



Academic Year 2022 - 2023, Term 2
IS415 Geospatial Analytics and Applications

User Guide

**Project Title: Transit-Ability - An Interactive Shiny App Analysing the Accessibility of
Singapore's Rail Transport System**

Section: G1

Group 5

Alanis Zoe Chia Hui Lin

Daniel Chng Chong Yee

Leon Tan Li Yang

Transit-Ability Quick Guide	3
1 Home Page	4
1.1 Navigation Tab Bar	4
2 EDA (Exploratory Data Analysis)	4
2.1 Selection of Place of Interest.....	4
2.2 Map Visualisation.....	5
2.2.1 Map of MRT stations and place of interest.....	5
2.2.2 Map of population density and MRT stations.....	6
3 Accessibility Models	7
3.1 Left Control Panel.....	7
3.2 Maps and Graphs.....	9
3.2.1 Hexagon Accessibility Heat Map.....	9
3.2.2 Point Map of MRT stations and place of interest.....	9
3.2.3 Statistical Box Plot.....	10
4 Frequently Asked Questions	10



Transit-Ability Quick Guide

Find out how effective Singapore's Mass Rapid Transit System is with Transit-Ability.

This application will allow you to study the accessibility of train stations with three different Geospatial models, even if you have no programming background. The models are: Hansen Model, KD2SFCA and Spatial Accessibility Model.

Access the application here: <https://idccy.shinyapps.io/Transit-Ability/>

1 Home Page

Upon landing on the home page, an overview of the project's motivation and the relevant datasets used is presented to the user. He will be able to look through the details of each dataset.

1.1 Navigation Tab Bar

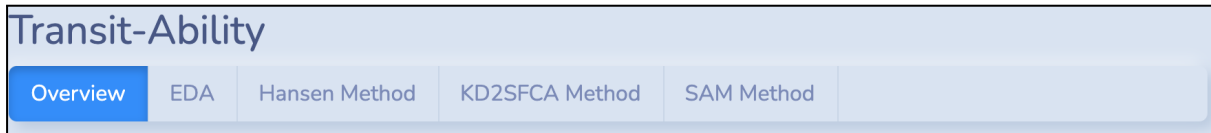


Figure 1: Navigation Tab

The navigation bar on the top of the application allows the user to navigate between models.

2 EDA (Exploratory Data Analysis)

2.1 Selection of Place of Interest

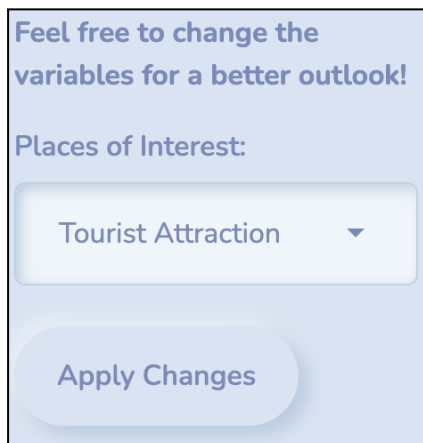


Figure 2: Feature to select place of interest

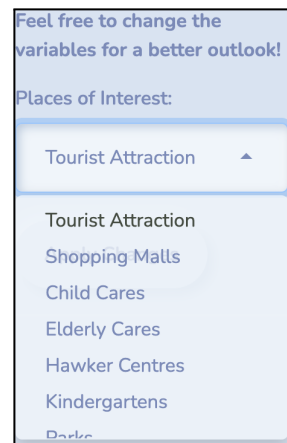


Figure 3: Drop-down list options

Navigating to the EDA tab, the user can get an overview of what the data is like and how the MRT stations are spread out over Singapore.

- On the left hand panel, he is able to select the place of interest that he would like to visualise on the map (Figure 2).
- Selecting the drop-down list will provide more options for the user to select (Figure 3).
- Once selected, the user can select on 'Apply Changes' in Figure 2 to visualise the points on the map. This will be reflected on the right hand side of the application.

2.2 Map Visualisation

2.2.1 Map of MRT stations and place of interest

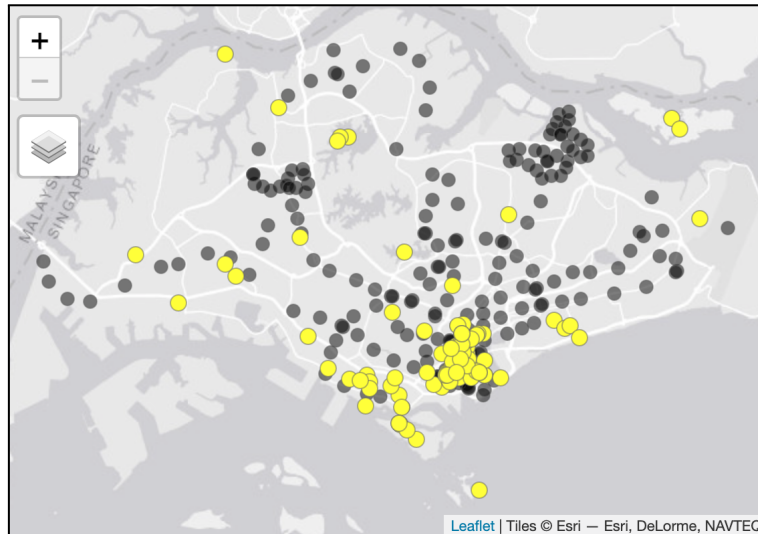


Figure 4: Visualisation of MRT stations and place of interest

Once the changes in 2.1 are applied, the user is able to get an overview of how the MRT stations and places of interest look like when represented on the map (Figure 4).

The black points represent the MRT stations and the yellow points represent the location of the selected place of interest.



Figure 5: Zoom Control



Figure 6: Layer Selection

The +/- control (Figure 5) on the top left of the map allows the user to zoom in and out of the map. '+' zooms further into the map and '-' zooms out. Alternatively, the mouse scroll does the same job.

The icon below the zoom control (Figure 6) on the map allows users to select their desired base maps.

2.2.2 Map of population density and MRT stations

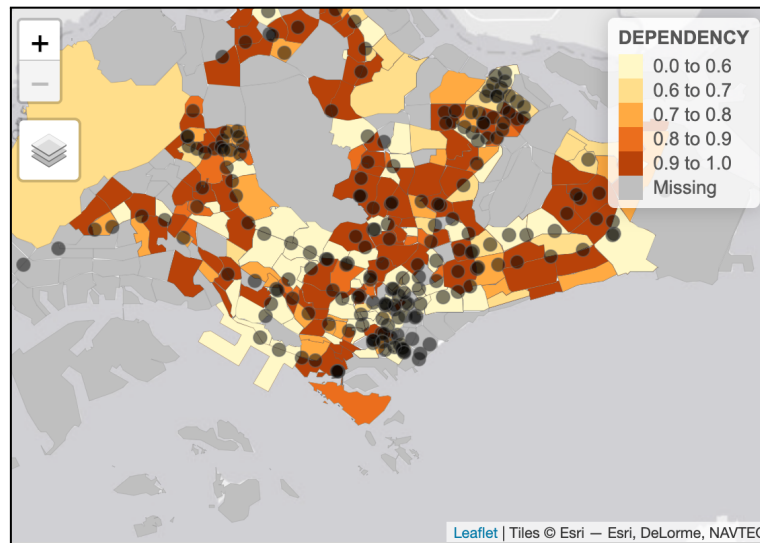


Figure 7: Visualisation of MRT stations and population density

Users are also able to visualise a rough relationship between density of MRT stations and population (Figure 7).

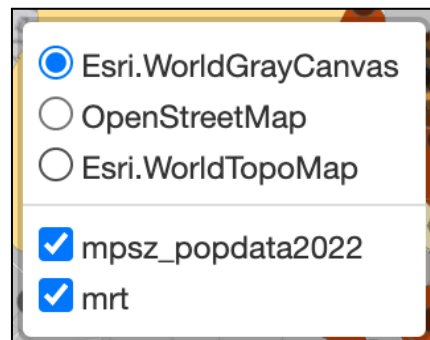


Figure 8: Layer options

They also have the option to select or deselect the data they wish to visualise on the map (Figure 8).

3 Accessibility Models

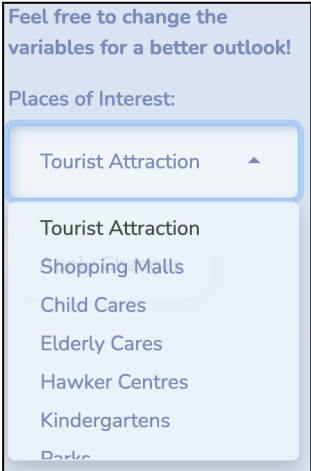
Navigating to each of the accessibility model’s tabs i.e. Hansen Method, KD2SFCA or SAM, the user will see a standardised view of a left panel and graphs on the right.

3.1 Left Control Panel



Figure 9: Overview of left panel for models

There are 6 variables the user can vary. They are:

Variable	Functionality
 <p>Figure 10: Place of interest</p>	<p>From this drop-down list in Figure 10, the user can select the place that he wants to analyse, in terms of accessibility from the MRT stations.</p> <p>‘Tourist Attraction’ is selected as the default. Other options include:</p> <ul style="list-style-type: none"> - Shopping Malls - Child Cares - Elderly Cares - Hawker Centres - Kindergartens - Parks - Supermarkets - Primary Schools

Demand:

Demand: Represents the population in each area

Capacity:

Capacity: Represents the number of amenities or services available at each location

Figure 11: Demand and capacity

The demand and capacity input fields allow the user to specify the demand and supply of the place of interest and MRT stations.

The map's accessibility value may change according to the demand and supply of each area.

Focus Region:

All Region
Central Region
West Region
East Region
North-East Region
North

Figure 12: Focus region

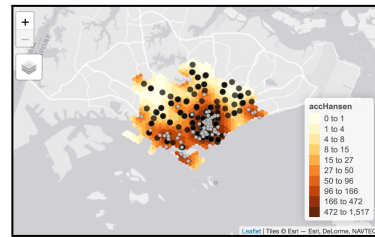


Figure 13: Result of 'Central Region' being selected

Focus region drop-down list will result in the highlighting of the area on the map according to the user's selection (Figure 13).

Mapping Colour:

Grey
White
Yellow Orange Brown
Green
Blue
Pink
Purple

Figure 14: Mapping Colour

The mapping colour defines the colour of the points representing the MRT stations.

The default mapping colour is grey. However, other options include:

- White
- Yellow
- Green
- Blue
- Pink
- Purple
- Cyan
- Lime Green

Hexagon Variable Colour:

Yellow Orange Brown
Yellow Orange Red
Purple Blue Green
Red Blue
Blue Green
Blue

Figure 15: Hexagon Variable Colour

The hexagon variable colour represents the hexagon colours.

The default colour scheme is 'Yellow Orange Brown'. However, other options include:

- Yellow Orange Red
- Purple Blue Green
- Red Blue
- Blue Green
- Blue

Once the changes are selected, the user can click on 'Apply Changes' at the bottom in Figure 9 for their selected changes to be applied to the maps. The maps and box plot on the right will be updated accordingly.

3.2 Maps and Graphs

3.2.1 Hexagon Accessibility Heat Map

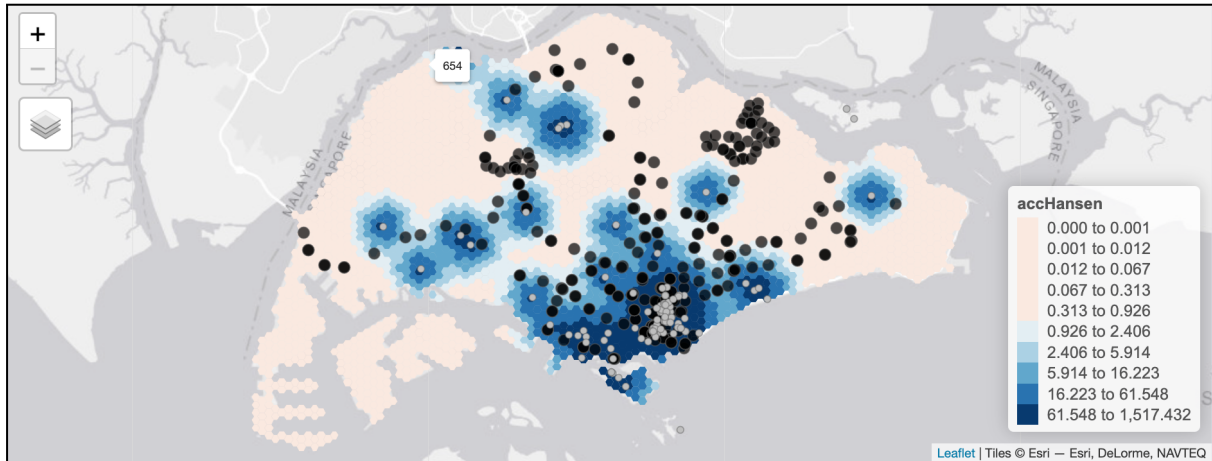


Figure 16: Hexagon heat map with Red Blue colour scheme

The first map displayed shows the heat map of accessibility of the MRT stations. Depending on the colour scheme chosen, the colours will represent the different accessibility values.

3.2.2 Point Map of MRT stations and place of interest

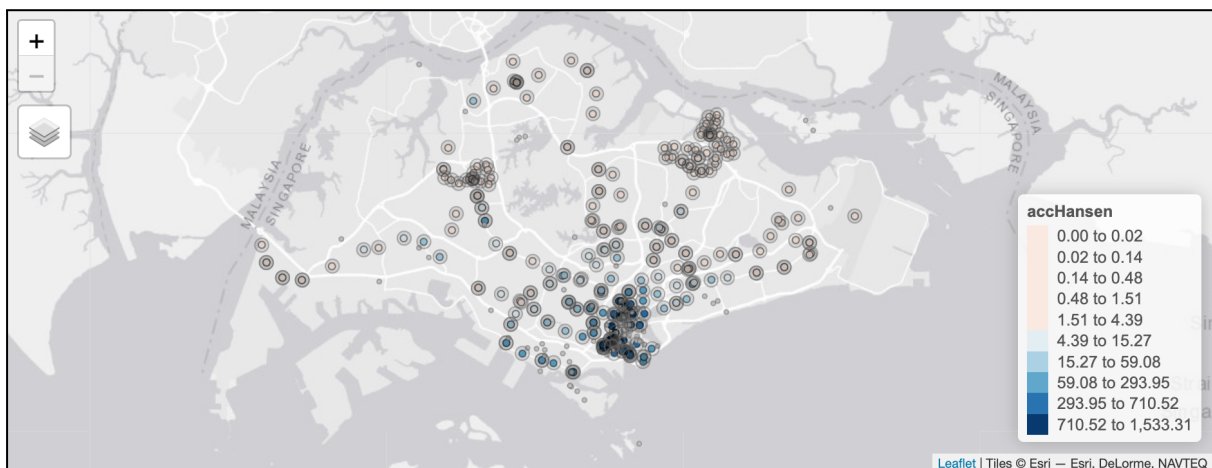


Figure 17: Point map with Red Blue colour scheme

The second map displayed shows the MRT stations, with their point colours representing the accessibility value of the station to the selected place of interest (Figure 17).

3.2.3 Statistical Box Plot

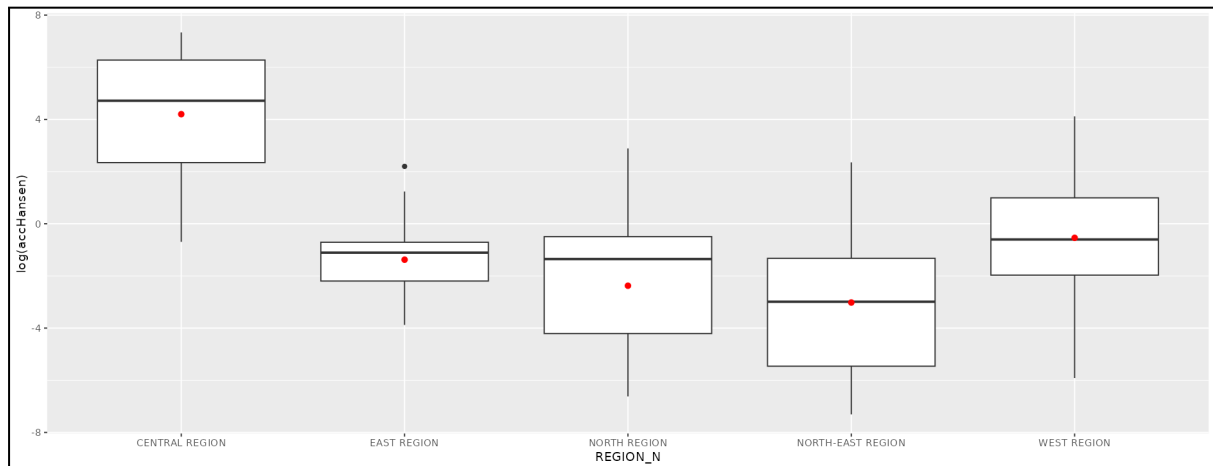


Figure 18: Statistical box plot of all regions' accessibility values

The last graph, the box plot (Figure 18), provides the user a clearer view of the accessibility of the MRT stations in the different regions.

4 Frequently Asked Questions

For other enquiries, please contact:

- Alanis Zoe Chia Hui Lin: alanischia.2018@scis.smu.edu.sg
- Daniel Chng Chong Yee: daniel.chng.2020@scis.smu.edu.sg
- Leon Tan Li Yang: leon.tan.2020@scis.smu.edu.sg