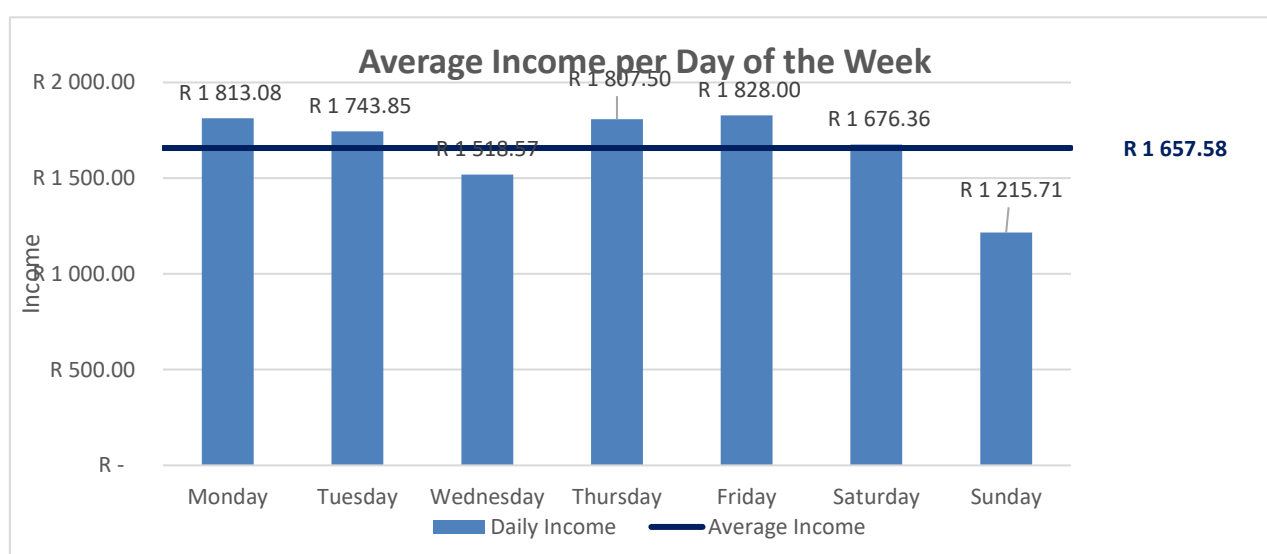
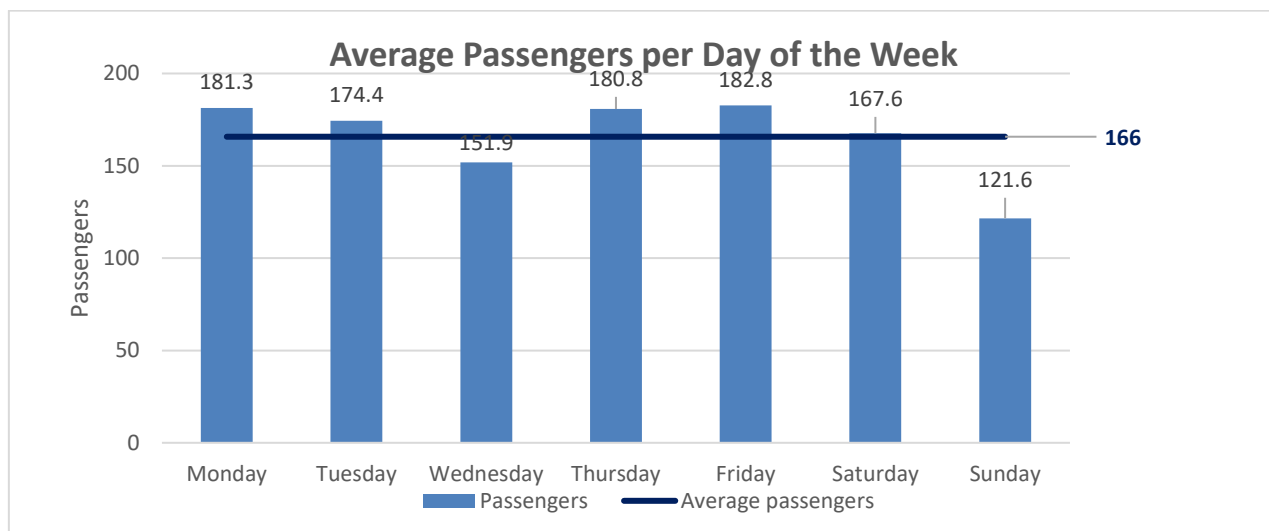


3.2. Daily average income

The average income per day over a spread of seven days are supplied in the table below:

	Average number of fare-paying passengers per day	Average Fare	Average daily income
Monday	181	R 10.00	R 1 813.08
Tuesday	174	R 10.00	R 1 743.85
Wednesday	152	R 10.00	R 1 518.57
Thursday	181	R 10.00	R 1 807.50
Friday	183	R 10.00	R 1 828.00
Saturday	168	R 10.00	R 1 676.36
Sunday	122	R 10.00	R 1 215.71
Weekly total	1160		R 11 603.07
Average	166	R 10.00	R 1 657.58
Weekday Avg	174	R 10.00	R 1 742.20

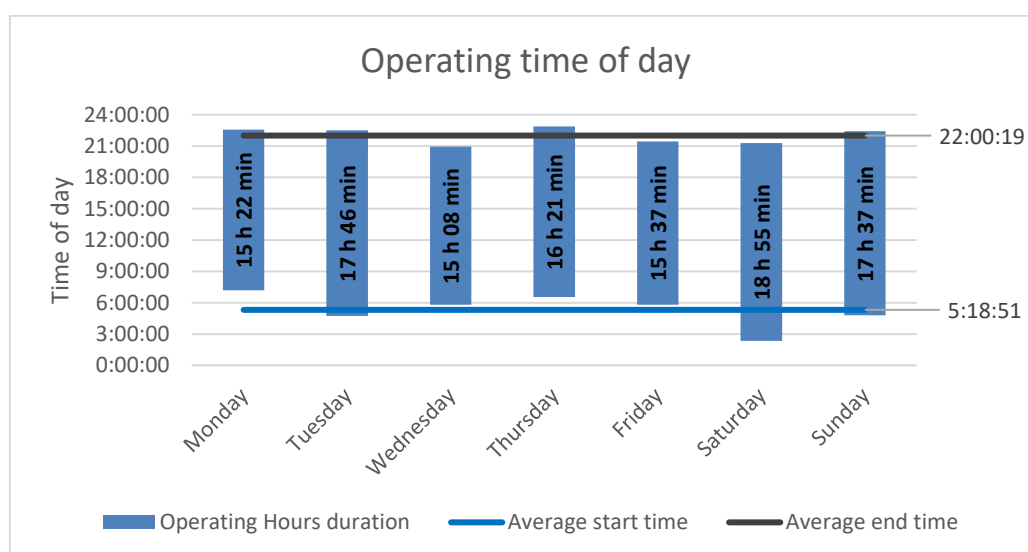




3.4. Daily operating times

The following table and graph show the starting and ending times of the taxis surveyed.

Operating time			
	Average start time	Average end time	Operating Hours duration
Daily (Mon - Sun) avg	5:18:51	22:00:19	16:41:28
Weekday (Mon-Fri) avg	6:00:45	22:04:10	16:03:25
Monday	7:11:24	22:34:02	15:22:37
Tuesday	4:43:20	22:30:16	17:46:57
Wednesday	5:47:55	20:56:43	15:08:48
Thursday	6:31:50	22:52:50	16:21:00
Friday	5:49:18	21:27:00	15:37:43
Saturday	2:21:04	21:16:54	18:55:49
Sunday	4:47:09	22:24:31	17:37:22



3.5. Distances travelled

The average distances travelled during operations are illustrated in the table below, together with the average vehicle occupancy per km.

Distances travelled and vehicle occupancy				
	Average of total km travelled	Average of operating km on Mangaung network	Average revenue per km	Vehicle Occupancy
Daily (Mon - Sun) avg	276	272	R 6.10	36%
Weekday (Mon-Fri) avg	279	279	R 6.25	35%
Monday	285	285	R 6.37	34%
Tuesday	282	282	R 6.19	34%
Wednesday	252	252	R 6.04	35%
Thursday	300	300	R 6.02	33%
Friday	276	276	R 6.61	37%
Saturday	302	285	R 5.88	41%
Sunday	236	222	R 5.47	38%

3.6. Operational analysis

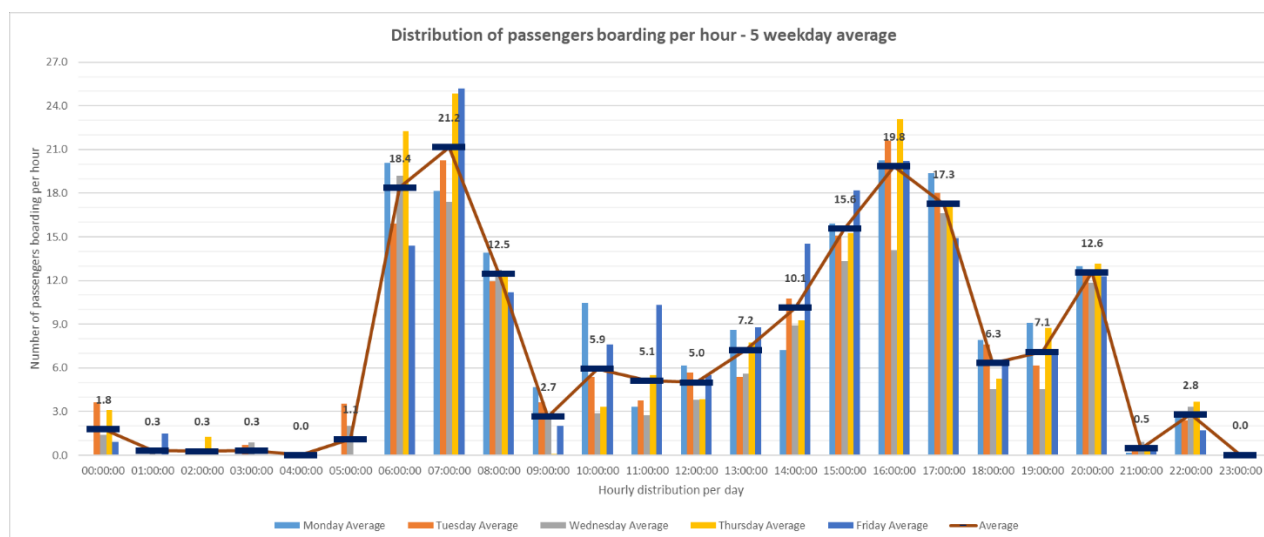
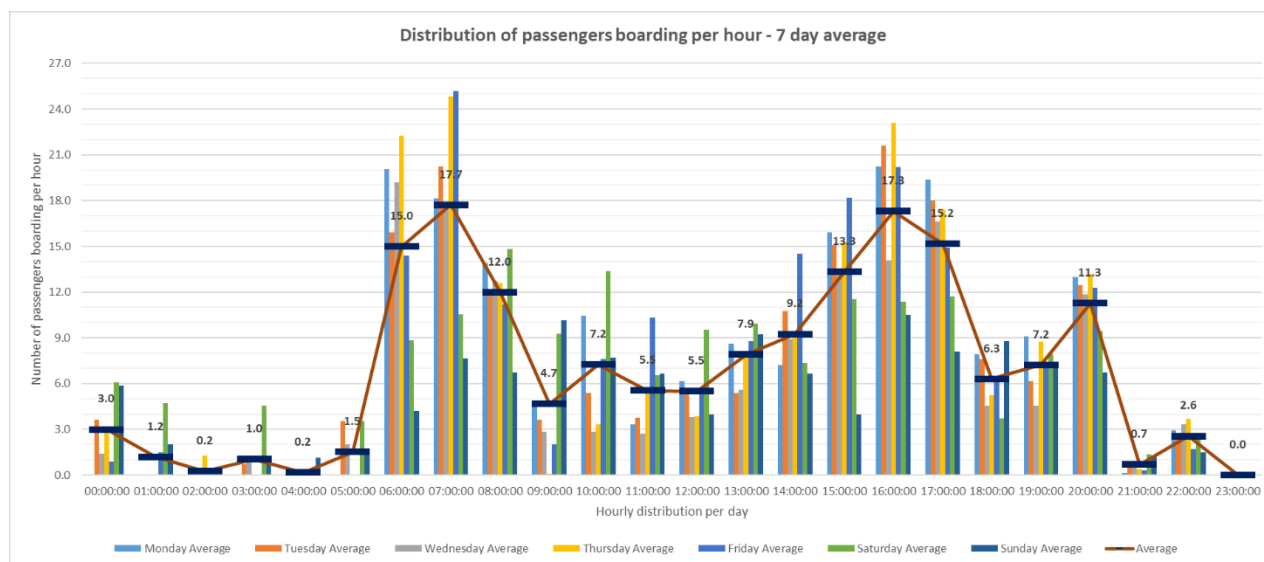
Operational analysis								
	Average of operating km on Mangaung network	Average number of paying passengers per day	Kms / Passenger	Service Frequency	Operating Speed	Passenger km	Seat kms	Vehicle Occupancy
Daily (Mon - Sun) avg	271.6	166	1.64	00:08:54	17.1	1618.9	4490.0	36%
Weekday (Mon-Fri) avg	278.8	174	1.60	00:07:41	18.0	1546.6	4508.4	35%
Monday	284.5	181	1.57	00:07:08	18.4	1533.6	4468.7	34%
Tuesday	281.5	174	1.61	00:08:31	16.5	1501.5	4406.3	34%
Wednesday	251.6	152	1.66	00:08:02	17.5	1455.9	4281.3	35%
Thursday	300.2	181	1.66	00:07:26	19.6	1548.4	4702.3	33%
Friday	276.4	183	1.51	00:07:16	18.0	1686.3	4649.4	37%
Saturday	285.2	168	1.69	00:10:55	15.0	2036.5	4831.6	41%
Sunday	222.1	122	1.81	00:12:57	14.9	1536.8	3935.7	38%

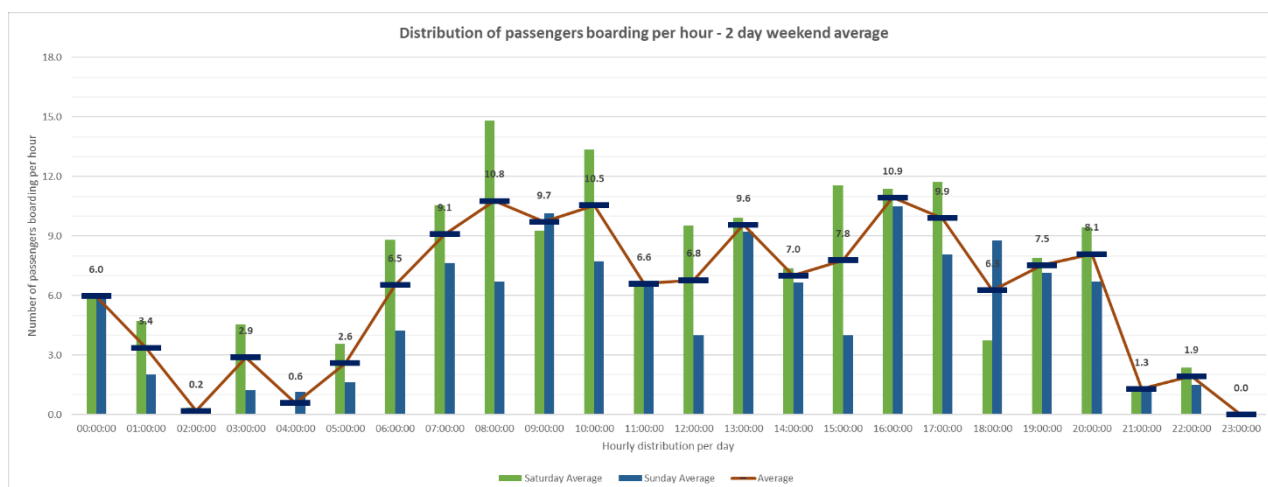
3.7. Fluctuations

The operational fluctuations during a single day of operation is shown in the table and following graphs.

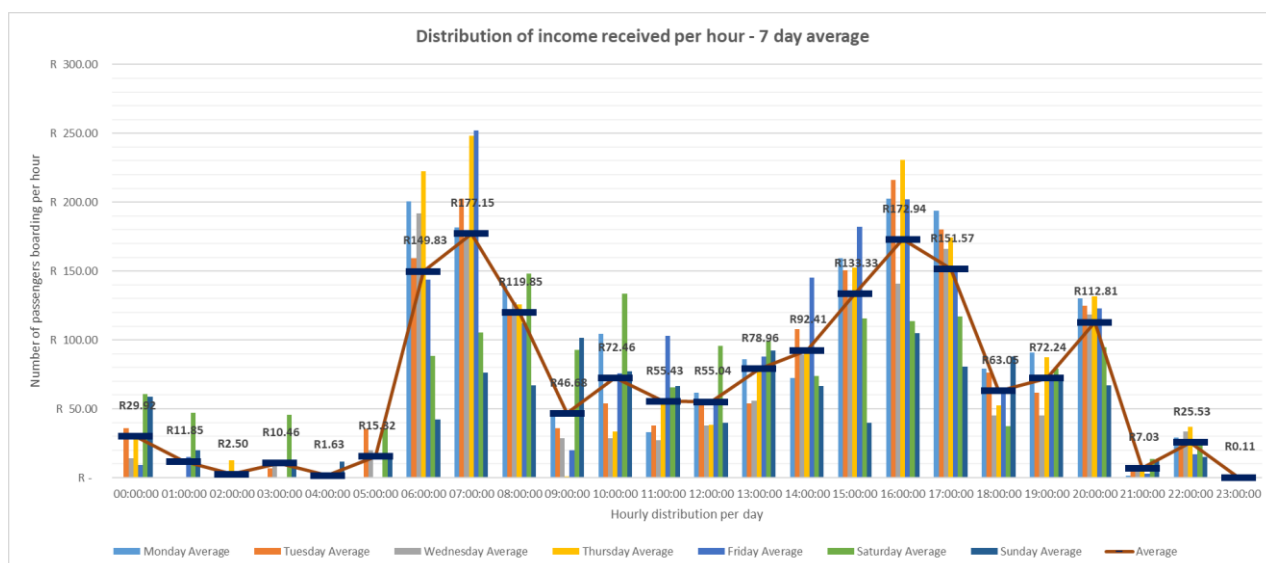
Operating slot		Number of passengers boarding per hour	Average income per hour	Occupancy per hour
From	To			
00:00	00:59	3.0	R 29.92	12%
01:00	01:59	1.2	R 11.85	6%
02:00	02:59	0.2	R 2.50	2%
03:00	03:59	1.0	R 10.46	6%
04:00	04:59	0.2	R 1.63	1%
05:00	05:59	1.5	R 15.32	6%
06:00	06:59	15.0	R 149.83	33%
07:00	07:59	17.7	R 177.15	33%
08:00	08:59	12.0	R 119.85	32%
09:00	09:59	4.7	R 46.68	15%
10:00	10:59	7.2	R 72.46	23%
11:00	11:59	5.5	R 55.43	20%
12:00	12:59	5.5	R 55.04	19%
13:00	13:59	7.9	R 78.96	18%
14:00	14:59	9.2	R 92.41	24%
15:00	15:59	13.3	R 133.33	25%
16:00	16:59	17.3	R 172.94	39%
17:00	17:59	15.2	R 151.57	58%
18:00	18:59	6.3	R 63.05	31%
19:00	19:59	7.2	R 72.24	20%
20:00	20:59	11.3	R 112.81	61%
21:00	21:59	0.7	R 7.03	15%
22:00	22:59	2.6	R 25.53	10%
23:00	23:59	0.0	R 0.11	3%

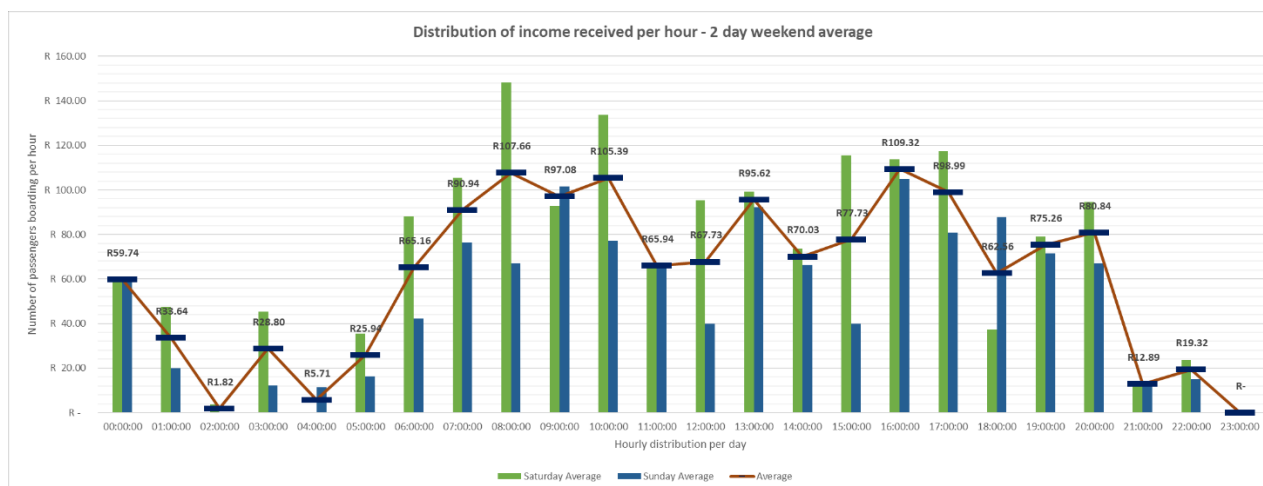
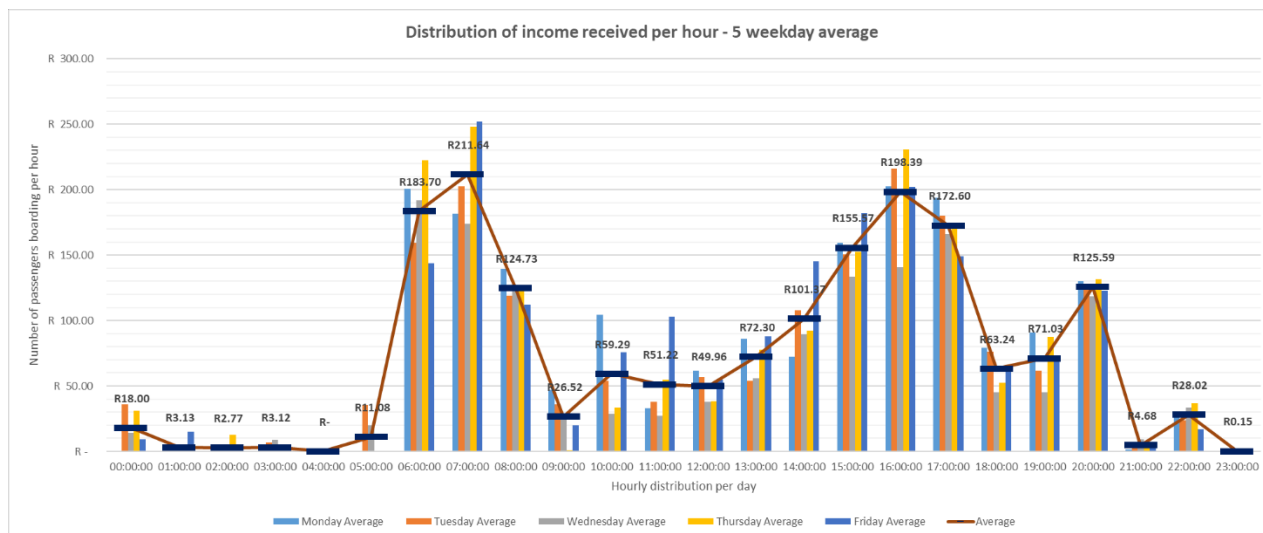
The following graphs show the average number of passengers boarding per hour over a 7-day period, a 5-day week period and 2-day weekend period.



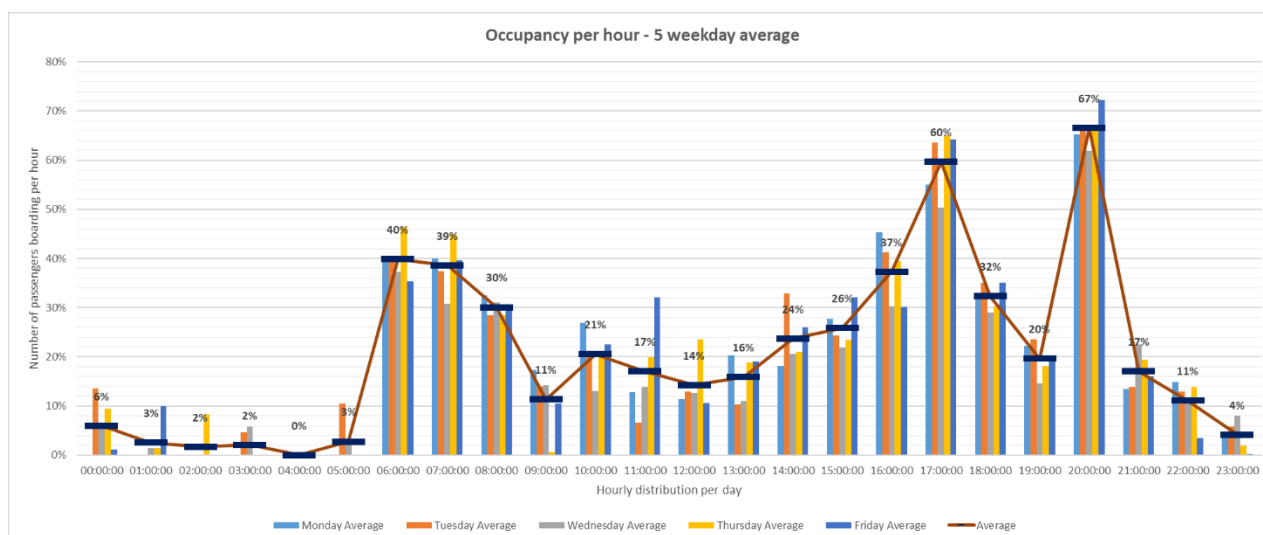
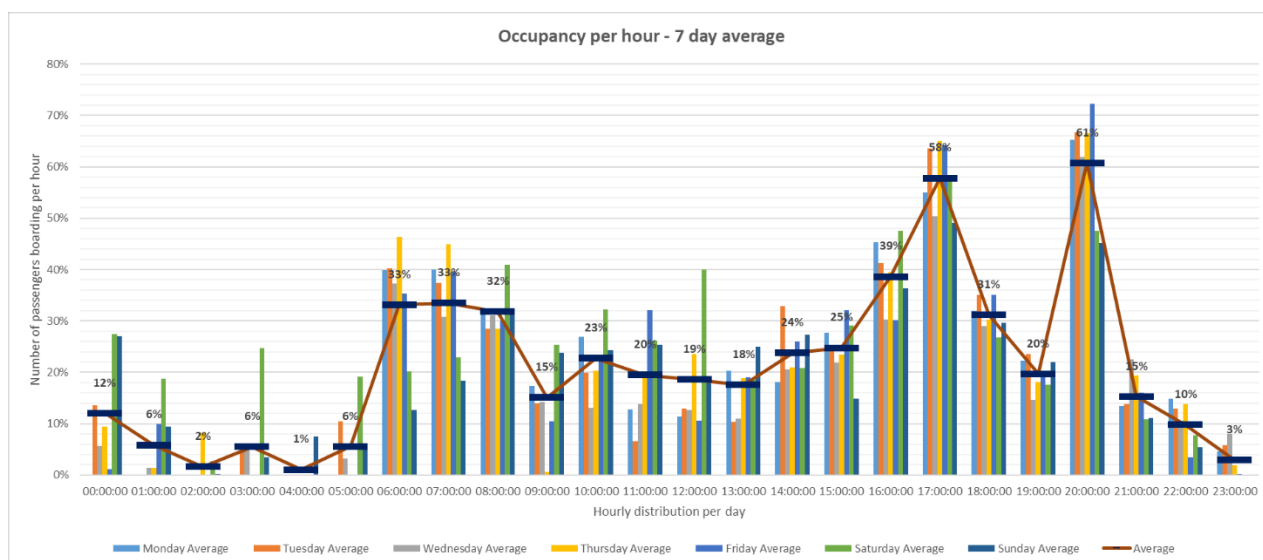


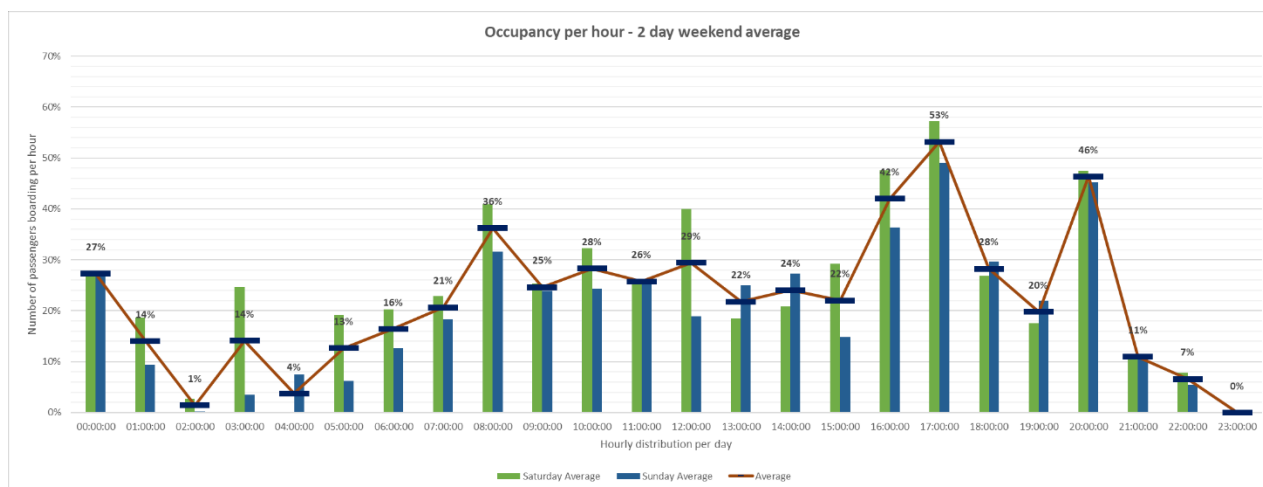
The following graphs show the average income per hour over a 7-day period, a 5-day week period and 2-day weekend period.





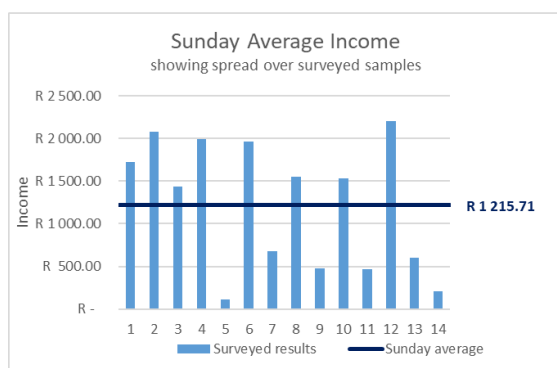
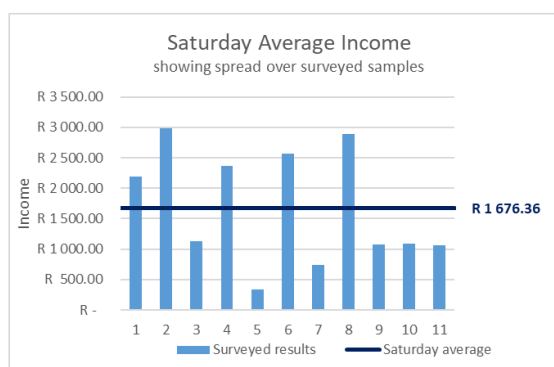
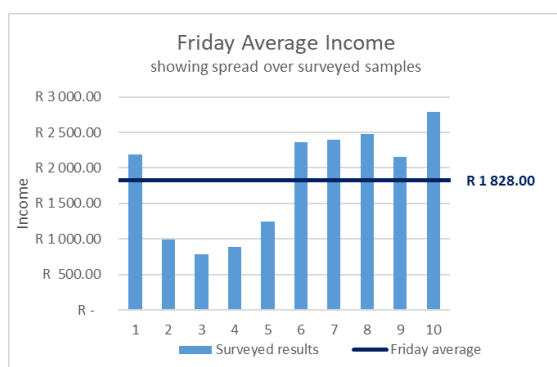
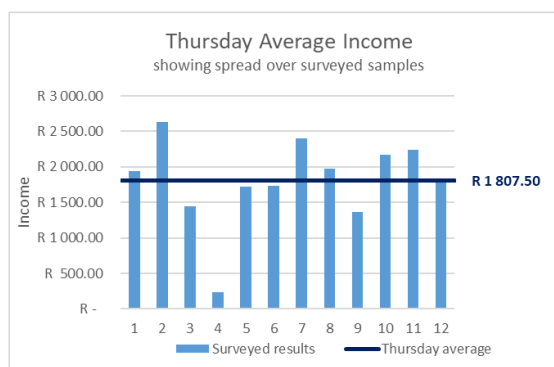
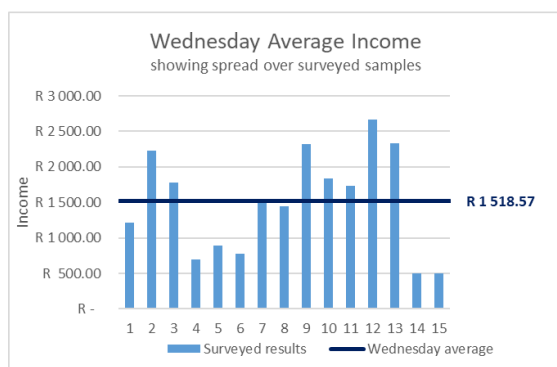
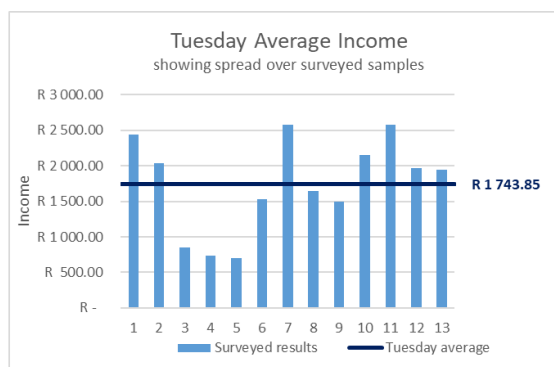
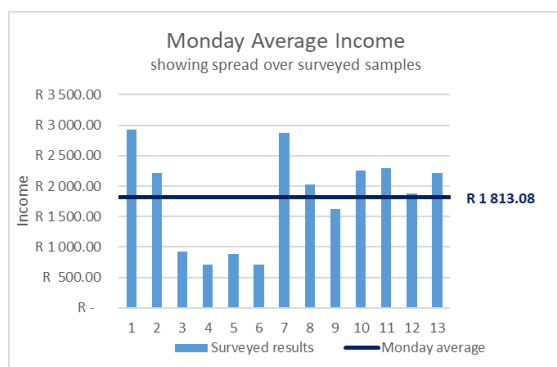
The following graphs show the average occupancy per hour over a 7-day period, a 5-day week period and 2-day weekend period.



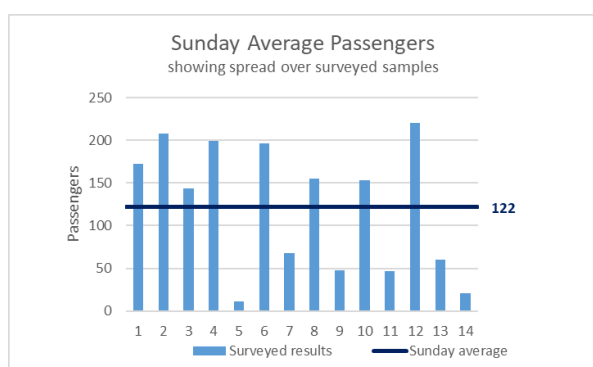
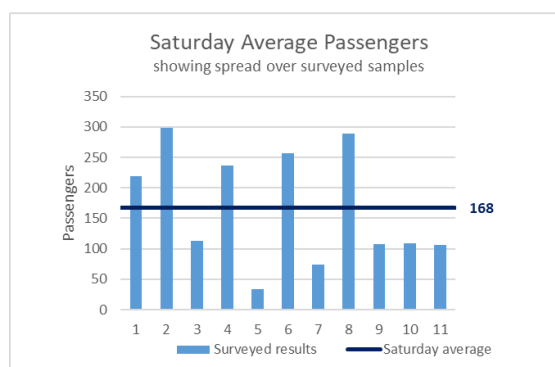
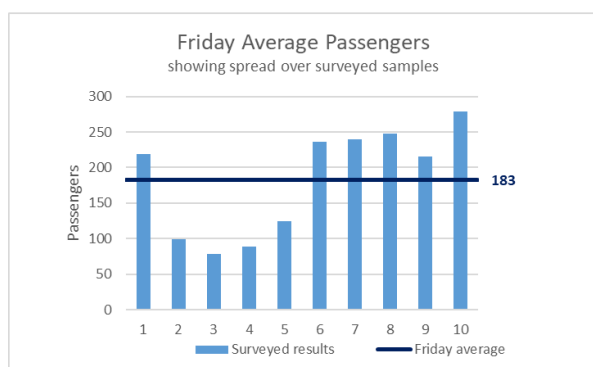
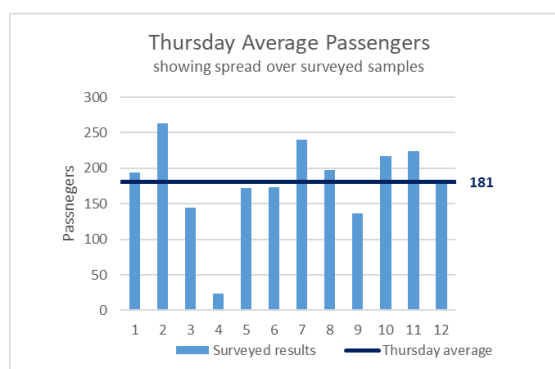
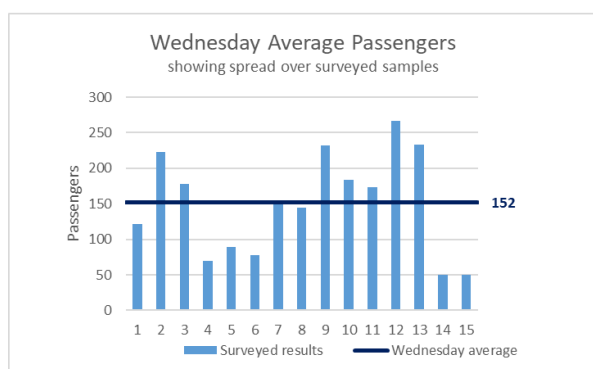
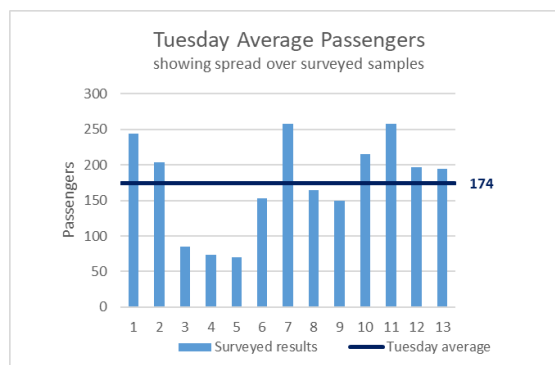
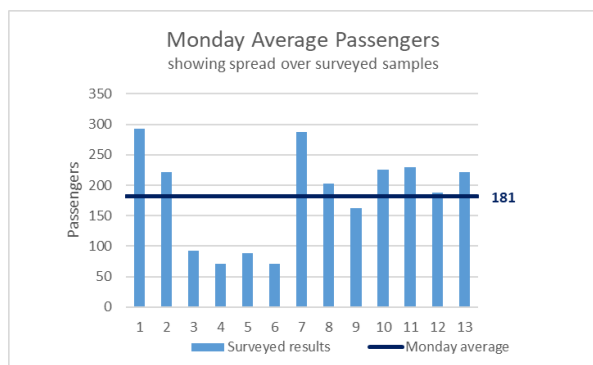


4. DETAILED SURVEY RESULTS

4.1. Income distribution



4.2. Passenger number distribution

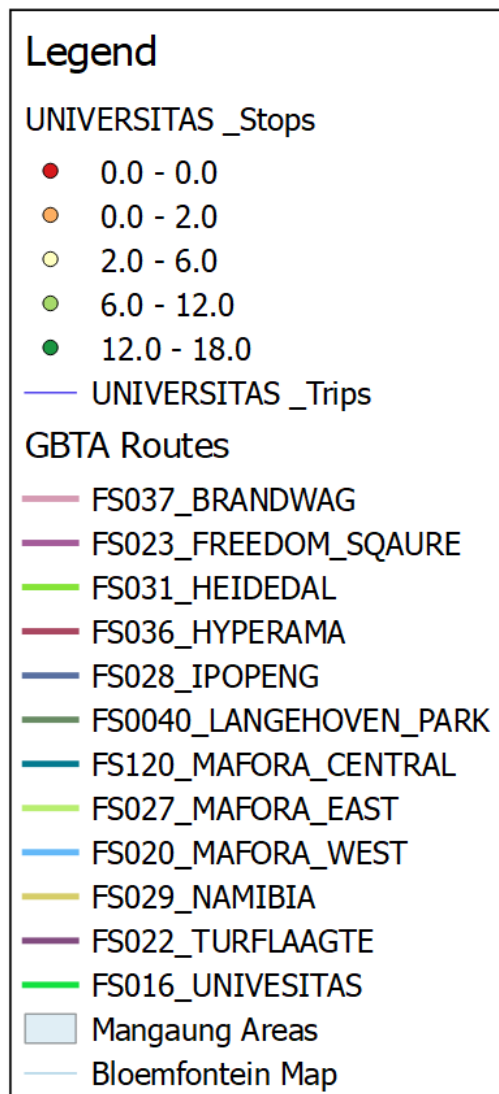


5. MAPS

The first maps show all the surveyed operations of the taxis alongside the Mangaung road network.

The maps following these indicate the a heatmap of the areas surveyed. These heatmaps demonstrate the zones of high volumes of boarding passenger.

Legend utilised for maps

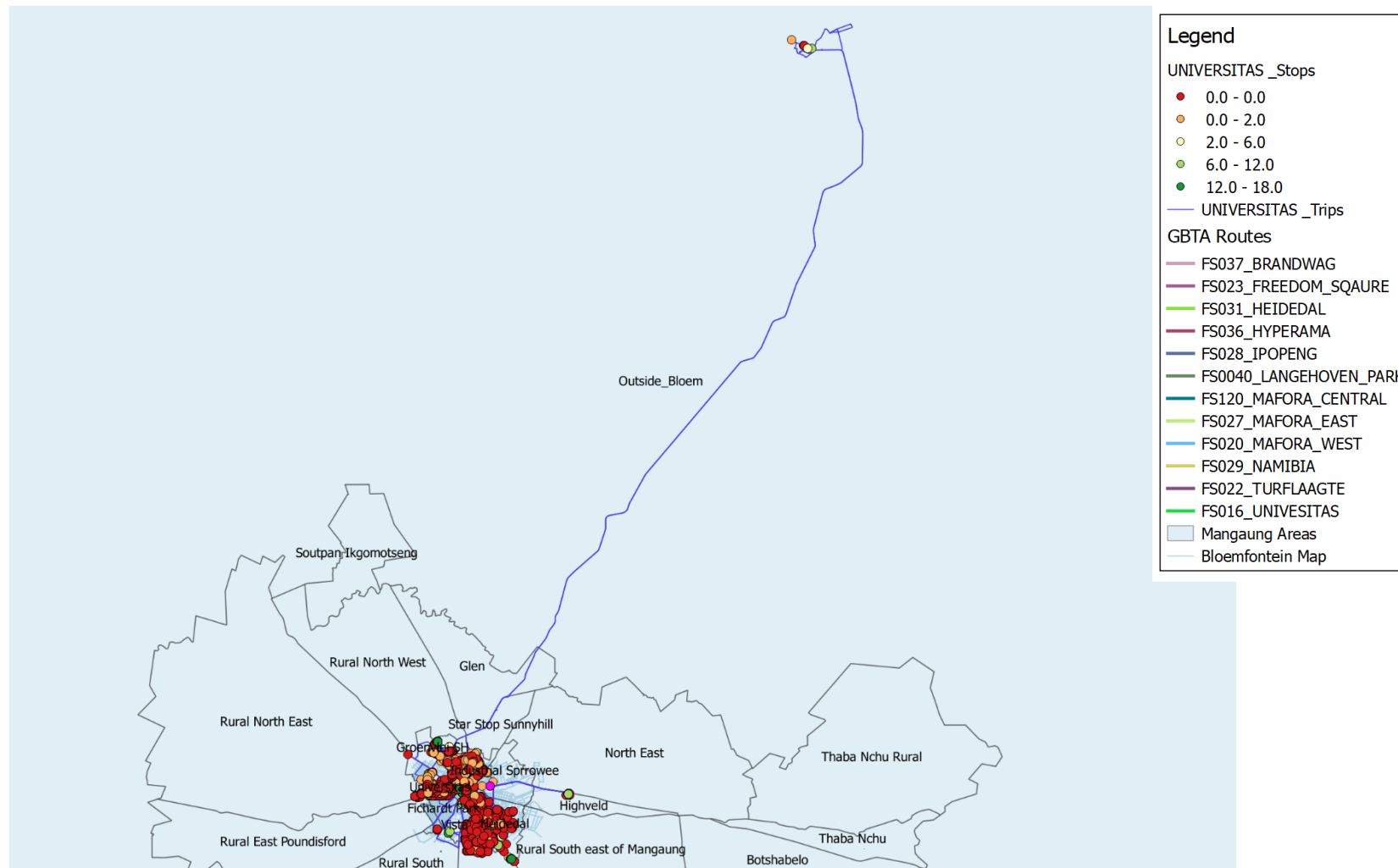


5.1. All surveyed operations

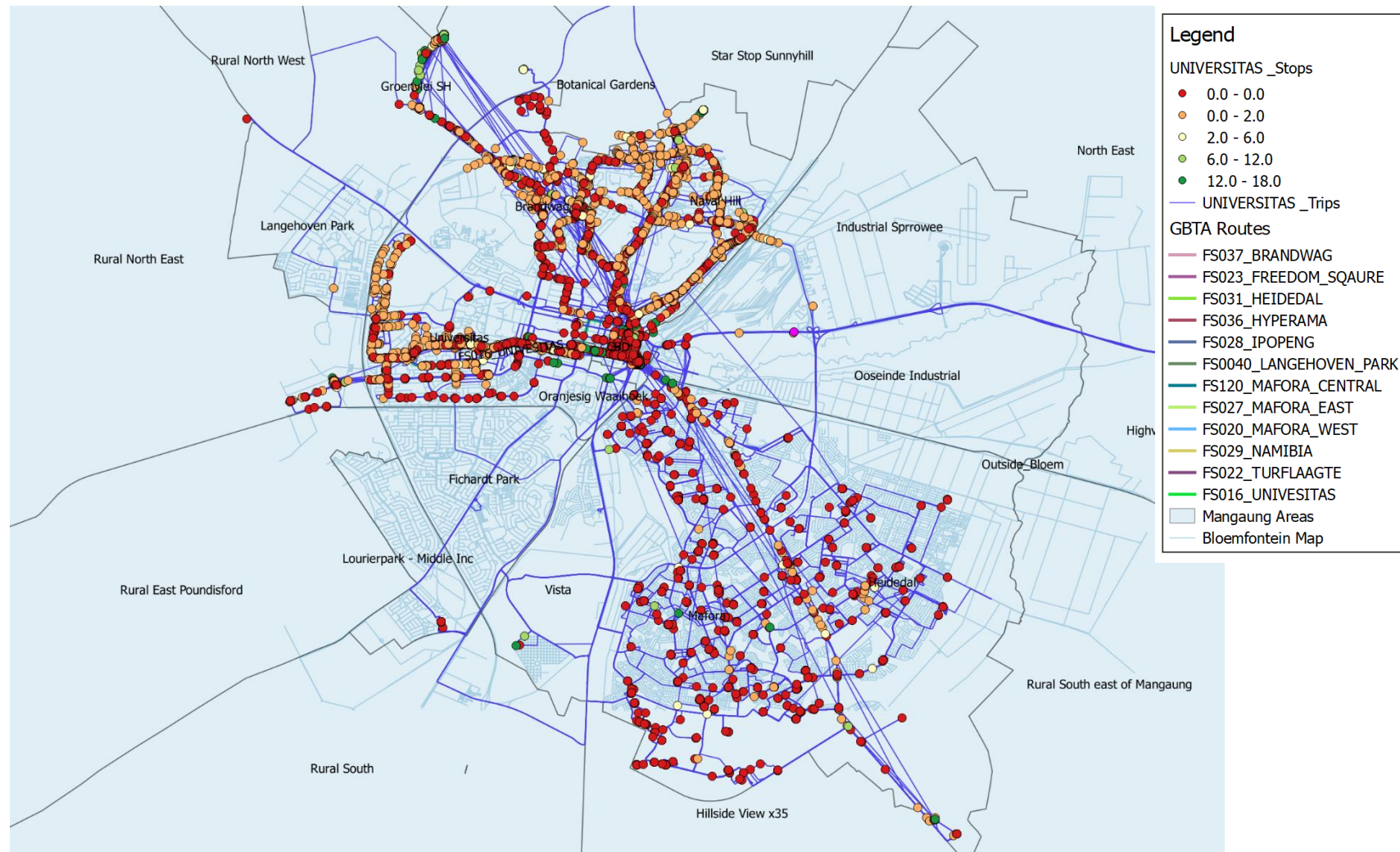
The tracks in blue illustrates the operations of all the surveyed taxis.

All the stops made by all the taxis to either pick up passengers or drop off passengers are indicated.

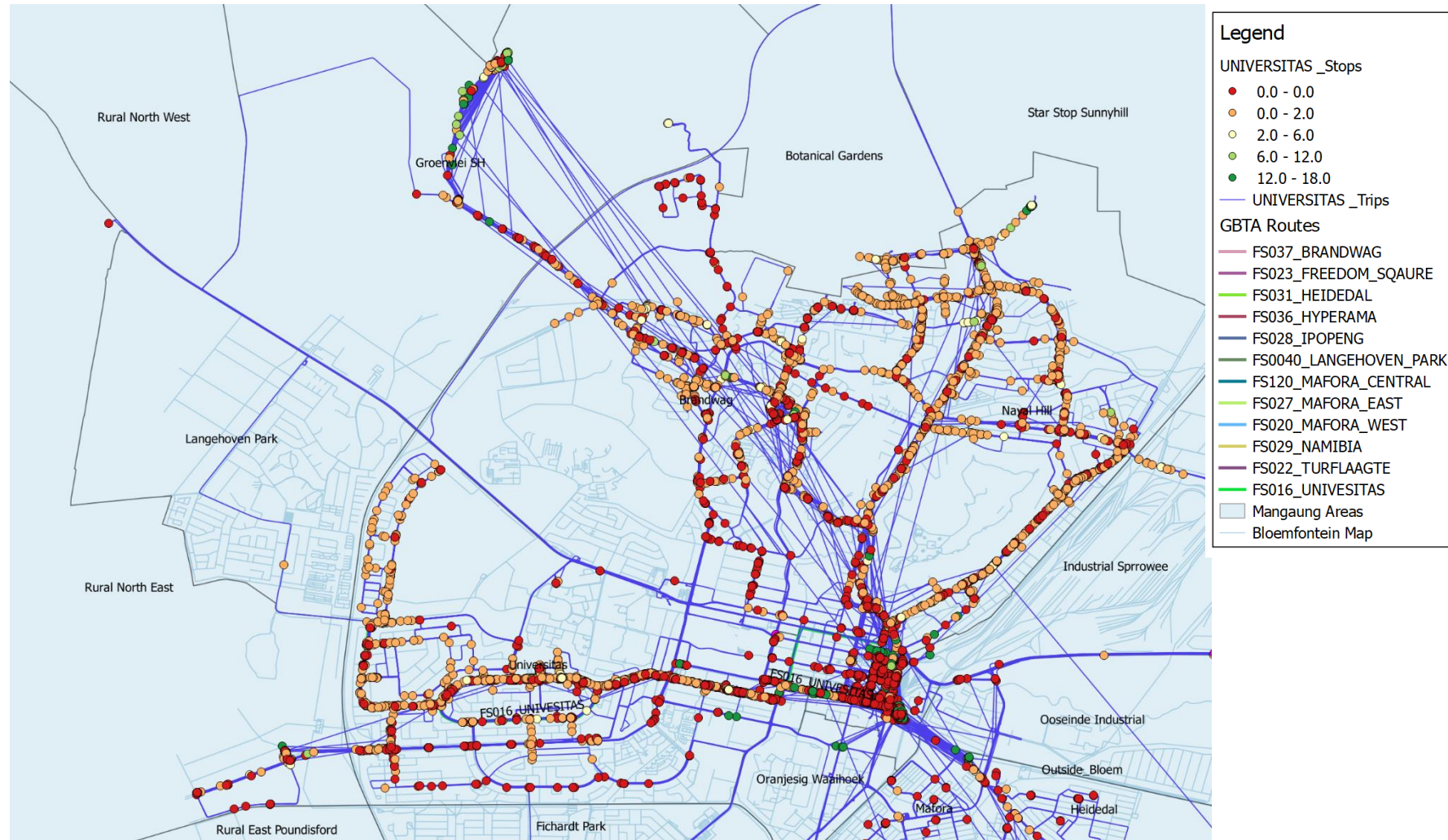
Operations of all surveyed taxis including stops



Operations of all surveyed taxis including stops – Focused on Mangaung



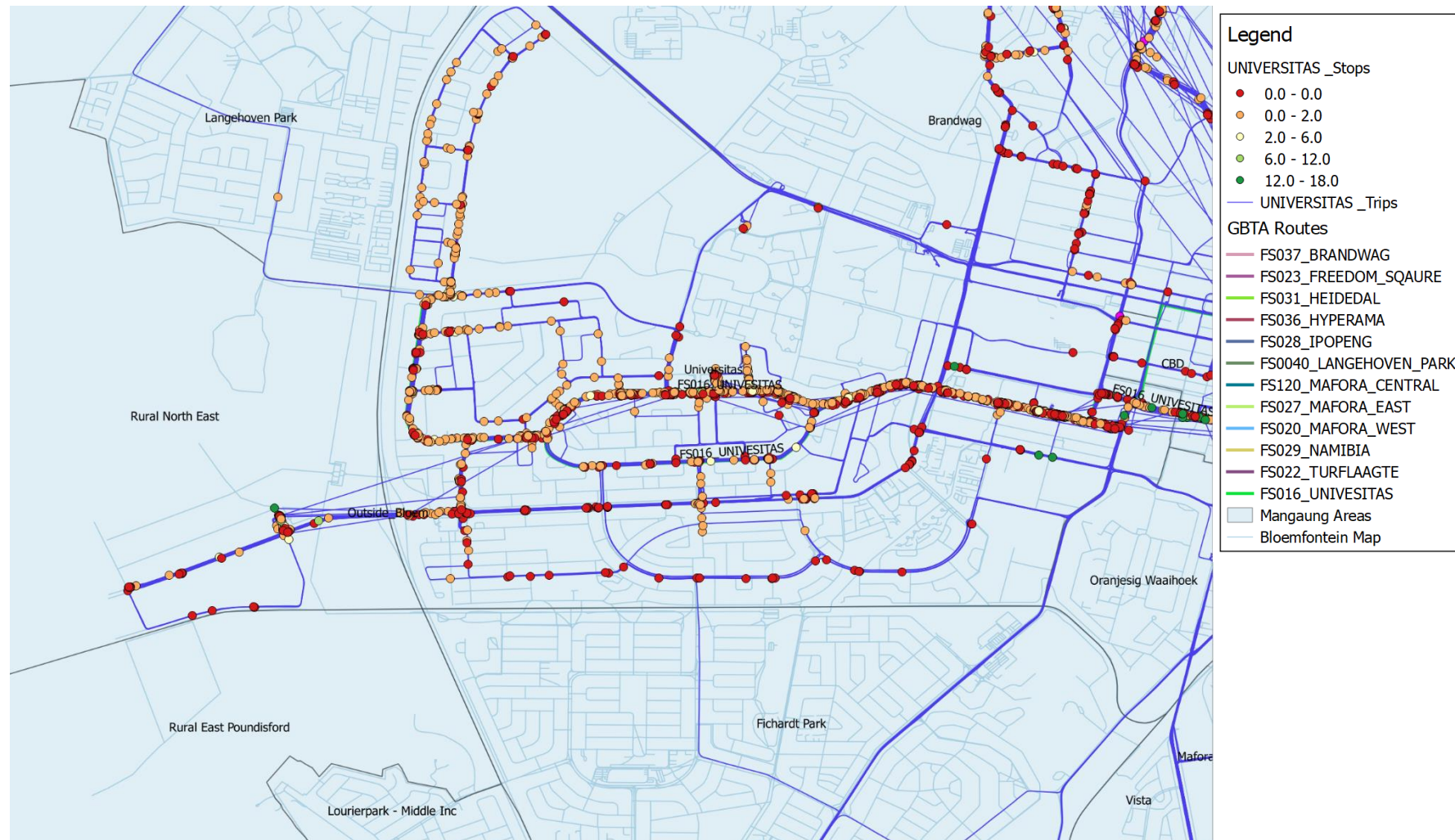
Operations of all surveyed taxis including stops – Focused on the UNIVERSITAS route



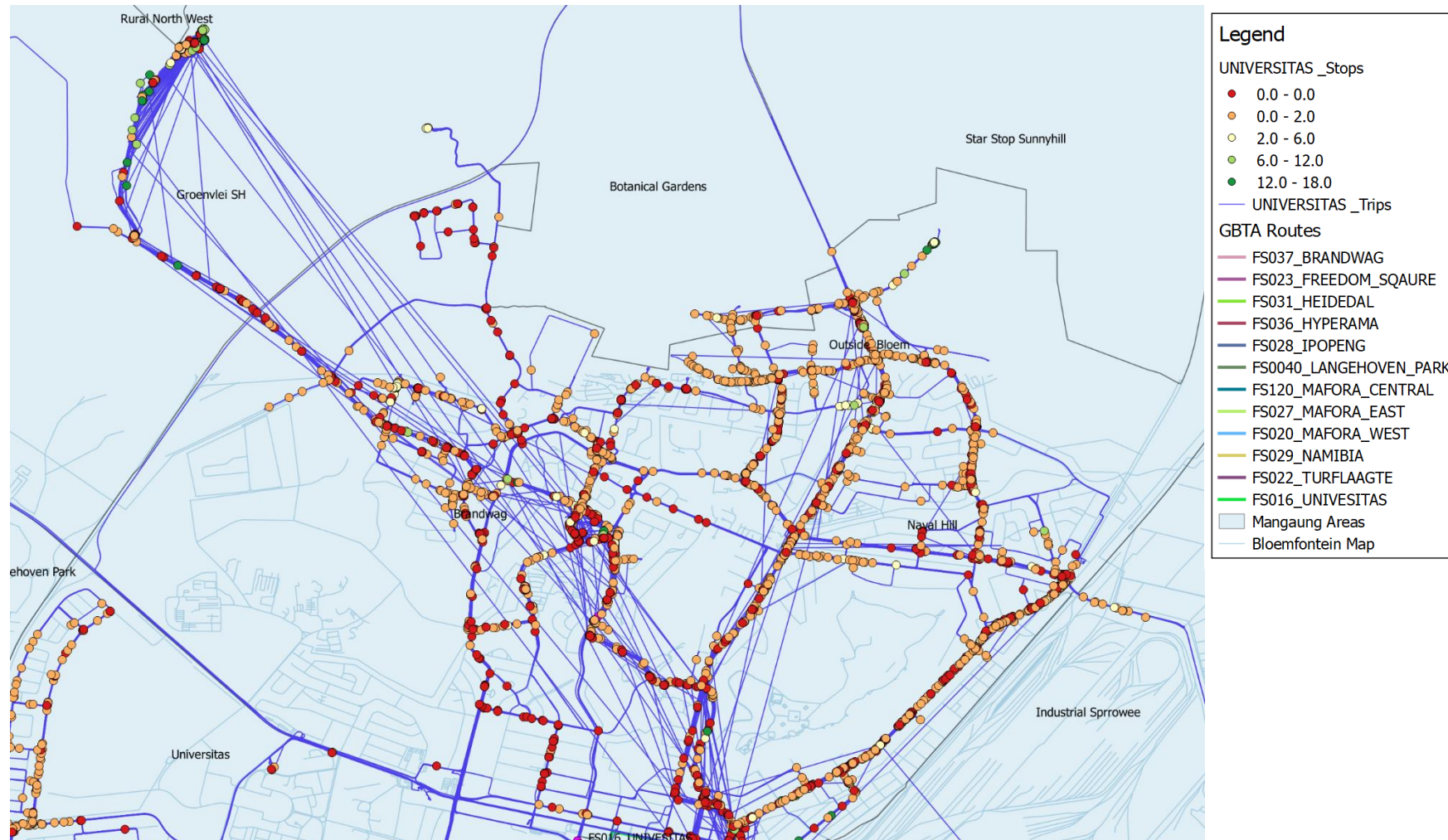
Operations of all surveyed taxis including stops – Focused on the CBD



Operations of all surveyed taxis including stops – Focused on the UNIVERSITAS area



Operations of all surveyed taxis including stops – Focused on Dan Pienaar

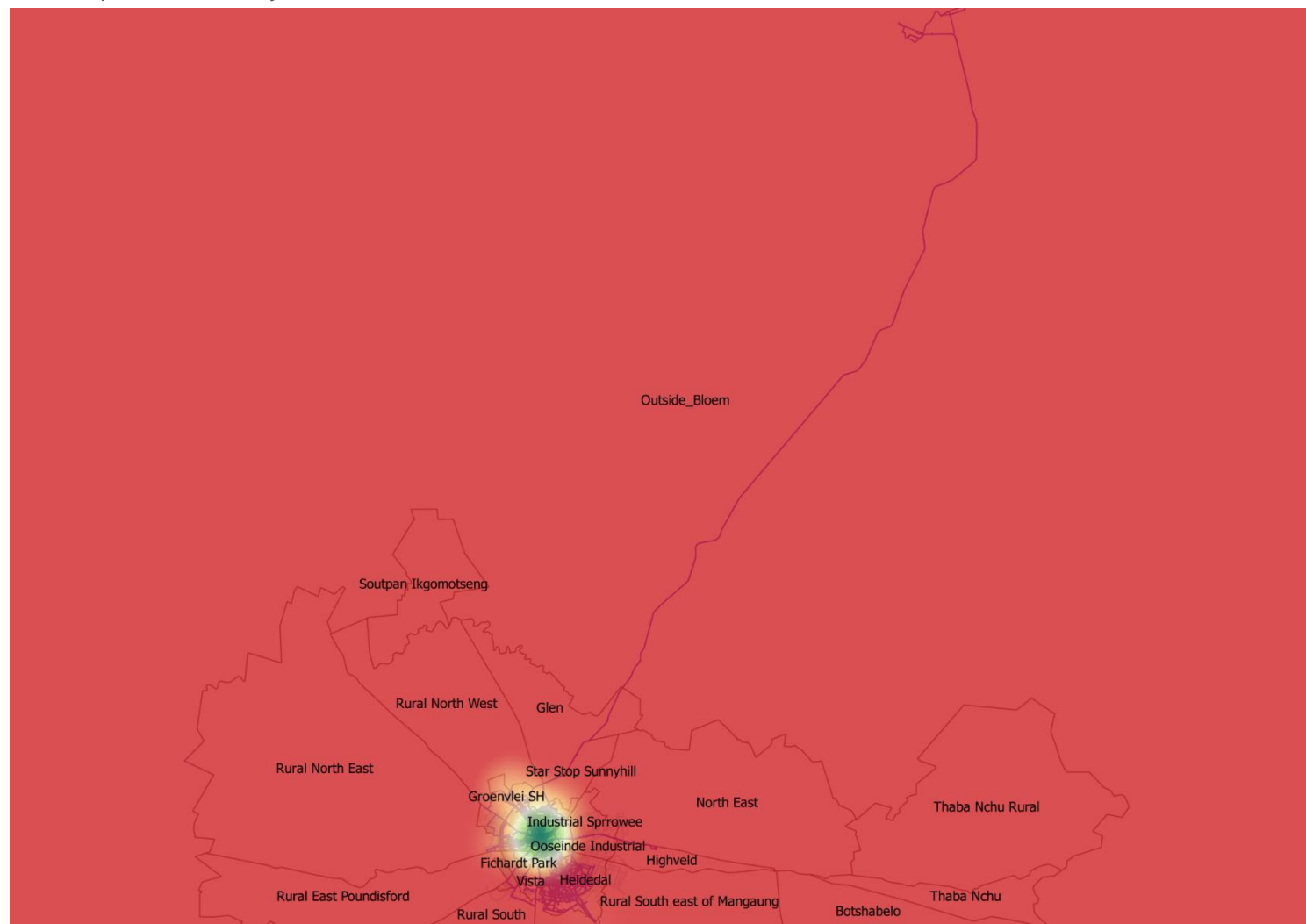


5.2. Heatmaps of taxi operations

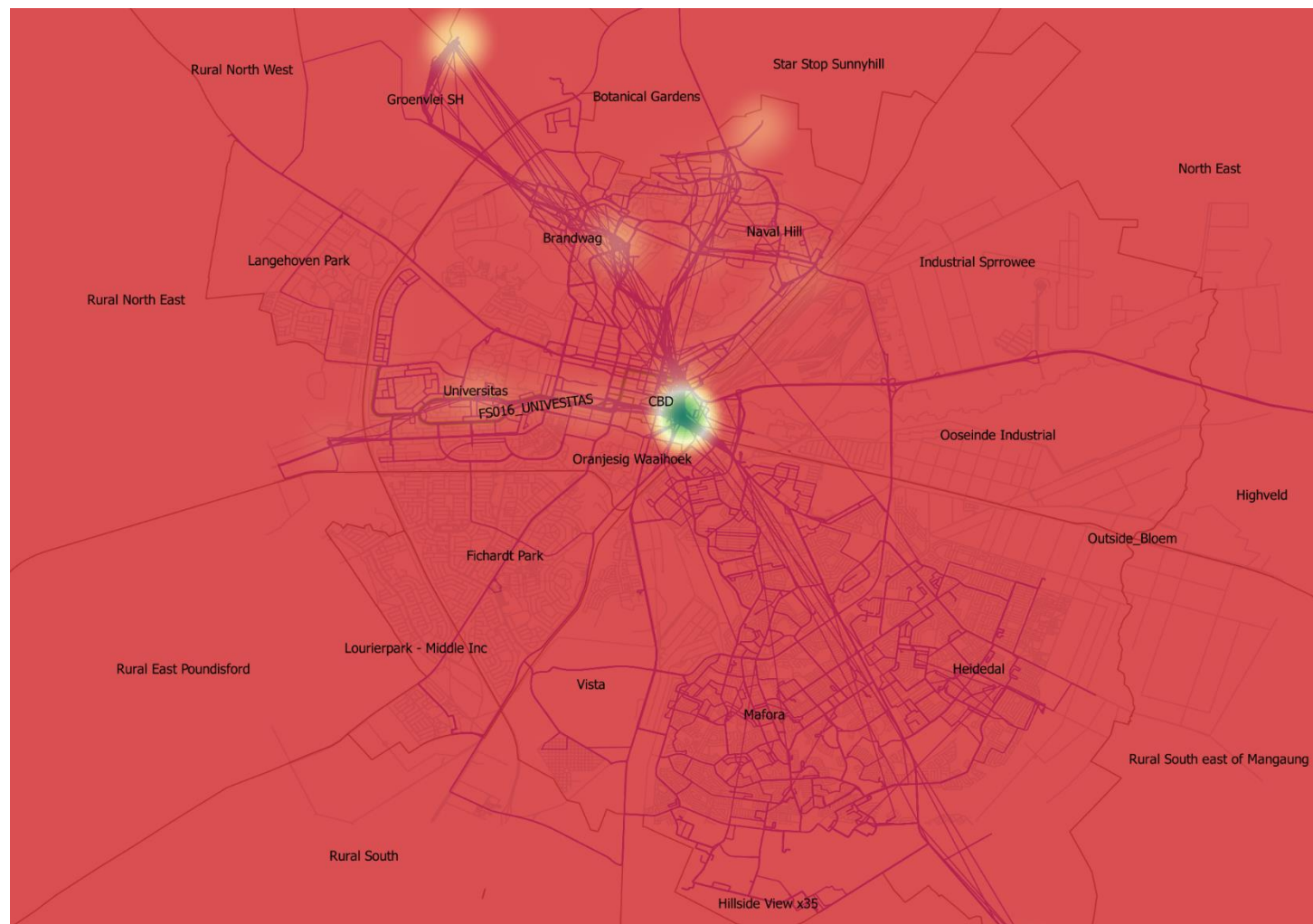
The following maps demonstrate the volume of passengers in each area.

- Red indicates little to no activity compare to the rest of the area.
- Yellow indicates high activity compared to the rest of the area
- Green indicates the highest activity compared to the rest of the area

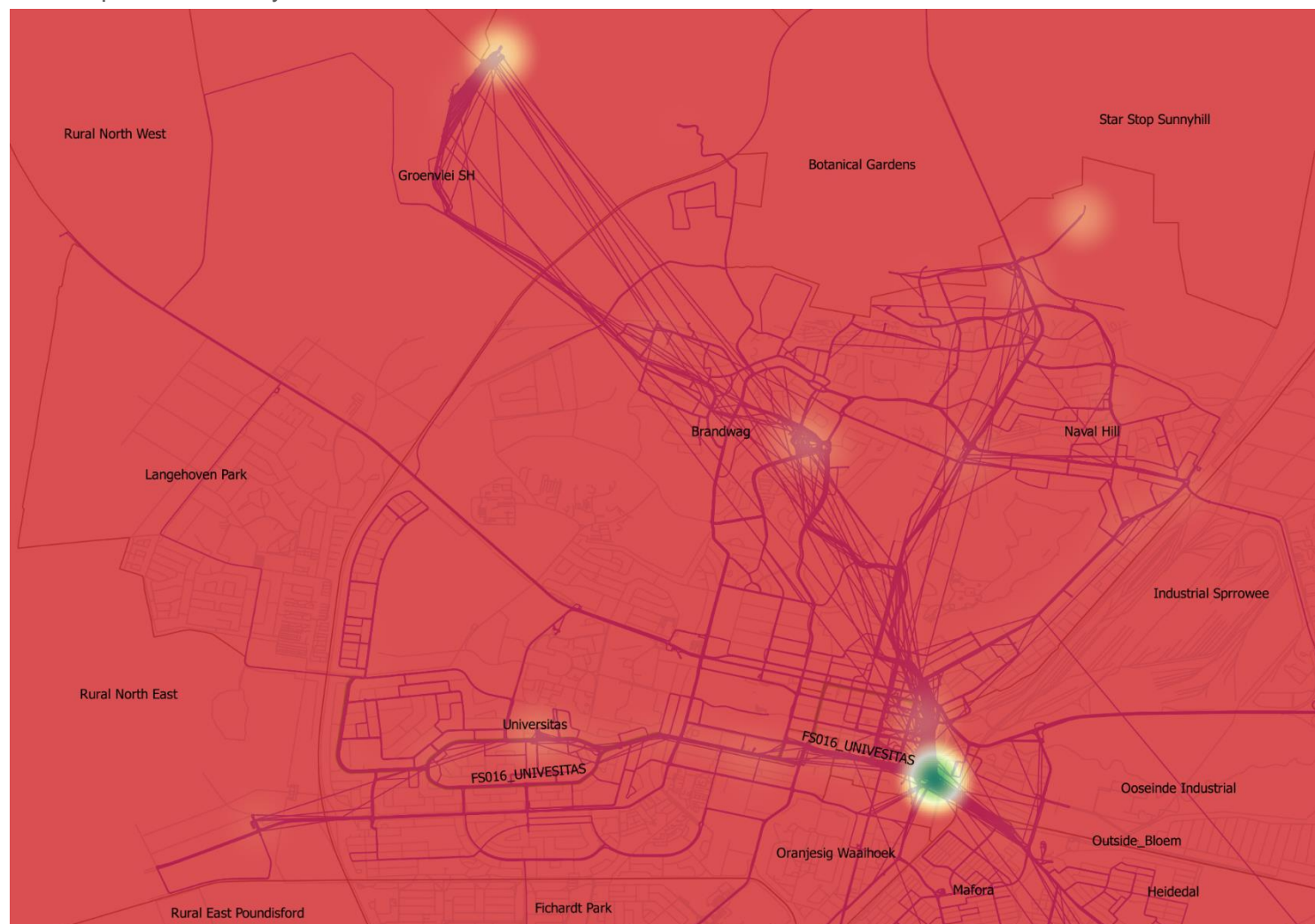
Heatmap of total surveyed area.



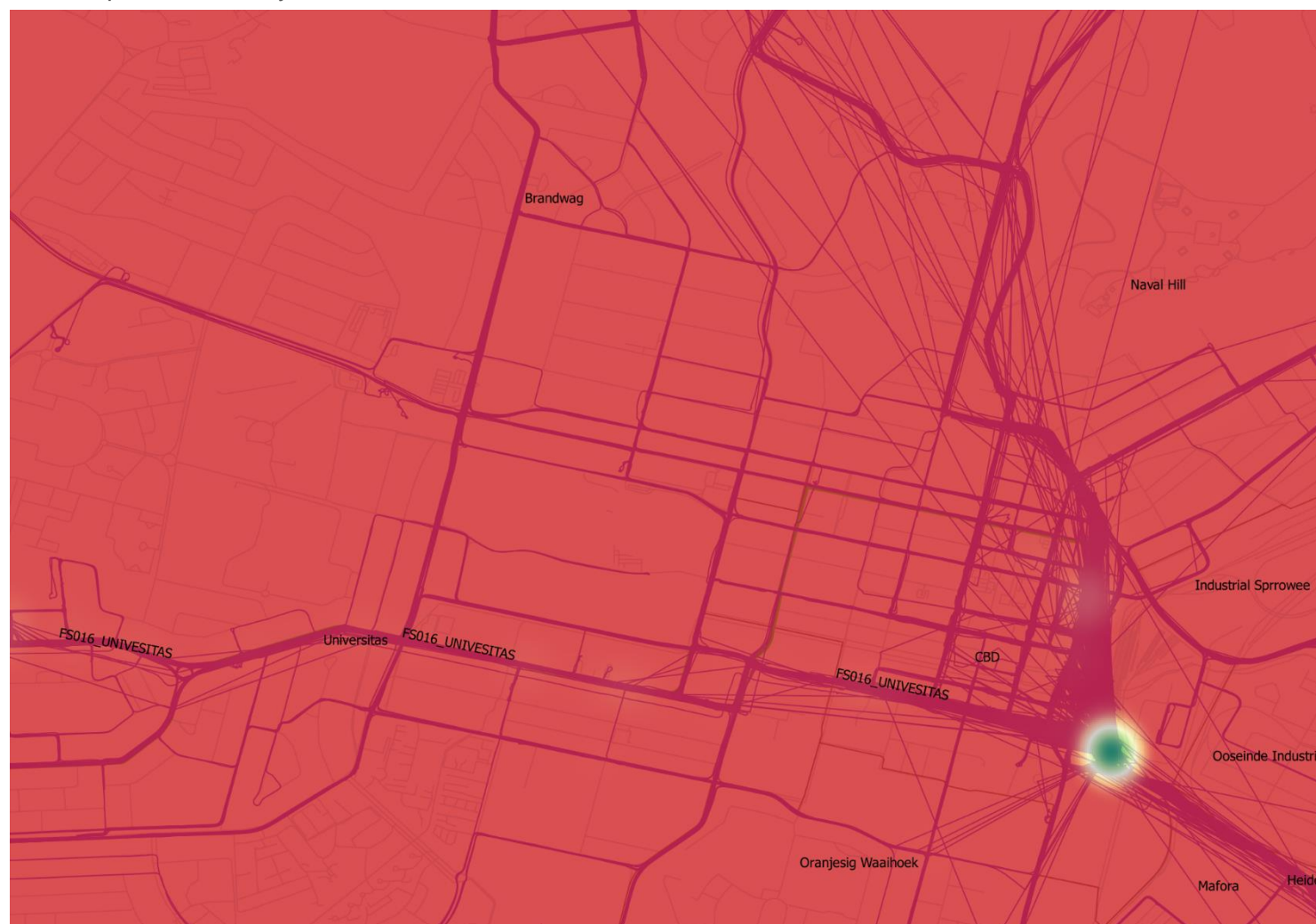
Heatmap of total surveyed area – Focused on Mangaung



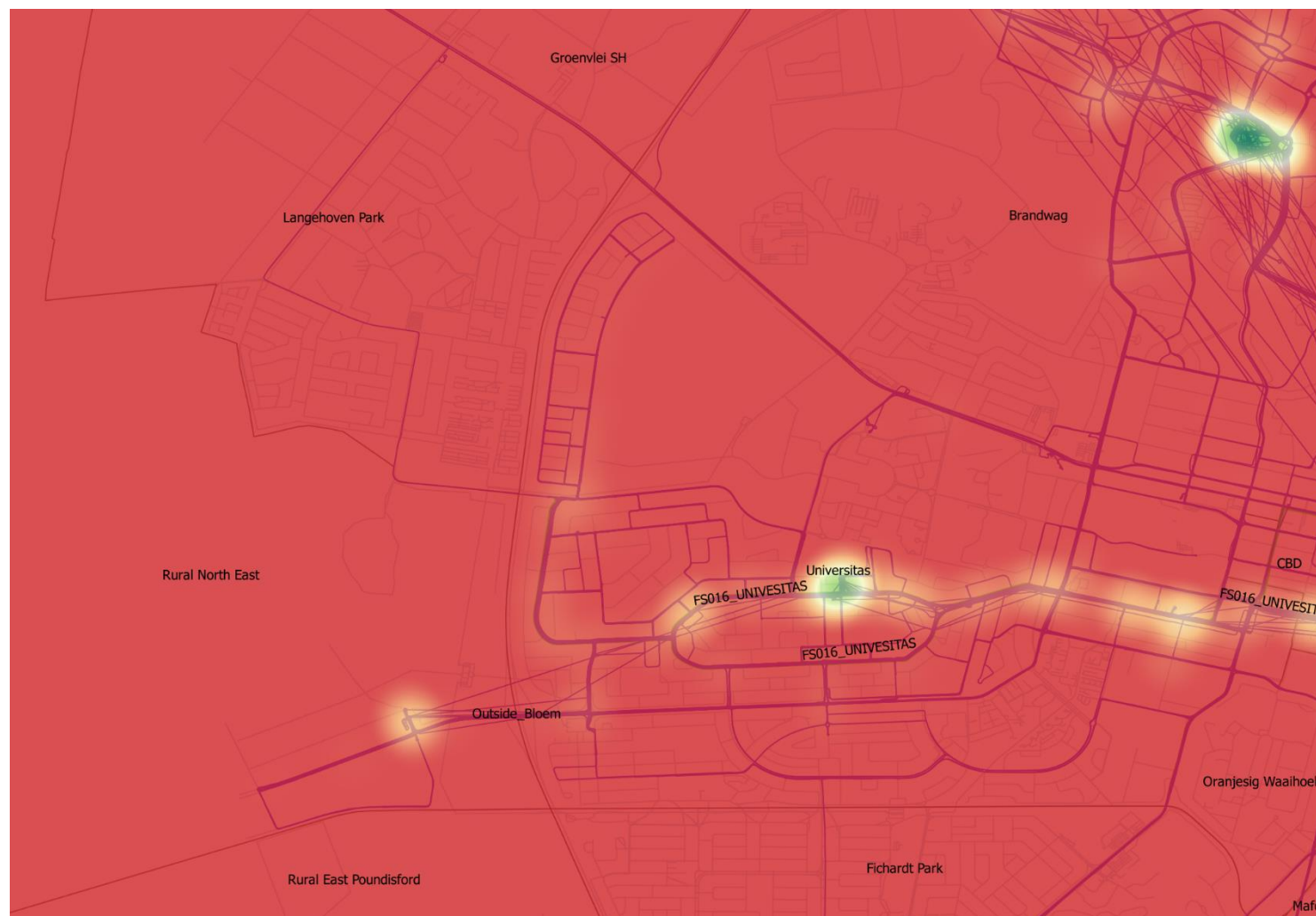
Heatmap of total surveyed area – Focused on the UNIVERSITAS route



Heatmap of total surveyed area – Focused on the CBD



Heatmap of total surveyed area – Focused on UNIVERSITAS



Heatmap of total surveyed area – Focused on Dan Pienaar



ELECTRONIC ON-BOARD SURVEY

Results



Survey results for
Taxi Route – UNIVERSITAS

iSAHA

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ROUTE: UNIVERSITAS
REPORT DATE: 15 December 2017

1. BACKGROUND

An on-board survey was conducted by means of electronic in-vehicle equipment and back-office processing and analysis.

The data collected from the survey included the routes travelled by the taxis and the passenger numbers boarding and alighting the taxis recorded with time and position information.

The positional information is recorded with an electronic on-board GPS device, which was fitted into the vehicle. The GPS information started recording only when the taxi was switched on.

The aim of the survey is to record the normal daily operations of minibus taxis for a period of 12 days and report on 7 days of operation. Operations for each day of the week was recorded and the average results for each day of the week are portrayed in this report.

2. SURVEY INFORMATION

2.1. Period

35 taxis were surveyed between the following dates:

Cycle 1: 21 February 2017

Cycle 11: 15 August 2017

2.2. Assumptions

The following assumptions were made in the analysis and calculations:

1. A flat fare was paid per passenger per trip

- a. Bloemfontein uses a flat fare of R10.00 on this route.

2. Private passengers were defined as follow:

- a. Private passengers 1: Passengers transported outside of the normal working area or time of the taxi. E.g. friends of the driver travelling late at night to a residence.
- b. Private passengers 2: Passengers traveling on a trip which originates or ends outside the official routes of the relevant association. E.g. passengers on a trip to Johannesburg.

3. % Private passengers: The number of passenger on a trip outside the official routes as a percentage of the total number of passengers who boarded the taxi

4. PasKm: Passenger Kilometre (PKM) is a measure of movement of passengers by a mode of

transport. It is calculated as: $PKM = TPC \times TDC$. Where, TPC is Total Passengers Carried measured in terms of number of passengers and, TDC is the Total Distance Covered measured in kilometres.

$$PasKM = Onboard \times Operating \text{ Km}$$

5. **SeatKms:** Seat kilometres (SK) is a measure of a minibus's passenger carrying capacity. It is equal to the number of seats available multiplied by the number kilometres travelled.

$$SeatKms = Capacity \text{ of vehicle} \times Operating \text{ Km}$$

6. **Occupancy:** The proportion of seats occupied or used.

$$Occ = PasKm / SeatKms$$

7. **DeadKm:** The number of Kms travelled with no passengers onboard
8. **PrivateKm:** The number of Kms travelled outside of the survey area.
9. **Trip:** The route travelled between one stop to the next stop.

2.3. Remark about the survey

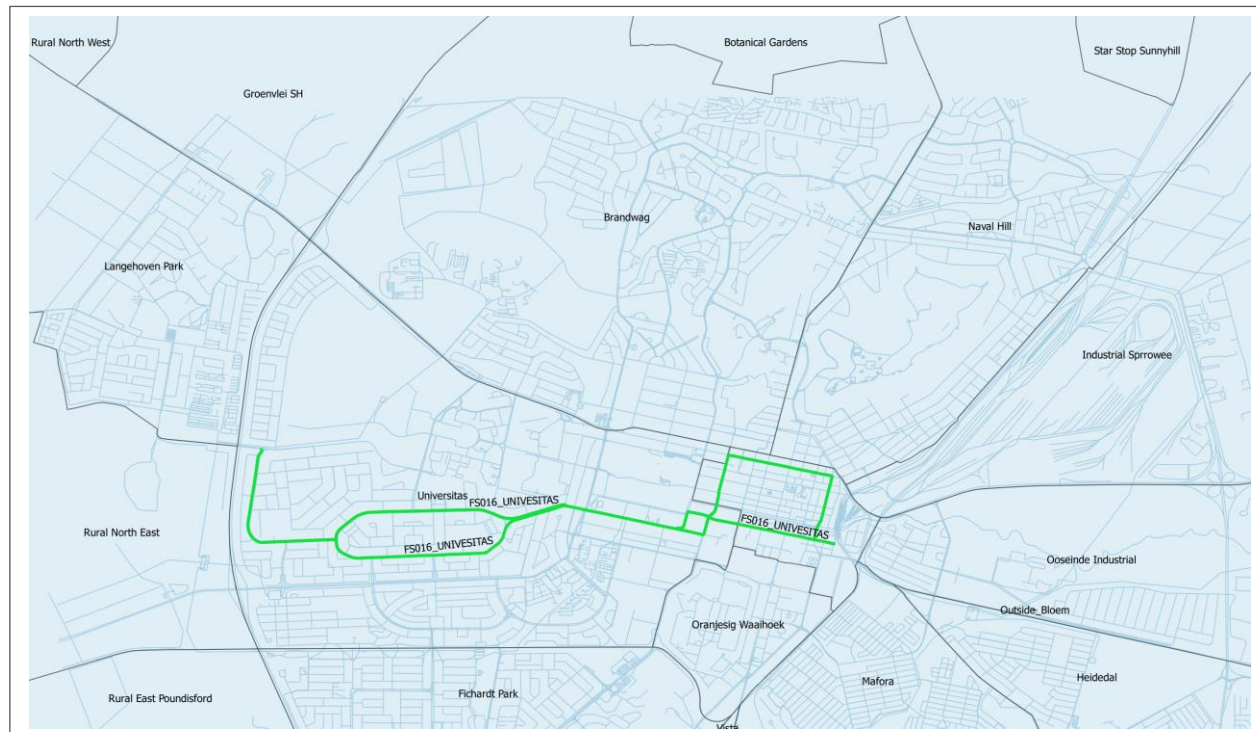
A total of 35 vehicles were surveyed between cycle 1 and cycle 11. 30 vehicles had 6 or more consecutive days of data and 5 vehicles did not have sufficient data.

3. RESULTS

3.1. Summary

The following average income from fare-paying passengers is the result from the on-board survey analysis:

Period	Value	Note
Average daily income	R 1 146.38	Per day for 7 days, covering each day of the week As determined from survey
Average weekly income	R 8 024.68	Per week As determined from survey
Average monthly income	R 34 746.87	Calculated from weekly result Formula: 4.33 x weekly average
Average annual turnover	R389 197.00	Calculated from weekly result Formula: 48.5 x weekly average

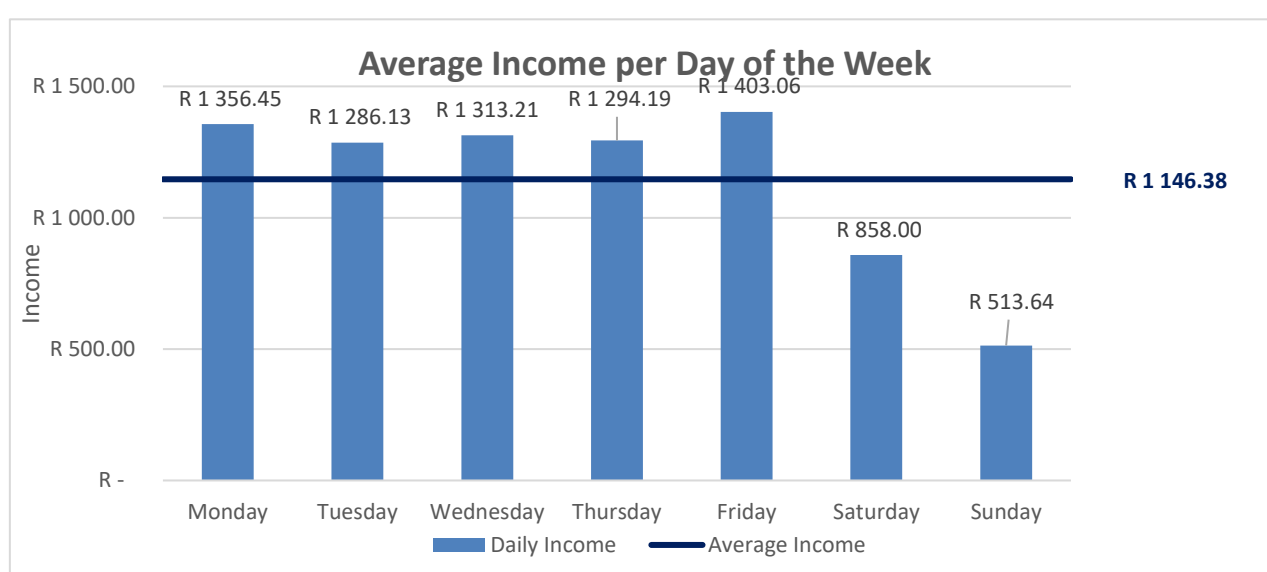


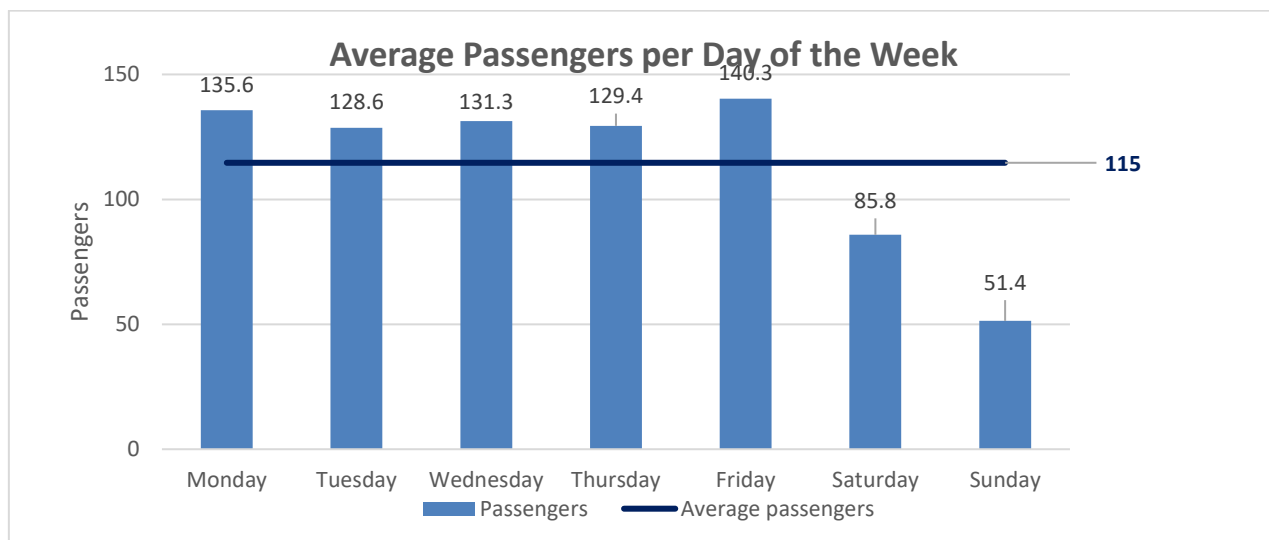
Corridor served by UNIVERSITAS Route

3.2. Daily average income

The average income per day over a spread of seven days are supplied in the table below:

	Average number of fare-paying passengers per day	Average Fare	Average daily income
Monday	136	R 10.00	R 1 356.45
Tuesday	129	R 10.00	R 1 286.13
Wednesday	131	R 10.00	R 1 313.21
Thursday	129	R 10.00	R 1 294.19
Friday	140	R 10.00	R 1 403.06
Saturday	86	R 10.00	R 858.00
Sunday	51	R 10.00	R 513.64
Weekly total	802		R 8 024.68
Average	115	R 10.00	R 1 146.38
Weekday Avg	133	R 10.00	R 1 330.61

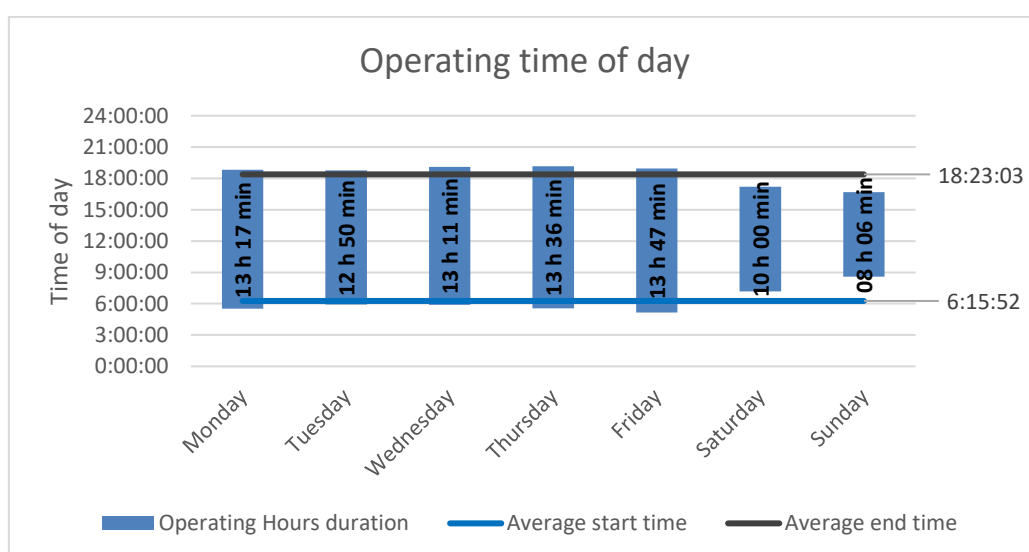




3.3. Daily operating times

The following table and graph show the starting and ending times of the taxis surveyed.

Operating time			
	Average start time	Average end time	Operating Hours duration
Daily (Mon - Sun) avg	6:15:52	18:23:03	12:07:11
Weekday (Mon-Fri) avg	5:36:58	18:57:34	13:20:36
Monday	5:31:22	18:48:54	13:17:32
Tuesday	5:55:37	18:46:15	12:50:38
Wednesday	5:54:05	19:05:18	13:11:13
Thursday	5:34:08	19:10:42	13:36:34
Friday	5:09:39	18:56:41	13:47:02
Saturday	7:10:57	17:11:46	10:00:49
Sunday	8:35:13	16:41:44	8:06:31



3.4. Distances travelled

The average distances travelled during operations are illustrated in the table below, together with the average vehicle occupancy per km.

Distances travelled and vehicle occupancy				
	Average of total km travelled	Average of operating km on Mangaung network	Average revenue per km	Vehicle Occupancy
Daily (Mon - Sun) avg	153	142	R 8.09	36%
Weekday (Mon-Fri) avg	172	165	R 8.07	35%
Monday	175	166	R 8.16	36%
Tuesday	166	166	R 7.73	34%
Wednesday	164	164	R 8.00	34%
Thursday	172	159	R 8.14	36%
Friday	184	168	R 8.33	37%
Saturday	130	102	R 8.39	39%
Sunday	83	65	R 7.88	41%

3.5. Operational analysis

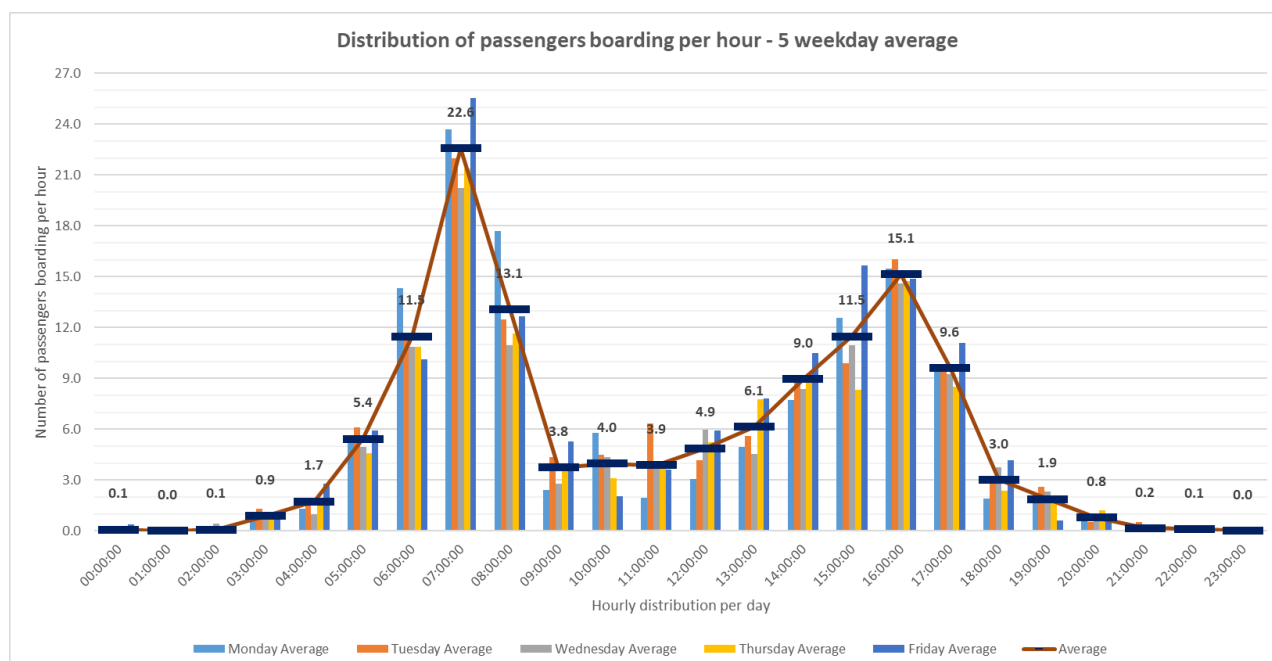
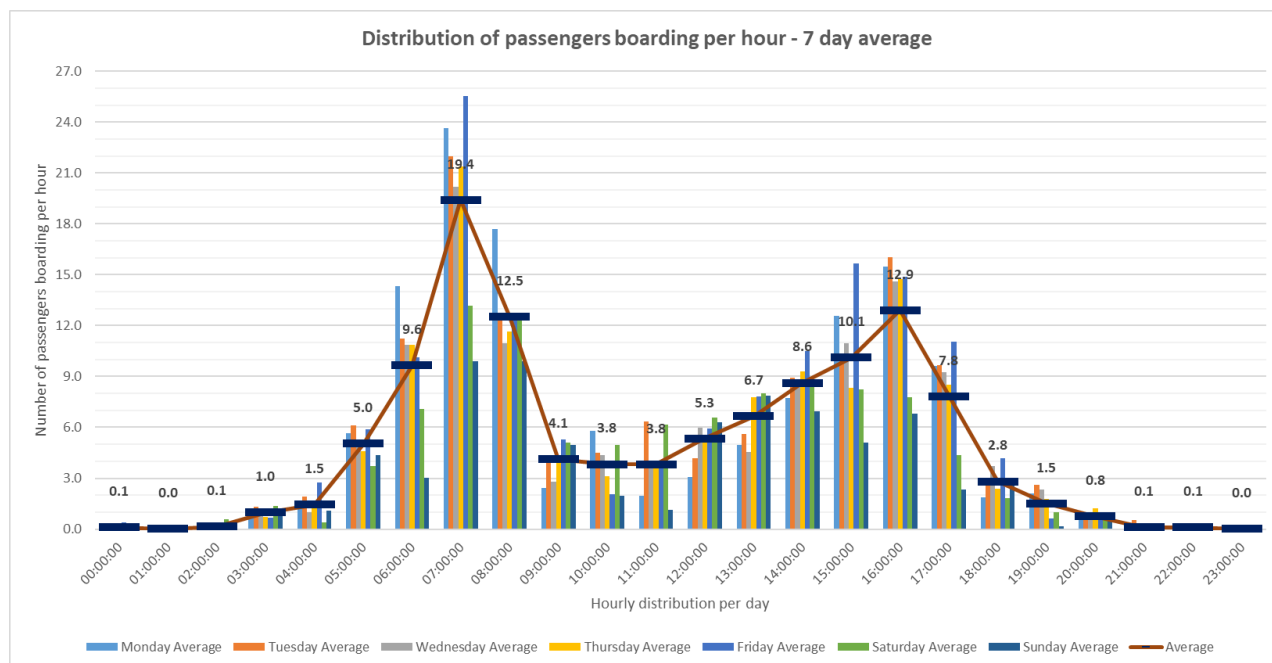
Operational analysis								
	Average of operating km on Mangaung network	Average number of paying passengers per day	Kms / Passenger	Service Frequency	Operating Speed	Passenger km	Seat kms	Vehicle Occupancy
Daily (Mon - Sun) avg	141.7	115	1.22	00:09:28	10.9	954.5	2704.2	36%
Weekday (Mon-Fri) avg	164.9	133	1.23	00:08:26	12.4	959.9	2788.0	35%
Monday	166.3	136	1.21	00:08:03	12.6	965.4	2764.7	36%
Tuesday	166.4	129	1.29	00:08:21	13.5	973.5	2970.8	34%
Wednesday	164.2	131	1.25	00:08:06	12.5	887.8	2697.8	34%
Thursday	159.0	129	1.21	00:09:03	11.3	955.2	2714.4	36%
Friday	168.4	140	1.17	00:08:39	11.9	1015.7	2788.0	37%
Saturday	102.3	86	1.14	00:09:52	8.6	1039.7	2597.9	39%
Sunday	65.2	51	1.22	00:14:12	5.5	752.8	1810.5	41%

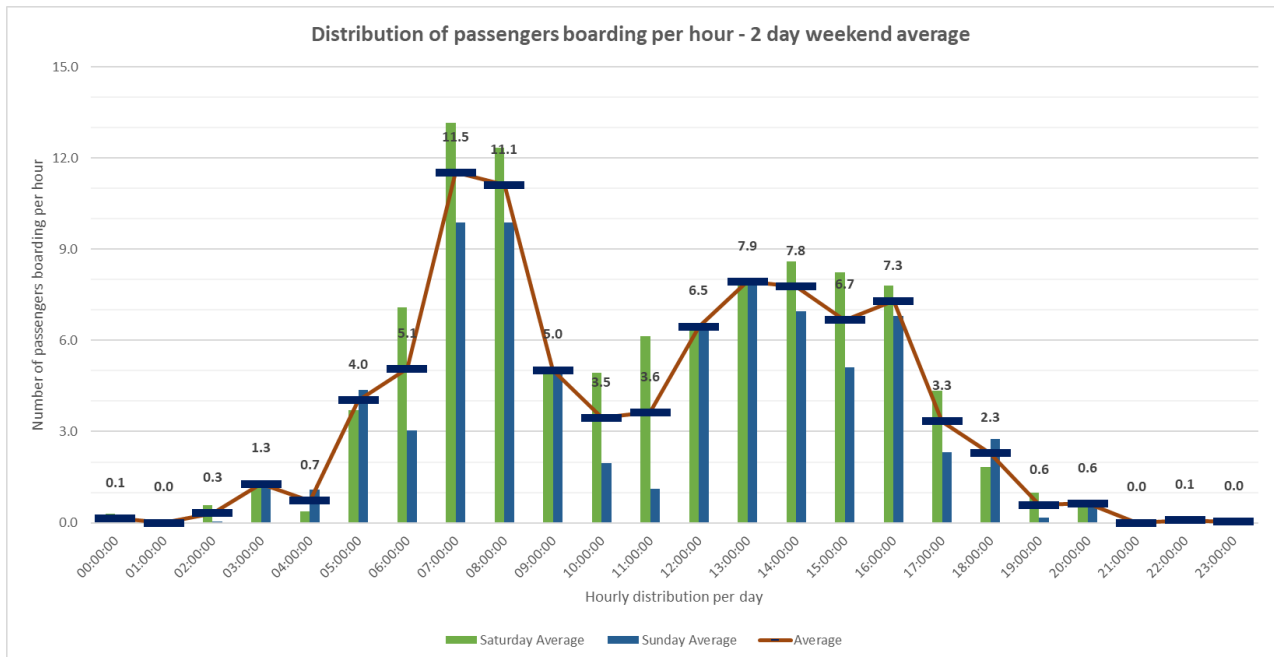
3.6. Fluctuations

The operational fluctuations during a single day of operation is shown in the table and following graphs.

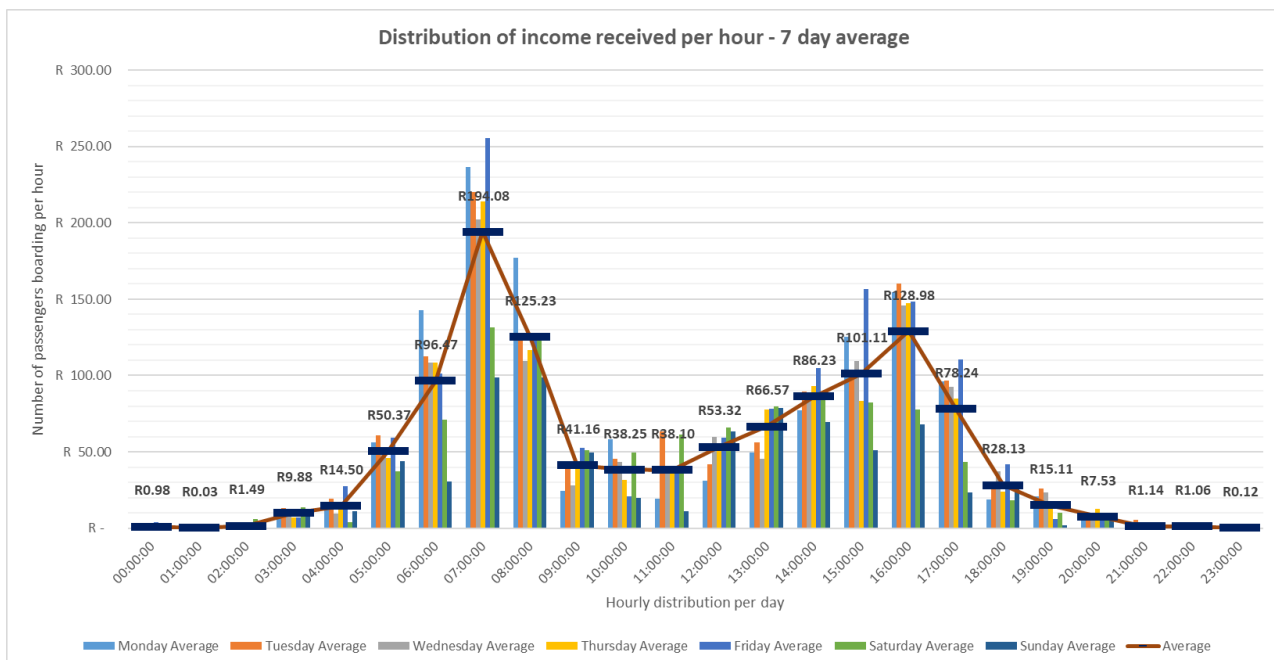
Operating slot		Number of passengers boarding per hour	Average income per hour	Occupancy per hour
From	To			
00:00	00:59	0.1	R 0.98	0%
01:00	01:59	0.0	R 0.03	0%
02:00	02:59	0.1	R 1.49	1%
03:00	03:59	1.0	R 9.88	3%
04:00	04:59	1.5	R 14.50	4%
05:00	05:59	5.0	R 50.37	23%
06:00	06:59	9.6	R 96.47	35%
07:00	07:59	19.4	R 194.08	37%
08:00	08:59	12.5	R 125.23	36%
09:00	09:59	4.1	R 41.16	18%
10:00	10:59	3.8	R 38.25	16%
11:00	11:59	3.8	R 38.10	17%
12:00	12:59	5.3	R 53.32	18%
13:00	13:59	6.7	R 66.57	21%
14:00	14:59	8.6	R 86.23	24%
15:00	15:59	10.1	R 101.11	26%
16:00	16:59	12.9	R 128.98	32%
17:00	17:59	7.8	R 78.24	27%
18:00	18:59	2.8	R 28.13	13%
19:00	19:59	1.5	R 15.11	6%
20:00	20:59	0.8	R 7.53	4%
21:00	21:59	0.1	R 1.14	2%
22:00	22:59	0.1	R 1.06	1%
23:00	23:59	0.0	R 0.12	0%

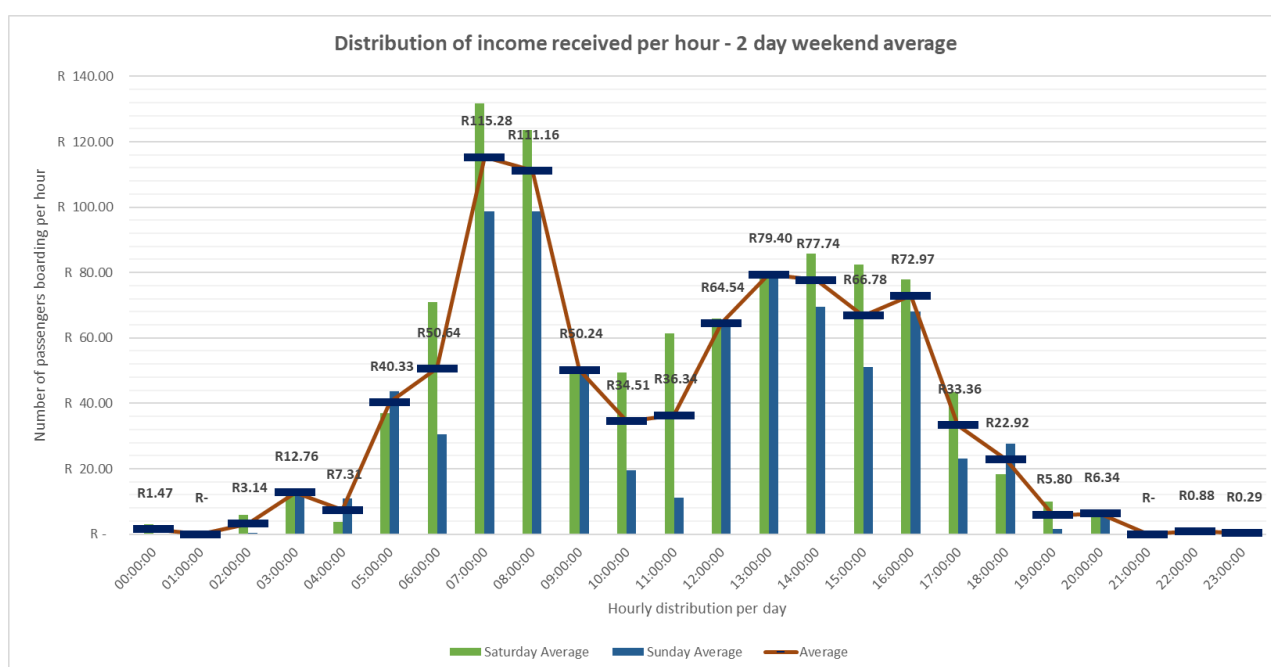
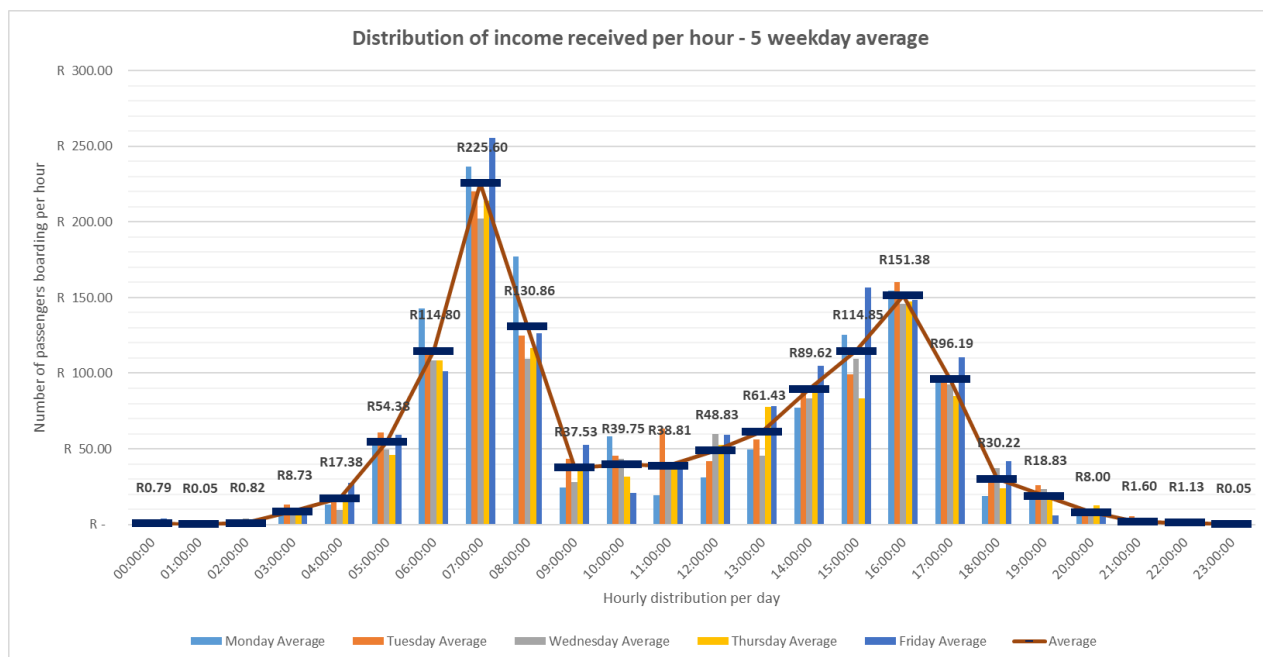
The following graphs show the average number of passengers boarding per hour over a 7-day period, a 5-day week period and 2-day weekend period.



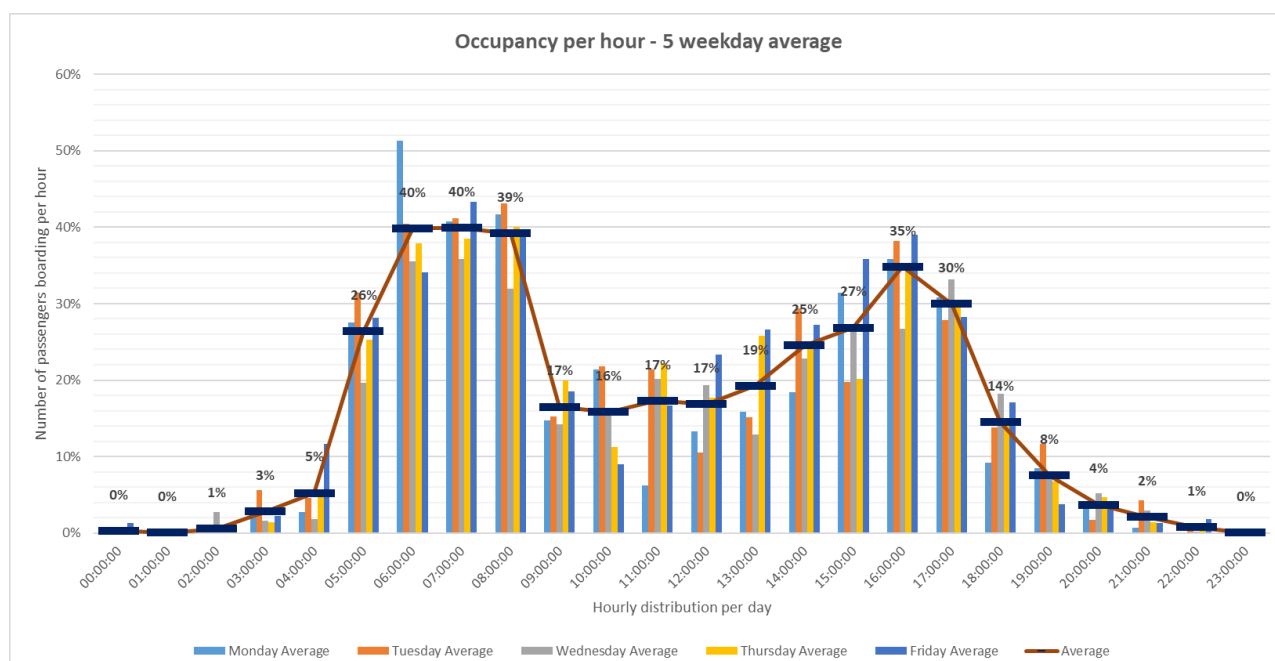
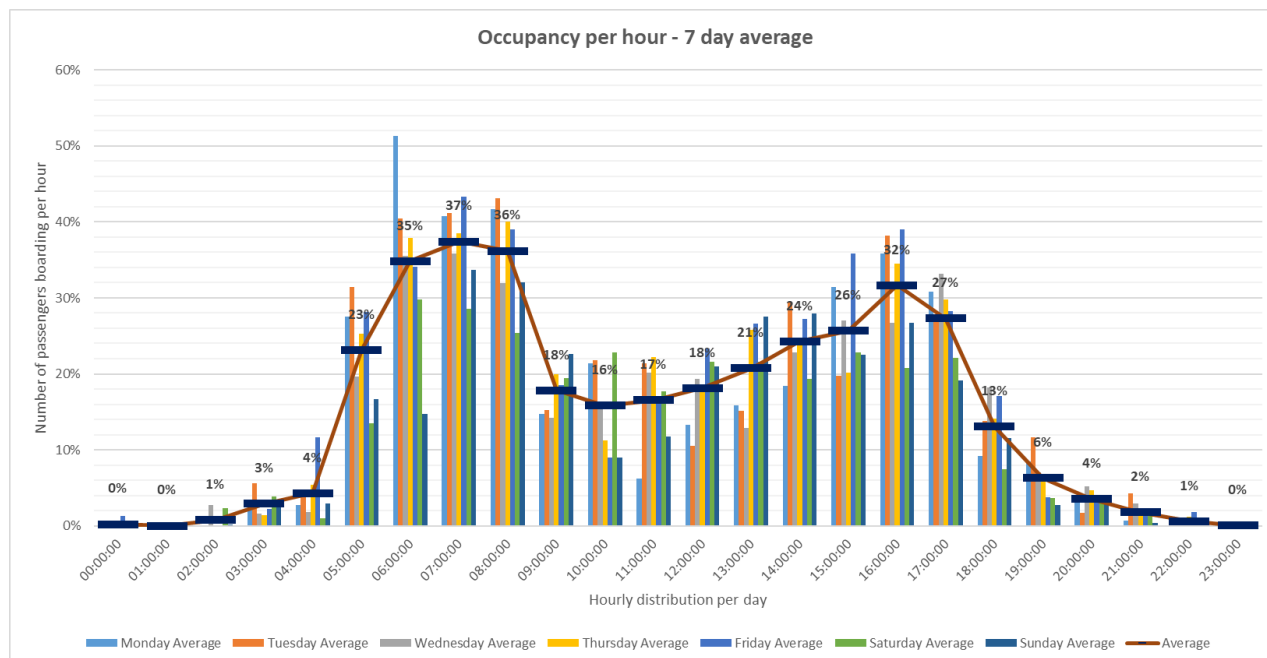


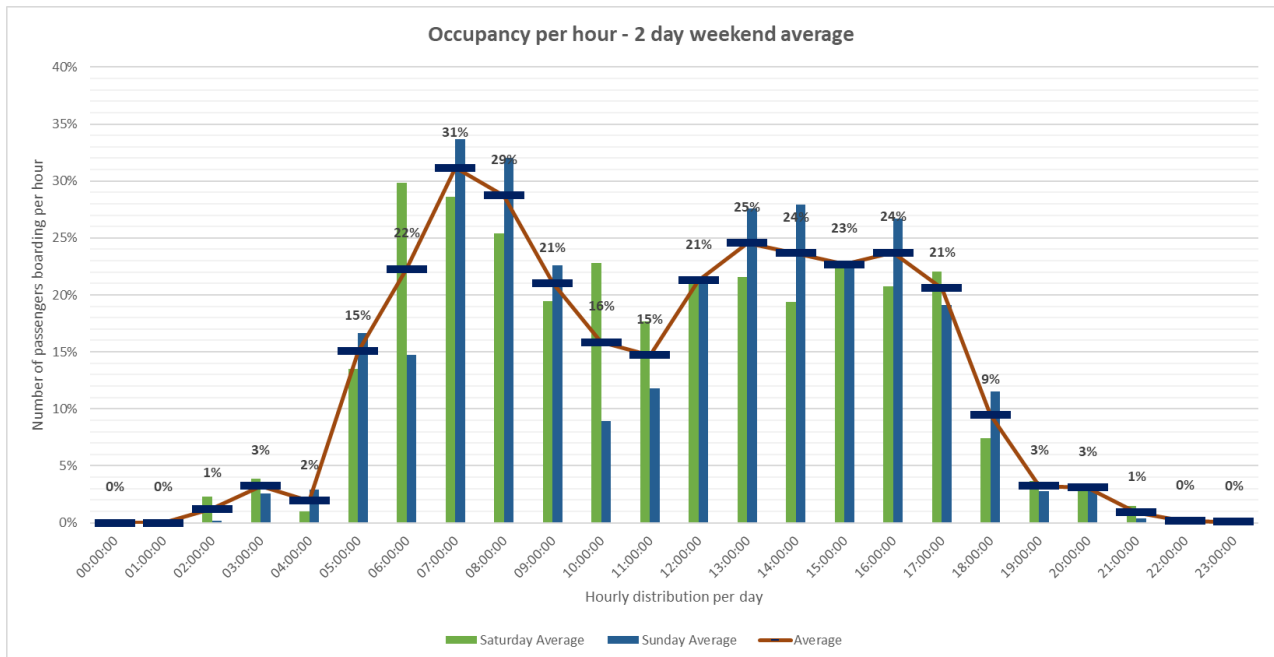
The following graphs show the average income per hour over a 7-day period, a 5-day week period and 2-day weekend period.





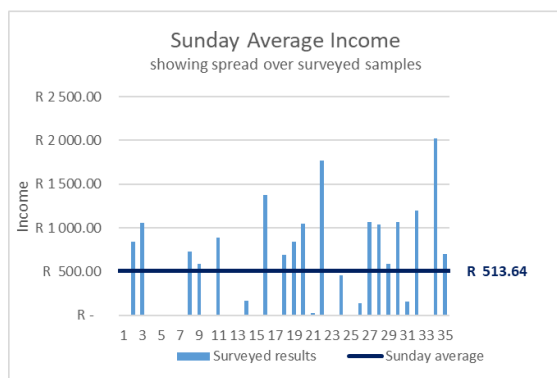
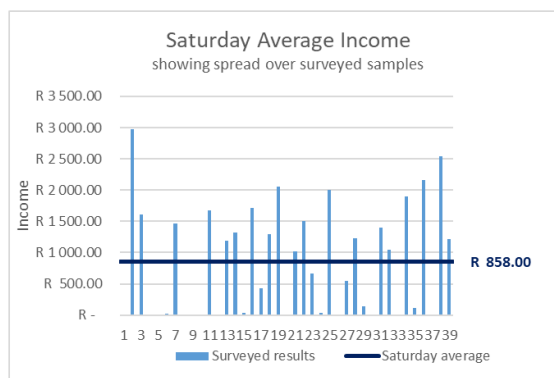
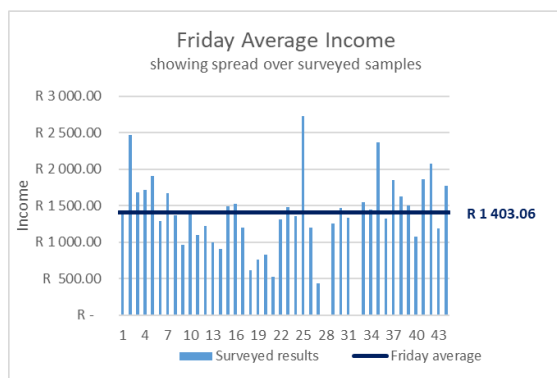
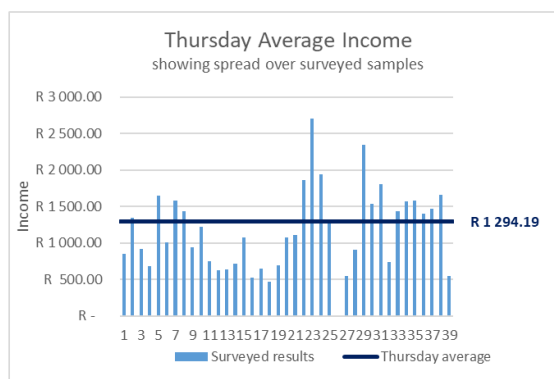
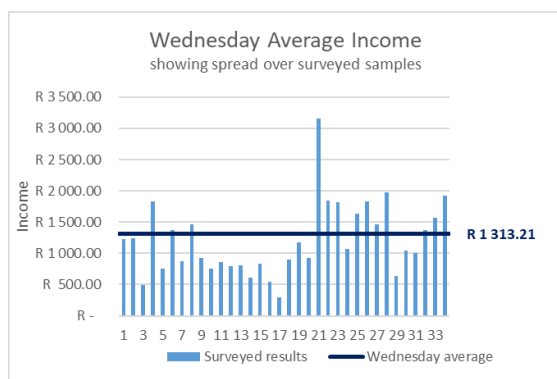
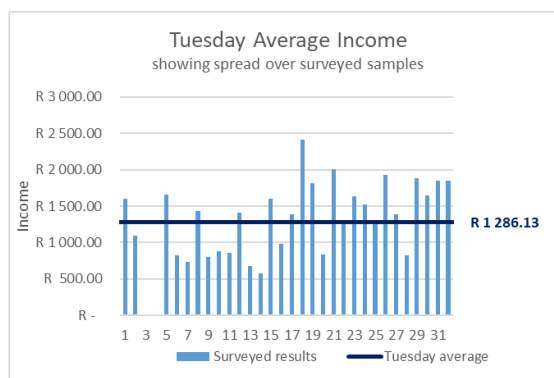
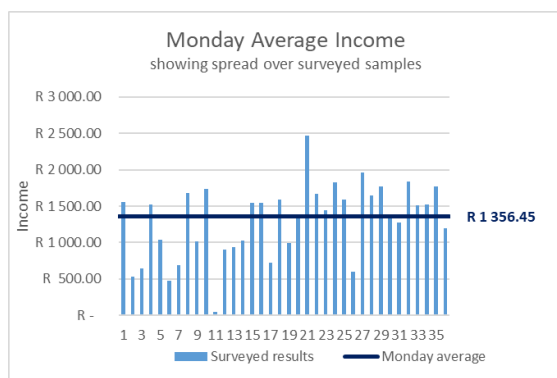
The following graphs show the average occupancy per hour over a 7-day period, a 5-day week period and 2-day weekend period.



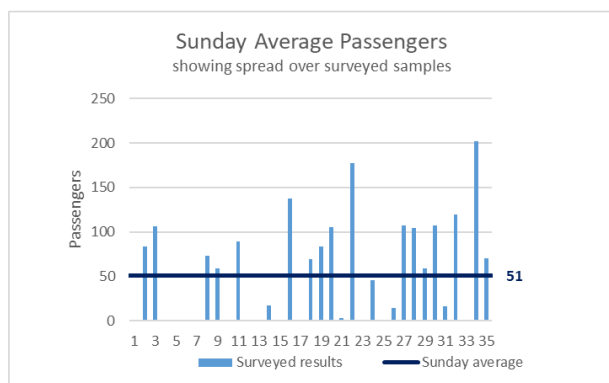
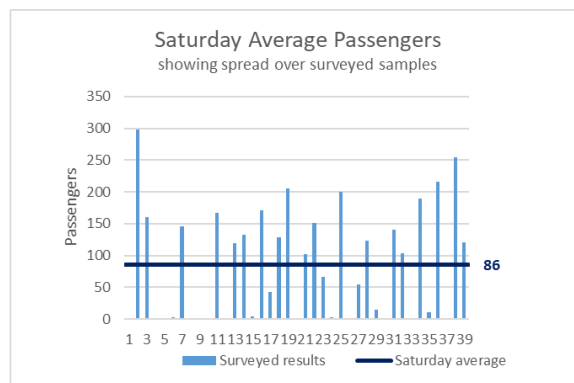
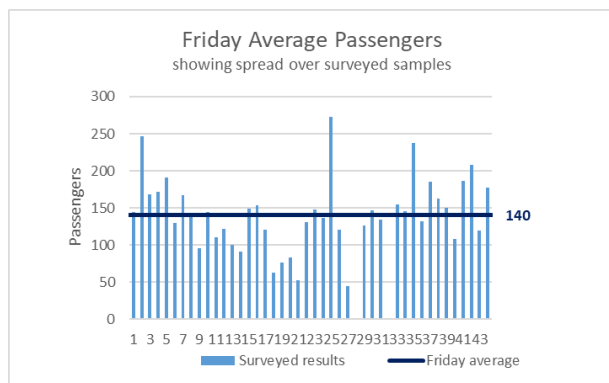
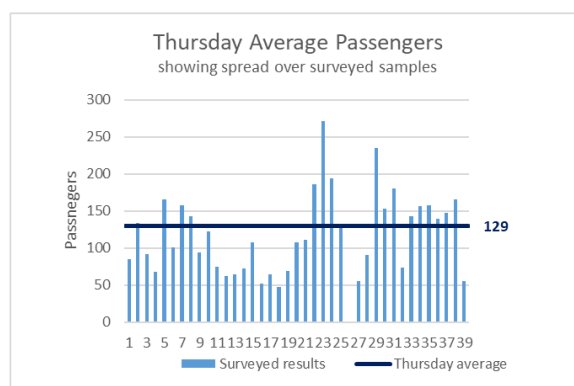
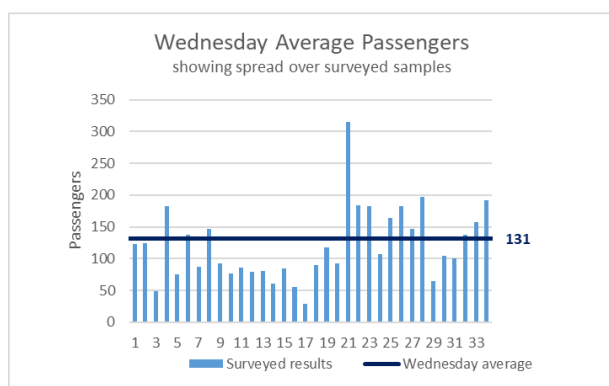
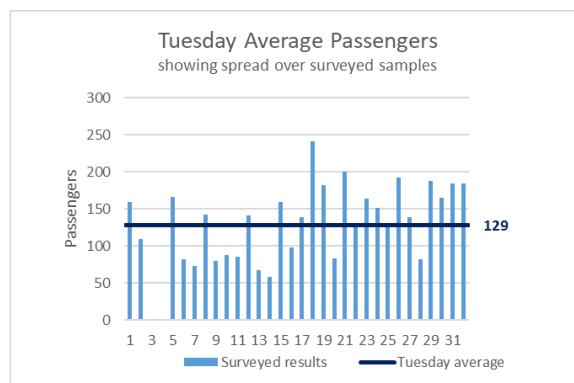
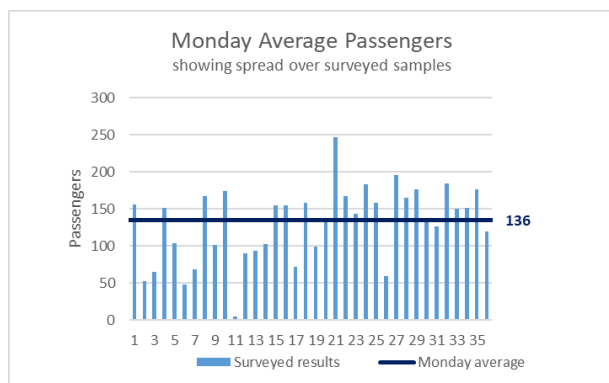


4. DETAILED SURVEY RESULTS

4.1. Income distribution



4.2. Passenger number distribution

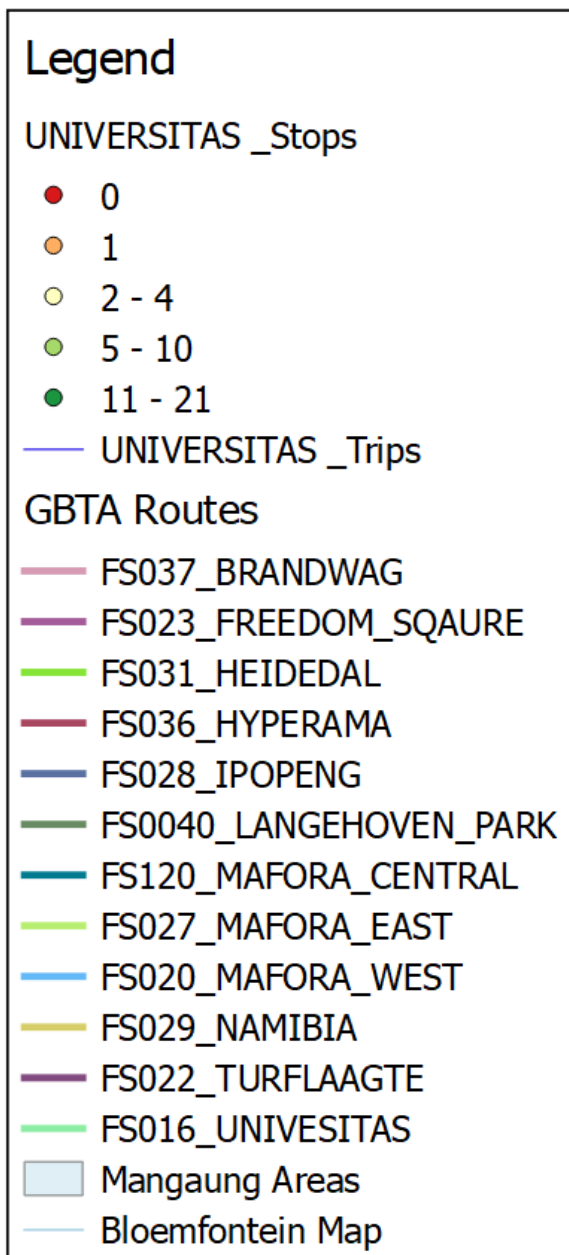


5. MAPS

The first maps show all the surveyed operations of the taxis alongside the Mangaung road network.

The maps following these indicate the a heatmap of the areas surveyed. These heatmaps demonstrate the zones of high volumes of boarding passenger.

Legend utilised for maps

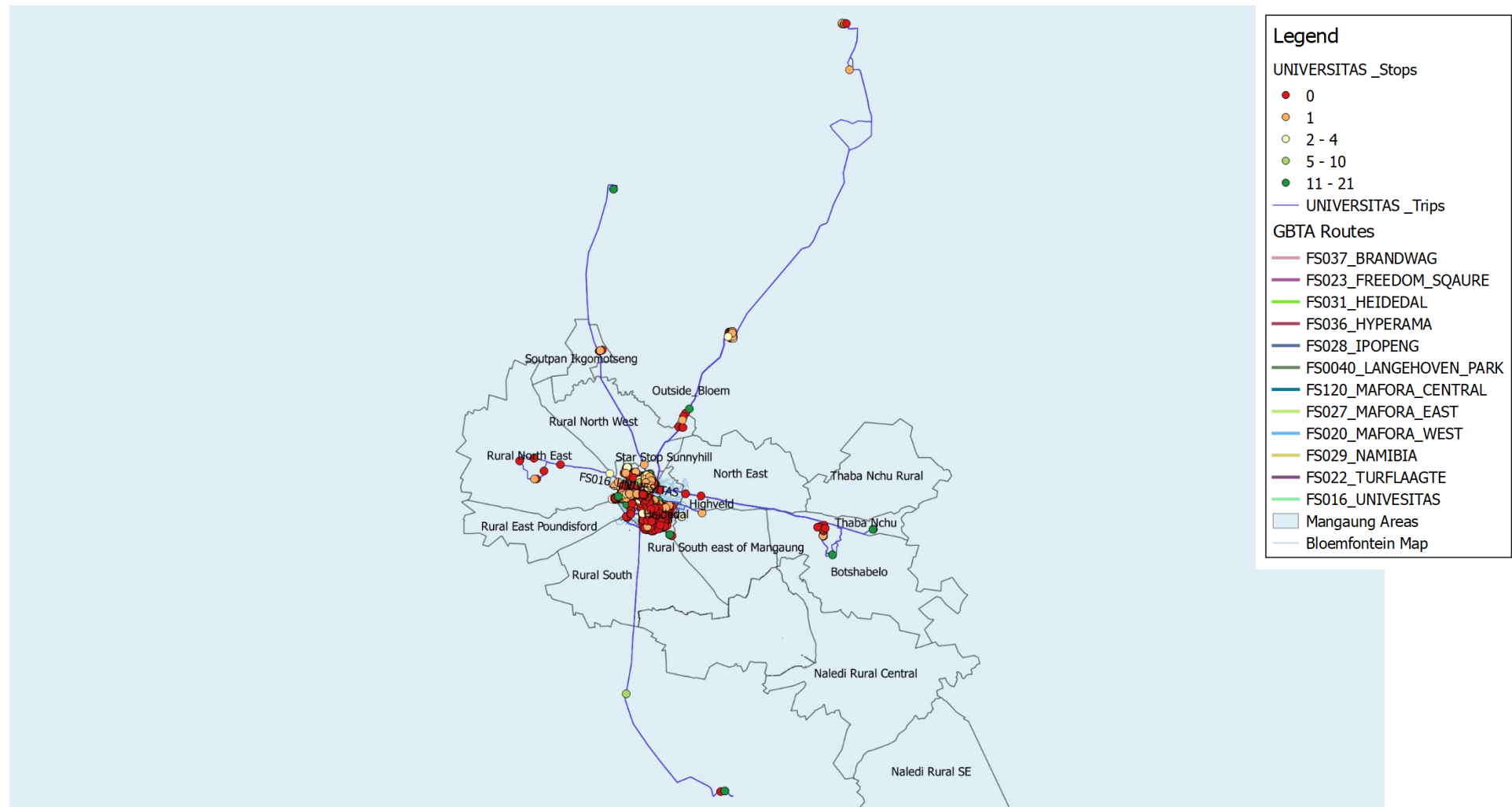


5.1. All surveyed operations

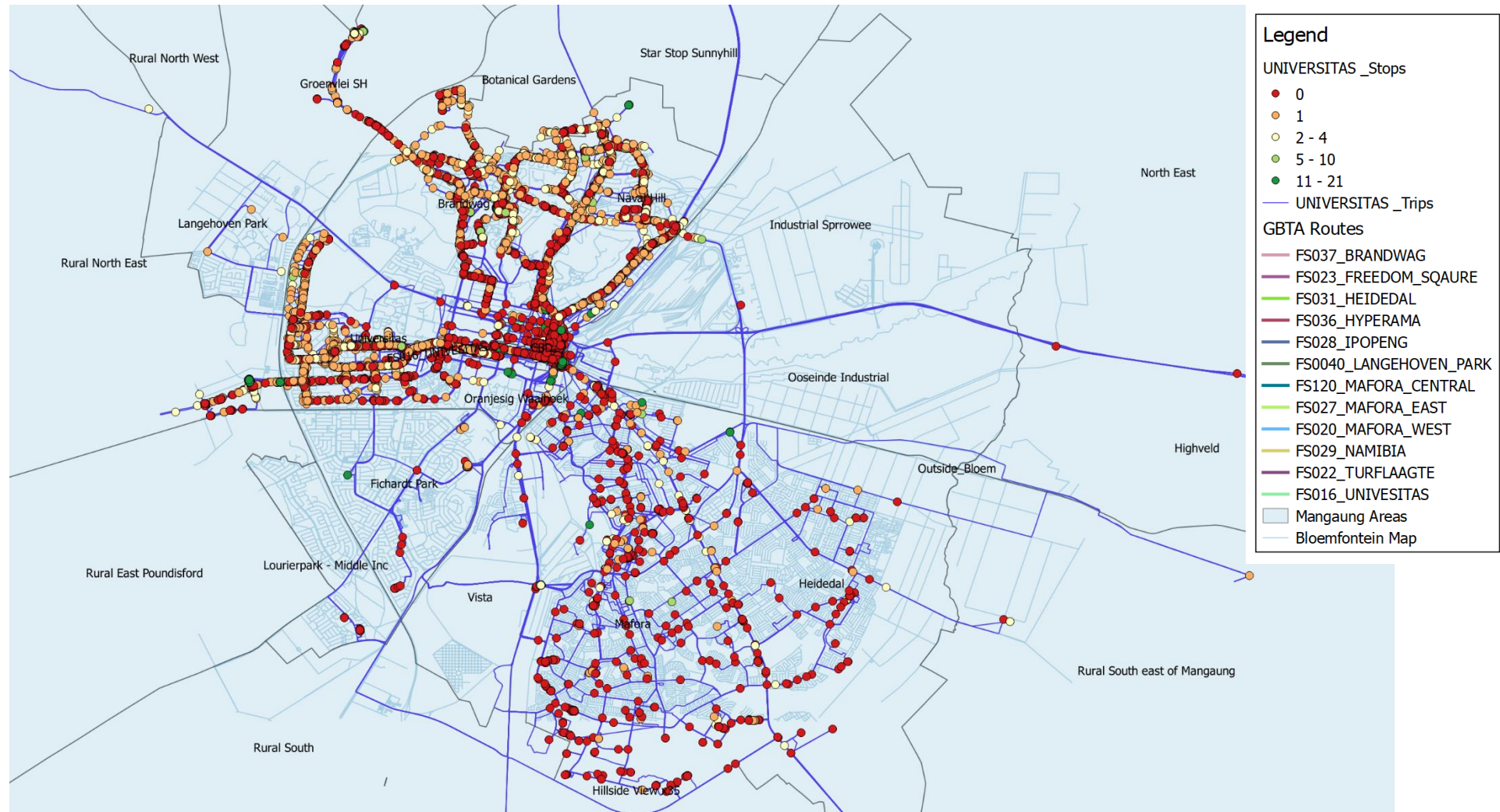
The tracks in blue illustrates the operations of all the surveyed taxis.

All the stops made by all the taxis to either pick up passengers or drop off passengers are indicated.

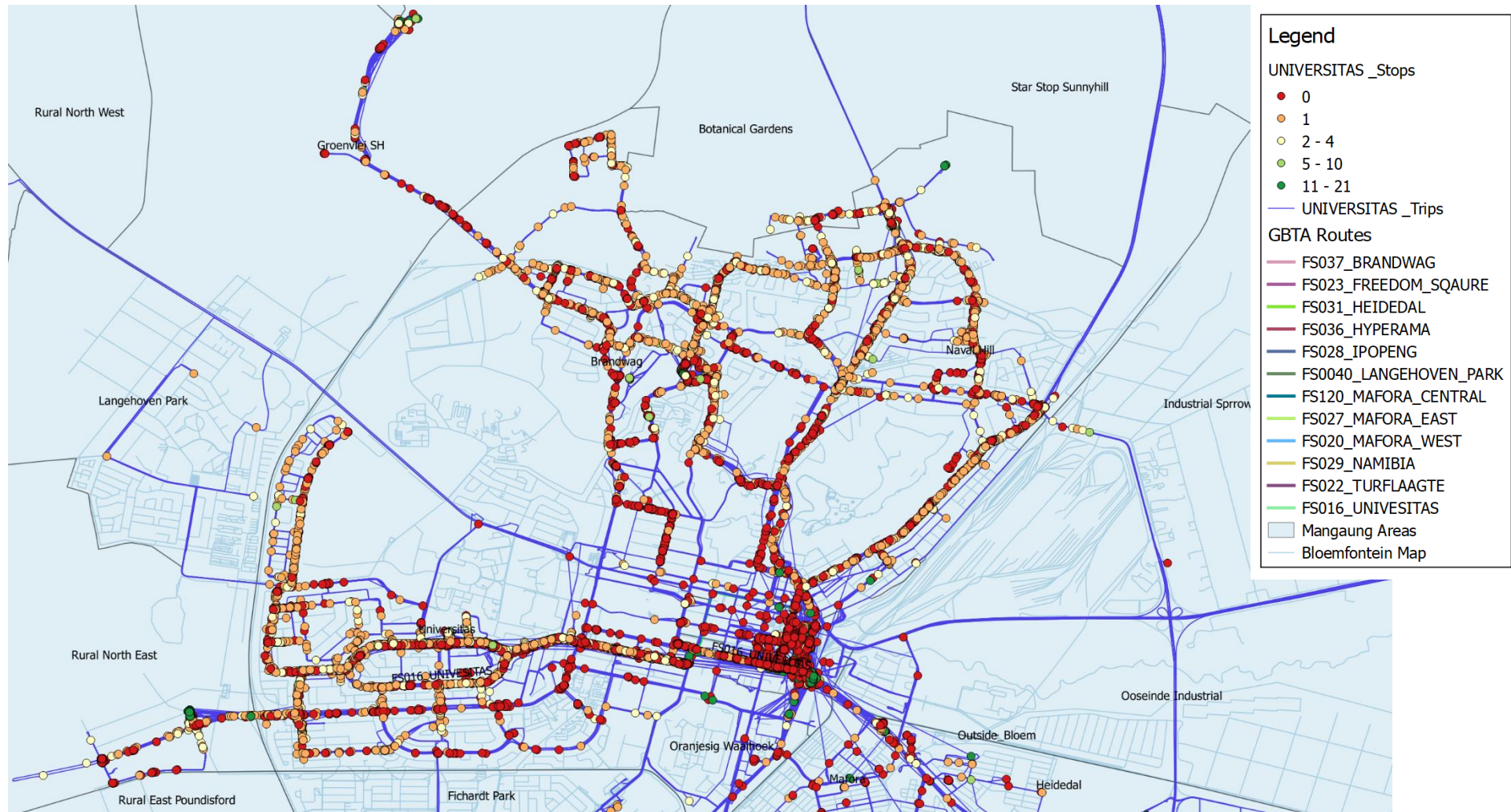
Operations of all surveyed taxis including stops



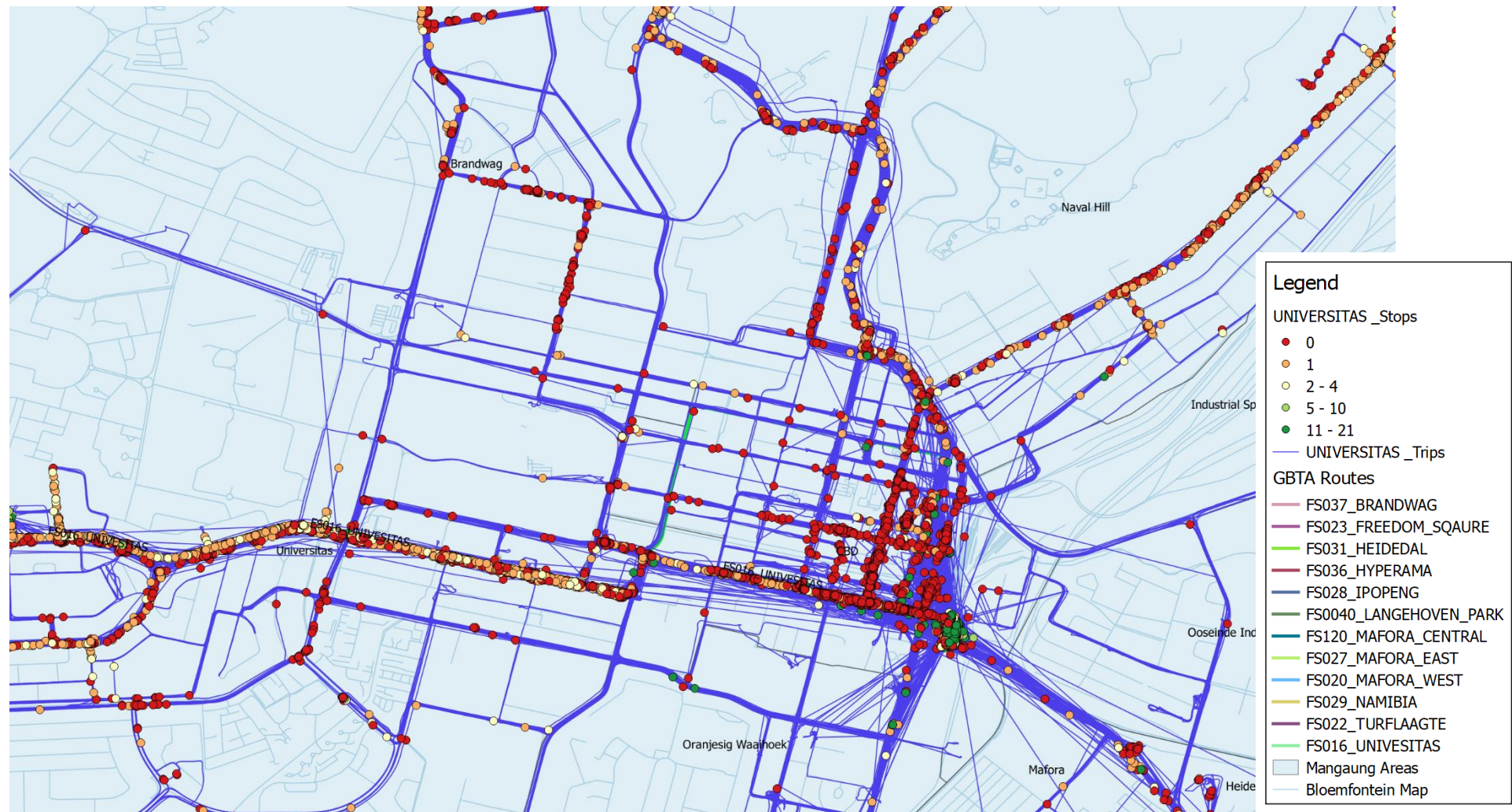
Operations of all surveyed taxis including stops – Focused on Mangaung



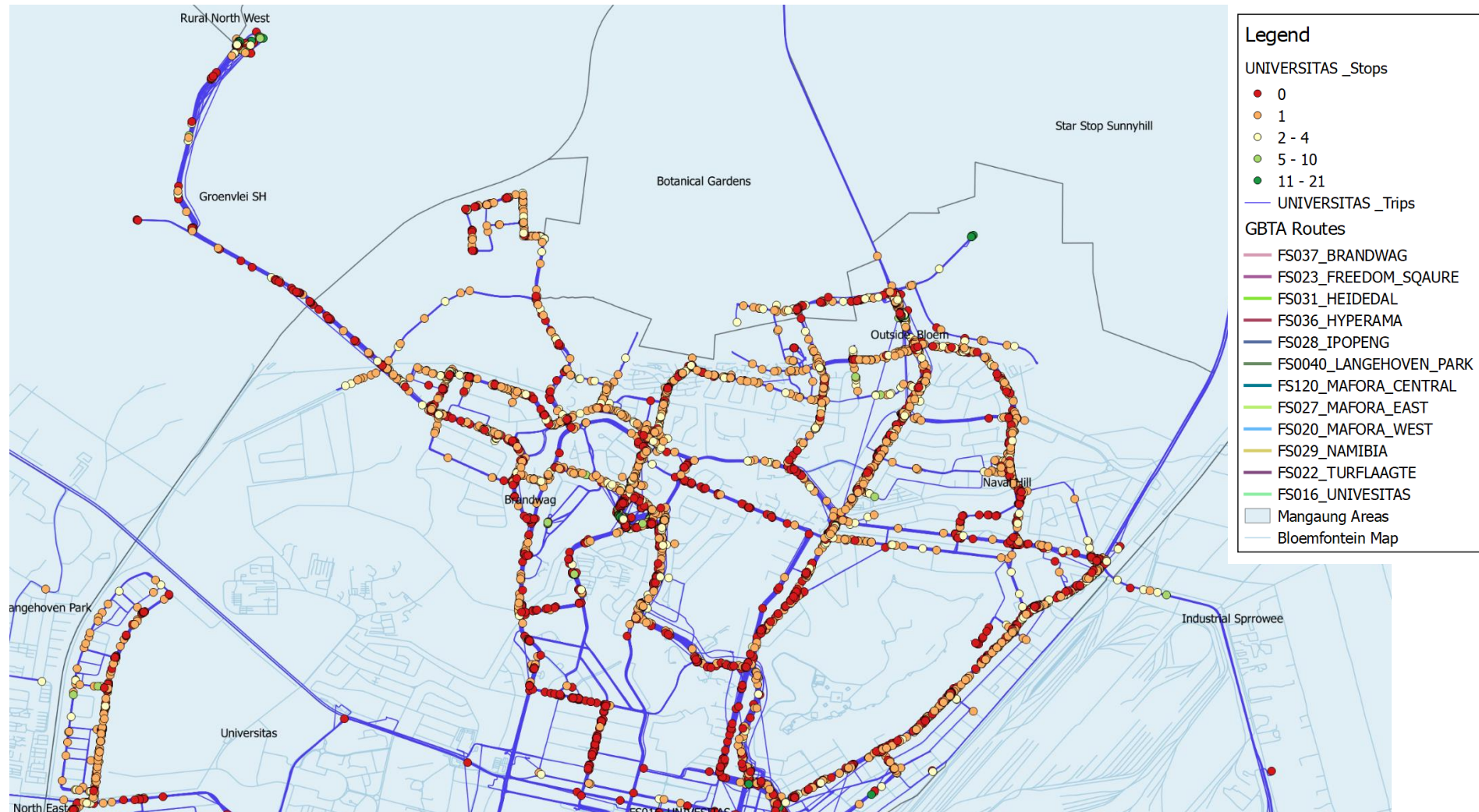
Operations of all surveyed taxis including stops – Focused on the UNIVERSITAS route



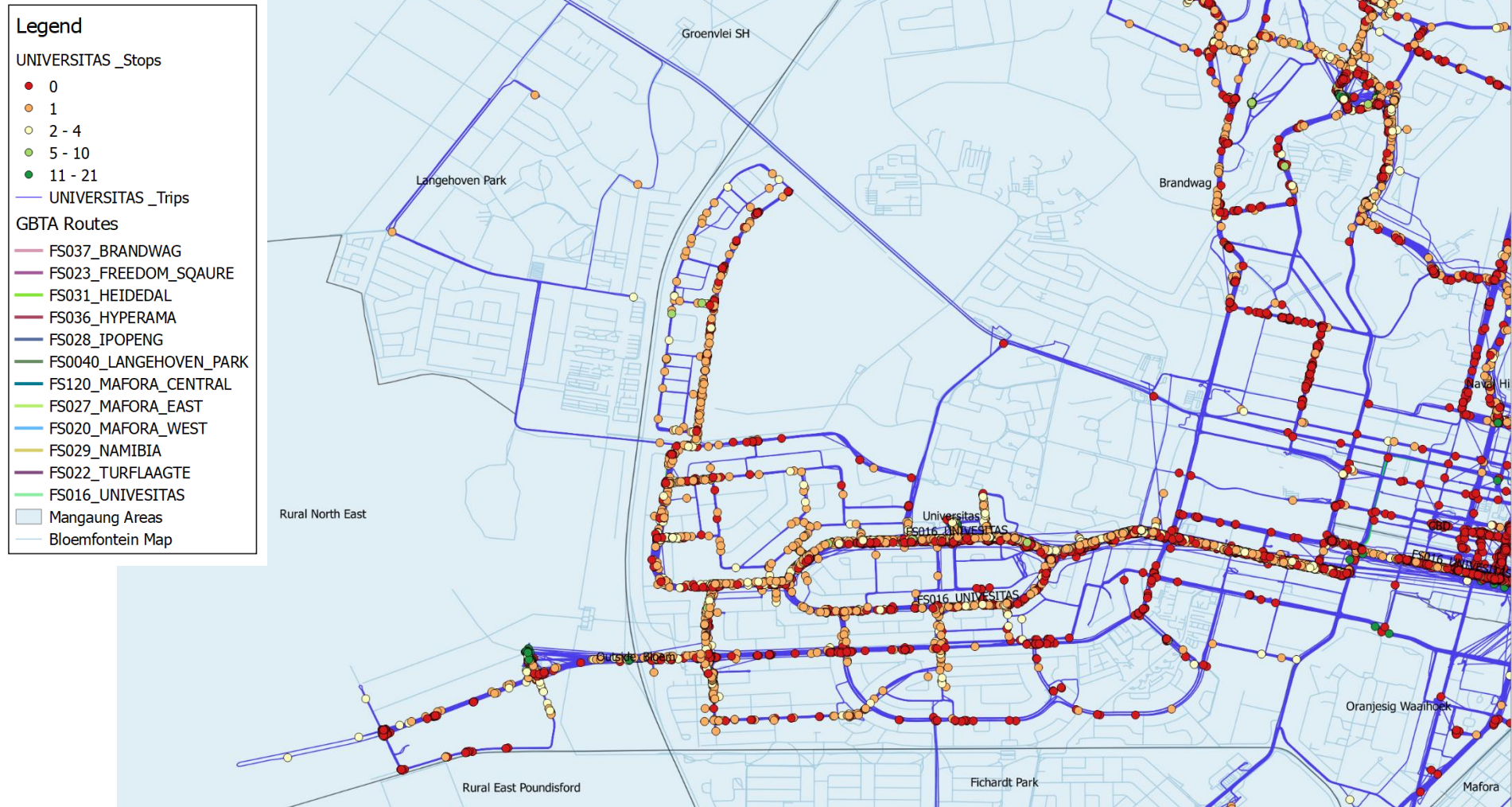
Operations of all surveyed taxis including stops – Focused on the CBD



Operations of all surveyed taxis including stops – Focused on Dan Pienaar



Operations of all surveyed taxis including stops – Focused on the UNIVERSITAS area

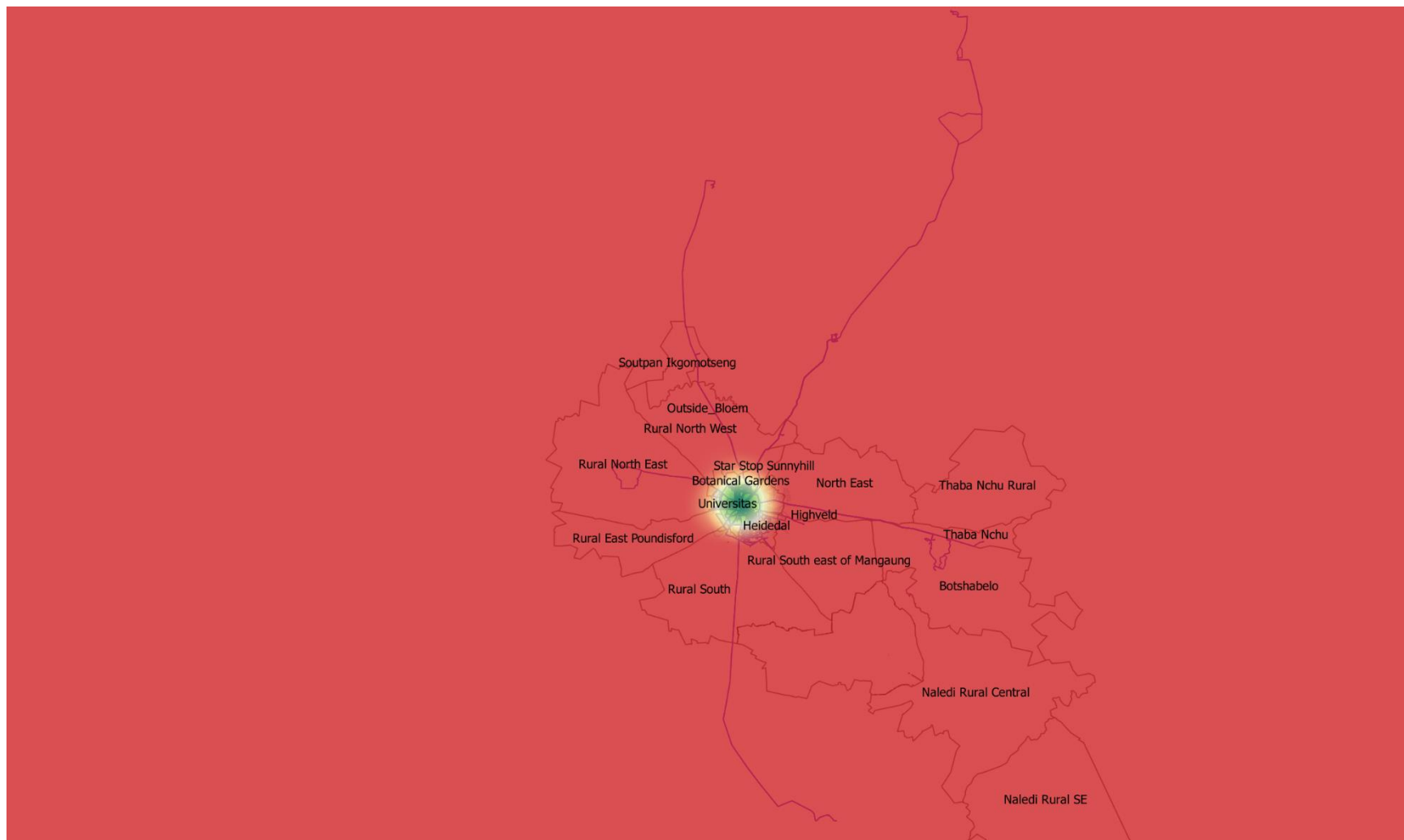


5.2. Heatmaps of taxi operations

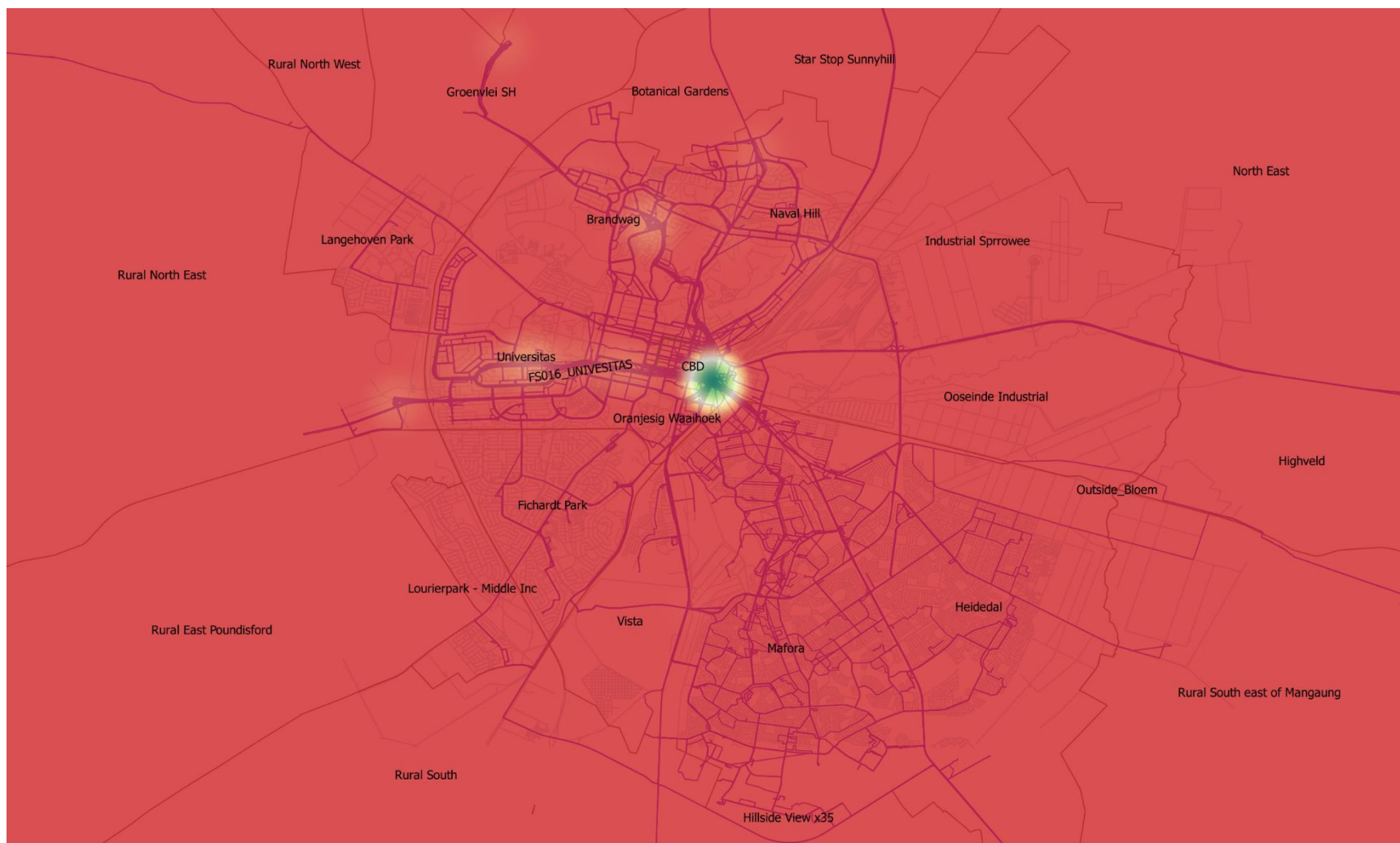
The following maps demonstrate the volume of passengers in each area.

- Red indicates little to no activity compare to the rest of the area.
- Yellow indicates high activity compared to the rest of the area
- Green indicates the highest activity compared to the rest of the area

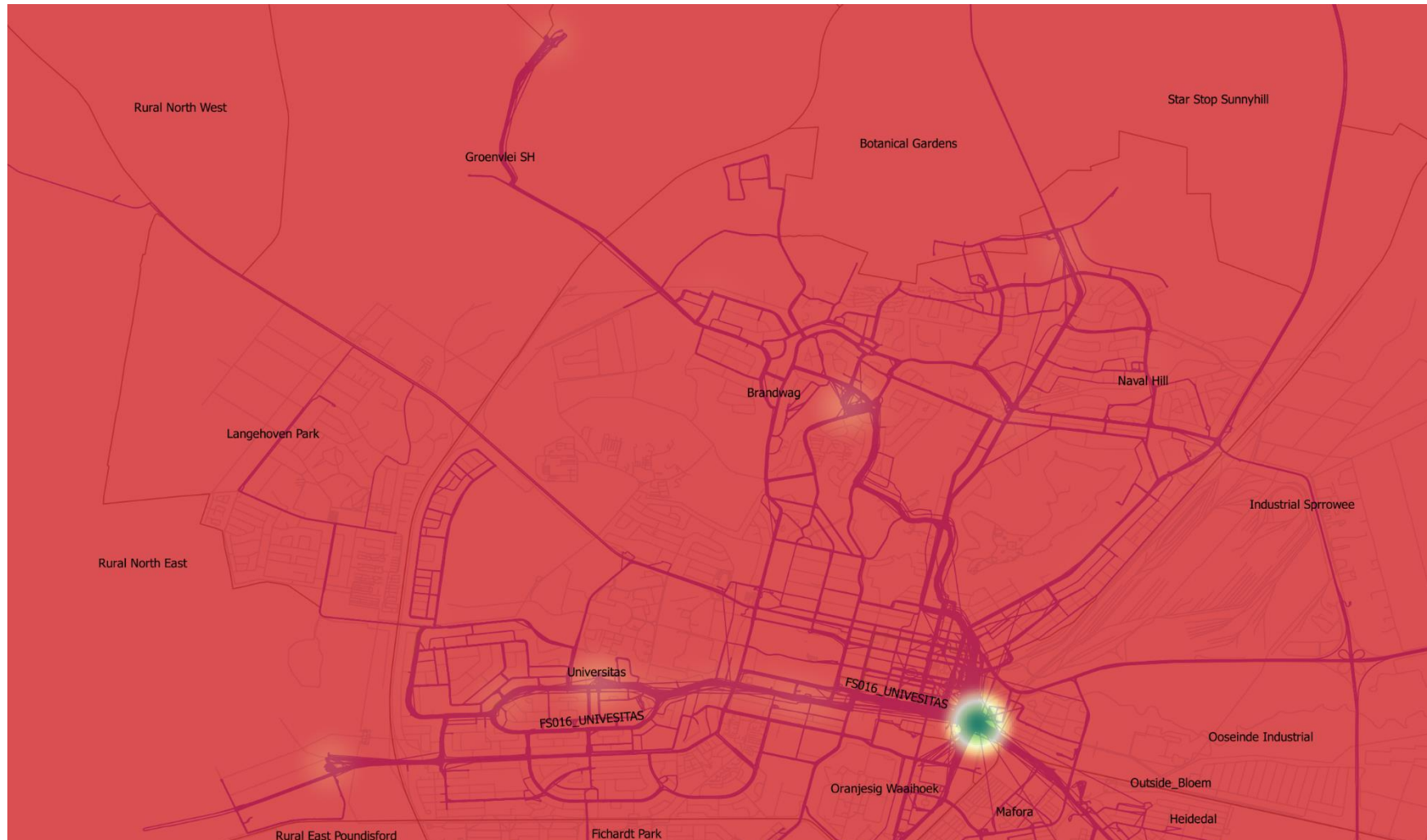
Heatmap of total surveyed area.



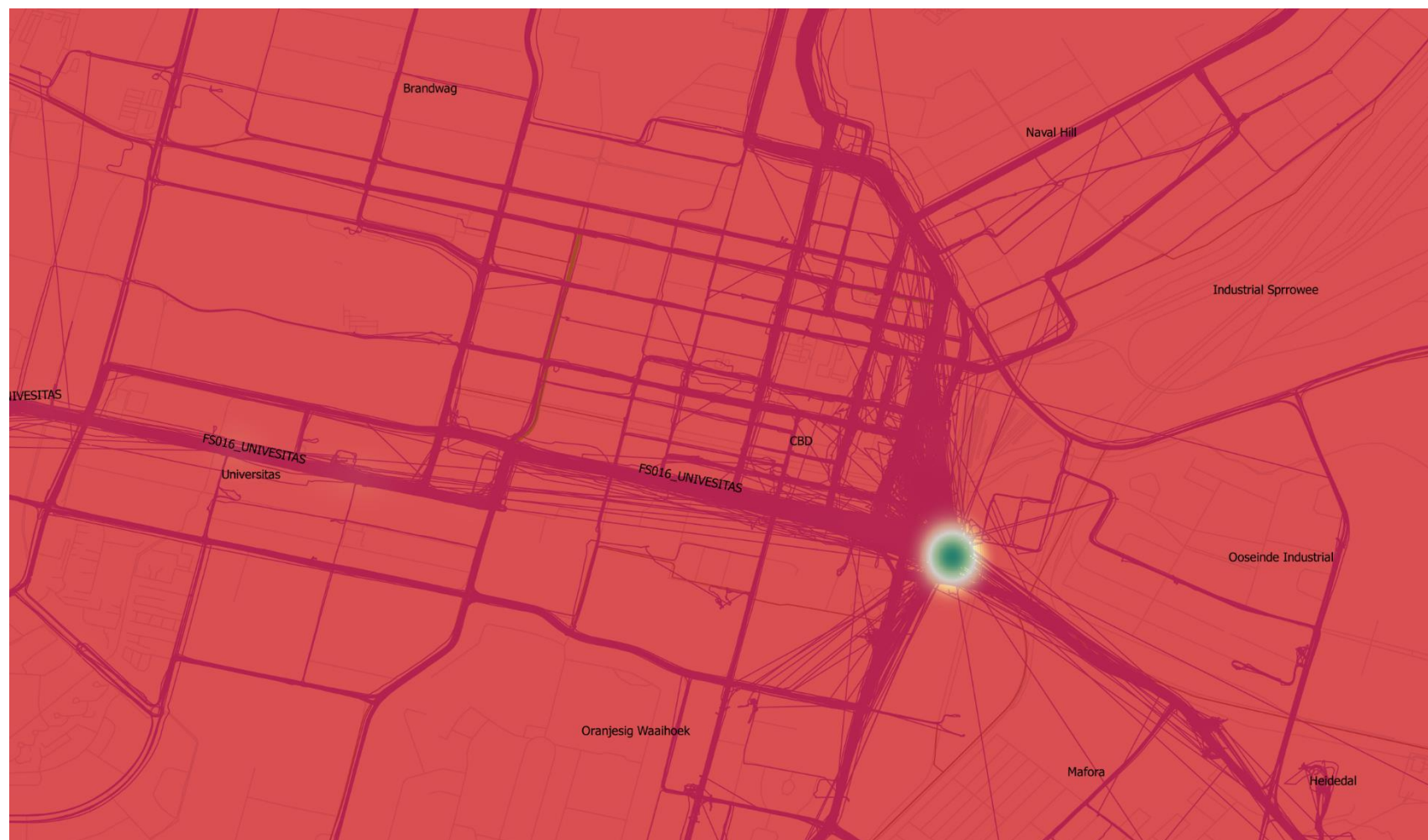
Heatmap of total surveyed area – Focused on Mangaung



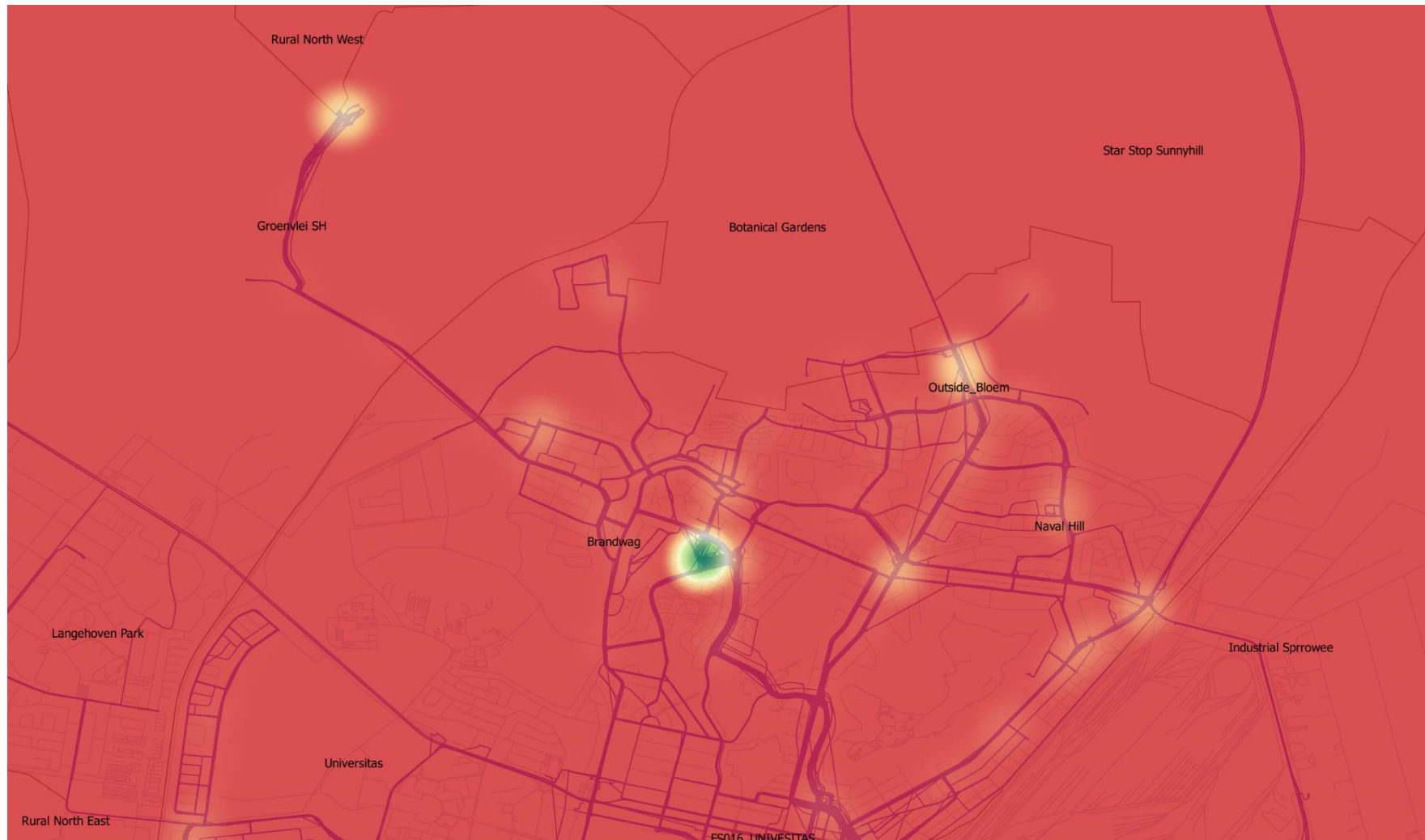
Heatmap of total surveyed area – Focused on the UNIVERSITAS route



Heatmap of total surveyed area – Focused on the CBD



Heatmap of total surveyed area – Focused on Dan Pienaar



Heatmap of total surveyed area – Focused on UNIVERSITAS

