The Impact of Urbanization, Culture, and Wealth on Public Art in Toronto*

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First sentence. Second sentence. Third sentence. Fourth sentence.

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1 Introduction

Public art installations, or art pieces available to the general public in public spaces can be found in many urban cities across the world. Installations can be found in New York City, Chicago, London, and even Toronto. The city of Toronto has over 400 public art installations provided by two organizations, Public Arts & Monument Collection and the Percent for Public Art Program ("Public Art Map", 2024). Public art not only enhances the urban environment, but it also brings together visitors and residents with local culture and history, creating an educational and bonding experience (Barone, 2023).

Public art design is heavily integrated with urban planning and development as a whole. It is crucial for overall public art design to consider the overall coordination of the environment,

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*Code and data are available at: https://github.com/alainahu/starter_folder.

meaning that public art should consider and reflect the environment that it is in (Meng, 2022). Furthermore, public art is also an important symbol of maturity in a city (Liu, 2021). Thus, our research is interested in the factors that influence public art design and selection of location. We analyze the trend between urbanization, cultural diversity, and wealth on the locations of public art installations in Toronto.

Our research paper begins with the Data section to visualize and further understand the variables we are examining. Next, we go into Discussion of the relationships between the data we are looking for. Finally, we end the paper with the Conclusion section, summarizing the takeaway and future of this research.

2 Data

Data for this research comes from Open Data Toronto, an open source data portal containing various topics of data for the city. For the data involved in this paper, we combine `Public Art` and `Ward Profiles (25-Ward Model)` In order to examine urbanization, cultural diversity, and wealth, we use population, minority population, and average household income as the explanatory variables to represent these factors. To analyze this trend across Toronto, we look at the effect of population, minority population, and average household income on the number of public art installations across the 25 wards of Toronto.

2.1 Public Art

The Public Art raw dataset includes information such as the source, artist, title, medium, installation year, and ward location on the 409 public art pieces in Toronto. Since we are only interested in the art pieces and their respective ward location, we focus on these two aspects of the data. Table 1, shows the part of the public art data we focus on.

Table 1: Sample of cleaned public art data

Art ID	Ward	Ward Name
1	14	Toronto-Danforth
2	13	Toronto Centre
3	11	University-Rosedale
4	11	University-Rosedale
5	14	Toronto-Danforth

2.2 Ward Profiles (25-Ward Model)

In the 25-Ward model, the city of Toronto is separated into 25 neighborhoods or voting districts. To better understand the effect of urbanization, cultural diversity, and wealth on the location of public art pieces, we compare the effect of population, minority population, income on the number of art works across the 25 wards. The `Ward Profiles (25-Ward Model)` data contains demographic, social, and economic information for each ward such as population, households, families, education, ethnocultural composition, spoken languages, income and housing costs. For our purpose of research, we are interested in population, minority population, and average income of each ward, so we extract these pieces of information. A sample of the cleaned dataset for the wards is shown below in Figure 2.

Table 2: Sample of cleaned Toronto 25 Ward data

Ward	Population	Minority Population	Income
1	115120	90130	95200
2	117200	37210	146600
3	139920	48675	127200
4	104715	30445	127200
5	115675	67120	88700

2.3 Public Art by Ward

As we are interested in the number of public art pieces in each ward, we take the cleaned art data and group the wards together. To better understand our dependent response variable of the number of public art installations by ward, we organize the artworks by ward collect a count. Figure 3 shows the number of art pieces by ward for the 25 wards of Toronto. To better visualize the spread of the number of pieces in each ward, we create a bar graph shown in Figure 4.

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Table 3: Number of public art installations by ward.

Ward	Ward Name	Number of Public Art Pieces
1	Etobicoke North	1
2	Etobicoke Centre	3
3	Etobicoke-Lakeshore	13
4	Parkdale-High Park	23
5	York South-Weston	7
6	York Centre	9
7	Humber River-Black Creek	0
8	Eglinton-Lawrence	4
9	Davenport	0
10	Spadina-Fort York	157
11	University-Rosedale	46
12	Toronto-St. Paul's	14
13	Toronto Centre	61
14	Toronto-Danforth	12
15	Don Valley West	2
16	Don Valley East	2
17	Don Valley North	19
18	Willowdale	14
19	Beaches-East York	3
20	Scarborough Southwest	3
21	Scarborough Centre	11
22	Scarborough-Agincourt	1
23	Scarborough North	1
24	Scarborough-Guildwood	2
25	Scarborough-Rouge Park	1
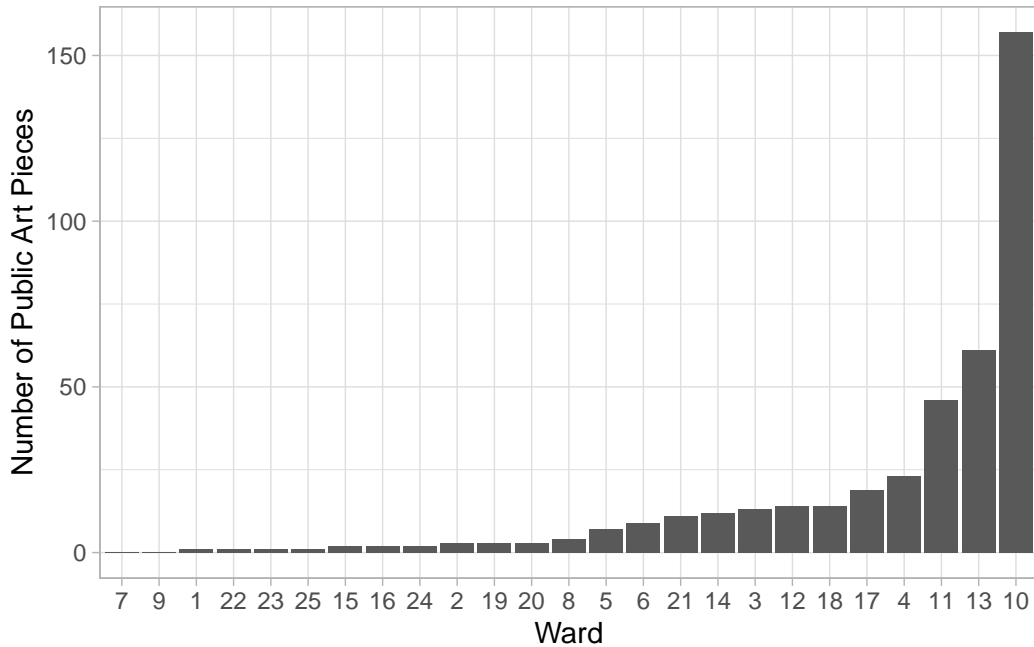
From Figure 4, we can see that Ward 10: Spadina-Fort York, Ward 13: Toronto-Centre, and Ward 11: University-Rosedale have the most number of public art installations while Ward 7: Humber River-Black Creek, Ward 9: Davenport, and Ward 1: Etobicoke North have the least number of public art installations. This aligns with intuition and literature regarding the connection between public art and urbanization. The wards with the

```
library(sf)
#| echo: false

# URL to the zip file
url <- "https://ckan0.cf.opendata.inter.prod-toronto.ca/dataset/5e7a8234-f805-43ac-820f-03

# Temporary file to store the downloaded zip
temp_zip <- tempfile(fileext = ".zip")

# Download the zip file
download.file(url, temp_zip, mode = "wb")

# Unzip the file to a temporary directory
temp_dir <- tempdir()
unzip(temp_zip, exdir = temp_dir)

# Assuming the shapefile is directly in the unzipped folder and has a standard .shp extens
```

```
shapefiles <- list.files(temp_dir, pattern = "\\.shp$", full.names = TRUE)

# Read the shapefile (replace 'shapefiles[1]' with the specific file if there are multiple
toronto_map <- st_read(shapefiles[1])
```

```
Reading layer `WARD_WGS84' from data source `/tmp/RtmpwviSeY/WARD_WGS84.shp' using driver `ES
Simple feature collection with 25 features and 9 fields
Geometry type: POLYGON
Dimension:      XY
Bounding box:   xmin: -79.63926 ymin: 43.581 xmax: -79.11524 ymax: 43.85546
Geodetic CRS:   WGS 84
```
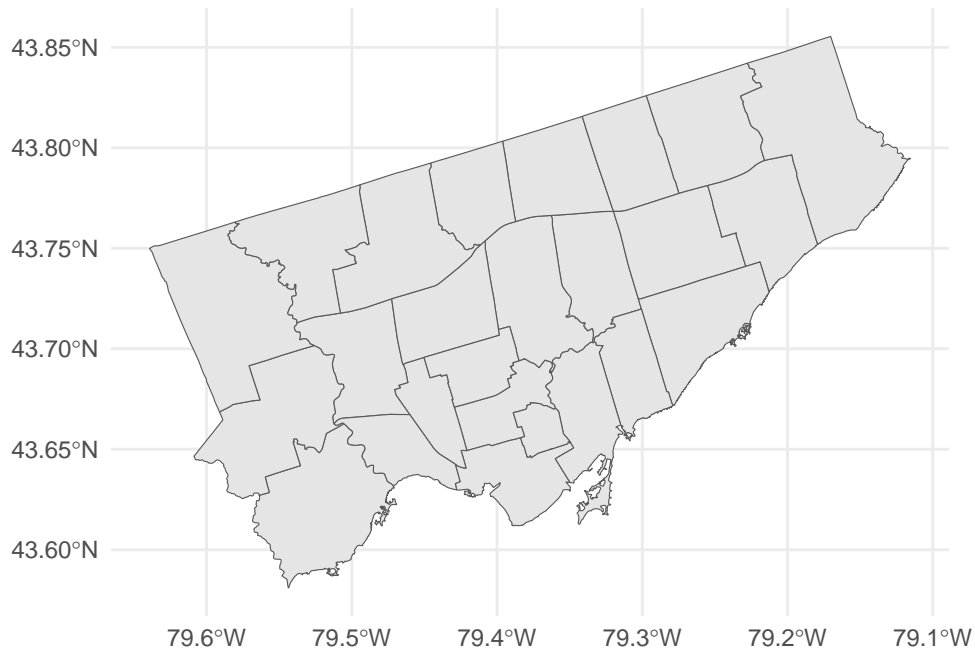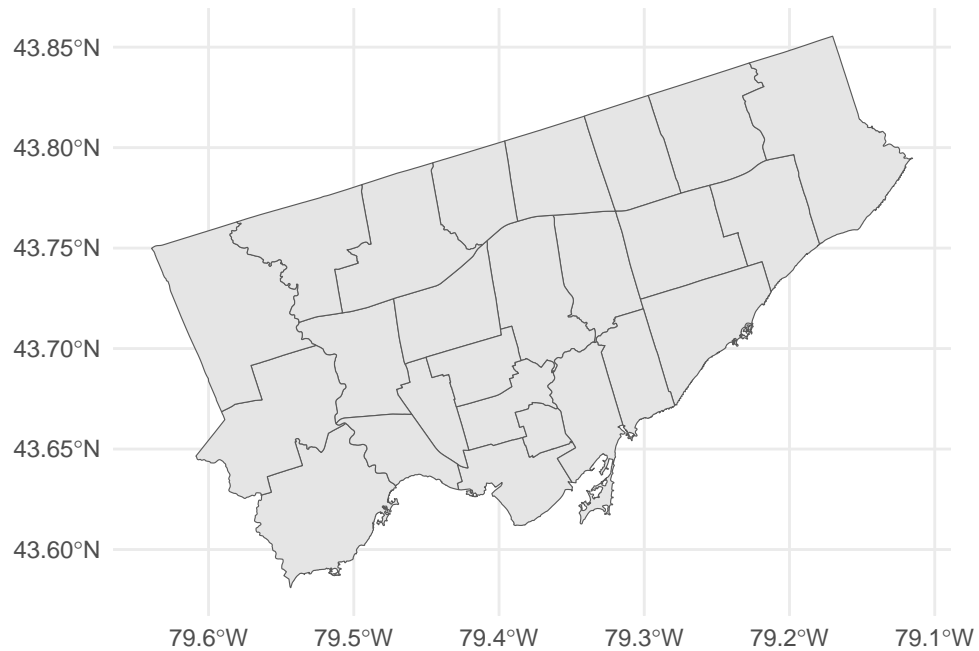
```
# Clean up the downloaded zip file
unlink(temp_zip)

ggplot(data = toronto_map) +
  geom_sf() +
  theme_minimal()
```

```
ggplot(data = toronto_map) +
  geom_sf() + # This plots all wards with the default color
  geom_sf(data = toronto_map[toronto_map$WARD14 == 10,], fill = 'red', color = 'red') + #
  theme_minimal()
```


3 References