Report for Canine Waste Dispensers Dashboard

Dog waste is an unpleasant issue that can occur when walking pets. While pet owners should responsibly clean up after their dogs, there can be situations where that doesn't happen, such as when waste bag dispensers are empty. Based on this issue, we found a dataset of Canine Waste Dispensers in New York to analyse. To engage a broad audience, including city planners, park management, and the general public, this dashboard displays a clean and straightforward design, focusing on clear visuals and labels to make complex data easily understandable.

The dataset on Canine Waste Dispensers provides detailed information about the location and specifications of dispensers placed across various boroughs. Each row represents a unique dispenser, capturing attributes such as the type of mounting surface, the entity responsible for restocking, the manufacturer, and the installation date when available. The accuracy and relevance of the data are preserved through regular updates, which provide a current snapshot of the dispenser network and support effective spatial analysis. The data cleaning process for the Canine Waste Dispensers dataset involves several steps to ensure accuracy and consistency. First, missing values in essential columns are handled by filling numerical columns like CommunityBoard and CouncilDistrict with their mean values, while categorical columns such as Borough, DispenserUnitLocation, MountingSurface, and RestockedBy are filled with their most common value (mode). Columns PropertyName and ParkDistrict are set to "Unknown" if missing. Additionally, InstallationDate is parsed into a standardized date format to facilitate time-based analysis. Once cleaned, an exploratory analysis is conducted to identify trends, including dispenser locations by borough and mounting surface distribution, enabling a deeper understanding of the data.

Map:

The point data format is designed by longitude and latitude. The Map Visualization is using leaflet in R to display dispenser locations. A map adds geographic context to other visualizations, letting visitors to better comprehend the spatial distribution of dispensers. To preserve clarity, we used circle markers of varying sizes to make dispensers stand out without dominating the map. The markers are color-coded by borough, allowing users to immediately spot patterns by location. This is consistent with the Color-Coding Principle, which states that color can help group related items without the need for written labels at each location. When a marker is clicked, popup information about the dispenser's location and type appears. This design promotes progressive disclosure,

allowing users to access more specific information on demand.

Time Trends:

An area chart effectively tracks installation activity over time, using a shaded region below a trend line to highlight both total volume and daily changes. Like a line graph but with filled space underneath, it shows total installations briefly while capturing subtle shifts in daily numbers. This clean, uncluttered visualization style makes installation patterns easy to understand, with the shaded area emphasizing cumulative growth and the upper line tracking detailed fluctuations. By including a date range selector, users can filter the data to specific periods, which dynamically updates the histogram. This interactive feature supports user exploration of different time ranges without requiring the dashboard to be reloaded.

Borough Distributions:

Bar charts is used for Borough Distribution. This straightforward chart allows users to easily compare the frequency of dispensers across different locations. The borough chart shows the number of dispensers in each borough, answering questions like "Which borough has the highest concentration?".

ZIP Code Distributions:

The Zip visualization combines a line chart with gradient coloring to show dispenser distribution across ZIP codes, creating an intuitive and clean display of the data. The line chart tracks sequential patterns while color gradients (from light to dark blue) instantly highlight high and low-density areas. Using a minimalist theme removes visual clutter, while angled ZIP code labels and a strategically placed color legend ensure clear readability. This approach effectively balances detailed information with visual simplicity, making complex distribution patterns easy to understand immediately.

Mounting Surface and Location Type Distributions:

For the mounting surface distribution, a circular bar chart is used to visually differentiate the types of mounting surfaces. This unique visualization adds visual interest while still enabling categorical comparisons. Finally, a treemap visualization is used to show the distribution of dispenser locations, such as whether they are placed on park perimeters or playgrounds. This minimalist visualization makes it easy to compare location distributions briefly, with each rectangle's size reflecting the number of dispensers in that location. The design efficiently uses space while keeping the data clear and instantly understandable. These visualizations support users in exploring patterns and trends in where the dispensers are physically located and installed.

The goal of this dashboard is to visually represent data on canine waste dispensers throughout multiple boroughs and ZIP codes, including installation trends, distribution by location, and mounting surface types. This design's goal is to develop a simple, accessible, and interactive interface that allows users to dynamically explore data, compare boroughs and ZIP codes, and analyze installation patterns over time. This dashboard was created with simplicity and user-centered design, emphasizing intuitive layout and ease of navigation. We used shiny-dashboard's modular and responsive framework to establish a clear separation between controls and content. This structure follows the Gestalt Principle of Proximity (Week 2 Lecture), ensuring that relevant controls and visualizations are placed together, allowing users to rapidly comprehend the interface. The sidebar contains filtering options that allow users to customize the data displayed throughout the dashboard. This simplifies exploration and analysis by allowing users to filter by date range, borough, mounting surface, and zip code. The main body consists of many tabs, each dedicated to unique data aspects map visualization, temporal trends, and distributions allowing users to access and study various dimensions of the data.