

Park Washroom Facilities*

Is the distribution of Park Washroom Facilities in the City of Toronto even?

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This paper investigates the distribution and accessibility of public washroom facilities in Toronto, highlighting their significant role in urban planning. Our analysis reveals disparities in access, with certain neighborhoods lacking sufficient facilities. This finding underscores the need for improved infrastructure to support public health and inclusivity in urban environments. By addressing these gaps, we can enhance the overall quality of life for residents and visitors, making cities more accommodating for all.

```
library(ggplot2)
library(readr)
library(opendatatoronto)
library(knitr)
library(conflicted)
```

1 Introduction

Public washroom facilities are an essential form of social infrastructure in urban environments. They serve a range of purposes, from providing accessible sanitation for park visitors to supporting recreational activities and promoting public health. More importantly, they are available for free to all members of the public, making them a vital service for individuals of diverse backgrounds, including those experiencing homelessness or transient visitors. These facilities are not just practical necessities, but also act as inclusive spaces that promote equity and accessibility in public areas. In a city where many services are privatized or commodified, public washroom facilities remain a key component of social welfare.

*Code and data are available at: <https://github.com/silentw/paper1>

The City of Toronto’s Parks, Forestry, and Recreation (PFR) division manages these washroom facilities across the city’s parks and recreational spaces. With facilities ranging from permanent washroom buildings to portable toilets, they are located in parks, community centers, and sports complexes, ensuring that both residents and visitors have access to essential services. Additionally, these washrooms are placed strategically across Toronto’s vast park system to meet the needs of different communities. However, the distribution of these facilities may vary depending on the neighborhood, park usage, and the city’s development priorities, raising questions about equitable access to these vital resources.

This paper aims to assess the distribution of public washroom facilities across Toronto’s parks, focusing on their availability in the city’s 25 wards. The analysis will explore the number of washroom facilities in each ward, their types (permanent vs. portable), and the accessibility for diverse populations. The findings will highlight whether certain areas of the city are underserved in terms of public washroom access and suggest where future facilities might be needed or existing ones expanded. Future research could also investigate demographic factors, such as income levels, to determine if washroom facilities are disproportionately located in lower- or higher-income neighborhoods, helping to ensure equitable access to public infrastructure.

2 Data

2.1 Data tools

The data utilized in this study was obtained from the OpenData Toronto portal via the `opendatatoronto` library (Gelfand 2022). Data cleaning and analysis were performed using the open-source statistical programming language R (R Core Team 2023). The libraries `tidyverse` (Wickham et al. 2019), `janitor` (Firke 2023), `knitr` (Xie 2022), `dplyr` (Wickham et al. 2023), and `lubridate` (Grolemund and Wickham 2011) were employed for simulation, cleaning, and testing. Visualizations were created using `ggplot2` (Wickham 2016).

2.2 Overview of Dataset

The selected dataset was operated by the City of Toronto Parks, Forestry and Recreation (PFR) division. In the dataset we contains the washroom facilities like: washroom buildings in parks; portable toilets in parks; or washrooms located inside community centres, schools, pool buildings, rink buildings, fieldhouses and clubhouses. Only washrooms open for public use have been identified in this dataset. This dataset does not include washrooms that may be private or used by members/staff only. The chosen variables of analysis were the Location, The details of the location, Type of the washroom, Accessible, and the status of this washrooms.(0 = closed 1 = open 2 = service alert) See **Table 1** for an overview of the data.

```
-- Attaching core tidyverse packages ----- tidyverse 2.0.0 --
v dplyr      1.1.4      v stringr    1.5.1
v forcats    1.0.0      v tibble     3.2.1
v lubridate  1.9.3      v tidyr      1.3.1
v purrr      1.0.2
```

Location	Type	Accessible
Bellevue Square Park	Washroom Building	NA
Colonel Danforth Park	Washroom Building	Entrance at Grade
East Point Park	Washroom Building	Accessible Stall, Entrance at Grade
Port Union Village Common Park	Washroom Building	Accessible Stall, Entrance at Grade, Automatic Door
Adams Park	Washroom Building	NA
E.T. Seton Park	Washroom Building	Accessible Stall, Entrance at Grade

Table 1: Sample of Toronto Park Washroom Facilities

In the table I save the original column name. And I change the data in the Status column to make it more readable and more intuitive. In the original column of Status, the data shows by 0,1,2, which 0 means the facilities is currently closed, 1 shows it is currently available and open to public, 2 shows it has service alert. which I change the original data in to 0 = closed, 1 = open, 2 = service alert.

2.3 Total count of Washroom Facilities

Table 2: Total Count of Washroom Facilities

Total_Count
418

Table 2: Total count of Washroom Facilities

In the table 2, we use the row of the data to count the total count of washroom facilities in Toronto area.

2.4 The total count of two types washrooms in Toronto

Table 3: Count of Asset Types

type	count
Portable Toilet	74
Washroom Building	344

Table 3: Sample of Count of Washrooms by Types

The total number of portable toilets and washroom buildings is calculated and presented in tabular form.

2.5 The Distribution of Toronto Washroom Facilities Status.

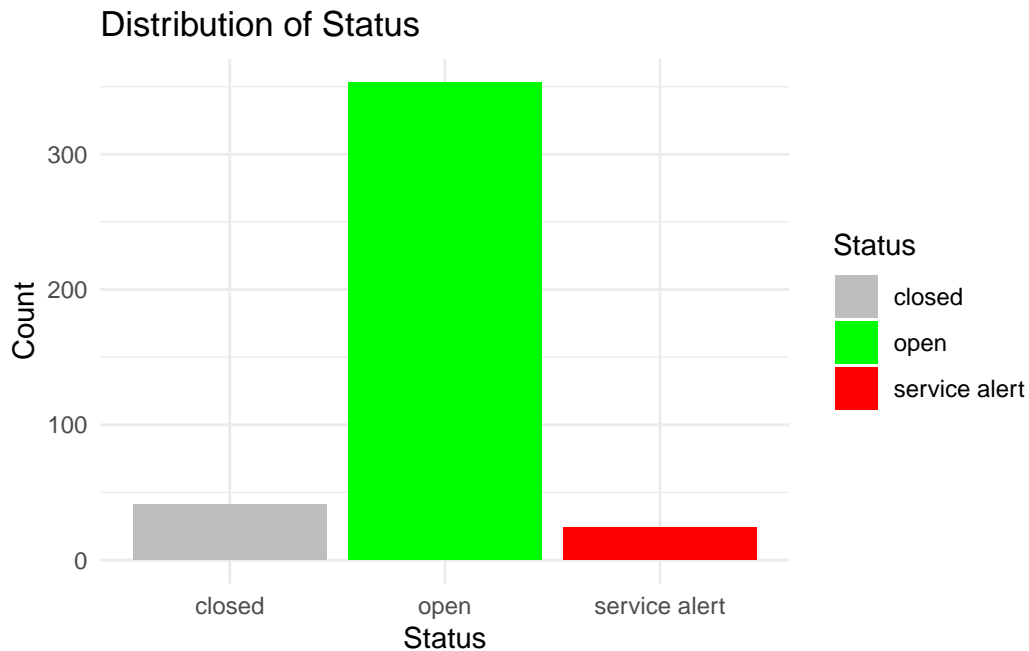


Figure 1: The Distribution of Toronto Washroom Facilities Status.

Integrate the three sets of data in the data and use histogram to more intuitively reflect the differences between the three sets of data.

2.6 The Opening Hours Distribution

[conflicted] Will prefer `dplyr::filter` over any other package.

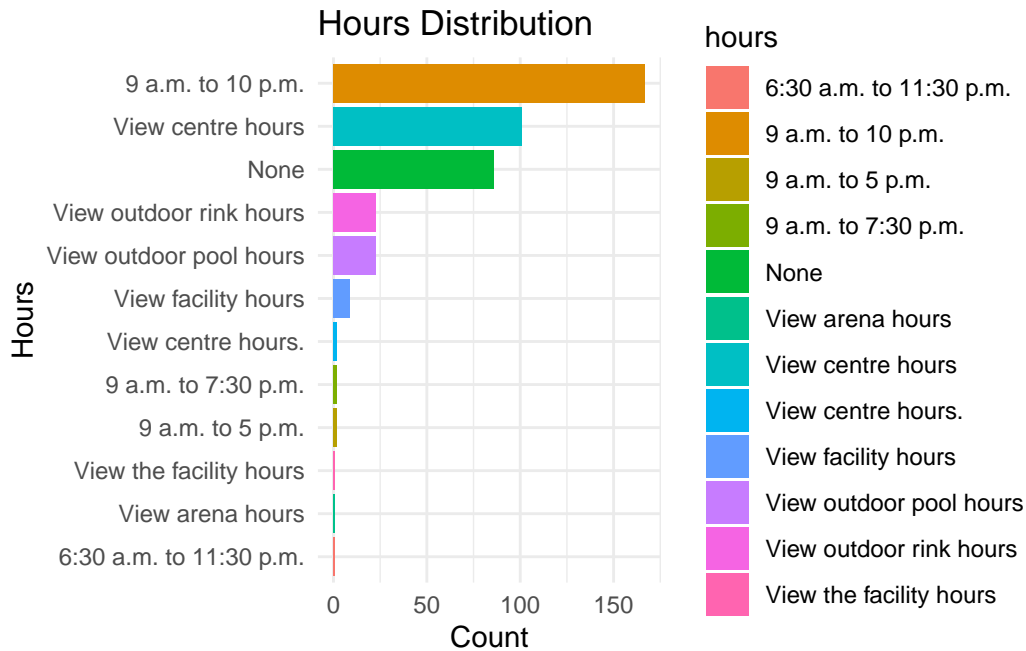


Figure 2: Hours Distribution

3 Discussion

3.1 Discussion based on table 2

In downtown Toronto, the presence of 418 public restrooms plays a crucial role in supporting the needs of residents and tourists alike. While this number may seem adequate, demand can spike during busy periods or events, potentially leading to long wait times or overcrowding. Access to clean and well-maintained facilities is vital for public health and encourages more outdoor activities. To enhance community satisfaction, it's essential for city officials to regularly review restroom locations and their accessibility, ensuring they cater effectively to diverse populations.

3.2 Discussion based on table 3

The data on Toronto's park washroom facilities, with 74 portable toilets and 344 washroom buildings, reflects broader societal needs for sanitation in public spaces. Adequate restroom facilities are essential for promoting public health, especially in urban parks where families and individuals gather. The predominance of washroom buildings suggests an emphasis on providing comprehensive amenities, yet the relatively low number of portable toilets could indicate a need for additional resources during peak usage times or events. Ensuring access to sanitation

facilities enhances community well-being and encourages outdoor activities, contributing to healthier lifestyles.

3.3 Discussion based on figure 1

Currently, Toronto parks have a significant number of washroom facilities that are operational, enhancing the overall visitor experience. With only a small percentage closed or under service alert, the city demonstrates its commitment to public health and convenience. This accessibility is especially vital during busy seasons when parks see increased foot traffic. Regular maintenance and prompt attention to closed facilities will ensure cleanliness and comfort for users. We can see this in Figure 1, the green part is weight higher than the grey and red part, which shows the city's maintenance on the washroom facilities is doing well.

3.4 Discussion based on figure 2

The most common operating hours for park washroom facilities in Toronto are between 9 AM and 10 PM. These hours align well with peak park usage times, accommodating morning visitors and those enjoying evening strolls. However, it's essential to assess whether these hours meet the needs of all community members, including those who may use parks at different times. Expanding operating hours during the summer months or for special events could enhance accessibility and overall visitor satisfaction. This balanced approach can support the well-being of the community while maintaining public health standards.

4 References

R Core Team. (2024). R: A language and environment for statistical computing. R Foundation for Statistical Computing. Retrieved from <https://www.r-project.org> City of Toronto. (n.d.). Washroom Facilities Dataset. Open Data Toronto. Retrieved from <https://open.toronto.ca/dataset/washroom-facilities/> Wickham, H. (2016). ggplot2: Elegant Graphics for Data Analysis. Springer. Available at: ggplot Wickham, H. (2019). readr: Read Rectangular Text Data. Available at: readr Toronto Open Data. (n.d.). Open Data Toronto Package. Available at: Open Data Toronto Yihui Xie (2021). knitr: A General-Purpose Package for Dynamic Report Generation in R. Available at: knitr Wikipedia contributors. (n.d.). Toronto. In Wikipedia, The Free Encyclopedia. Retrieved [date you accessed the page], from <https://zh.wikipedia.org/wiki/>