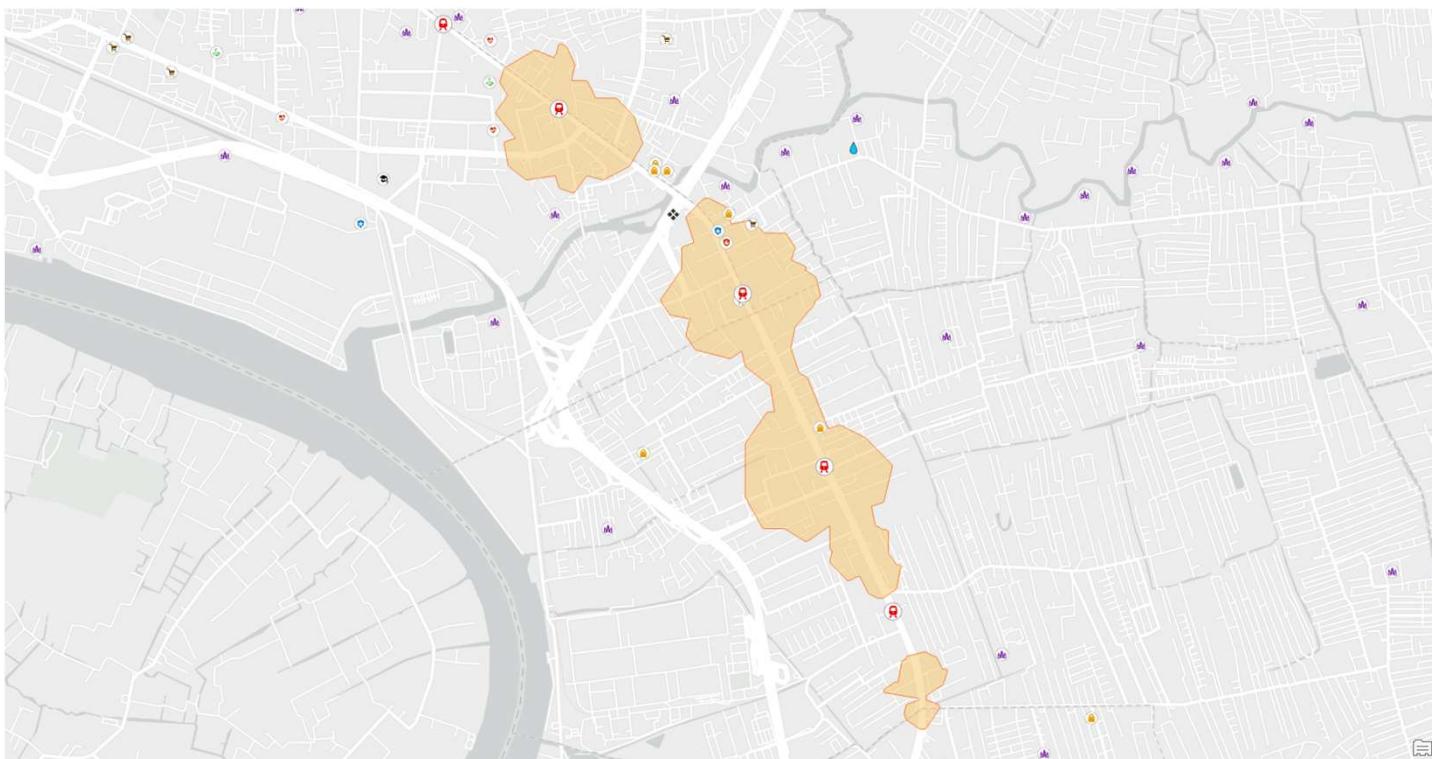
Finding optimum candidate location



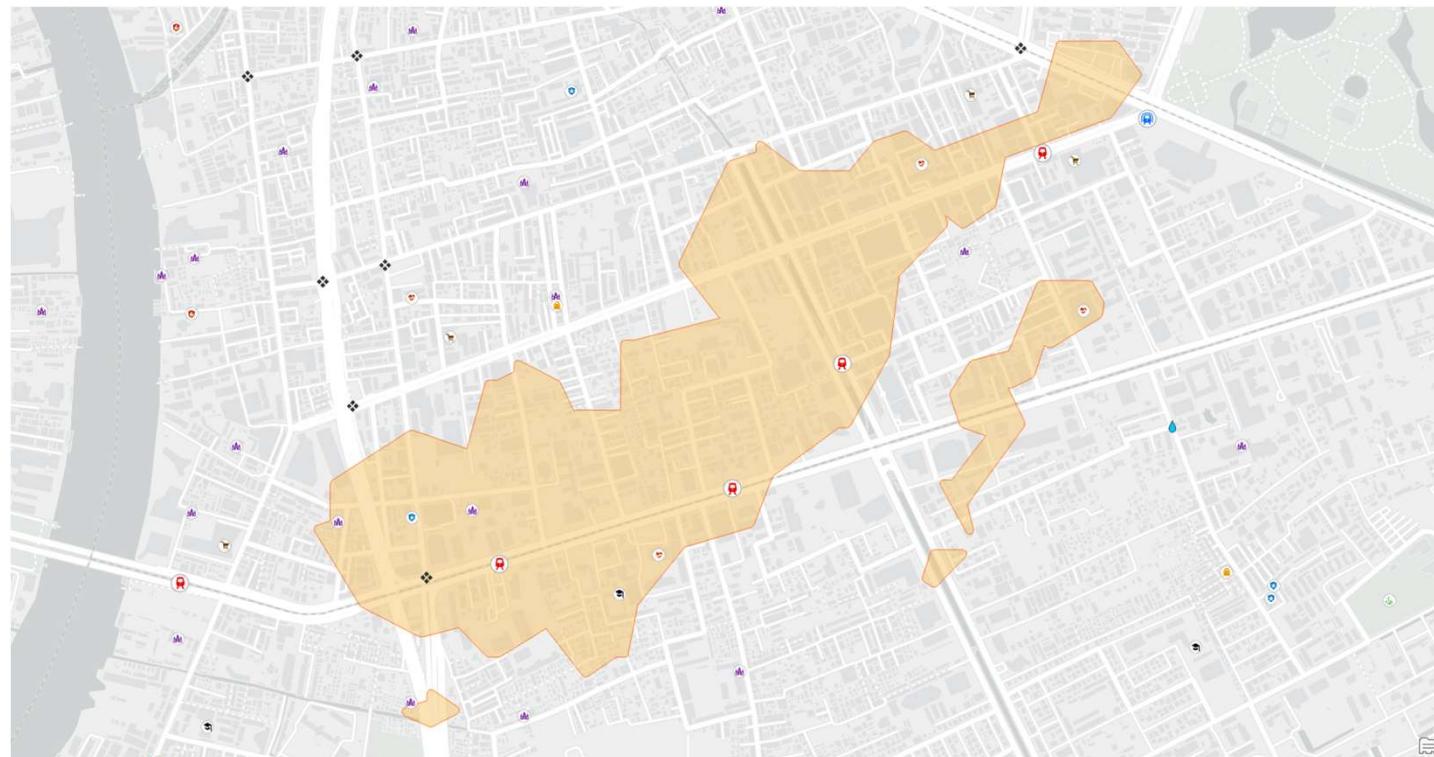
Finding optimum candidate location



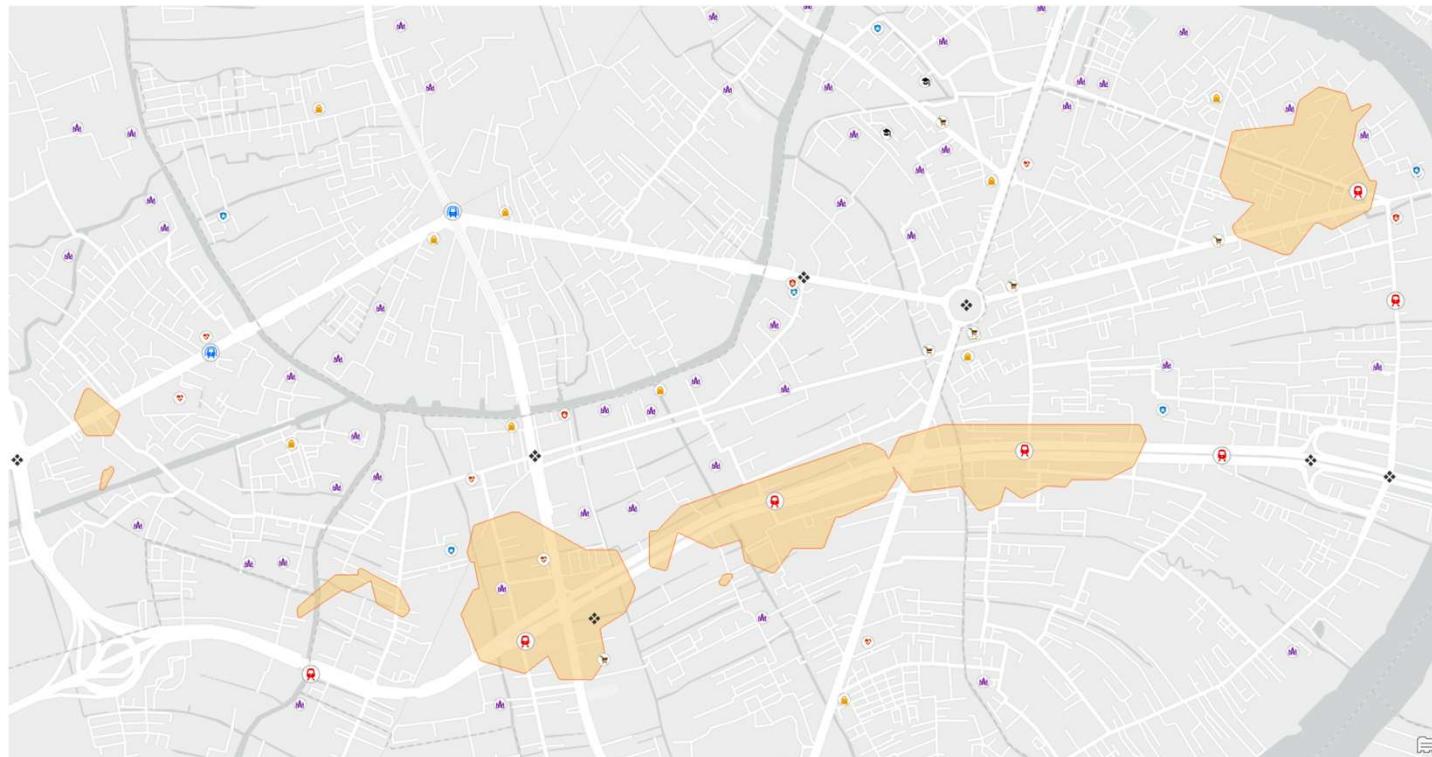
Candidate location 1 : Phra Khanong



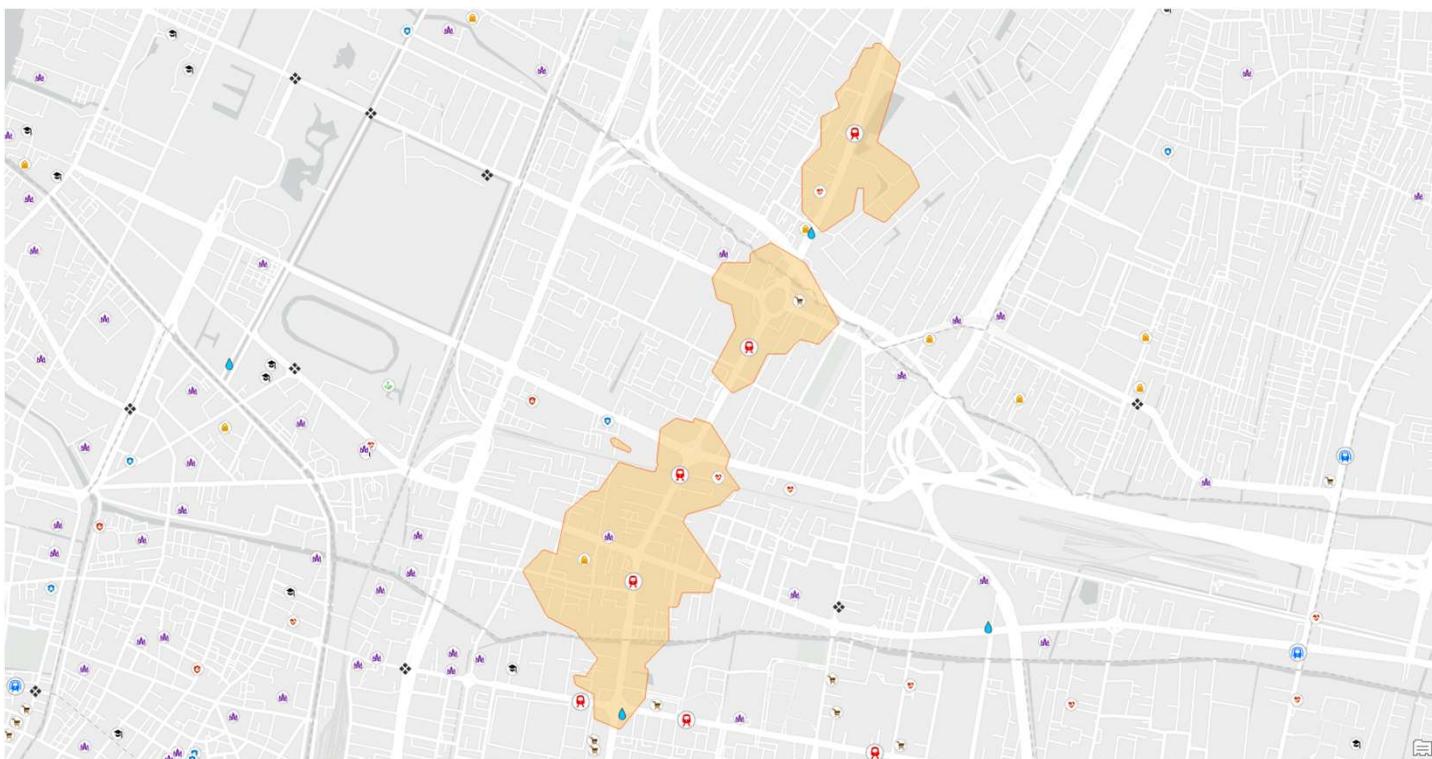
Candidate location 2 : Sathorn - Silom



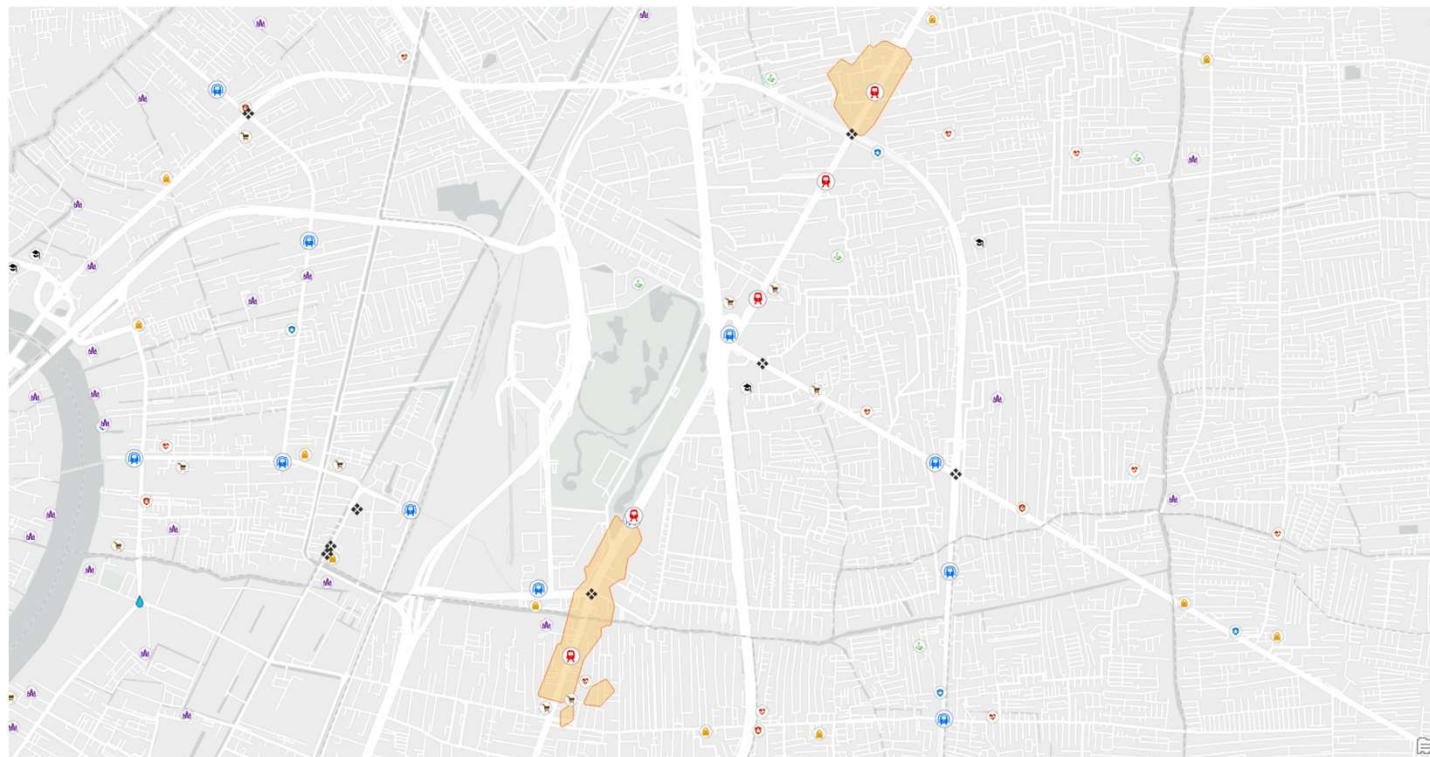
Candidate location 3 : Thonburi



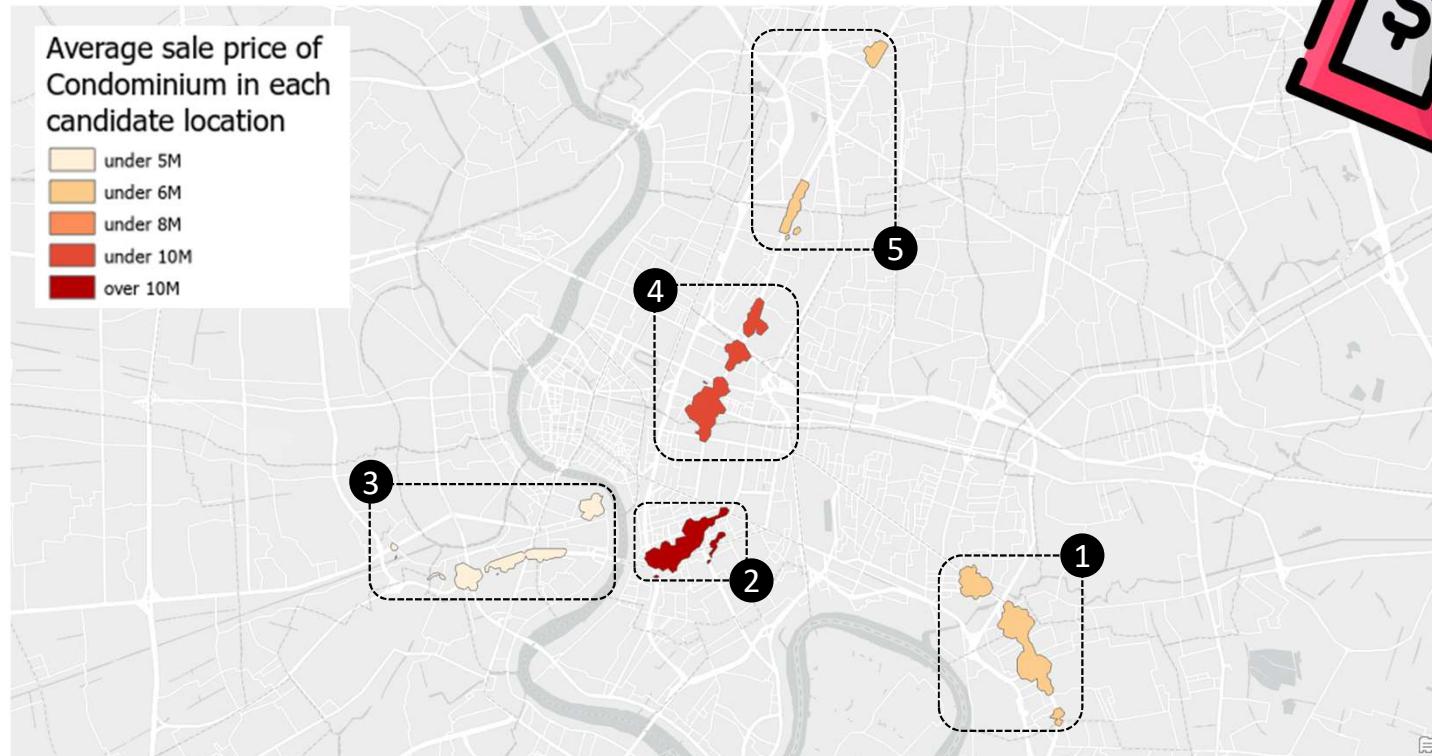
Candidate location 4 : Ratchatewi



Candidate location 5 : Chatuchak



Candidate location



Available condo overview

Total Ad
Within Budget

374

Total Ad

626

Avg Price

5.57M

SD Price

1.59M

Avg Price/Sqm

143.36K

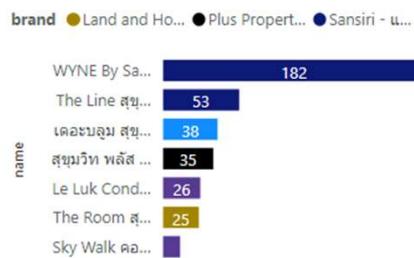
SD Price/Sqm

31.87K

Available condo for sales within budget



Ad count by name and brand



Condo name

- Le Luk Condominium
- Morning Dew Condo
- Sky Walk คอนโดมิเนียม พ拉...
- The Line พหลฯ – ประดิพัทธ์
- The Line สุขุมวิท 71 (เดอ ไล...
- The Room สุขุมวิท 69 (เดอะ ร...

Price

2500000 6000000



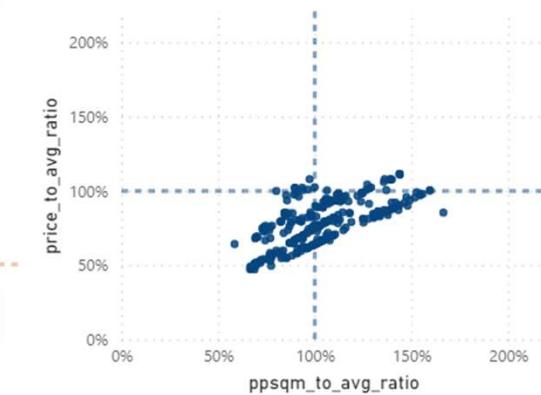
Condo age

- 2
- 4
- 5
- 6
- 7
- 8
- 9
- 10

Bedroom

- 0
- 1
- 2

Pricing analysis



No_

name

year_

age

space

bed_

bath

floor

BTS_wa

price

price_avg

price_med

price_per_s

per_sqm_avg

per_sqm_m

hospi

market

oil_st

toll

ation

fin

roo

_roo

m

m

lk_dista

nce

78665 สุขุมวิท พลส คอนโดมิเนียม

2015

6

48.00

1

1

0.32

3400000

5,288,400.78

4200000

70833

121,021.79

111,667.00

2

4

2

5

49889 สุขุมวิท พลส คอนโดมิเนียม

2015

6

31.03

0

1

16

0.32

2500000

5,288,400.78

4200000

80567

121,021.79

111,667.00

2

4

2

5

81757 สุขุมวิท พลส คอนโดมิเนียม

2015

6

30.00

0

1

3

0.32

2500000

5,288,400.78

4200000

83333

121,021.79

111,667.00

2

4

2

5

135870 สุขุมวิท พลส คอนโดมิเนียม

2015

6

43.00

1

1

5

0.32

3600000

5,288,400.78

4200000

83721

121,021.79

111,667.00

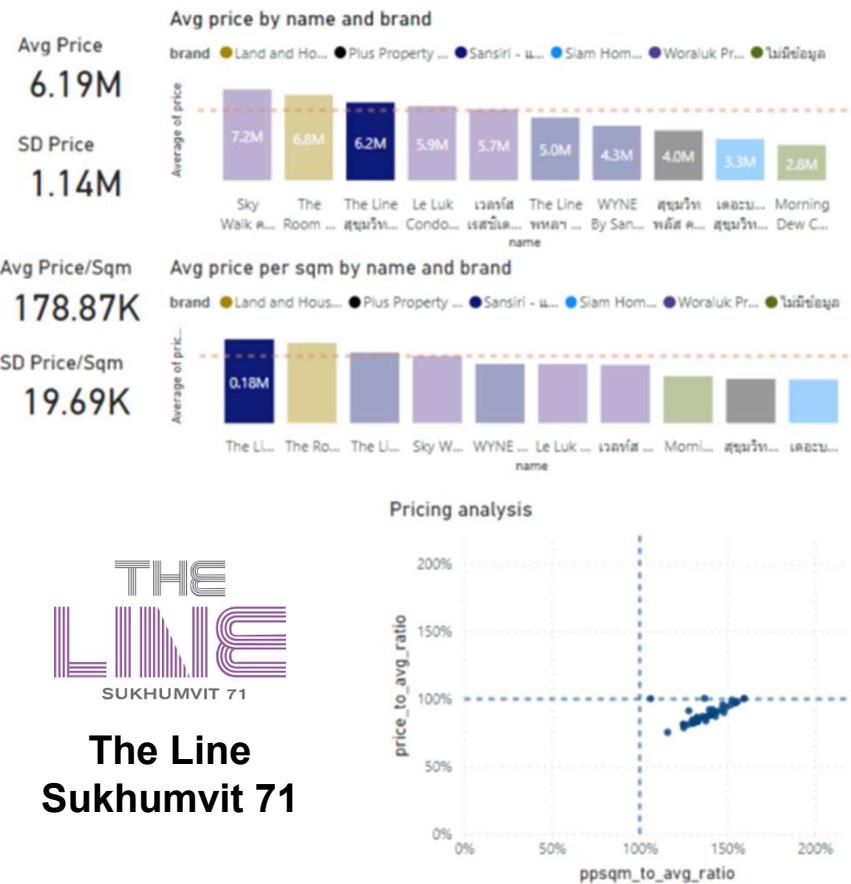
2

4

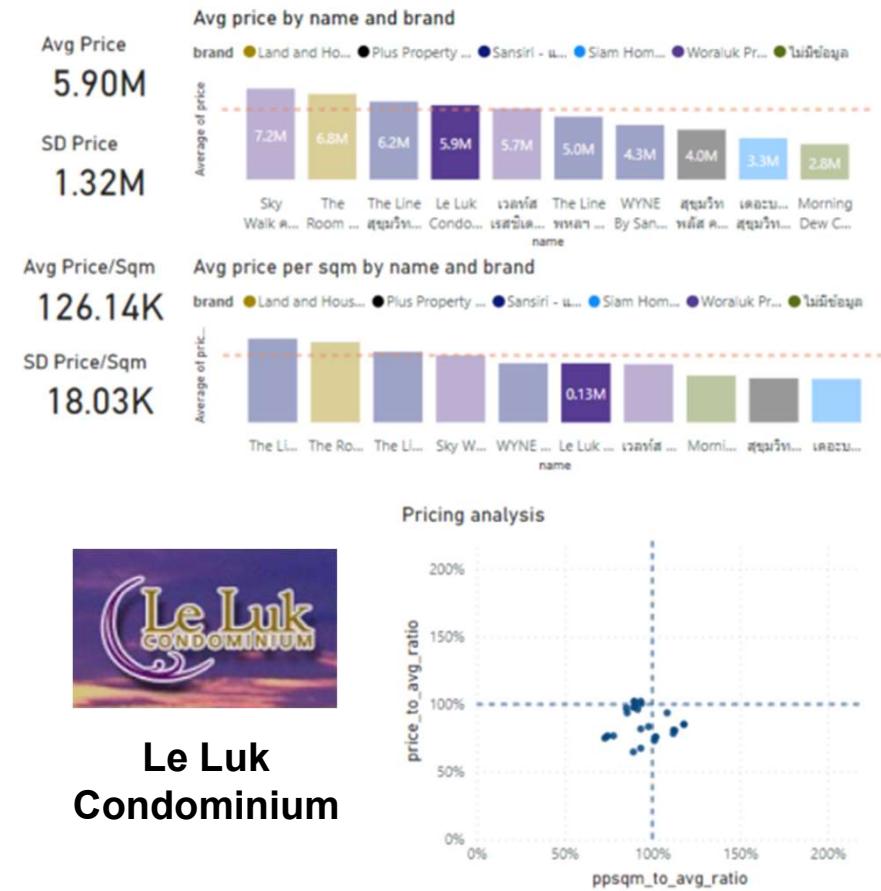
2

5

The Line Sukhumvit71 vs Le Luk Condominium

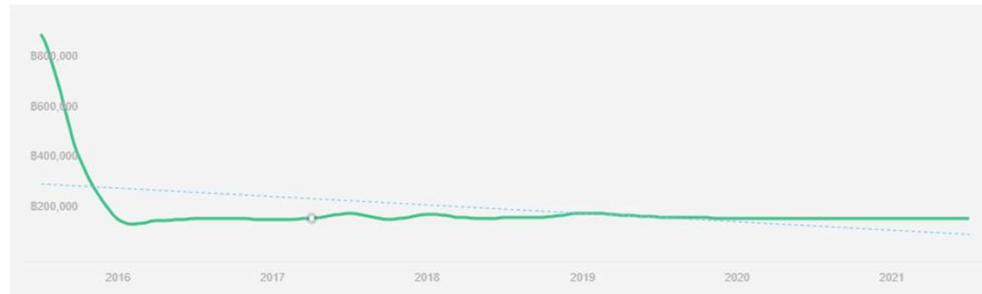


**THE
LINE
SUKHUMVIT 71**
**The Line
Sukhumvit 71**

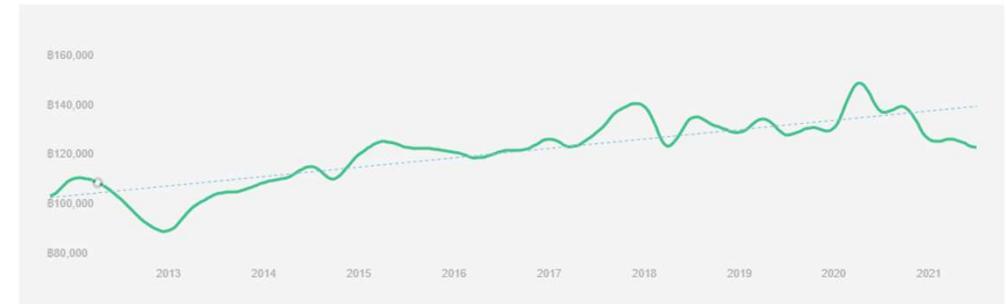


**Le Luk
Condominium**

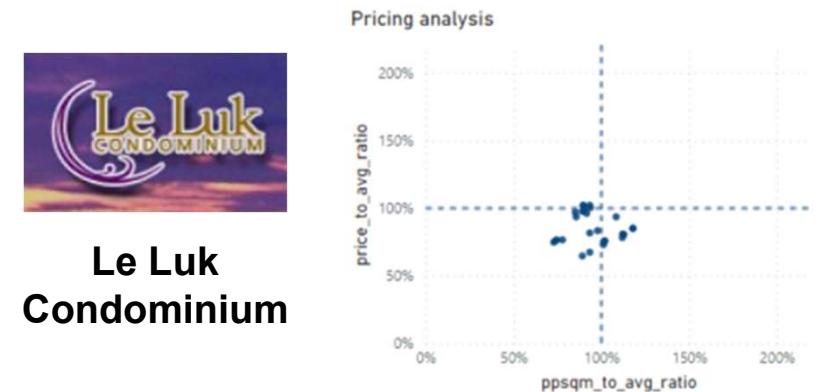
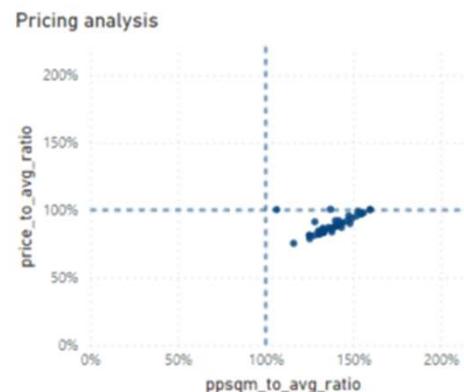
The line Sukhumvit71 vs Le Luk Condominium



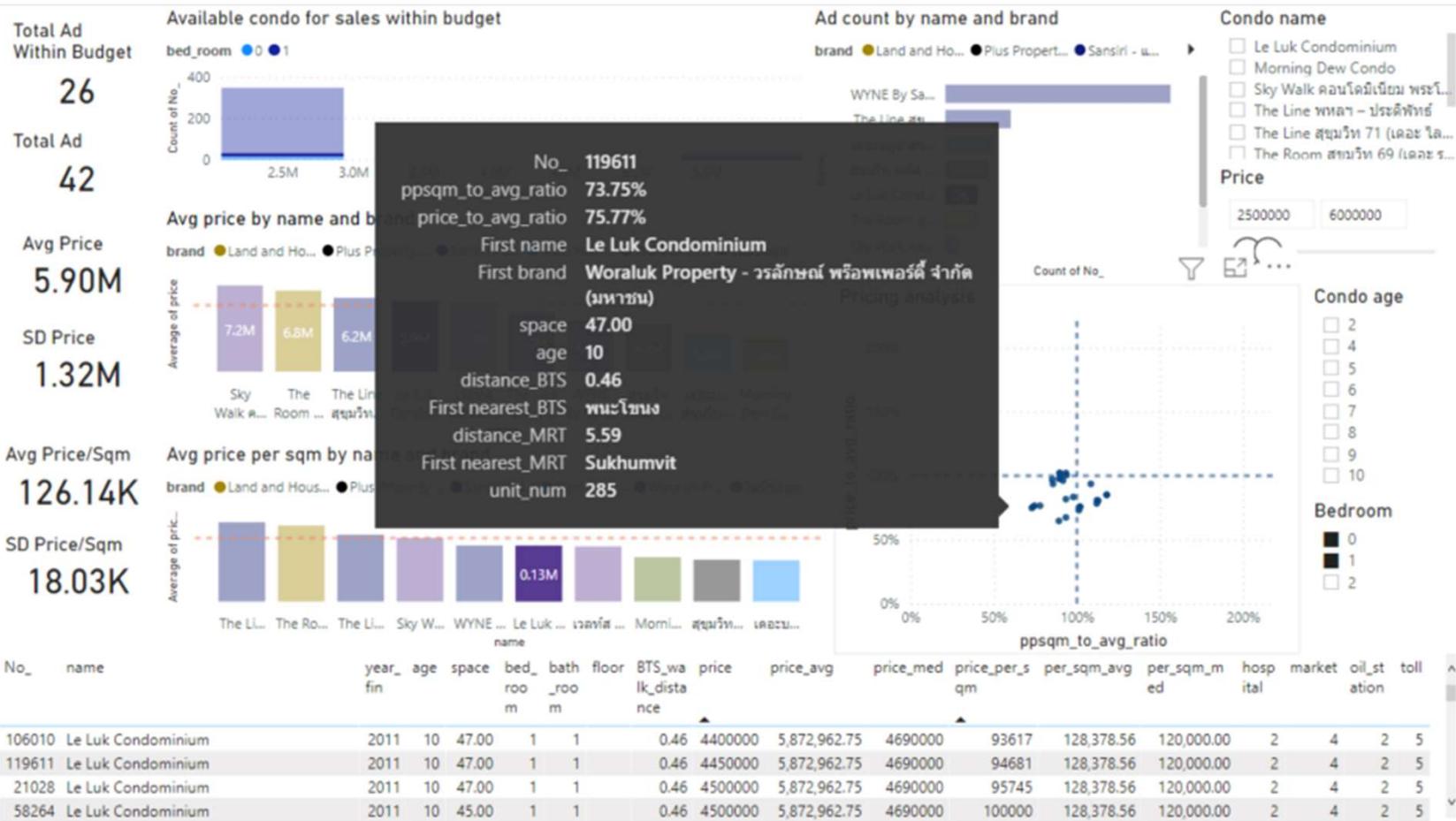
Source: www.hipflat.co.th



Source: www.hipflat.co.th



Le Luk Condominium

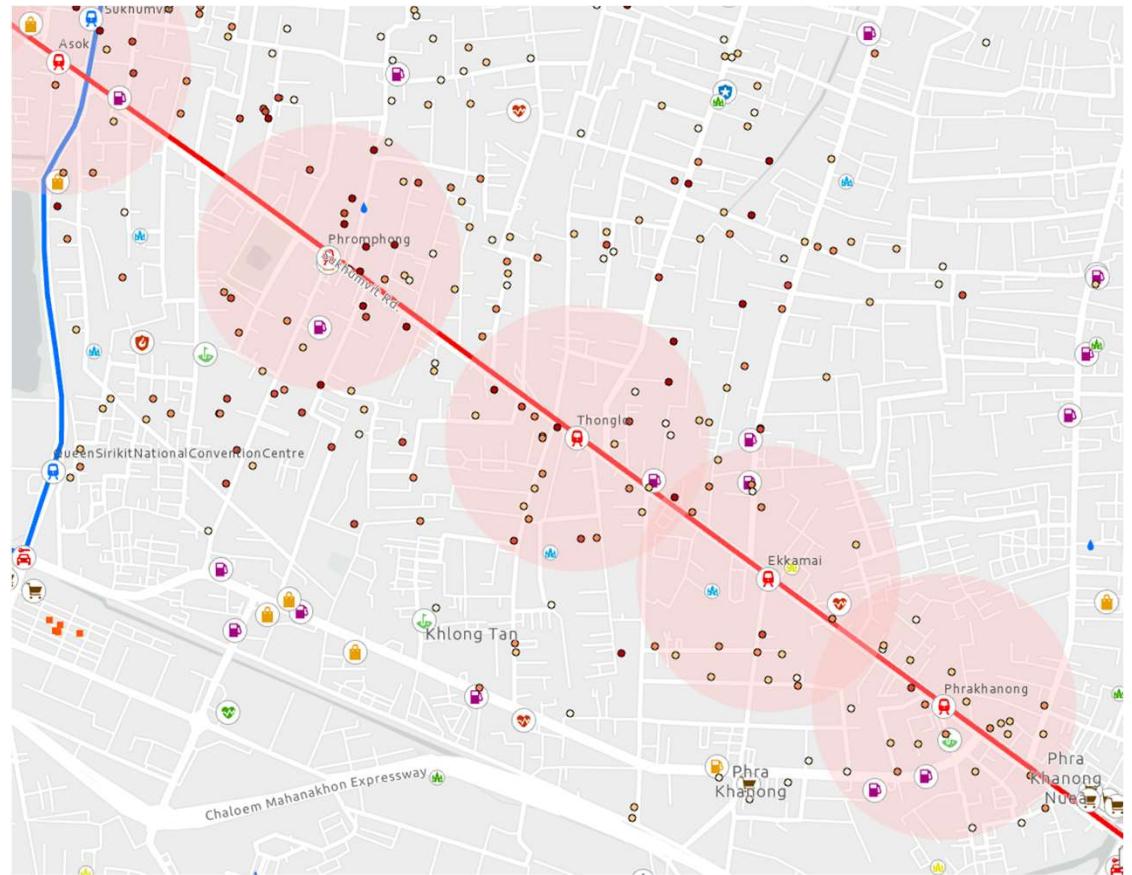




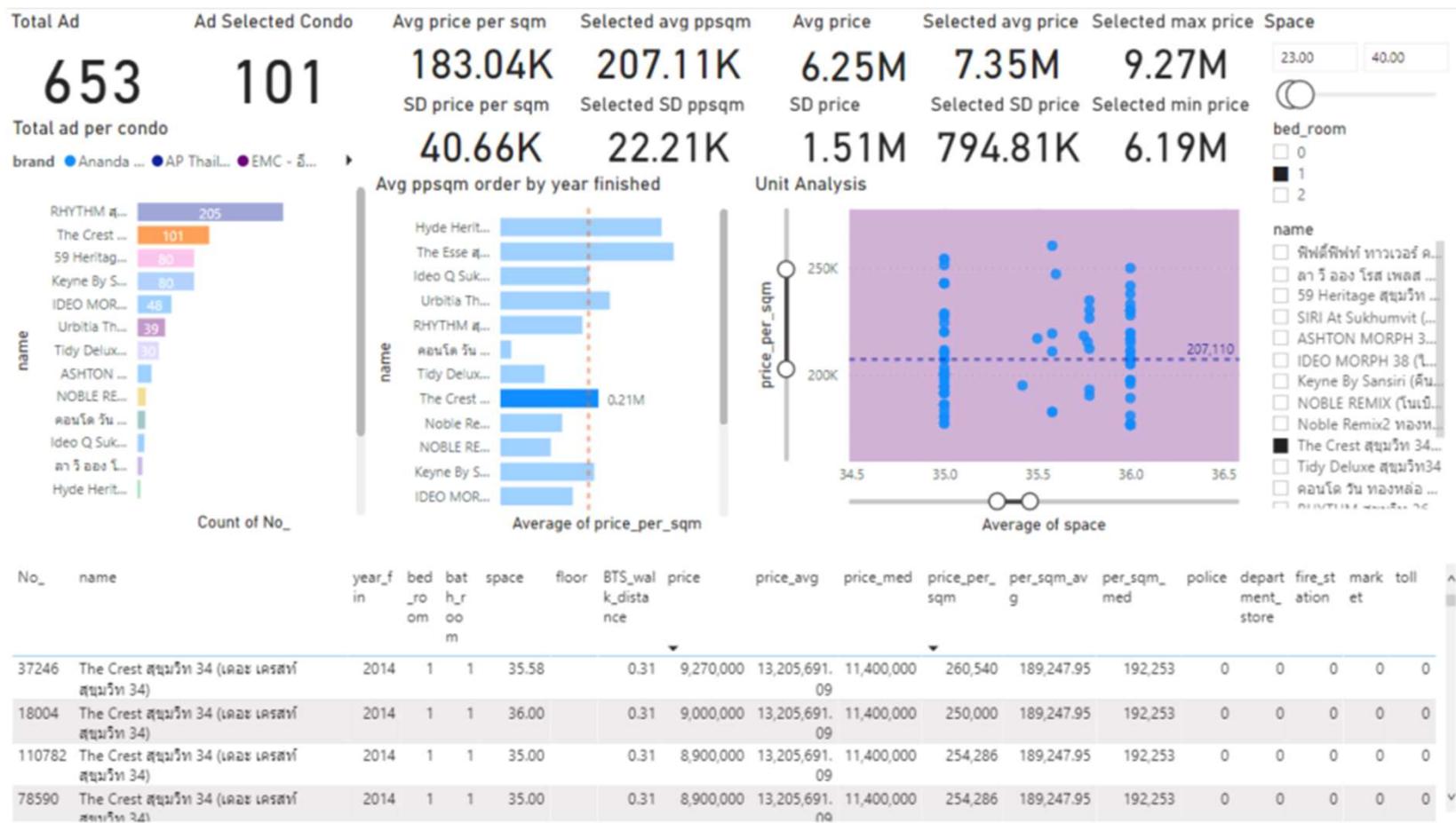
Applications for condo seller

Seller Condo Details

- Owns a condo near Thonglor BTS station
 - The Crest
 - Room size : 35.5 sqm
 - Floor : 20
- Want to knows the optimum price range for selling



Area Overview



The Crest Overview

Avg price Selected avg price Selected max price

6.25M **7.35M** **9.27M**

SD price Selected SD price Selected min price

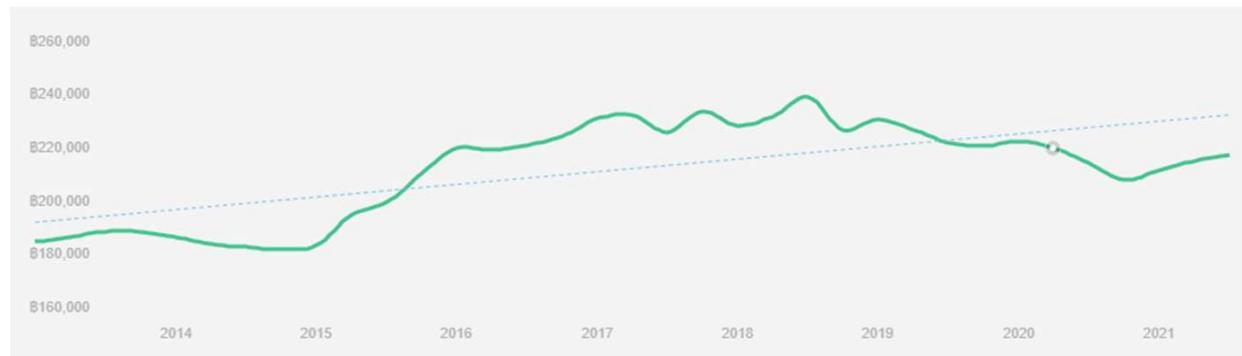
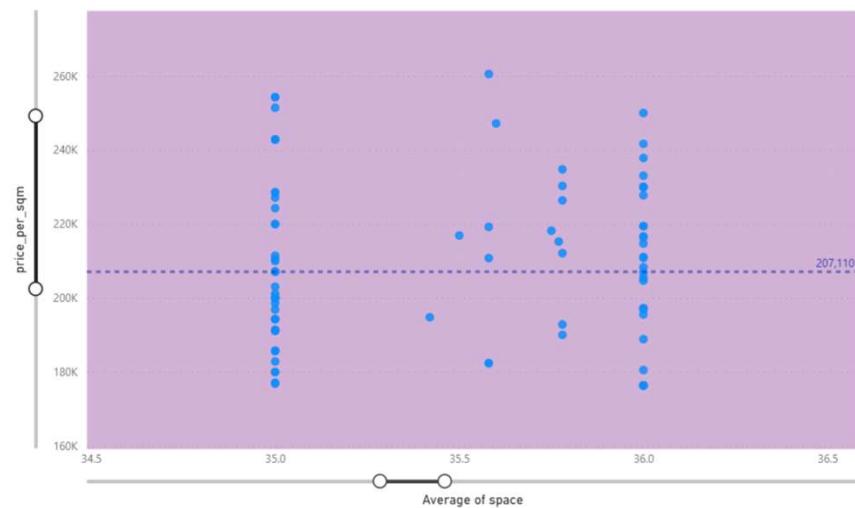
1.51M **794.81K** **6.19M**

Avg price per sqm Selected avg ppsqm

183.04K **207.11K**

SD price per sqm Selected SD ppsqm

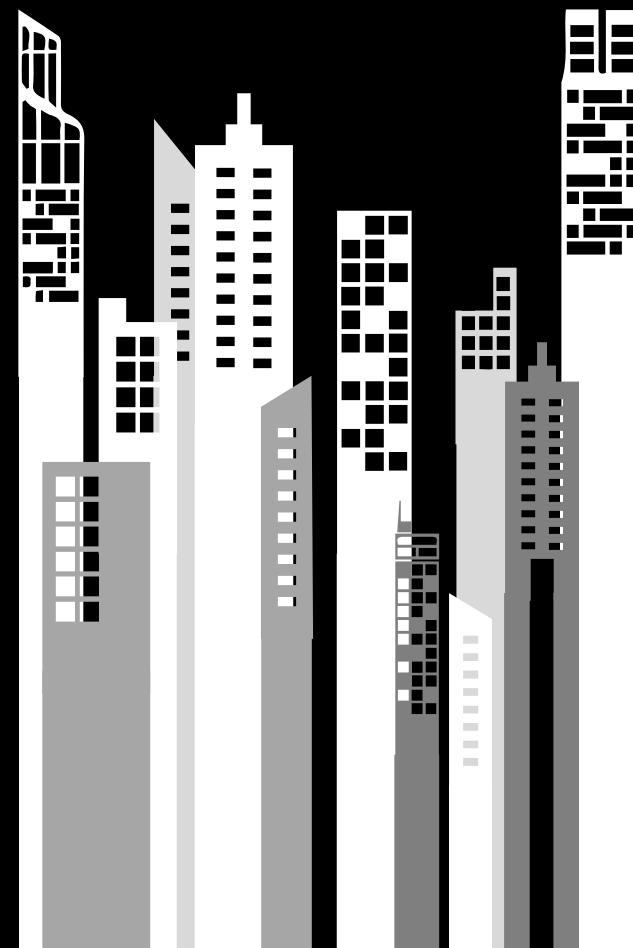
40.66K **22.21K**



Source: www.hipflat.co.th



Looking ahead



Other applications and future projects

- Explore price change with time series data
 - Calculating NPV and IRR
- Evaluate branding affect
 - Which brand has the best potential for asset value increment
 - Which brand has the highest asset depreciation over time
- Create score card for each condo asset
- Automate report for interested buyer and seller
- Condo buyer seller matching platform
- Personalized ad targeting, save lengthy search time
- Fast condo value estimation for banking industry



Members

- Ekularn Watanatanasup 6310422003
- Thiti Leelasomphop 6310422006
- Peem Simasathien 6310422020

