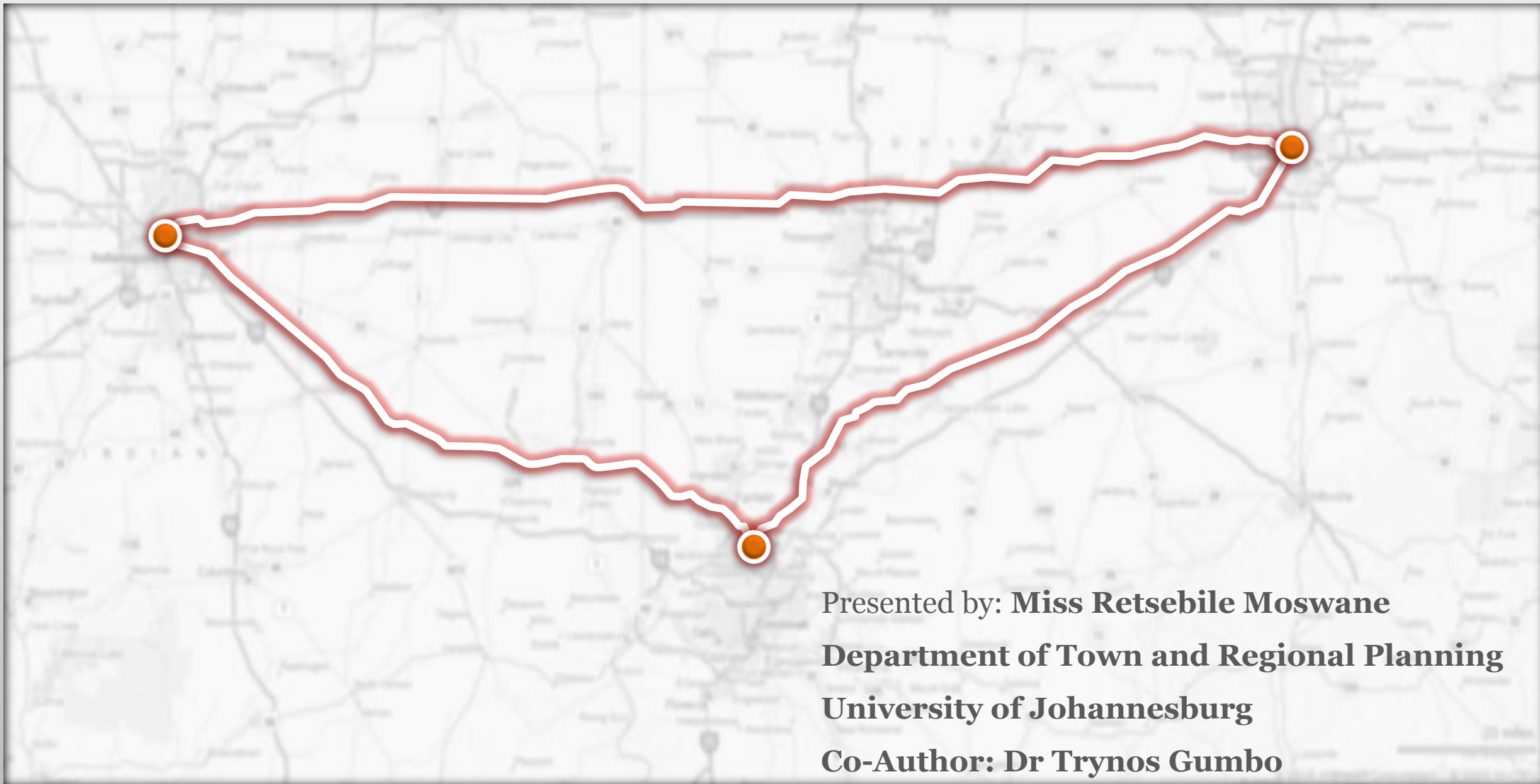# Examining the applicability of Location Based Services to determine the movement patterns of commuters between Sandton and Park station in Johannesburg City.
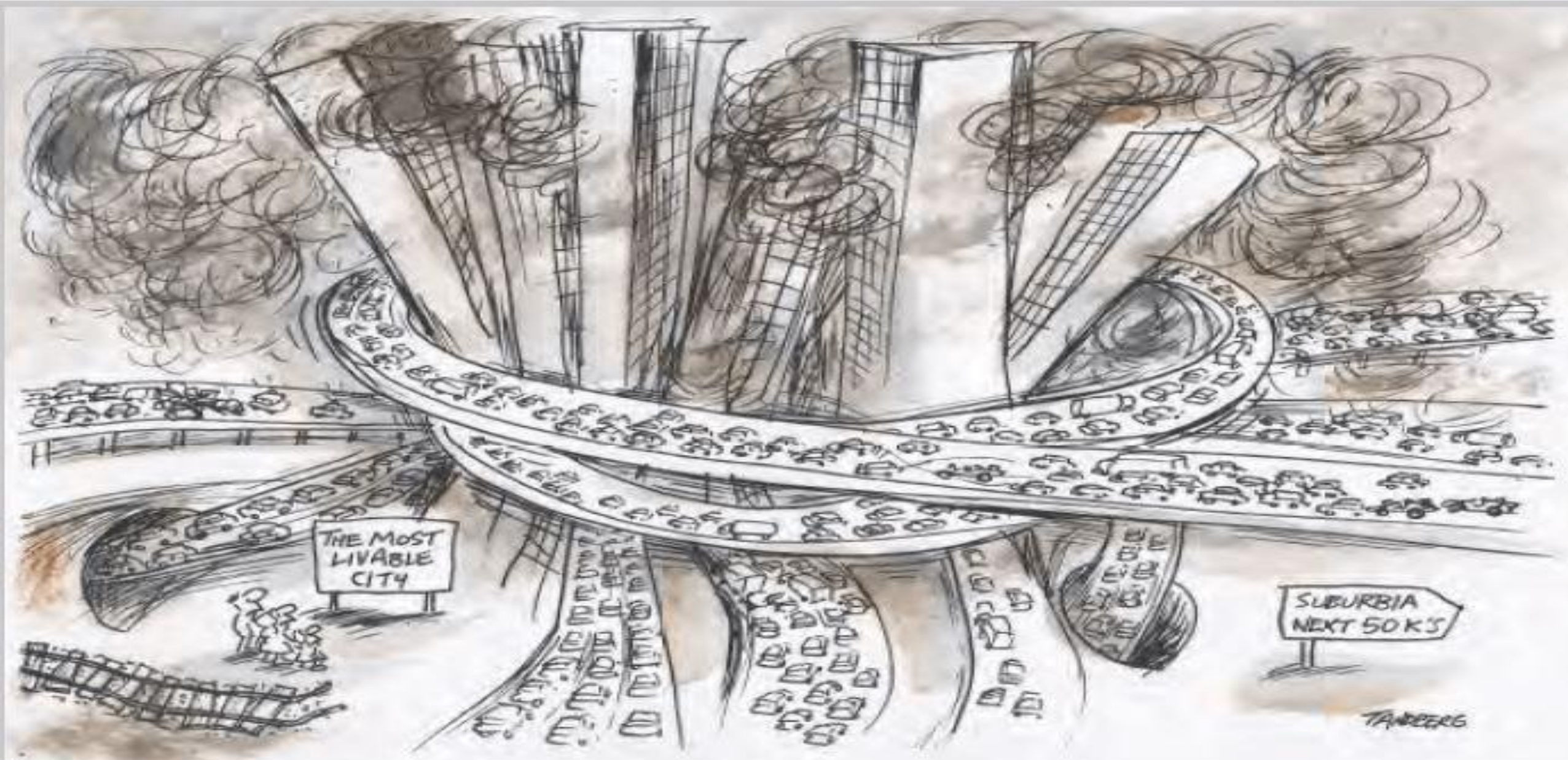
Presented by: **Miss Retsebile Moswane**

Department of Town and Regional Planning

University of Johannesburg
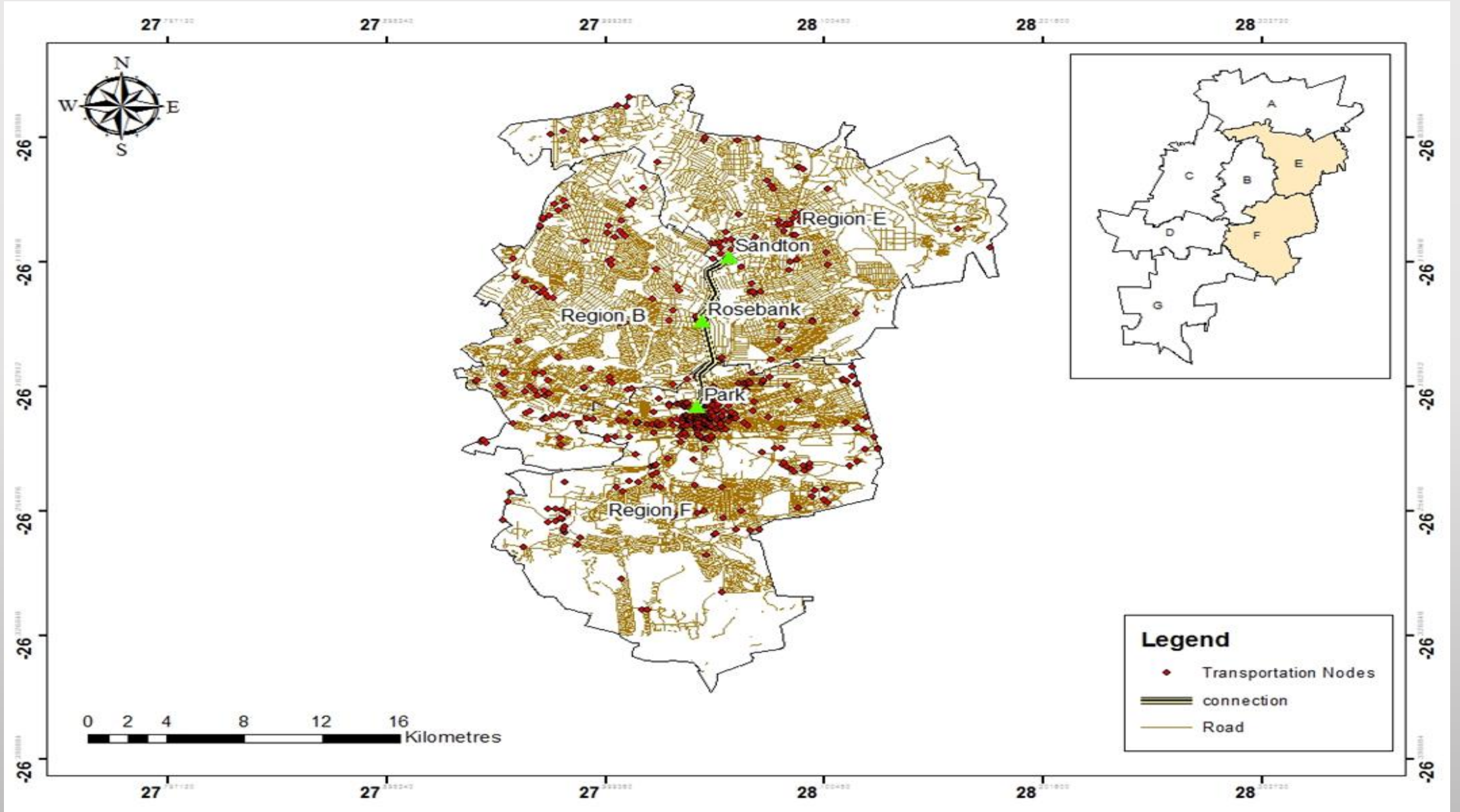
Co-Author: Dr Trynos Gumbo

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Introduction

# Locating the Research

Locating the Research

Problem statement

- Urban public transport systems in Johannesburg Metropolitan City have been transformed from being mere vehicles to agents that address spatial fragmentation. Currently, urban public transport systems have been directed towards restructuring the City TOD as a way of redressing issues of transportation such congestion, lack of safe, affordable, reliable, convenient and sustainable public transport faced by commuters daily. A variety of modes of innovative transport such as Gautrain and Rea Vaya to name a few has been introduced in the City of Johannesburg as sustainable modes of transport to address these issues.

- Although studies have been carried out internationally on transportation analysis in general, mobility patterns, historic and current travel patterns as well as studies suburbs to town travel patterns there have been very few studies if not none on the movement patterns of commuters from one centre to the other centre in the Johannesburg Metropolitan City. In particular, there have not been enough studies to illuminate the movement patterns of commuters between Sandton and Park micro city. As a result, this work focuses on examining the applicability of LBS in determining the movement patterns of commuters between Sandton and Park Station, with the objective of understanding the connections that need to be developed between micro city centers.

Study methods

- Adopted a case study design with Mixed Approaches (Qualitative, Quantitative and Spatial).

- Echo-Echo software was used to mine crowd sourced data from social media platforms such as Twitter and Facebook.

- The data revealed commuters locations that was used to show their movement patterns within the City of Johannesburg.

- Echo-Echo qualitative and quantitative data provided understanding of language usage, the psychological drivers behind conversations, language and linguistic insight, advanced word clouds, topics, category analysis and crucial data in determining socio-economic transformations in the City.

- A survey of 60 Gautrain and Rea Vaya commuters took park in the study by filling in electronic questionnaires.

- Key informant interviews were conducted on GMA and JRA
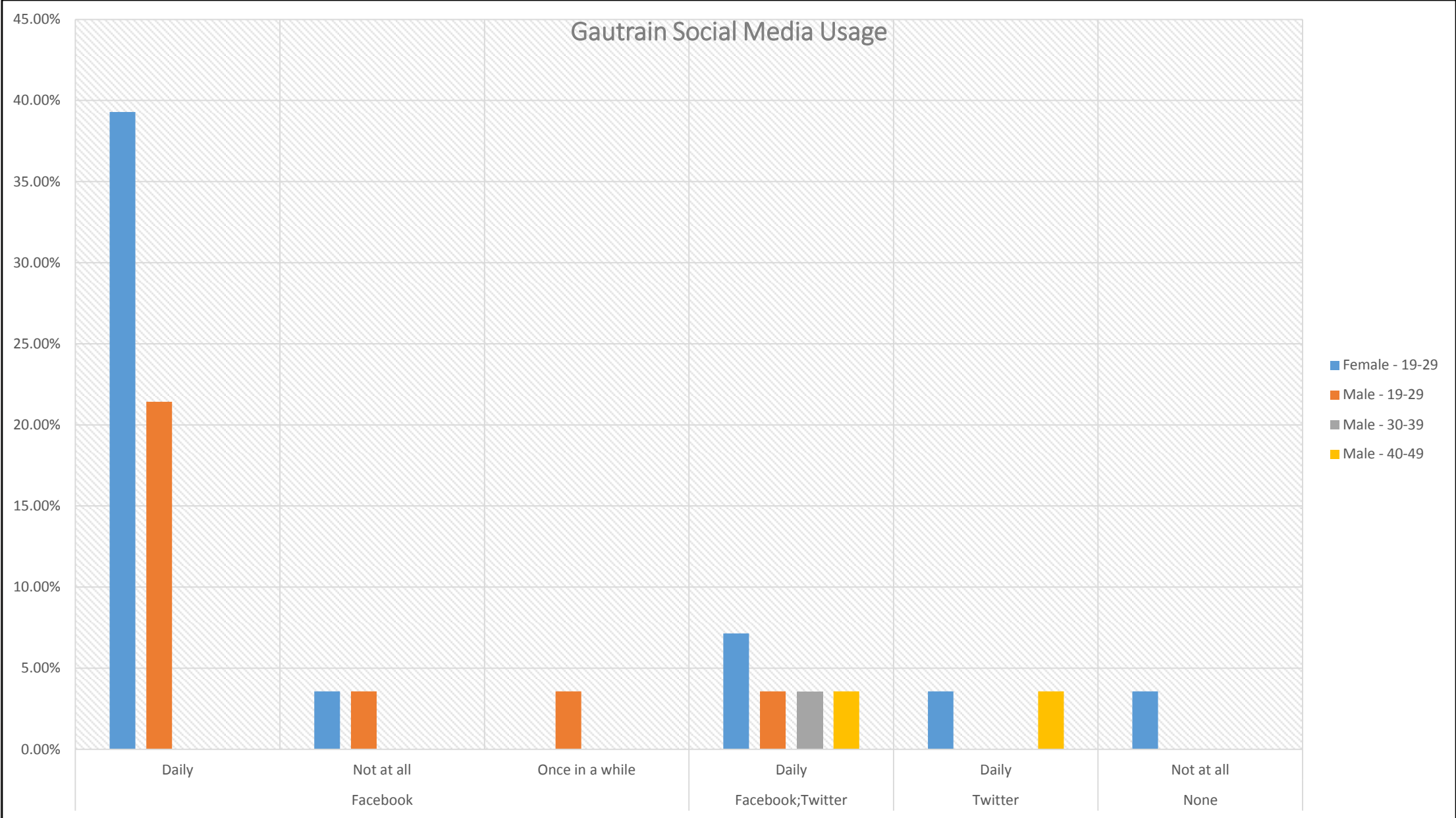
Network Nodes
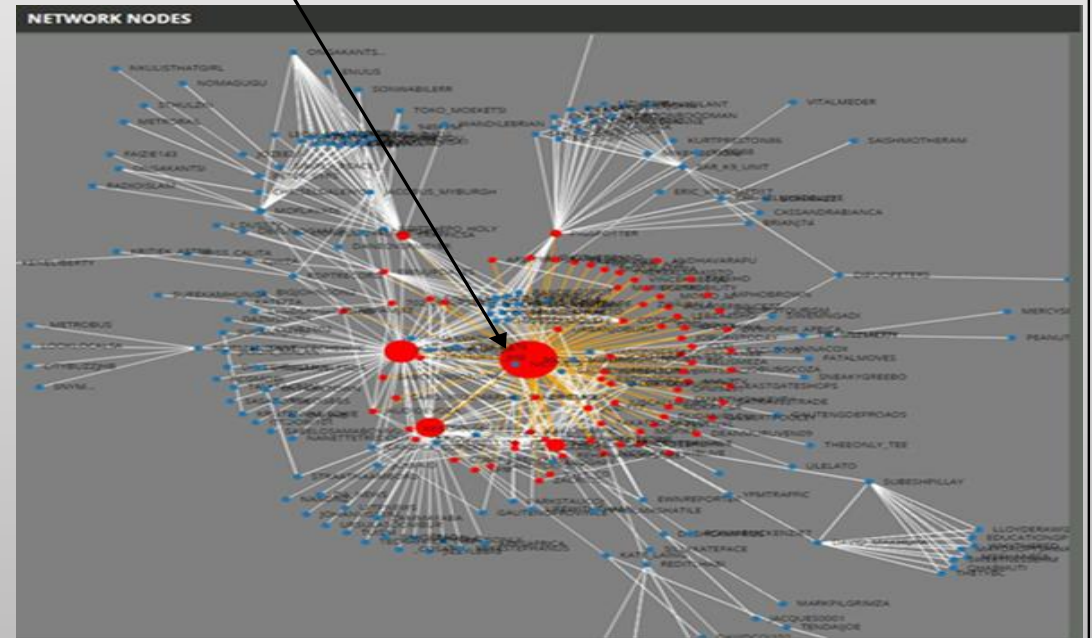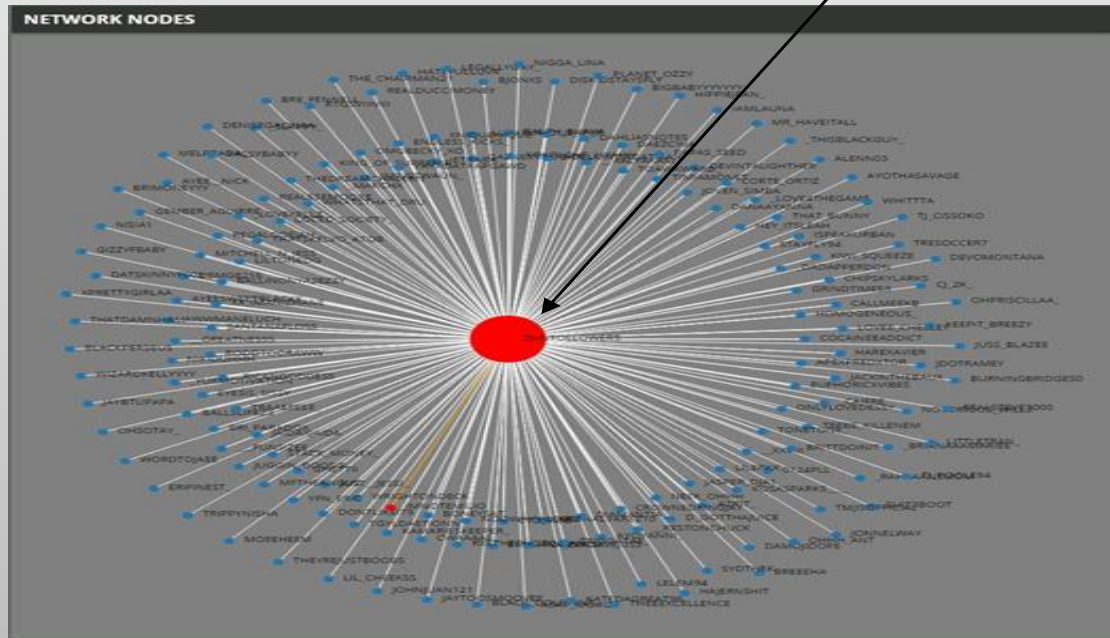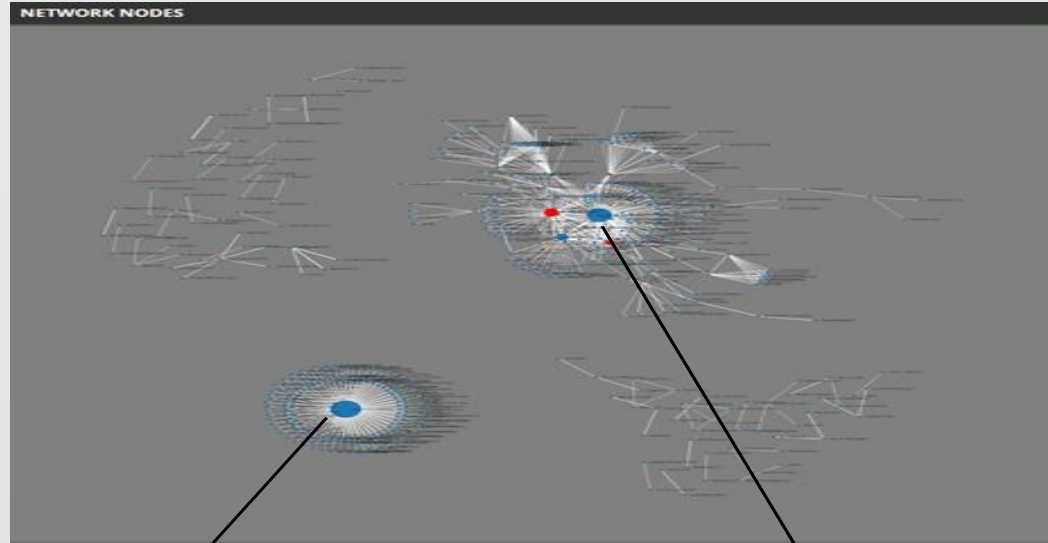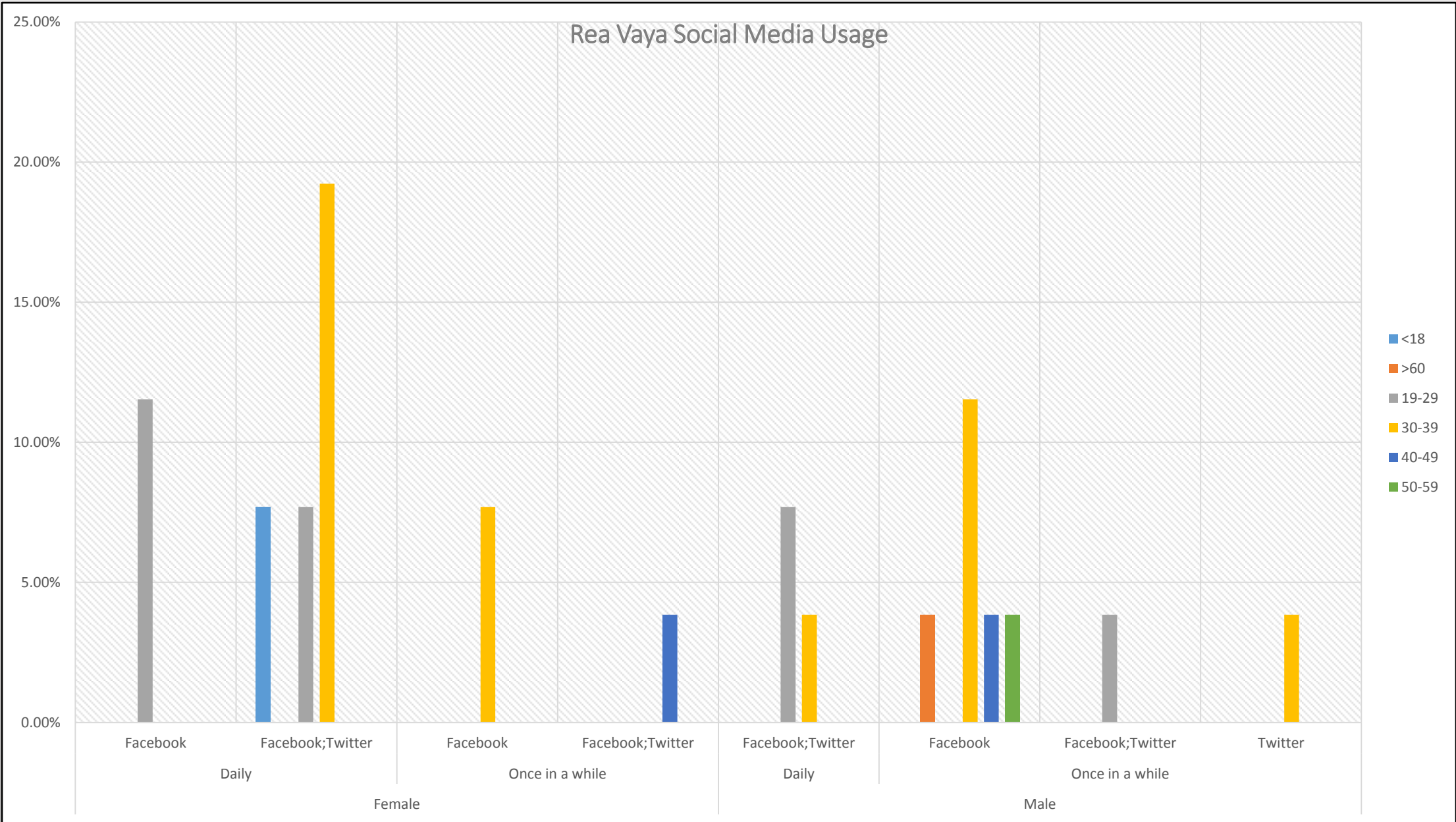
Social Media Usage
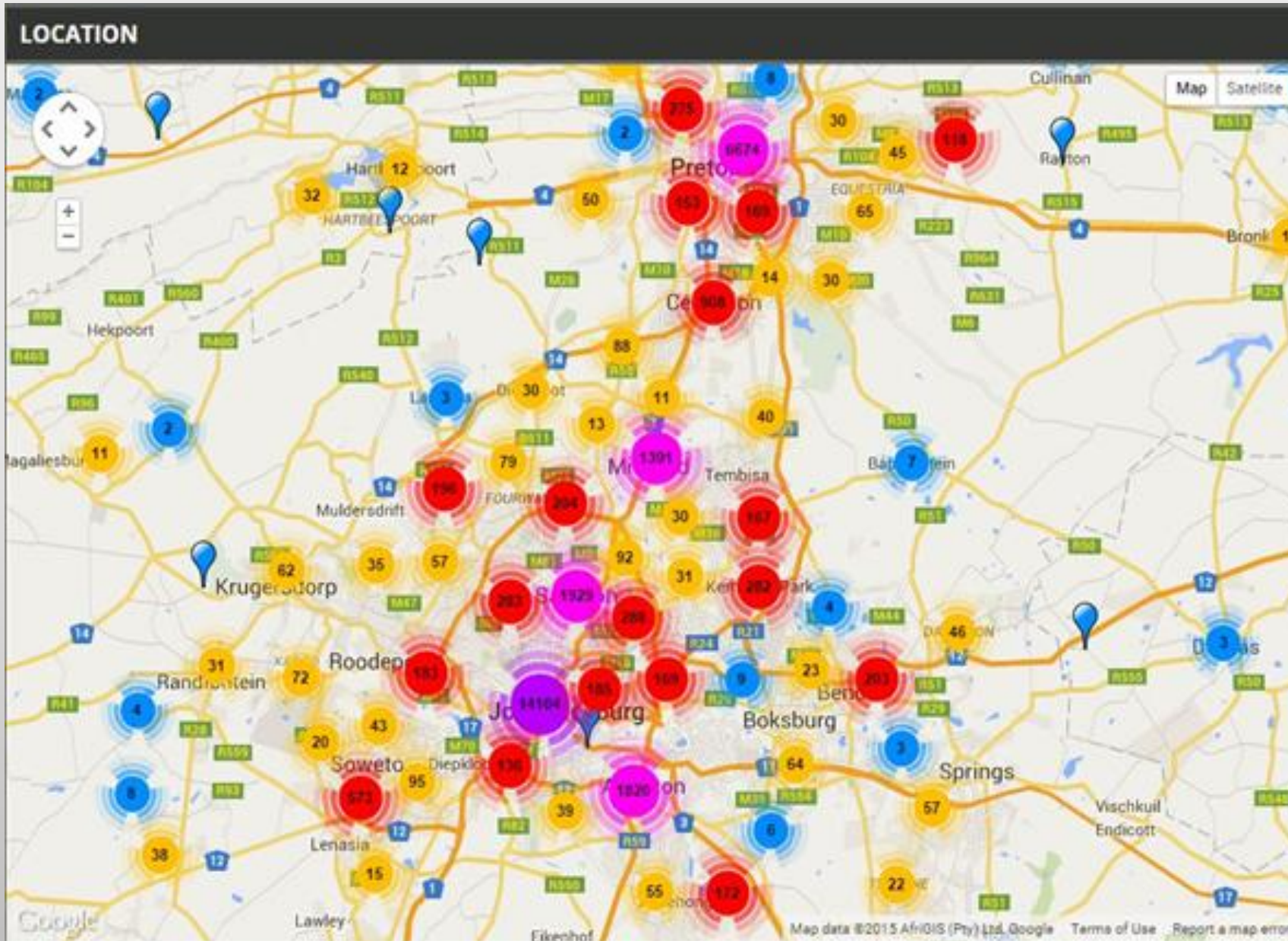
- Echo-Echo Location Analysis

- Blue icon = 1 tweet or post

- Blue = less than 10 tweets and posts

- Yellow = less than 100 tweets and posts

- Red = less than 1000 tweets and posts

- Pink = less than 10 000 tweets and posts
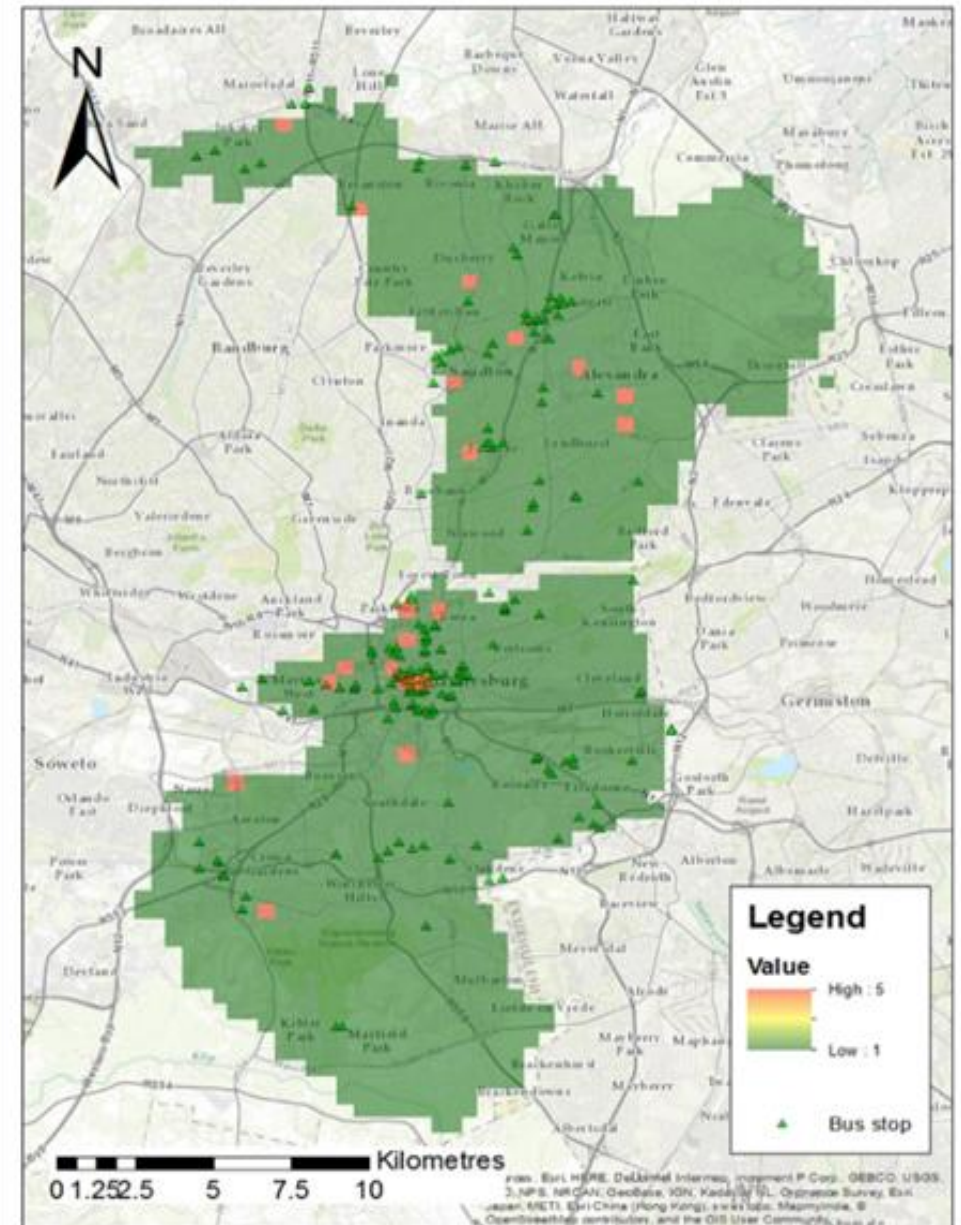
- Purple = less than 100 000 tweets and posts

Social Media Usage

Gautrain Social Media Usage

Social Media Usage
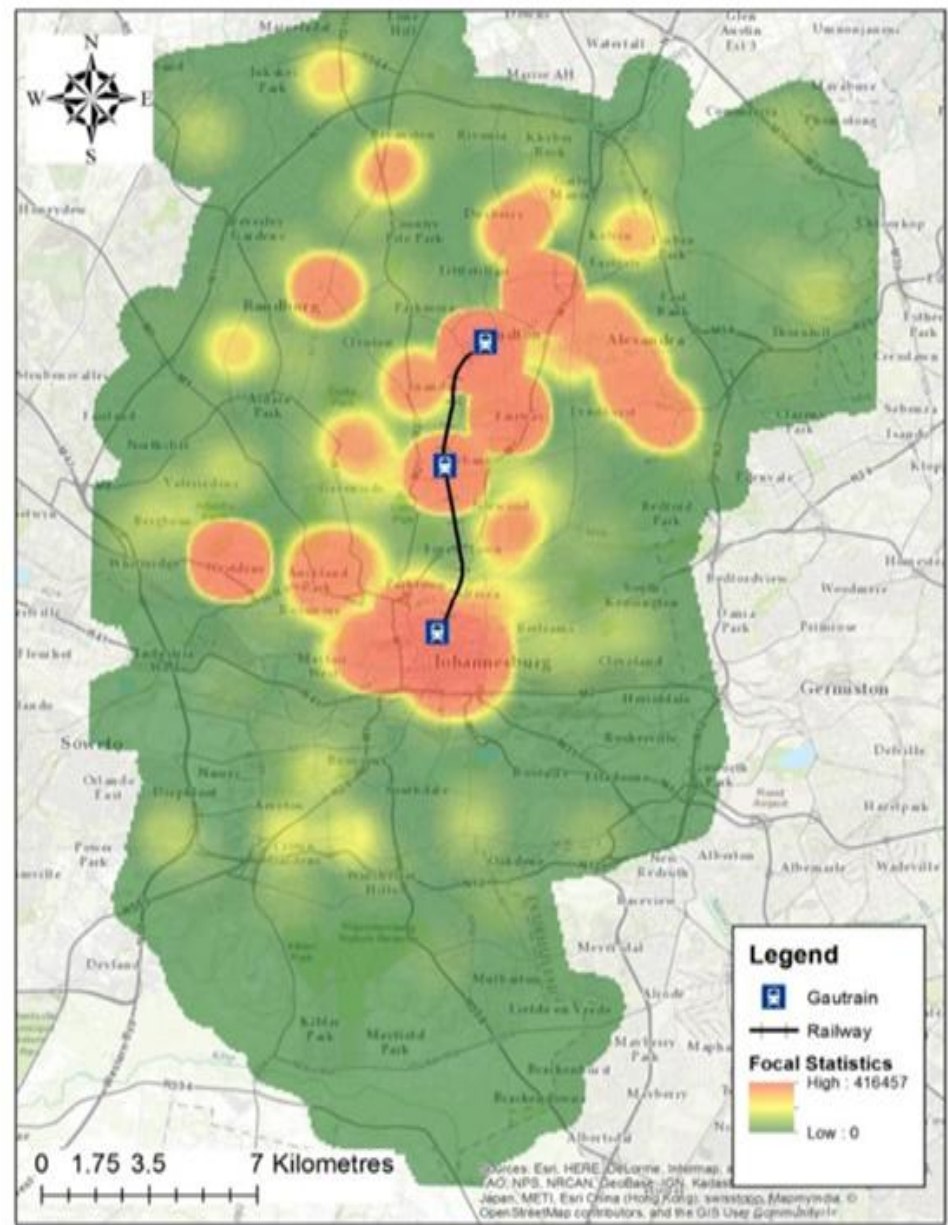
Rea Vaya Social Media Usage

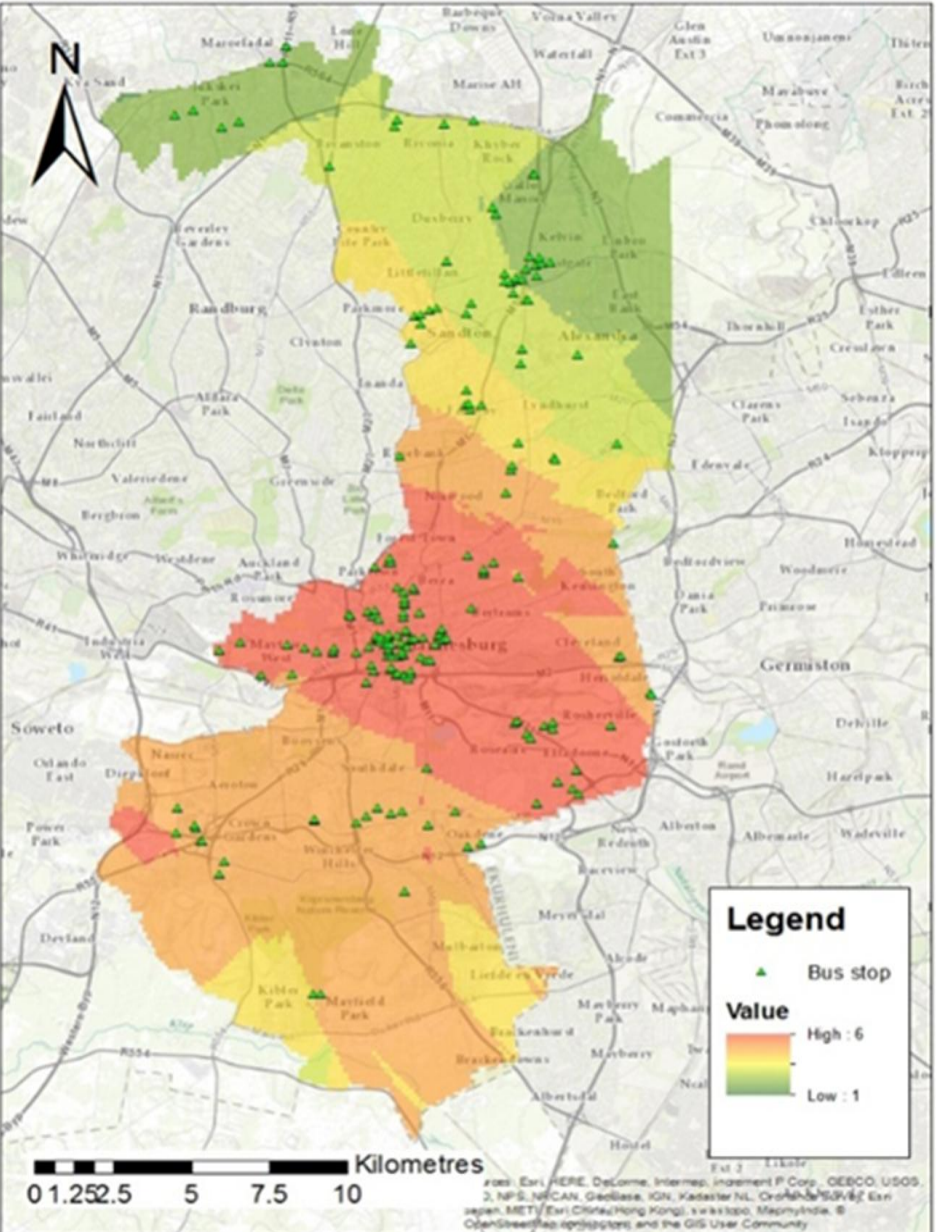# Focal Statistics results

- Areas in red have high clusters (Many posts, people, Gautrain and Rea Vaya commuters)

- Areas in green have low clusters (Few posts, people, Gautrain and Rea Vaya commuters)

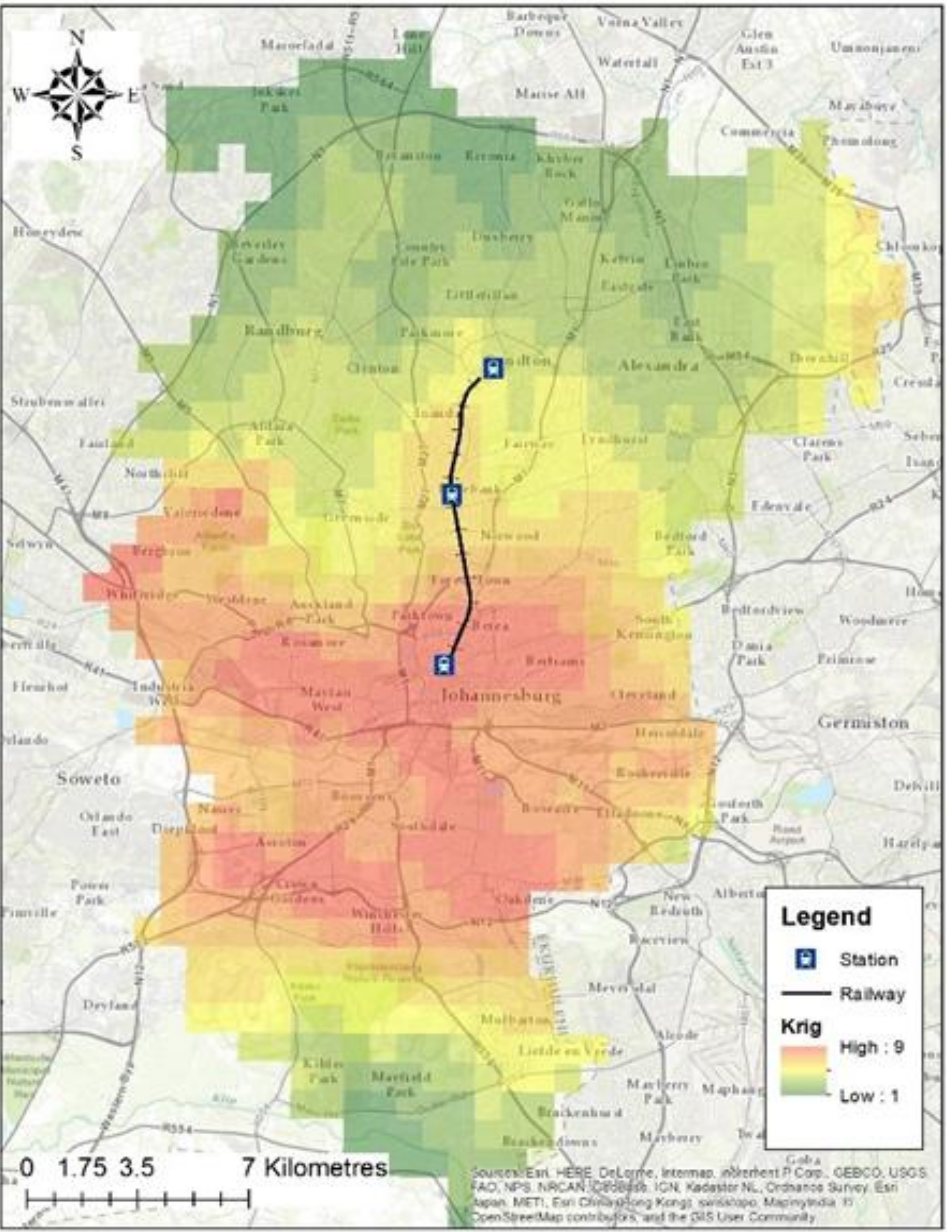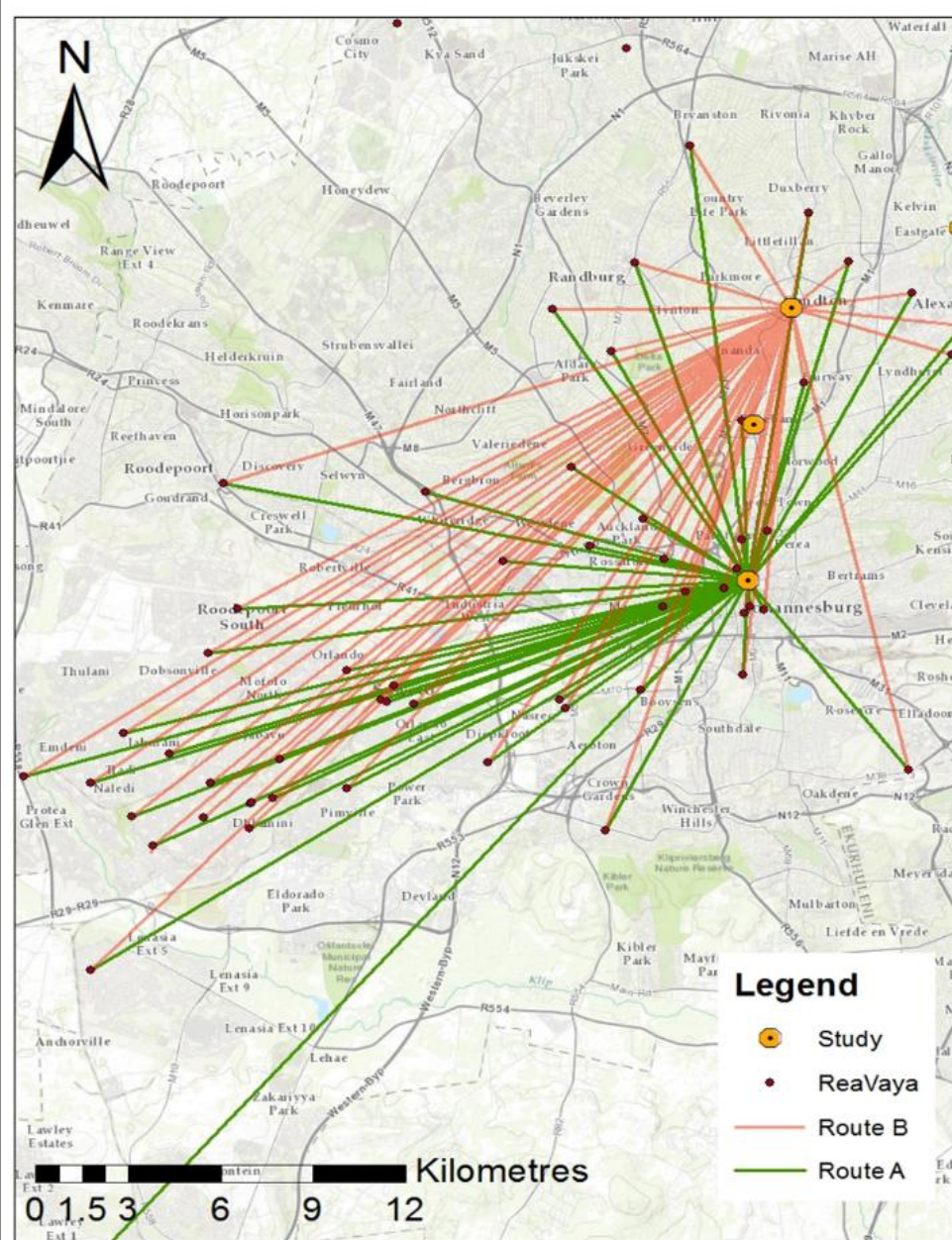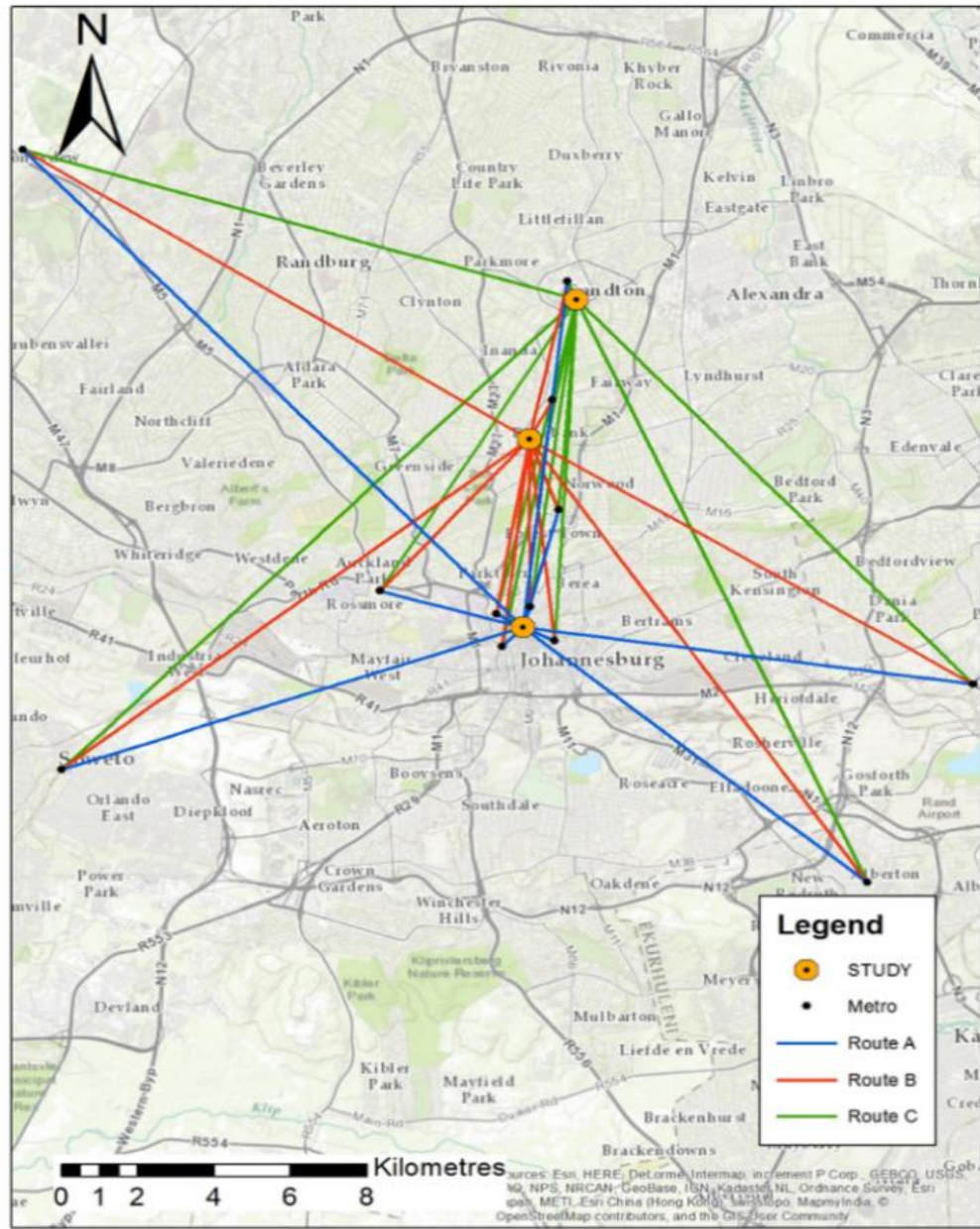# Kriging results

- Areas in red have high clusters (Many posts, people, Gautrain and Rea Vaya commuters)

- Areas in green have low clusters (Few posts, people, Gautrain and Rea Vaya commuters)

Movement of Commuters

- Movement patterns of Gautrain and Rea Vaya respondents

Conclusion

- This research presents novel data analysed into empirical results suggesting that location based services plays a pivotal influence in determining movement of urban public transport commuters in Johannesburg city.

- The findings also reveal the complexity of spatial and communicative platforms in multiplicity of urban public modes resulting in complex models of movement patterns.

- These empirical results require further research on the applicability of location based services in determining movement patterns of commuters, with the aim of corroborating the prospects of agglomerating an urban mobility model at a city wide scale.

- This study has presented how location based data obtained from social media platforms such as Facebook and twitter can be used to model the points of origin as well as movement patterns of Gautrain and Rea Vaya commuters in the Johannesburg Metropolitan city particularly between Sandton and Park station.

Conclusion

- There are many areas that are marginalized from Gautrain and Rea vaya bus development in the Johannesburg Metropolitan city, reasons may be that there is no market for these services to sustain operational costs.

- On the contrary the model shows hot spots for locations that need services from Gautrain and Rea vaya and are currently not serviced. As a result, Location Based Data (LBS) is applicable in determining movement of commuters and may assists interested professionals and stakeholders when making informed decision in development.

- The data used in this study was conducted for a time period of 6 months from January 2016 to June 2016. Moreover, there is need to increase the time period for further studies especially for all Regions of the City of Johannesburg to increase accuracy and validity of results and to track variations between time periods in different locations.

Conclusion cont…

- Although the model has proved that LBS are applicable in determining the movement patterns of Gautrain and Rea Vaya commuters between Sandton and Park station, it has also revealed that LBS provided is highly dependent on geo-locational coordinates which needed to be accurate.

- In this study, gaps were identified from the data collected from LBS. The LBS data had some unidentified variables that caused errors when processed, as a result the data needed to be cleaned and only data that had geo-location co-ordinates was used to create the maps.

- In addition, the posts from social media posts are not stating whether people who post are actual Gautrain and Rea Vaya commuters or are possible commuters. In summation, this study discussed and examined the applicability of location based services in determining movement patterns of commuters in Johannesburg Metropolitan city.

THE END

THANK YOU