Exploring Pedestrian Activity and Park Utilisation in Casey Suburbs

Aims:

- To analyse pedestrian activity and park usage patterns in the City of Casey suburbs.
- To provide insights into peak pedestrian times and trends for weekday vs. weekend activity.
- To explore how parks and reserves are utilised and identify trends in their usage across different seasons.
- To support urban planning decisions that enhance public safety, community well-being, and sustainable development.

Motivation:

- Rapid urbanisation in the City of Casey creates challenges in managing public spaces like parks and pedestrian pathways.
- Understanding pedestrian movement and park utilisation can guide city planners to improve infrastructure, accessibility, and community engagement.
- The goal is to make data-driven decisions that promote safer, liveable, and sustainable urban environments

Yehezkiel Efraim Darmadi

Park Utilisation & pedestrian activity

A → Idea: pedestrian count distribution overtime

A1 heat map
- month
- weekofday
- date
- week ofdays
- hour

A2 ridgeline
- month
- weekofday
- date
- weekdays
- hour

A3 Stream graph
- date
- weekof days
- hour
number of pedestrian
month

A4 line plot
number of pedestrian
month
- date (1-30)
- weekof days (1-7)
- hour (0-24)

B → Idea: pedestrian count distribution location

B1 choropleth map
low — high pedestrian count

B2 Bubble map

B3 Bar Graph
Pedestrian count
loc

C → Idea: forecast count pedestrian

C1 Line plot
Top 3 Suburbs or dor site (by mean)
... t4 t3 t2 t1 t0 t1

C2 Ultroop plot
- by default show all suburb underfitted
t-4 t3 t2 t1 t0 t1

D → Idea: Weekend & weekdays pedestrian count trend

D1 line plot
Pedestrian count
per Suburb
weekday

D2 Stacted bar plot
Pedestrian count
per Suburb
not weekend
weekend

D3 Heat map per suburb
week end
not weekend
- hourly
- monthly

E → Idea: distribution of park & reserves

Pedestrian dataset
E1 park & reserves
closest
map
sensor
using boundaries

Bar Graph
E2
num of park & reserves
suburb
working boundaries

F → Idea: Pedestrian count for park reserves

F1 choropleth map
low — high pedestrian count

F2 Bubble map

F3 Stacted Histogram (time frame)
number of pedestrian
top park
Park reserves

Questions:

* Would displaying data overtime be more effective in highlighting trends?
* If showing pedestrian data geographically necessary to convey key insights effectively?
  * Can users filter the data based on location, timeperiod, or parks?
  * Can users view a summary of overall graph after applying filters to better understand the pedestrian trends across the city?

Filter
- A4, C1, and D1 tell the same insight
- C2 is not sufficient to show all suburb
- All choropleth map is not possible since the loc is only according

- All D is redundant to A
- F2 is not possible because each park & reserves are near eachother

Categorize
Pedestrian count vs Time frame vs location & Time frame comparison
A, B, C

Pedestrian count vs location vs park & reserves
E, F

Combine & refine
B could filters
↓
A & C → can be combined into one graph, it could be into line graph or Stream graph

E & F → can be combined into one map

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6-Oct-2024
Sheet 1

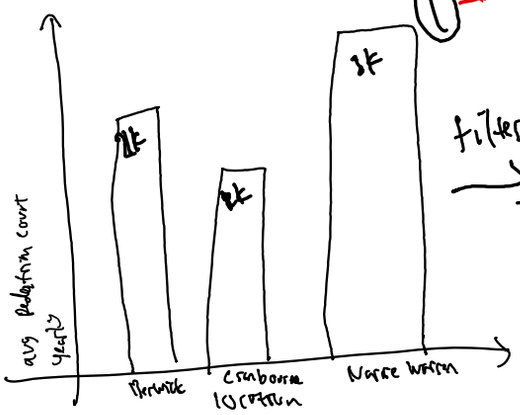
Layout

Count pedestrian per location

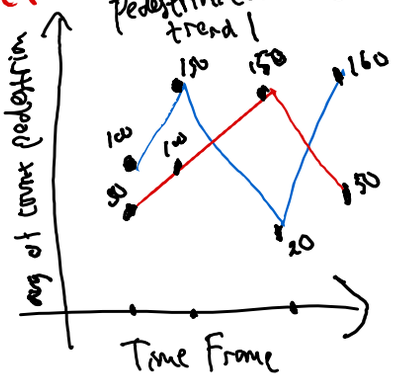
Aggs
- Monthly
- Date
- Dose of week
- weekend vs weekday
- Hourly

(2)

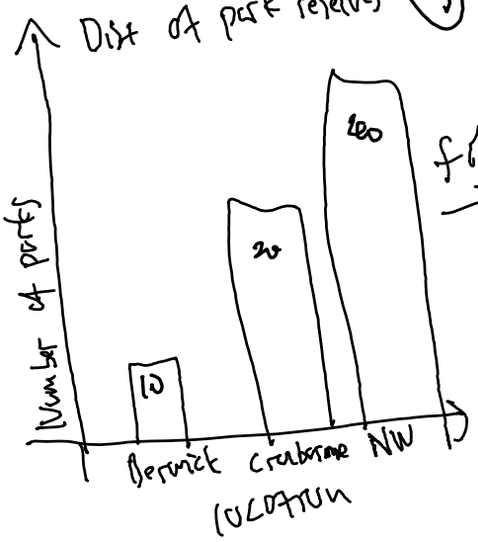
(1) reset



filters



(3) reset

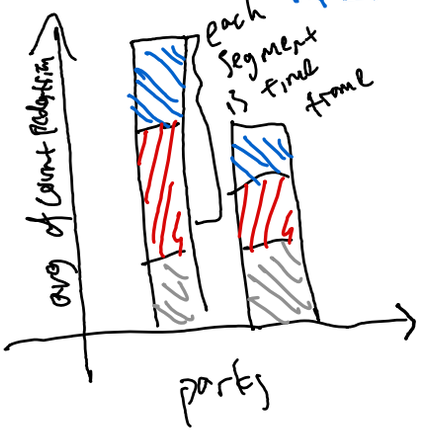


filters

(4)

Pedestrian count trend for parks

top



Info

Author: Yehezkiel Efraim D

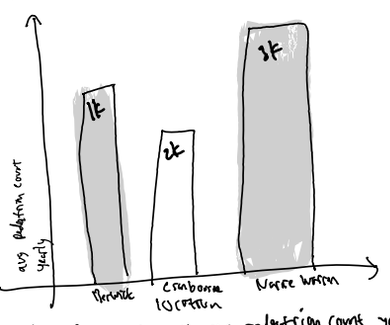
Date: 6-10-2024

Sheet: 2

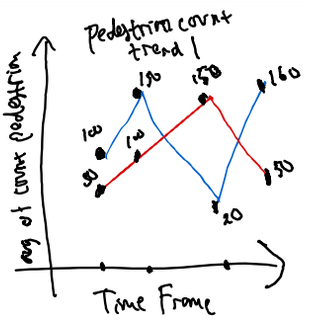
Task: Detailed centered dashboard

Operations
- clicking or hovering over each bar in plot 1 & 3, it will filters plot 2 & 4.
- Aggregate option in plot 2 is to combine the line chart as one line to see the overall trend line
- Reset option to clear filters
- It is possible to select 2 bars for plot 1, 3
- plot 4 could select how many top-n parks to show, up until 10.
- Time frame availability (filters 2, 4)
  - Monthly
  - Date
  - Dose of week
  - weekend vs weekday
  - Hourly
- Hovering over to each subsection in plot 4, reveal its value

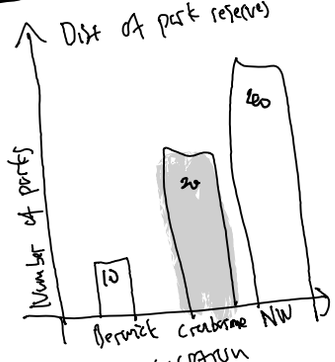
Focus



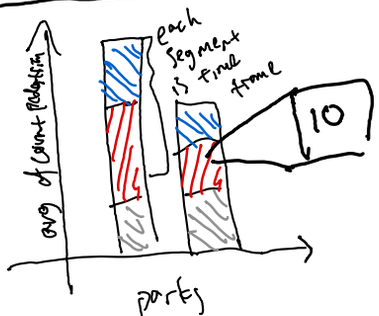
- Shows number of avg pedestrian count yearly
- It highlights selected bar for filter



- Shows number of avg pedestrian count per time frame



- Shows the distribution of parks each location
- It highlights selected bar for filter

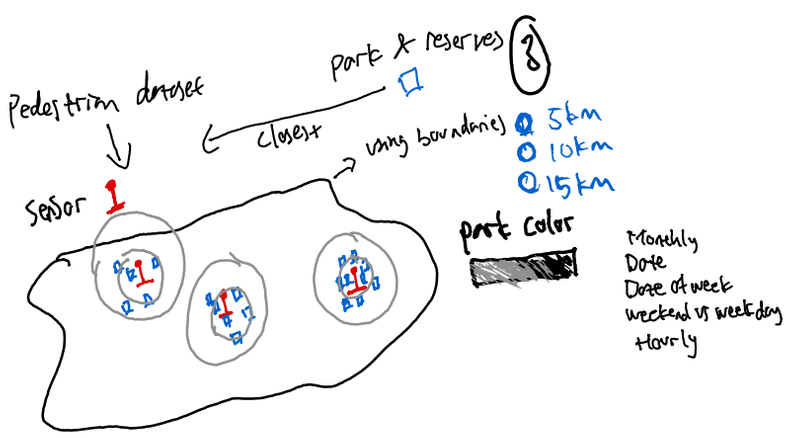


- Shows the avg count pedestrian per parks and time frame
- Each section could shows the avg values if hovered

Advantages
- Graphs are simple & easy to understands
- Figures are layed out more clearly

Disadvantages
- Too many plots
- Too many filter options

Layout



Info

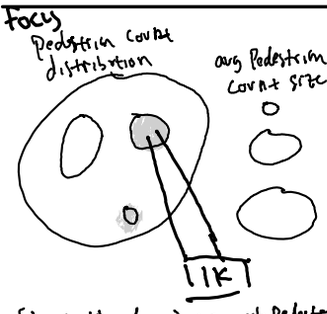
Author: Yehezkiel Efraim D

Date: 6-10-2024

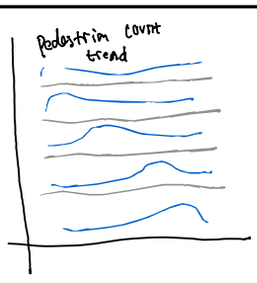
Sheet: 3

Task: Visual centered dashboard

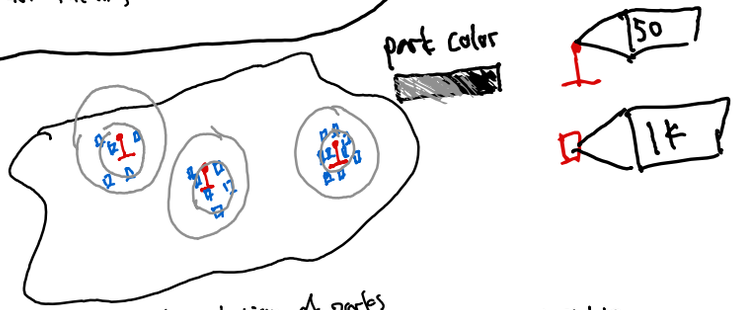
Focus



- Shows the distribution of pedestrian count
- Hovering shows real values
- It highlights circles that is used for filtering



- Shows the distribution count trend timeframe vs time frame



- Shows the distribution of parks
- Each parks has color using color hue (tab limited to colors)
- Hovering shows the detailed values of each sensor and parks, also the park codes

Operations

- Clicking & hovering circle in plot 1 could filter plot 2.
- Plot 1 could change location granularity
- Could choose several circles in plot 1 to filter plot 2
- Hovering circle in plot 1 could show avg count pedestrian yearly
- Plot 2 axis granularity could be change:

X-axis	Y-axis
- date	- Monthly
- Day of week	- Date
- Hourly	- Day of week
	- weekend weekday

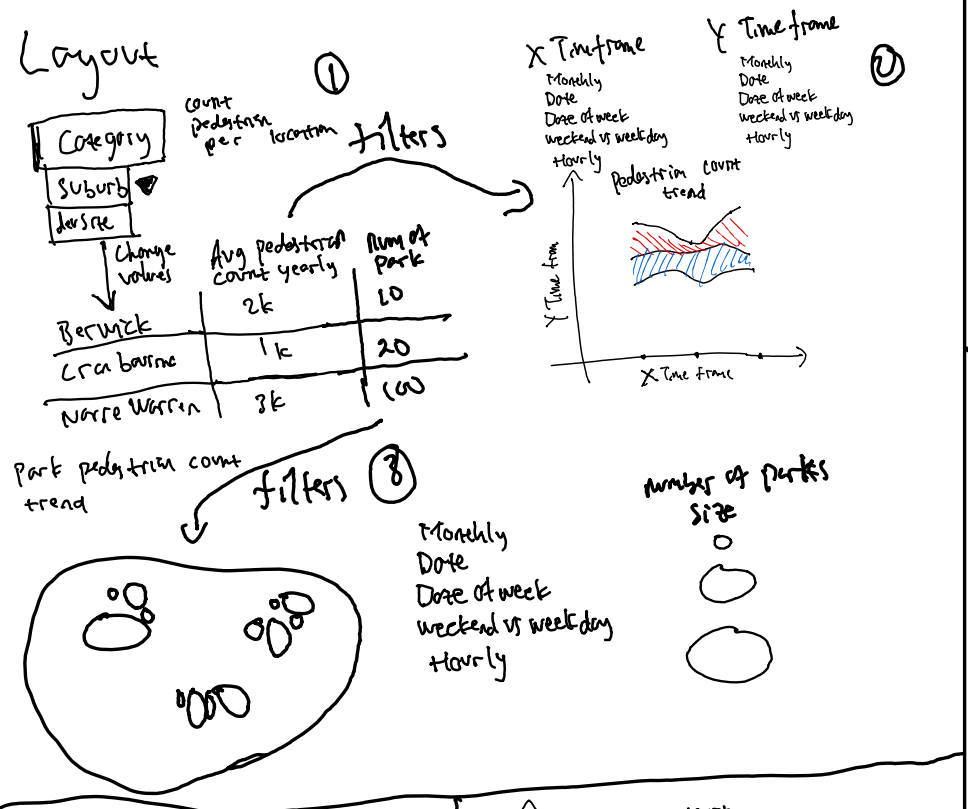
- Hovering each dist graph could show central statistics.
- Hovering each park in plot 3 shows the avg pedestrian count and the park code
- Hovering each sensor shows the number of parks
- Could choose the radius of circle for plot 3.
- Reset button for reset the filter
- Plot 3 uses to filter timeframes
  - Monthly
  - Date
  - Dose of week
  - weekend vs weekday
  - Hourly

Advantages:

- More flexibility to the users
- Users could visually see the distribution in the map
- The usage of the size in plot 1, intuitively easier for the user.
- The different shape in plot 3 gives a nice visualization
- The color hue in the plot 3 makes it easier for the user to identify the trend
- Plot 2 intuitively shows the trend very clearly

disadvantages

- Too many filtering options
- Some plots are more difficult to understand
- Some detailed values (plot 2) isn't mentioned
- The shapes & circles in plot (1&3) could be overlapping and it will make it harder to hovering
- Y-axis filter values dependson X-axis filter values, which could make user confuse



Info

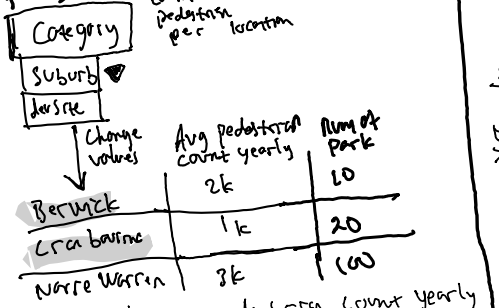
Author: Yehezkiel Efraim D

Date: 6-10-2024

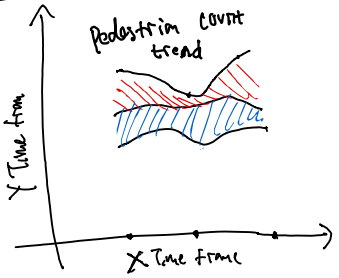
Sheet: 4

Task: Table filter dashboard

Focus



- Shows the avg pedestrian count yearly
- Shows the number of parks
- It highlights the selected filters



- Shows the data count trend timeframes vs timeframe

Operations

- plot 1 could choose category to change the values in the table. It will show:
  - Avg pedestrian count yearly
  - number of parks
- The values in the category could be used to filter plot 2&3
- The users could choose multiple values in plot 1.
- Hovering for each section in plot 2 shows central statistics.
- X and Y time frame for plot 2 can be customized:

X Time frame
- Monthly
- Date
- Day of week
- weekend vs weekday
- hourly

Y Time frame
- Monthly
- Date
- Day of week
- weekend vs weekday
- hourly

- Hovering each figure in plot shows the number avg pedestrian count for plot 3
- The user could choose time frame for plot 3

- Shows the pedestrian count trend per parks

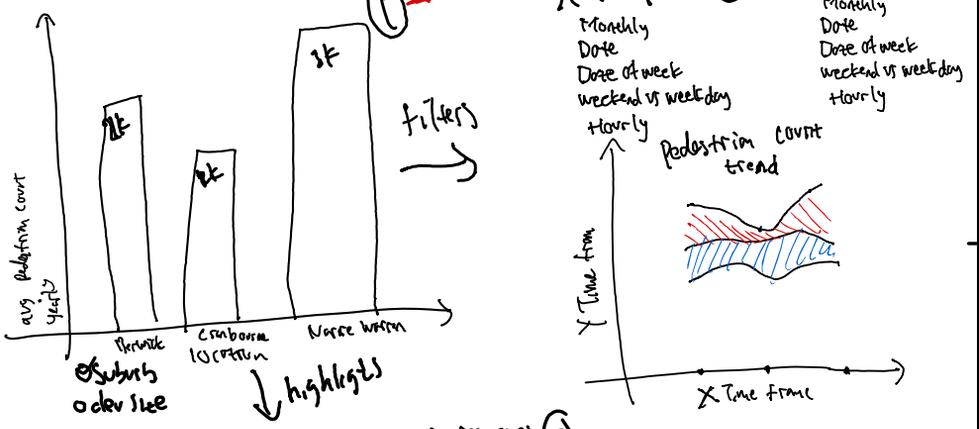
Advantages

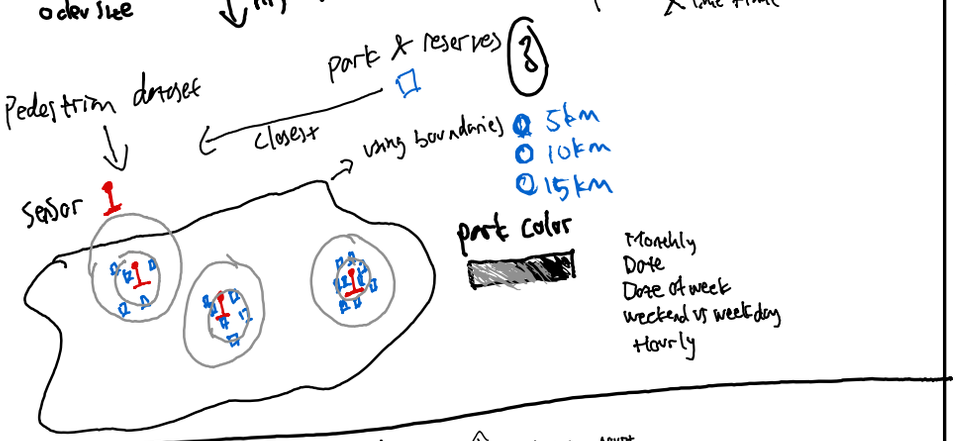
- The design has less plots
- Plot 1 gives every detailed values
- Less operations such as filters and options to choose
- Plot 2 time frame is flexible

Disadvantages

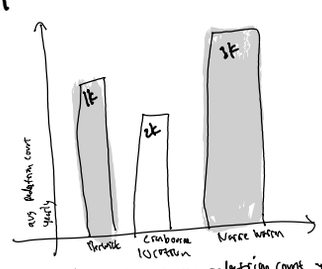
- It is hard to see the trend on location for plot 1.
- It is hard to seperate location & filter on plot 2&3
- Since the park coordinate is very small, the size of the parks for the visualisation will be small

Layout

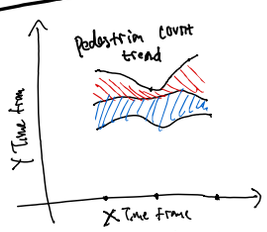




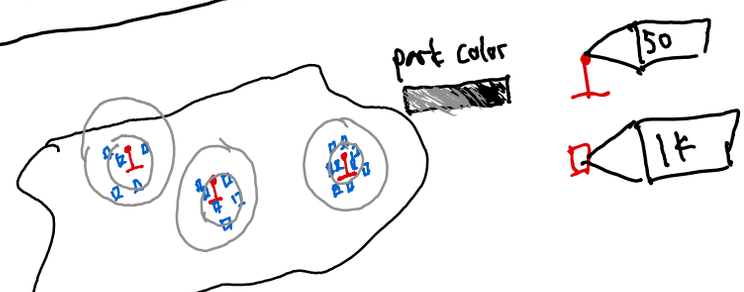
Focus



- Shows number of avg pedestrian count yearly
- It highlights selected bar for filter



- Shows the data count trend timeframes vs timeframe
- Trend changes according to plot 1



- Shows the distribution of parks
- Each parks has color using color hue (tab limited to colors)
- Hovering shows the detailed values of each sensor and parks, also the park codes

Details

Dependencies
- RShiny
- Wrangling R

Estimate (cost)

- No cost

Info

Author: Yeheskiel Efraim D

Date: 6-10-2024

Sheet: 5

Task: Final Dashboard

Operations

- clicking and hovering plot 1 will filter plot 2 and highlights the area in plot 3
- the user could change the location from suburb to development site
- The users could choose multiple bar on plot 1 to be used for filter
- Hovering for each section in plot 2 shows central statistics

X and Y time frame for plot 2 can be customized:

X Timeframe
- Monthly
- Date
- Dose of week
- weekend vs weekday
- Hourly

Y Timeframe
- Monthly
- Date
- Dose of week
- weekend vs weekday
- Hourly

- Hovering each park in plot 3 shows the avg pedestrian count and the park code
- Hovering each sensor shows the number of parks
- Could choose the radius of circle for plot 3.
- Reset button for reset the filter
- Plot 3 uses to filter timeframes
  - Monthly
  - Date
  - Dose of week
  - weekend vs weekday
  - Hourly

Estimates (time)

- 1 day for plot 1
- 1 day for plot 2
- 2 days for plot 3
- 1 day to connect the plots
- 1 day buffer