

WORCESTER PEDESTRIAN SURVEY REPORT MAY 2016

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EXECUTIVE SUMMARY

The Western Cape Government (WCG), through the Department of Environmental Affairs and Development Planning (DEADP), is involved in a Regional Socio-Economic /Violence Prevention through Urban Upgrading Programme (RSEP/VPUU Programme) in six municipalities in the Western Cape. The Breede Valley Local Municipality is one of these municipalities. During December 2015 the municipality requested the RSEP/VPUU Programme Office to conduct a pedestrian survey for the RSEP identified "Focus Area" in Worcester. The purpose of the survey was to gain an understanding of pedestrian volumes and movement patterns in the Focus Area. Funds have been earmarked for the construction of pedestrian walkways in these areas and the survey aims to assist in determining priority areas for implementation. This report provides an analysis and evaluation of pedestrian, taxi and bus volumes and movement patterns at eight survey stations located in the neighbourhoods of Zwelethemba, Roodewal, Riverview and Avian Park in Worcester.

The survey was conducted over two hours starting from 07h00 until 09h00 on Thursday 3rd March 2016. The team was made up of nine provincial officials from the WCG DEADP and eight students from the Boland College, involved in the local Expanded Public Works Programme (EPWP) in Worcester. Three count forms were developed for each station: one to count pedestrian movement; a second to count taxis and a third to count buses. The pedestrian count form required pedestrians to be counted according to two broad age groups and also gender per 30 minute time slot. The bus count form required buses to be counted according to the type of bus service (e.g. corporate, public, school, etc.) per 30 minute time slot. Lastly, the taxi count form required the number of taxis travelling to and from activity areas to be counted per 30 min time slot. In addition, an estimation was made regarding how full/empty the taxis were during each time slot, in order to estimate the number of people who make use of taxis as a means of transport

Following completion of the survey, the RSEP/VPUU Programme Office compiled the results per survey station. The results of the data analysed shows that Station 1 (Zwelethemba: Intersection) experiences far greater pedestrian activity than the other stations as 30% of the 4 036 pedestrians counted were recorded at Station 1 while only 5% were recorded at Station 8 (Riverview: Community Learning Centre). With regards to the age profile of pedestrians, the majority of pedestrians counted at the survey stations were adults who are older than 18 years old. At all the survey stations, there were more males walking past the stations compared to females.

It is clear from the results that Station 2 (Zwelethemba: Industrial) and Station 3 (Roodewal: Intersection) experience far greater bus movement than the other stations as 33% of the 128 buses counted were recorded at Station 2 and 39% were recorded at Station 3. Only 7%

were recorded at Station 7 (Riverview: Residential). When looking at all the survey stations, more buses were counted traveling from residential areas towards activity nodes and fewer buses counted travelling from activity nodes towards residential areas. There were significantly less buses counted overall compared to taxis, and this suggests that taxis are the main form of public transport in Worcester. The majority of buses counted were school buses with a few company-owned buses counted, which are used to transport workers to and from work.

Station 2 (Zwelethemba: Industrial) experiences far greater taxi movement than the other stations as 31% of the 707 taxis counted were recorded at Station 2 while only 4% were recorded at Station 8 (Riverview; Community Learning Centre). When looking at all the survey stations, more taxis were counted traveling from residential areas towards activity nodes and less taxis counted travelling from activity nodes towards residential areas, but which could be explained as people are going to work, or to do shopping, or to visit government services and facilities.

A comparison was done between the number of people walking and the number of people using taxis which showed that more people use taxis than walking. However, the difference was rather small. There is also potential for the taxis counted at the stations to carry more people as the majority of the taxis counted at all stations were empty or only had a few passengers in them. This could mean that public transport in Worcester is too expensive for residents or that the public transport system available is unreliable.

Through the pedestrian survey, valuable information has been obtained about the movement patterns of pedestrians, buses and taxis in the RSEP focus area in Worcester as well as pedestrian, bus and taxi volumes at the eight stations in the identified neighbourhoods. The survey met its intended objectives. The planned construction of pedestrian walkways for the selected RSEP neighbourhoods in Worcester will play a significant role in improving pedestrian safety in these areas, and this survey and report will hopefully assist in identifying priority areas for implementation.

1 INTRODUCTION AND BACKGROUND

The Breede Valley Local Municipality's RSEP Project Manager, Mr Chris Smal, requested the RSEP/VPUU Programme Office to conduct a pedestrian survey in Worcester, which was conducted on the 3rd of March 2016.

The roll-out of the Regional Socio-Economic Programme (RSEP) in Worcester is taking place in the following areas/neighbourhoods:

- Zwelethemba;
- Roodewal;
- Riverview; and
- Avian Park.

The RSEP/VPUU Programme is concerned with the daily experiences of the urban environment by the poor and focuses on spatial reconstruction of disadvantaged areas and social upliftment. The Programme offers financial support for municipalities and provides a platform for line departments to work together at a local level. Critical to the Programme is ensuring that planned projects and interventions achieve the RSEP objectives and make a meaningful impact on local communities; hence, the Breede Valley Local Municipality, in collaboration with the RSEP team, saw the need to conduct a pedestrian survey in Worcester.

The RSEP/VPUU Programme developed a Reconstruction Framework to create a more consistent approach for the Programme and to guide future interventions, especially when rolling out the programme to new towns/municipalities. The framework consists of seven building blocks, one of which focuses on pedestrian movement patterns. This building block aims to identify and analyse the main pedestrian desire lines and transport routes in a town so that the quality and functionality of the main pedestrian routes and transport corridors can be improved.

Understanding the pedestrian movement in Worcester is important considering that many residents living in lower income areas can't afford to use public transport and therefore have to walk to their destinations, often far distances along unsafe routes.

The purpose of the Worcester pedestrian survey was to gain an understanding of pedestrian volumes and movement patterns at eight points in the identified RSEP neighbourhoods. More specifically, the survey sought to determine the number of pedestrians and the primary direction of movement, whether towards or away from activity nodes at the various stations. Funds have been earmarked for the construction of pedestrian walkways in these areas, and the survey would assist in determining priority areas for implementation.

The RSEP Team also decided to do a taxi and bus count at each station in order to gain an understanding of public transport volumes and movement patterns as with the pedestrian count.

Two members from the RSEP team met with the RSEP Municipal Project Manager (Mr. Chris Smaal) in Worcester prior to the survey to determine the location of survey points in the town. Survey points were selected in order to gain a broader understanding of pedestrian movement patterns at the eight strategic locations and covering the four identified RSEP neighbourhoods. All eight of the survey stations selected are located in the “transition areas” between Worcester’s low income residential areas and Worcester’s northern areas, which encompasses the traditional CBD, government buildings, Primary and Secondary schools, health facilities and other community facilities. The eight identified stations covered all possible pedestrian routes into and out of the neighbourhoods (residential areas). The location of the eight survey stations can be seen in Figure 1.

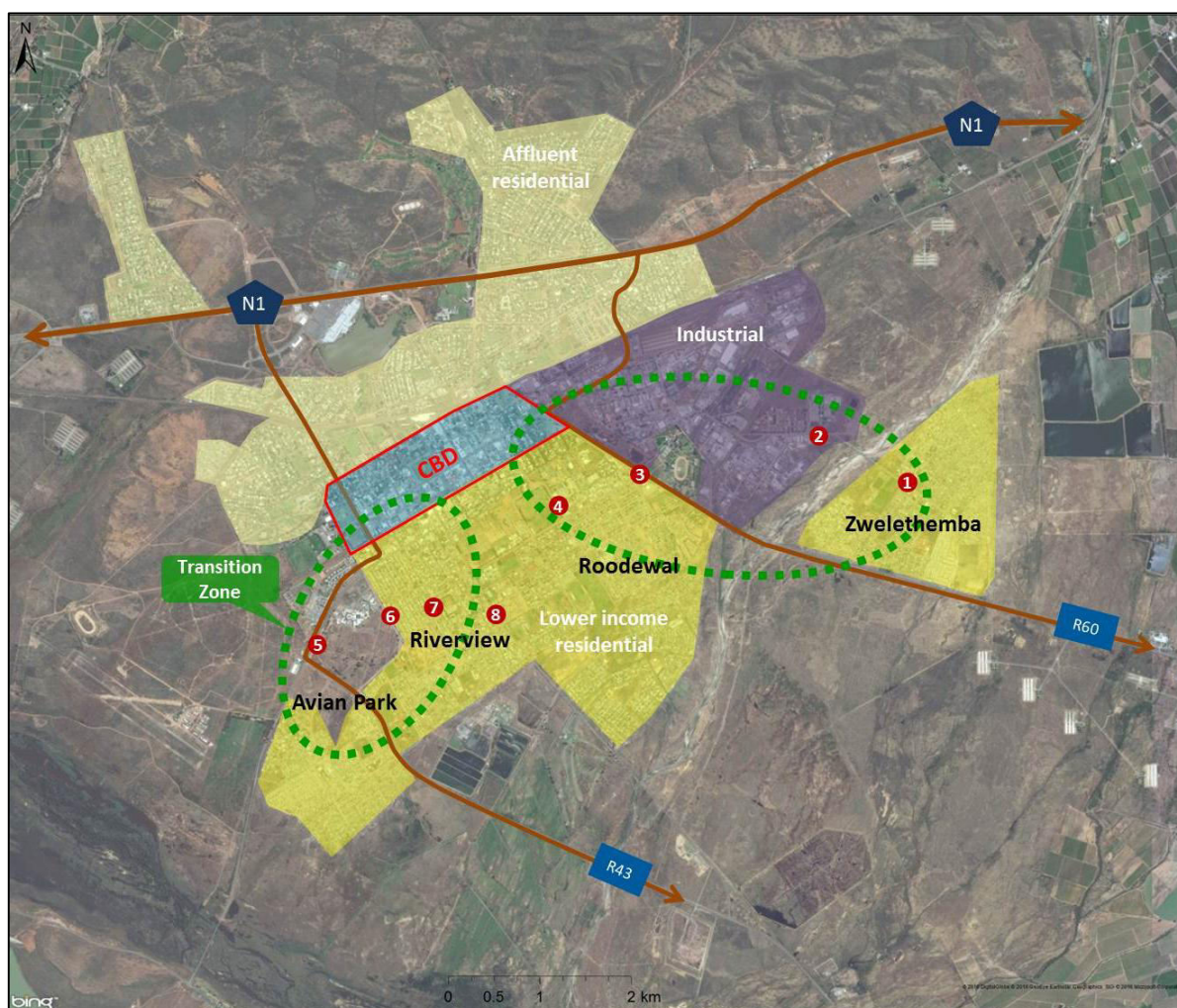


Figure 1: Location of eight survey stations in Worcester

The pedestrian survey also stems from the fact that pedestrian movement is largely misunderstood, undervalued and underestimated by the public and by transport specialists, particularly in relatively small-to-medium-sized towns, such as Worcester. Thus, by conducting a pedestrian survey, the RSEP/VPUU team sought to influence decision-making in the planning of transport and space – not only in Worcester but also in other small-to-medium-sized towns in the Western Cape.

2 METHODOLOGY

2.1 Planning and preparations for the survey

In preparation for the survey, the RSEP/VPUU Programme Office developed count forms for each survey station. Three count forms were developed for each station: one to count pedestrian movement; a second to count taxis and a third to count buses. The pedestrian count form required pedestrians to be counted according to age group and gender per 30 minute time slot. The bus count form required buses to be counted according to the type of bus service (e.g. company specific, general, school, etc.) per 30 minute time slot. Lastly, the taxi count form required the number of taxis travelling to and from activity areas to be counted per 30 min time slot. In addition, an estimation was made regarding how full/empty the taxis were during each time slot. This was in order to calculate the number of people travelling by taxi. The number of seats in an average taxi is assumed to be 16, and a full taxi would, therefore, represent 16 people, half full approximately 8 people and so forth. This information is also reflected in this report as number of people travelling by taxi through the survey stations.

The RSEP Municipal Project Manager, Mr Chris Smal, was consulted about the content of the count forms. Additionally, the RSEP/VPUU Programme Office also provided inputs on the content. The necessary adjustments were made thereafter.

Prior to commencing the survey, a brief training session was conducted in order to provide a background of what led to the pedestrian survey and to outline the purpose of the survey. The survey team was briefed about the contents of the count forms, and roles and responsibilities were assigned to the survey team for the survey period.

2.2 Conducting the survey

The survey was conducted over two hours starting at 07h00 until 09h00 on Thursday, 3rd March 2016.

The survey team was made up of nine provincial officials from the WCG DEADP and eight students from the local Expanded Public Works Programme (EPWP) in Worcester. The names of the survey team are contained in Table 1 below.

Station	WCG DEADP	EPWP
Station 1 (Zwelethemba: Intersection):	Dawie Kruger	Beulah Markus
		Thalia Afrika
Station 2 (Zwelethemba: Industrial):	Roy Gardener	Krisandra Harmse
Station 3 (Roodewal: Intersection):	Samantha Dyer	Nicole Brown
		Desmine Jafftha
Station 4 (Roodewal: Residential):	Wadzanai Madangombe	Desiree August
	Francois Wüst	
Station 5 (Avian Park):	Michelle Botha	Edwinia Nuku
Station 6 (Riverview: Boland College):	Nathaneal Jacobs	Edwideen
Station 7 (Riverview: Residential):	Dylan Johnstone	Ezra Van Rooi
Station 8 (Riverview: Community Learning Centre):	Mari Botha	
	Sugen Kistensamy	

Table 1: The Worcester Pedestrian Survey Team

The survey was conducted at the following eight stations:

- Station 1 (Zwelethemba: Intersection):** The team stationed here was comprised of three people and was led by Dawie Kruger. During the survey, all three people conducted the pedestrian count at various directions at the Raymond Pollet Drive and Mayinjana Avenue intersection. This is not only the main route into Zwelethemba but it is the only route from the CBD and industrial areas to Zwelethemba. Two schools, a clinic and a taxi rank appear in close proximity to the intersection, which resulted in a lot of children (learners) and women moving through the intersection. There were no buses or taxis counted at this station as they all had to drive past station 2 where they had been picked up (as mentioned earlier, there is only one access road to Zwelethemba).



Figure 2: Station 1 location

- **Station 2 (Zwelethemba: Industrial):** The team stationed here was comprised of two people and was led by Roy Gardener, with one person conducting the pedestrian count and the second person conducting the bus and taxi count. The team at this station also counted small “bakkies” (LUV’s) and trucks transporting mainly labourers / construction people from Zwelethemba to sites elsewhere in Worcester and surrounding areas. The figures for the bakkies/ trucks were not added to the total number of people travelling by taxi in section 3.8 as taxis are a paid service and the bakkies/trucks presumably offer free lifts to workers; therefore, this would skew the conclusions made.



Figure 3: Station 2 location

- **Station 3 (Roodewal: Intersection):** The team stationed here was comprised of three people and was led by Samantha Dyer, with two people conducting the pedestrian count and the third person conducting the bus and taxi count. The survey station is situated on a busy intersection with people moving in different directions; thus, it was decided that two people were needed to count pedestrians moving along both Robertson Road and Leipoldt Avenue.



Figure 4: Station 3 location

- **Station 4 (Roodewal: Residential):** The team stationed here was comprised of two people and was led by Wadzanaï Madangombe, with one person conducting the pedestrian count and the second person conducting the bus and taxi count along Fisher Street.



Figure 5: Station 4 location

- **Station 5 (Avian Park):** The team stationed here was comprised of two people and was led by Michelle Botha, with one person conducting the pedestrian count and the second person conducting the bus and taxi count along Durban Street.



Figure 6: Station 5 location

- **Station 6 (Riverview: Boland College):** The team stationed here was comprised of two people and was led by Nathaneal Jacobs, with one person conducting the pedestrian count and the second person conducting the bus and taxi count along Rainer Street.



Figure 7: Station 6 location

- **Station 7 (Riverview: Residential):** The team stationed here was comprised of two people and was led by Dylan Johnstone, with one person conducting the pedestrian count and the second person conducting the bus and taxi count along Le Sueur Street.



Figure 8: Station 7 location

- **Station 8 (Riverview: Community Learning Centre):** The team stationed here was comprised of two people and was led by Mari Botha and Sugun Kistensamy, with one person conducting the pedestrian count and the second person conducting the bus and taxi count along Grey Street.



Figure 9: Station 8 location

At all eight survey stations, the count was conducted by counting all pedestrians that walked past the survey station and the numbers were recorded on the count form per 30 minute time slot according to age group (only two age groups: younger than approximately 18 years, and older than approximately 18 years) and gender. At five of the eight survey stations, the bus count was conducted by counting all buses that drove past the survey station and the numbers were recorded on the count form per 30 minute time slot according to presumed ownership of the buses. At seven of the eight survey stations (as station 2 covered also all vehicles going through station 1), the taxi count was conducted by counting all taxis that drove past the survey station and the numbers were recorded on the count form per 30 minute time slot.

2.3 Compiling and analysing the results

Following completion of the survey, the RSEP/VPUU Programme Office compiled the results per survey station. The data was sorted and filtered using *Microsoft Excel* and the results were then presented graphically and interpreted.

3 RESULTS

3.1 Count Size

i. Station 1 (Zwelethemba: Intersection)

		A. Station 1 Pedestrian Count		
Street Name	Direction of movement	Residential towards activity nodes	Activity nodes towards residential	TOTAL
Mayinjana Ave	South to North	250	172	422
Raymond Pollet Drive	East to West	222	124	346
	West to East	178	254	432
TOTAL		650	550	1 200

Table 2: Station 1 Pedestrian Count

Table 2 illustrates the pedestrian count at survey station 1. The total number of pedestrians counted that walked past the survey station is 1 200 during the two-hour survey period. There were more people counted walking from residential areas towards activity nodes (650) compared to those walking from activity nodes to residential areas (550) although the difference is relatively small.

ii. Station 2 (Zwelethemba: Industrial)

B. Station 2 Pedestrian Count			
Street Name	Residential towards activity nodes	Activity nodes towards residential	TOTAL
Raymond Pollet Dr	327	43	370

Table 3: Station 2 Pedestrian

B. Station 2 Bus Count			
Street Name	Residential towards activity nodes	Activity nodes towards residential	TOTAL
Raymond Pollet Dr	28	14	42

Table 4: Station 2 Bus Count

B. Station 2 Taxi Count			
Street Name	Residential towards activity nodes	Activity nodes towards residential	TOTAL
Raymond Pollet Dr	132	85	217

Table 5: Station 2 Taxi Count

B. Station 2 Bakkie/Truck count			
Street Name	Residential towards activity nodes	Activity nodes towards residential	TOTAL

Raymond Pollet Dr	78	94	172
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Table 6: Station 2 Bakkie/Truck Count

Table 3 illustrates the pedestrian count at survey station 2. The total number of pedestrians counted that walked past the survey station is 370 during the survey period. There were more people counted walking from residential areas towards activity nodes (327) compared to those walking from activity nodes to residential areas (43).

Table 4 illustrates the bus count at survey station 2. The total number of buses counted that drove past the survey station is 42 during the survey period. There were more buses counted driving from residential areas towards activity nodes (28) compared to those driving from activity nodes towards residential areas (14).

Table 5 illustrates the taxi count at survey station 2. The total number of taxis counted that drove past the survey station is 217 during the survey period. There were more taxis counted driving from residential areas towards activity nodes (132) compared to those driving from activity nodes to residential areas (85).

Table 6 illustrates the number of small bakkies and trucks transporting labourers/construction workers counted at survey station 2. The total number of bakkies/trucks counted that drove past the survey station is 172 during the survey period. There were more bakkies/trucks counted driving from activity nodes towards residential areas (94) compared to those that drove from residential areas towards activity nodes (78).

iii. Station 3 (Roodewal: Intersection)

		A. Station 3 Pedestrian Count		
Street name	Direction of movement	Residential towards activity nodes	Activity nodes towards residential	TOTAL
Robertson Road	West to East	160	15	175
Leipoldt Avenue	South to North	139	48	187
TOTAL		299	63	362

Table 7: Station 3 Pedestrian Count

		G. Station 3 Bus Count		
Street Name		Residential towards activity nodes	Activity nodes towards residential	TOTAL
Robertson Road		20	30	50

Table 8: Station 3 Bus Count

G. Station 3 Taxi Count			
Street Name	Residential towards activity nodes	Activity nodes towards residential	TOTAL
Robertson Road	43	50	93

Table 9: Station 3 Taxi Count

Table 7 illustrates the pedestrian count at survey station 3. The total number of pedestrians counted that walked past the survey station is 362 during the survey period. There were more people counted walking from residential areas towards activity nodes (299) compared to those walking from activity nodes to residential areas (63).

Table 8 illustrates the bus count at survey station 3. The total number of buses counted that drive past the survey station is 50 during the survey period. There were more buses counted driving from activity nodes towards residential areas (30) compared to those driving from residential areas towards activity nodes (20).

Table 9 illustrates the taxi count at survey station 3. The total number of taxis counted that drove past the survey station is 93 during the survey period. There were more taxis counted driving from activity nodes towards residential areas (50) compared to those driving from residential areas towards activity nodes (43); however, this difference is very small.

iv. Station 4 (Roodewal: Residential)

D. Station 4 Pedestrian Count			
Street Name	Residential towards activity nodes	Activity nodes towards residential	TOTAL
Fischer Street	493	77	570

Table 10: Station 4 Pedestrian Count

D. Station 4 Taxi Count			
Street Name	Residential towards activity nodes	Activity nodes towards residential	TOTAL
Fischer Street	121	4	125

Table 11: Station 4 Taxi Count

Table 10 illustrates the pedestrian count at survey station 4. The total number of pedestrians counted that walked past the survey station is 570 during the survey period. There were far more people counted walking from residential areas towards activity nodes (493) compared to those walking from activity nodes to residential areas (77).

Table 11 illustrates the taxi count at survey station 4. The total number of taxis counted that drove past the survey station is 125 during the survey period. There were more taxis counted

driving from residential areas towards activity nodes (121) compared to those driving from activity nodes to residential areas (4).

No buses were counted driving past station 4 during the survey period.

v. Station 5 (Avian Park)

E. Station 5 Pedestrian Count			
Street Name	Residential towards activity nodes	Activity nodes towards residential	TOTAL
Durban Street	342	48	390

Table 12: Station 5 Pedestrian Count

E. Station 5 Bus Count			
Street Name	Residential towards activity nodes	Activity nodes towards residential	TOTAL
Durban Street	9	5	14

Table 13: Station 5 Bus Count

E. Station 5 Taxi Count			
Street Name	Residential towards activity nodes	Activity nodes towards residential	TOTAL
Durban Street	23	131	154

Table 14: Station 5 Taxi Count

Table 12 illustrates the pedestrian count at survey station 5. The total number of pedestrians counted that walked past the survey station is 390 during the survey period. There were more people counted walking from residential areas towards activity nodes (342) compared to those walking from activity nodes to residential areas (48).

Table 13 illustrates the bus count at survey station 5. The total number of buses counted that drove past the survey station is 14 during the survey period. There were more buses counted driving from residential areas towards activity nodes (9) compared to those driving from activity nodes towards residential areas (5).

Table 14 illustrates the taxi count at survey station 5. The total number of taxis counted that drove past the survey station is 154 during the survey period. There were more taxis counted driving from activity nodes towards residential areas (131) compared to those driving from residential areas towards activity nodes (23).

vi. Station 6 (Riverview: Boland College)

G. Station 6 Pedestrian Count			
Street Name	Residential towards activity nodes	Activity nodes towards residential	TOTAL
Rainer Street	314	30	344

Table 15: Station 6 Pedestrian Count

G. Station 6 Taxi Count			
Street Name	Residential towards activity nodes	Activity nodes towards residential	TOTAL
Rainer Street	24	14	38

Table 16: Station 6 Taxi Count

Table 15 illustrates the pedestrian count at survey station 6. The total number of pedestrians counted that walked past the survey station is 344 during the survey period. There were more people counted walking from residential areas towards activity nodes (314) compared to those walking from activity nodes to residential areas (30).

Table 16 illustrates the taxi count at survey station 6. The total number of taxis counted that drove past the survey station is 38 during the survey period. There were more taxis counted driving from residential areas towards activity nodes (24) compared to those driving from activity nodes towards residential areas (14).

No buses were counted driving past station 6 during the survey period.

vii. Station 7 (Riverview: Residential)

G. Station 7 Pedestrian Count			
Street Name	Residential towards activity nodes	Activity nodes towards residential	TOTAL
Le Sueur Street	519	97	616

Table 17: Station 7 Pedestrian Count

G. Station 7 Bus Count			
Street Name	Residential towards activity nodes	Activity nodes towards residential	TOTAL
Le Sueur Street	5	4	9

Table 18: Station 7 Bus Count

G. Station 7 Taxi Count			
Street Name	Residential towards activity nodes	Activity nodes towards residential	TOTAL
Le Sueur Street	26	25	51

Table 19: Station 7 Taxi Count

Table 17 illustrates the pedestrian count at survey station 7. The total number of pedestrians counted that walked past the survey station is 616 during the survey period. There were far more people counted walking from residential areas towards activity nodes (519) compared to those walking from activity nodes to residential areas (97).

Table 18 illustrates the bus count at survey station 7. The total number of buses counted that drove past the survey station is 9 during the survey period. There were almost an equal number of buses counted driving from residential areas towards activity nodes (5) compared to those driving from activity nodes towards residential areas (4).

Table 19 illustrates the taxi count at survey station 7. The total number of taxis counted that drove past the survey station is 51 during the survey period. There were almost an equal number of taxis counted driving from residential areas towards activity nodes (26) compared to those driving from activity nodes towards residential areas (25).

viii. Station 8 (Riverview: Community Learning Centre)

H. Station 8 Pedestrian Count			
Street Name	Residential towards activity nodes	Activity nodes towards residential	TOTAL
Grey Street	141	43	184

Table 20: Station 8 Pedestrian Count

H. Station 8 Bus Count			
Street Name	Residential towards activity nodes	Activity nodes towards residential	TOTAL
Grey Street	2	11	13

Table 21: Station 8 Bus Count

H. Station 8 Taxi Count			
Street Name	Residential towards activity nodes	Activity nodes towards residential	TOTAL
Grey Street	17	12	29

Table 22: Station 8 Taxi Count

Table 20 illustrates the pedestrian count at survey station 8. The total number of pedestrians counted that walked past the survey station is 184 during the survey period. There were more people counted walking from residential areas towards activity nodes (141) compared to those walking from activity nodes to residential areas (43).

Table 21 illustrates the bus count at survey station 8. The total number of buses counted that drove past the survey station is 13 during the survey period. There were more buses counted

driving from activity nodes towards residential areas (11) compared to those driving from residential areas towards activity nodes (2).

Table 22 illustrates the taxi count at survey station 8. The total number of taxis counted that drove past the survey station is 29 during the survey period. There were more taxis counted driving from residential areas towards activity nodes (17) compared to those driving from activity nodes towards residential areas (12); however, this difference is small.

3.2 Pedestrian Profile

i. Age Profile

As mentioned earlier, only two age categories were used, namely younger than approximately 18 years, and older than 18 years.

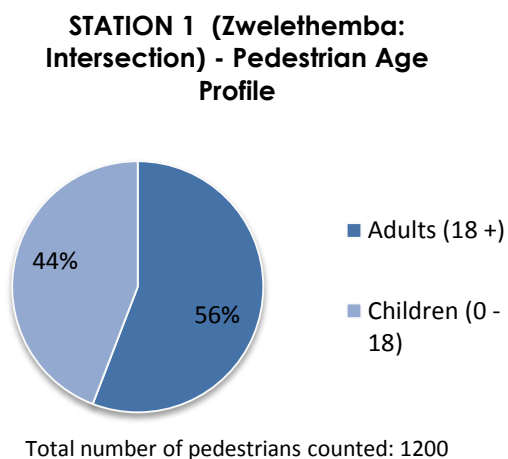


Figure 10: Station 1 Pedestrian Age Profile

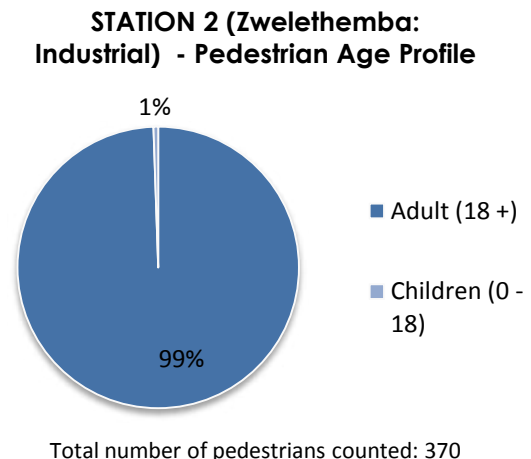


Figure 11: Station 2 Pedestrian Age Profile

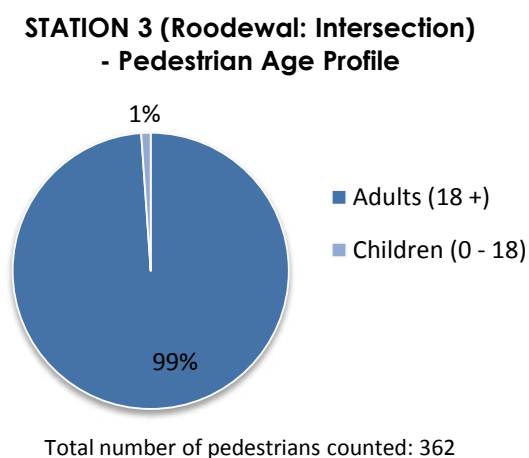


Figure 12: Station 3 Pedestrian Age Profile

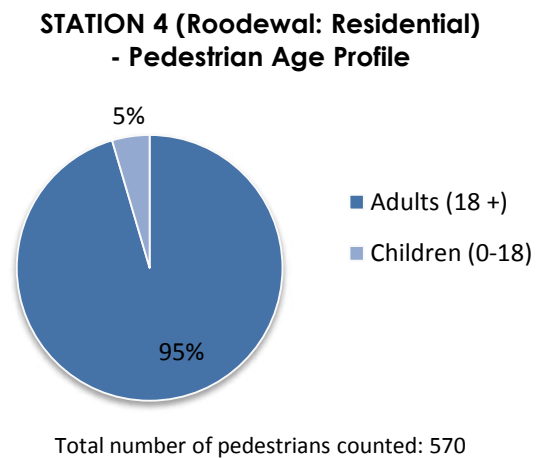
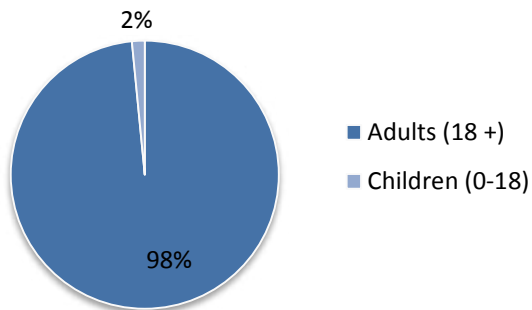


Figure 13: Station 4 Pedestrian Age Profile

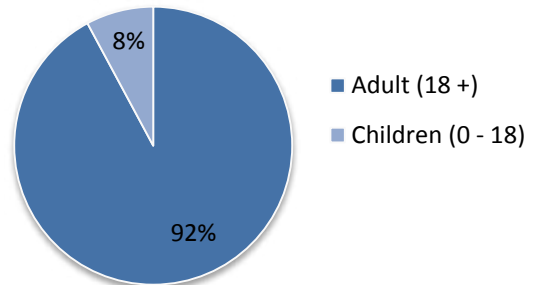
STATION 5 (Avian Park) - Pedestrian Age Profile



Total number of pedestrians counted: 390

Figure 14: Station 5 Pedestrian Age Profile

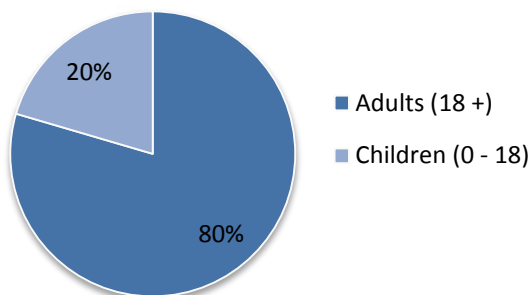
STATION 6 (Riverview: Boland College) - Pedestrian Age Profile



Total number of pedestrians counted: 344

Figure 15: Station 6 Pedestrian Age Profile

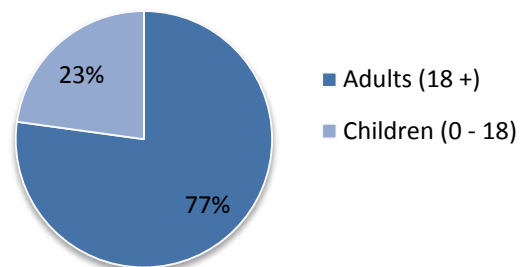
STATION 7 (Riverview: Residential) - Pedestrian Age Profile



Total number of pedestrians counted: 616

Figure 16: Station 7 Pedestrian Age Profile

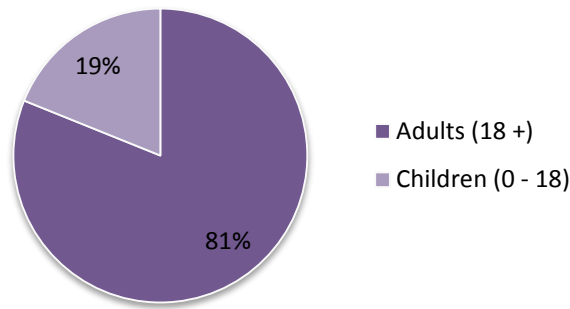
STATION 8 (Riverview: Community Learning Centre) - Pedestrian Age Profile



Total number of pedestrians counted: 184

Figure 17: Station 8 Pedestrian Age Profile

COMPOSITE - Pedestrian Age Profile



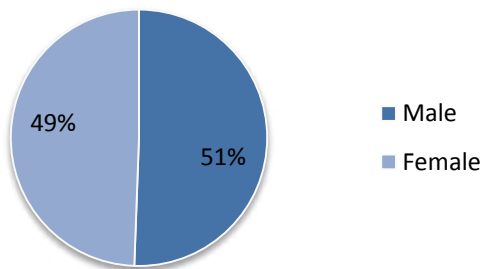
Total number of pedestrians counted: 4036

Figure 18: Composite Pedestrian Age Profile

Figures 10 to 17 above illustrate the pedestrian profile according to age group at each survey station followed by the composite results for all eight stations in Figure 18. At all eight stations, the majority of pedestrians were adults (aged 18+) accounting for 77% of the total number of pedestrians. At stations 2 to 8, the number of children (aged 0 – 18) counted was very low while station 1 had the highest percentage of children (44%). This can be attributed to the location of two schools in close proximity to the road-intersection of the count station.

ii. Gender Profile

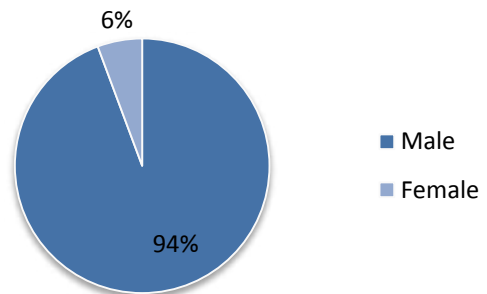
STATION 1 (Zwelethemba: Intersection) - Pedestrian Gender Profile



Total number of pedestrians counted: 1200

Figure 19: Station 1 Pedestrian Gender Profile

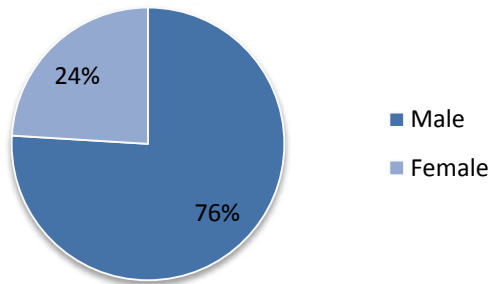
STATION 2 (Zwelethemba: Industrial) - Pedestrian Gender Profile



Total number of pedestrians counted: 370

Figure 20: Station 2 Pedestrian Gender Profile

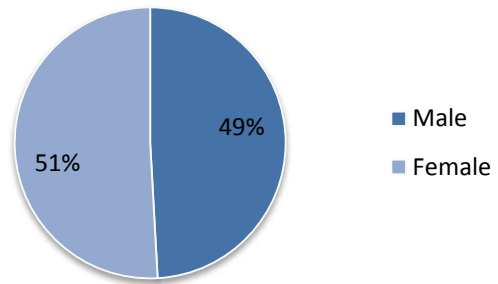
STATION 3 (Roodewal: Intersection) - Pedestrian Gender Profile



Total number of pedestrians counted: 362

Figure 21: Station 3 Pedestrian Gender Profile

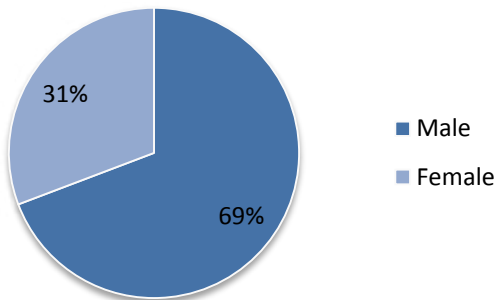
STATION 4 (Roodewal: Residential) - Pedestrian Gender Profile



Total number of pedestrians counted: 570

Figure 22: Station 4 Pedestrian Gender Profile

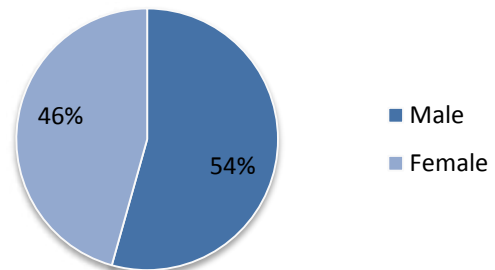
STATION 5 (Avian Park) - Pedestrian Gender Profile



Total number of pedestrians counted: 390

Figure 23: Station 5 Pedestrian Gender Profile

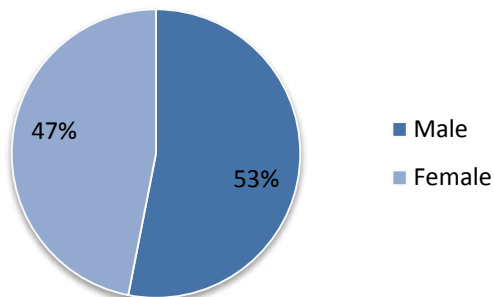
STATION 6 (Riverview: Boland College) - Pedestrian Gender Profile



Total number of pedestrians counted: 344

Figure 24: Station 6 Pedestrian Gender Profile

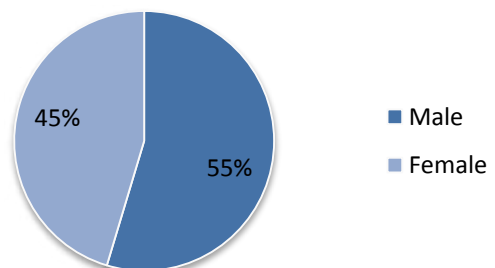
STATION 7 (Riverview: Residential) - Pedestrian Gender Profile



Total number of pedestrians counted: 616

Figure 25: Station 7 Pedestrian Gender Profile

STATION 8 (Riverview: Community Learning Centre) - Pedestrian Gender Profile



Total number of pedestrians counted: 184

Figure 26: Station 8 Pedestrian Gender Profile

COMPOSITE - Pedestrian Gender Profile

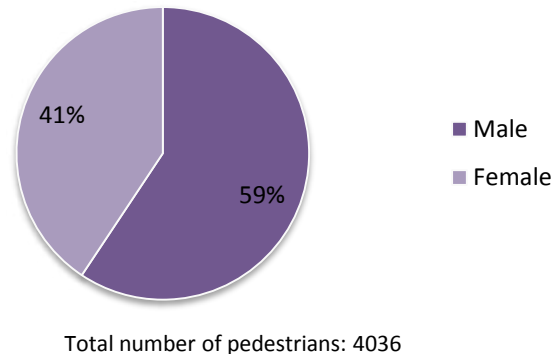


Figure 27: Composite Pedestrian Gender Profile

Figures 19 to 26 above illustrate the pedestrian profile according to gender at each survey station followed by the composite results for all eight stations in Figure 27. At all stations, more male pedestrians were counted than females, totalling 2401 male pedestrians (59%) compared to 1645 females (41%). At stations 1, 4, 6, 7 and 8, there was an almost 50:50 split between male and females. Station 2, 3 and 5 had significantly more males than females.

3.3 Pedestrian Distribution

i. Station 1 (Zwelethemba: Intersection)

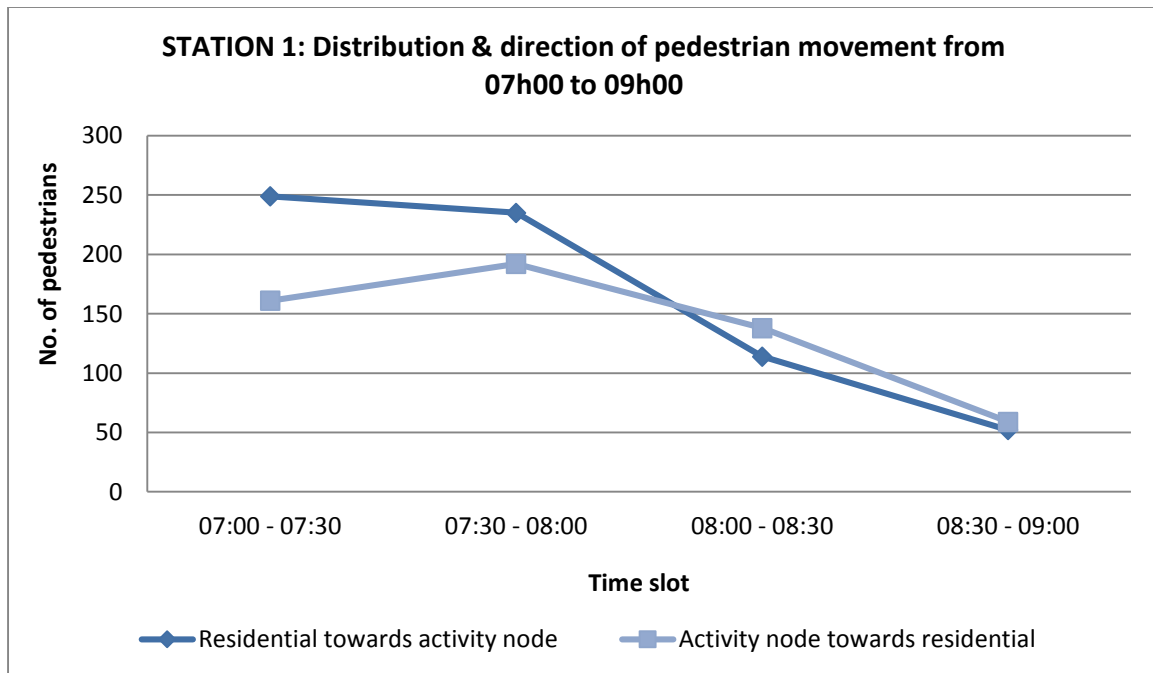


Figure 28: Station 1 distribution & direction of pedestrian movement from 07h00 to 09h00.

Figure 28 above illustrates the distribution and direction of pedestrian movement between 07h00 and 09h00 at survey station 1. The line graph shows that there was a higher level of pedestrian movement from residential areas towards activity nodes during the 07h00 to 07h30 period during which 249 pedestrians were counted. From 08h00 to 08h30, pedestrian movement dropped to 114 pedestrians and, from 08h30 to 09h00, 52 pedestrians were counted walking from residential areas towards activity nodes.

Pedestrian movement from activity nodes towards residential areas was less than pedestrian movement from residential areas to activity nodes from 07h00 to 08h00 but, between 08h00 to 09h00, this trend reversed. This phenomena appears to be strange, but can be attributed to the location of the clinic, schools and taxi stand at the intersection. The peak time was 07h30 to 08h00 during which 192 pedestrians were counted walking from activity nodes to residential areas.

ii. Station 2 (Zwelethemba: Industrial)

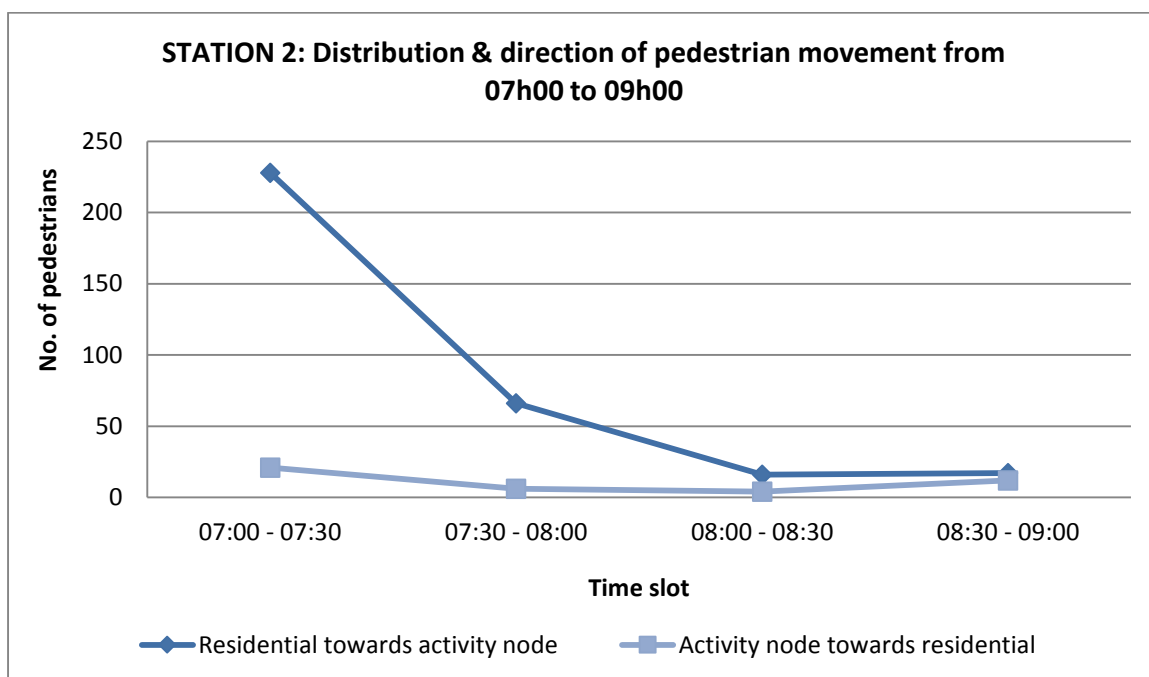


Figure 29: Station 2 distribution & direction of pedestrian movement from 07h00 to 09h00.

Figure 29 above illustrates the distribution and direction of pedestrian movement between 07h00 and 09h00 at survey station 2. The line graph shows that there was a higher level of pedestrian movement from residential areas towards activity nodes between 07h00 to 07h30 during which 228 pedestrians were recorded walking in that direction. From 07h30 onwards, pedestrian movement from residential areas to activity nodes dropped significantly; however, it remained higher than pedestrian movement from activity nodes towards residential areas.

There were very few pedestrians observed walking from activity nodes towards residential areas during the survey period. The peak time was 07h00 to 07h30 during which 21 pedestrians were counted. Between 07h30 and 08h30, there was a decrease in pedestrian movement observed followed by a slight increase between 08h30 and 09h00.

iii. Station 3 (Roodewal: Intersection)

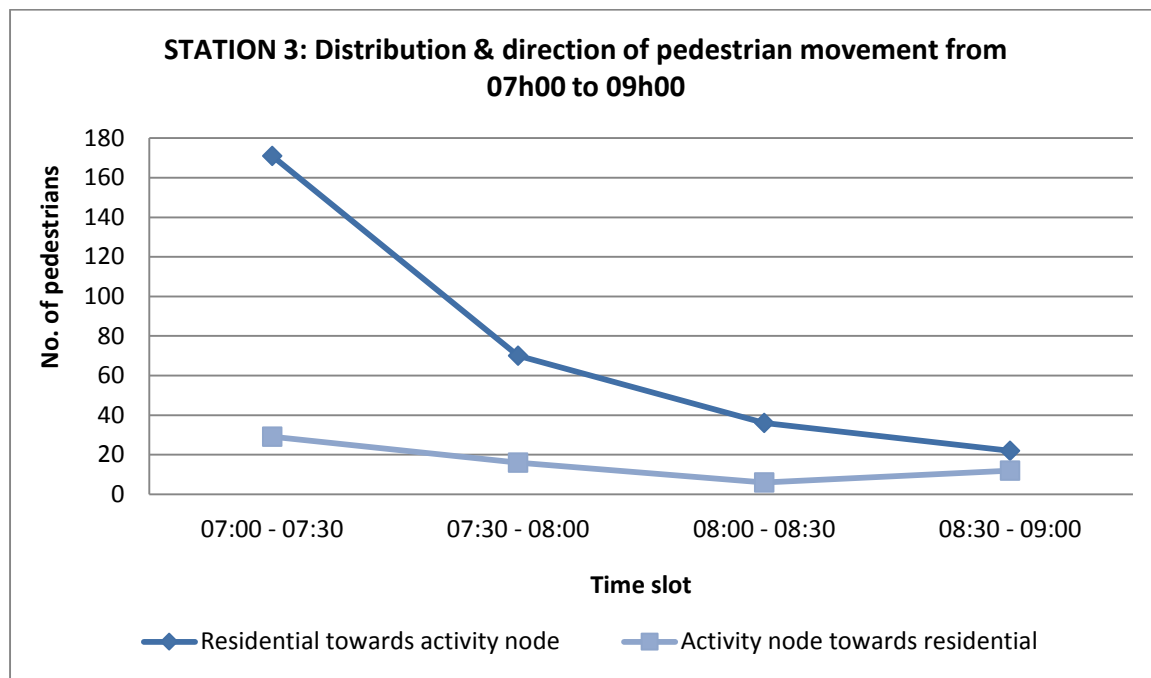


Figure 30: Station 3 distribution & direction of pedestrian movement from 07h00 to 09h00.

Figure 30 above illustrates the distribution and direction of pedestrian movement between 07h00 and 09h00 at survey station 3. The line graph shows that there was a higher level of pedestrian movement from residential areas towards activity nodes between 07h00 and 07h30 during which 171 pedestrians were recorded walking in that direction. From 07h30 onwards, pedestrian movement from residential areas to activity nodes dropped.

There were very few pedestrians observed walking from activity nodes towards residential areas during the survey period. The peak time was 07h00 to 07h30 during which 29 pedestrians were counted. Between 07h30 and 08h30, there was a decrease in pedestrian movement observed followed by a slight increase between 08h30 and 09h00.

iv. Station 4 (Roodewal: Residential)

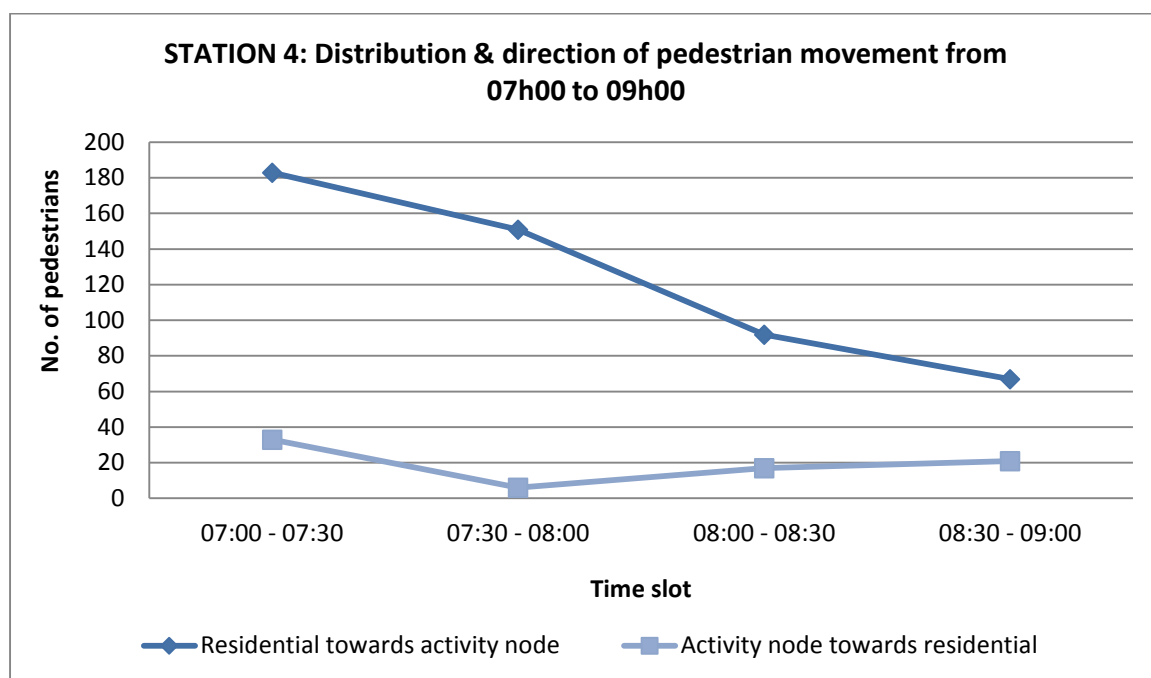


Figure 31: Station 4 distribution & direction of pedestrian movement from 07h00 to 09h00.

Figure 31 above illustrates the distribution and direction of pedestrian movement between 07h00 and 09h00 at survey station 4. The line graph shows that there was a higher level of pedestrian movement from residential areas towards activity nodes during the 07h00 to 08h00 period during which 334 pedestrians were counted. From 08h00 to 08h30, pedestrian movement from residential areas to activity nodes dropped to 92 pedestrians and from 08h30 to 09h00, 67 pedestrians were counted.

There were very few pedestrians observed walking from activity nodes towards residential areas during the survey period. The peak time was 07h00 to 07h30 during which 33 pedestrians were counted. There was a sharp decrease in the number of pedestrians walking from activity nodes towards residential areas from 07h30 to 08h00 followed by an increase in movement from 08h00 to 09h00.

v. Station 5 (Avian Park)

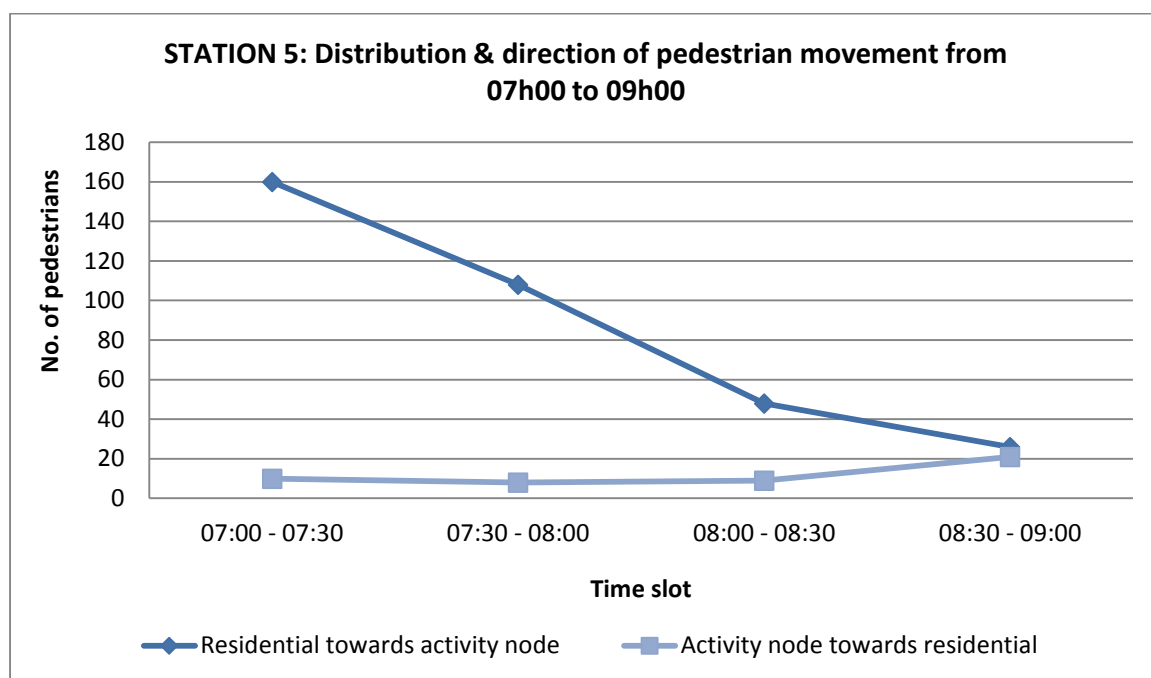


Figure 32: Station 5 distribution & direction of pedestrian movement from 07h00 to 09h00.

Figure 32 above illustrates the distribution and direction of pedestrian movement between 07h00 and 09h00 at survey station 5. The line graph shows that there was a higher level of pedestrian movement from residential areas towards activity nodes between 07h00 to 07h30 during which 160 pedestrians were recorded walking in that direction. From 07h30 onwards, pedestrian movement from residential areas to activity nodes dropped, with only 26 pedestrians counted between 08h30 and 09h00.

The number of pedestrians moving from activity nodes towards residential areas was very low early in the morning but progressively increased from 08h00. The peak time was 08h30 to 09h00 during which 21 pedestrians were recorded.

vi. Station 6 (Riverview: Boland College)

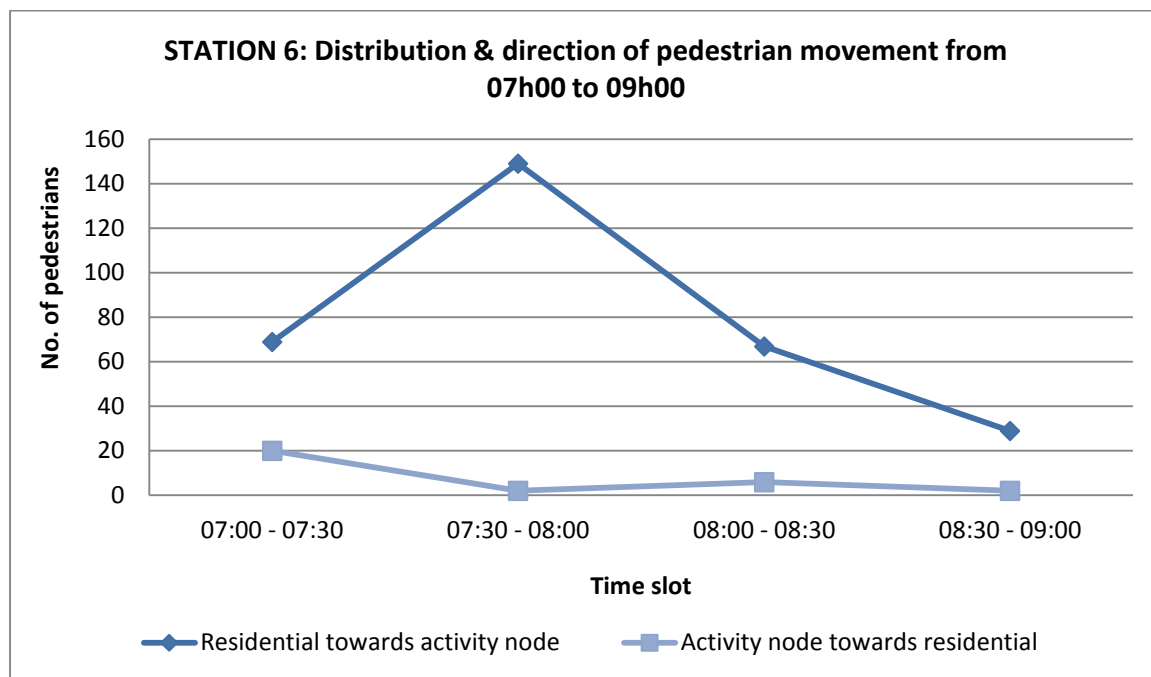


Figure 33: Station 6 distribution & direction of pedestrian movement from 07h00 to 09h00.

Figure 33 above illustrates the distribution and direction of pedestrian movement between 07h00 and 09h00 at survey station 6. The line graph shows that there was a higher level of pedestrian movement from residential areas towards activity nodes during the 07h30 to 08h00 period during which 149 pedestrians were counted.

There were very few pedestrians observed walking from activity nodes towards residential areas during the survey period. The peak time was 07h00 to 07h30 during which 20 pedestrians were counted. There was a sharp decrease in the number of pedestrians walking from activity nodes towards residential areas from 07h30 to 08h00 followed by a slight increase in movement from 08h00 to 08h30.

vii. Station 7 (Riverview: Residential)

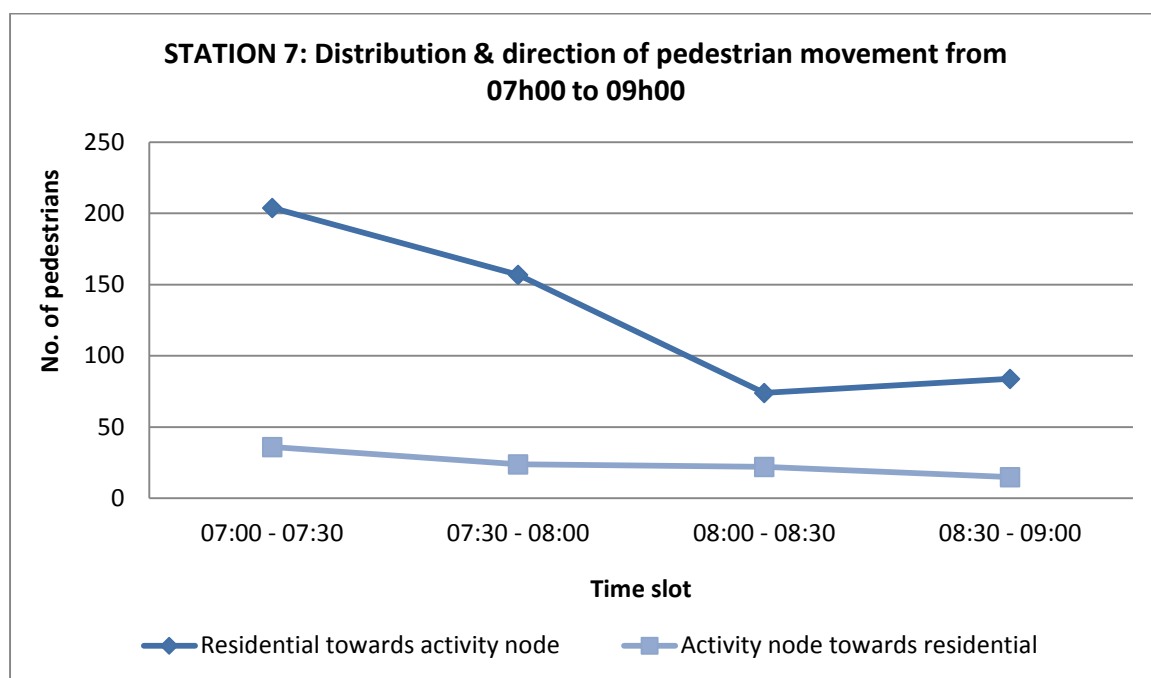


Figure 34: Station 7 distribution & direction of pedestrian movement from 07h00 to 09h00.

Figure 34 above illustrates the distribution and direction of pedestrian movement between 07h00 and 09h00 at survey station 7. The line graph shows that there was a higher level of pedestrian movement from residential areas towards activity nodes during the 07h00 to 07h30 period during which 204 pedestrians were counted.

There were very few pedestrians observed walking from activity nodes towards residential areas during the survey period. The peak time was 07h00 to 07h30 during which 36 pedestrians were counted. There was a slight decrease in the number of pedestrians walking from activity nodes towards residential areas from 07h30 onwards.

viii. Station 8 (Riverview: Community Learning Centre)

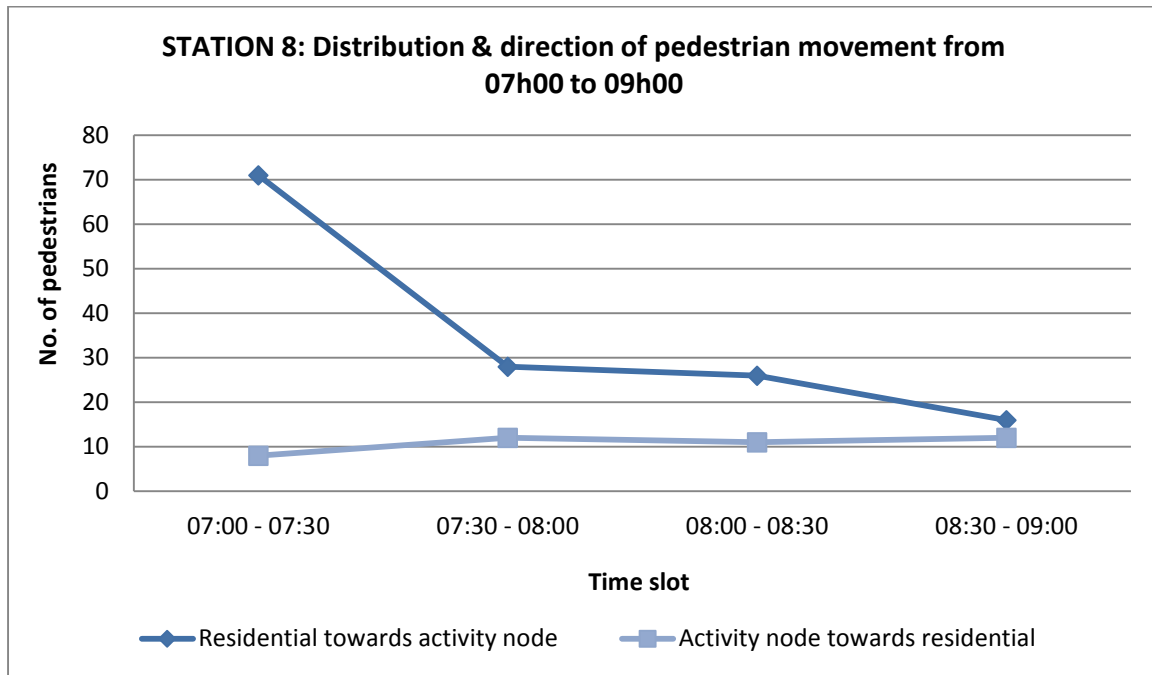


Figure 35: Station 8 distribution & direction of pedestrian movement from 07h00 to 09h00

Figure 35 above illustrates the distribution and direction of pedestrian movement between 07h00 and 09h00 at survey station 8. The line graph shows that there was a higher level of pedestrian movement from residential areas towards activity nodes during the 07h00 to 07h30 period during which 71 pedestrians were counted. There was a sharp decrease in pedestrian movement from 07h30 onwards.

The number of pedestrians moving from activity nodes to residential areas was very low throughout the two hour period. The peak times were 07h30 to 08h00 and 08h30 to 09h00 during which 12 pedestrians were recorded walking from activity nodes to residential areas.

ix. Composite direction of pedestrian movement

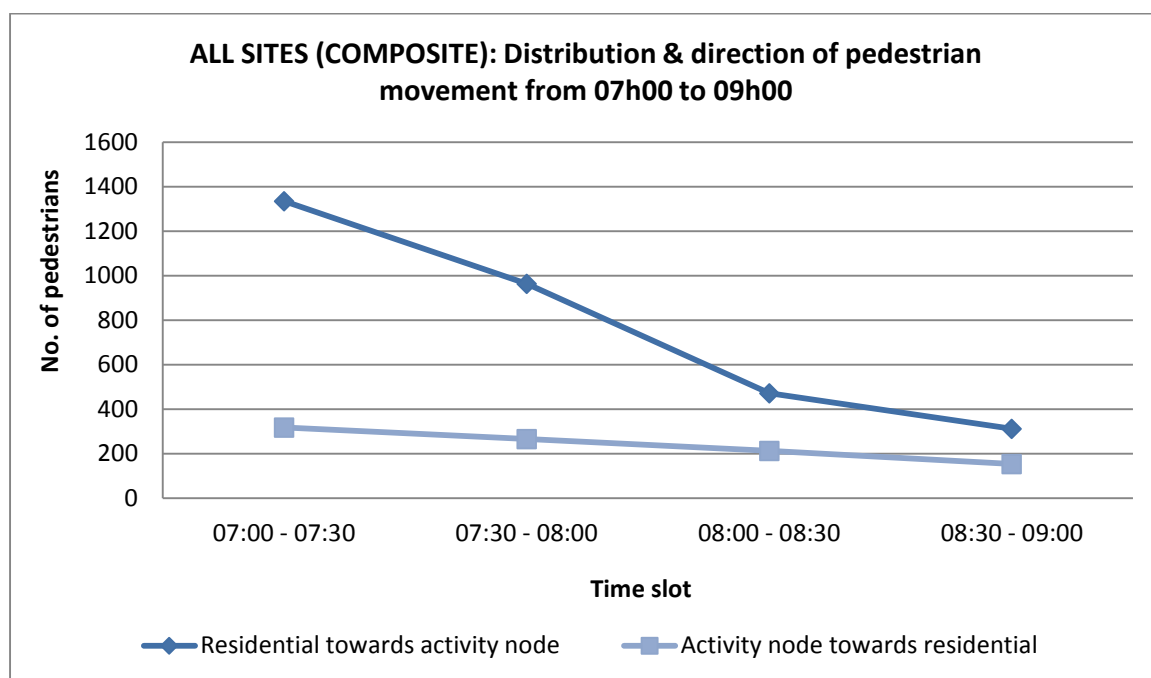


Figure 36: Composite distribution & direction of pedestrian movement from 07h00 to 09h00.

Figure 36 above illustrates a composite representation of the distribution and direction of pedestrian movement at all eight survey points between 07h00 and 09h00. The line graph shows that there was a higher level of pedestrian movement from residential areas towards activity nodes between 07h00 to 07h30 during which 1335 pedestrians were recorded. From 07h30 onwards, pedestrian movement from residential areas to activity nodes dropped steadily, with 313 pedestrians counted in the 08h30 to 09h00 time slot.

The number of pedestrians moving from activity nodes towards residential areas started off higher (<300) early in the day but progressively decreased until 09h00. The peak time was between 07h00 and 07h30 during which a total of 318 pedestrians were recorded.

x. Comparison of pedestrian movement between eight stations

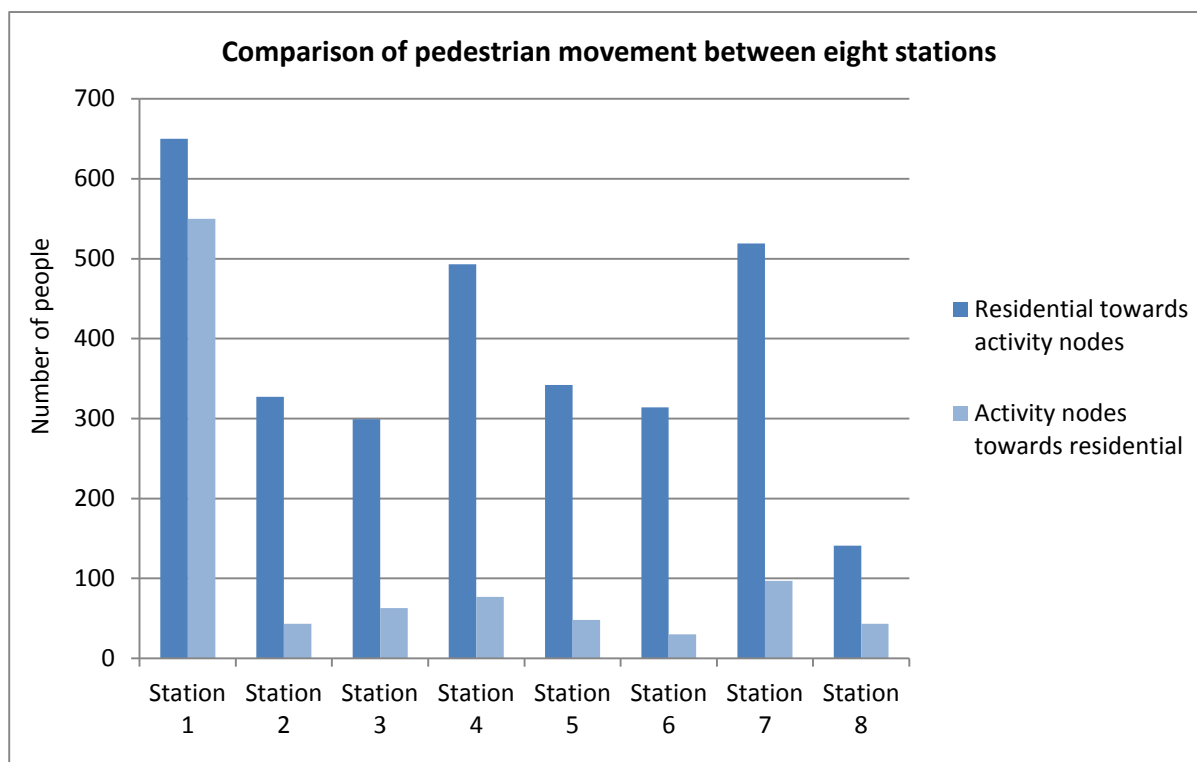
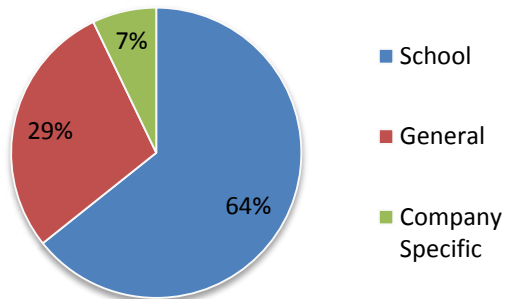


Figure 37: Comparison of pedestrian movement between eight stations

Figure 37 above shows the comparison of pedestrian movement between all eight stations. It is clear that Station 1 experienced the most pedestrian movement with 650 people walking from residential areas towards activity nodes and 550 people walking from activity nodes towards residential areas. Station 8 experienced the least pedestrian movement with 141 people walking from residential areas towards activity nodes and 43 people walking from activity nodes towards residential areas. In total there were more people walking from residential areas towards activity nodes (3085) than people walking from activity nodes towards residential areas (621).

3.4 Bus Profile

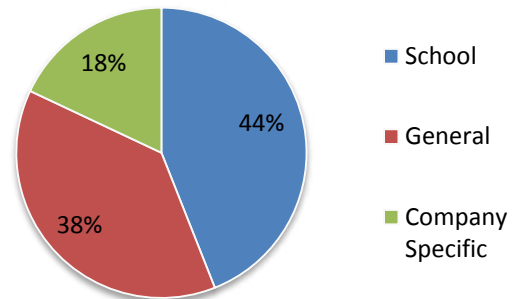
STATION 2 (Zwelethemba: Industrial) - Bus Profile



Total number of buses counted: 42

Figure 38: Station 2 Bus Profile

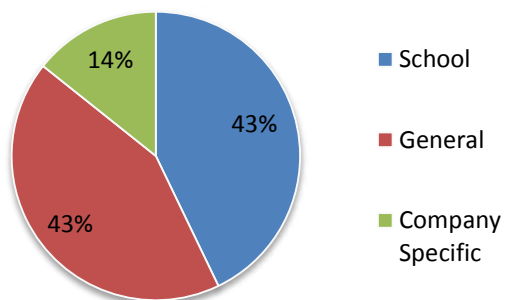
STATION 3 (Roodewal: Intersection) - Bus Profile



Total number of buses counted: 50

Figure 39: Station 3 Bus Profile

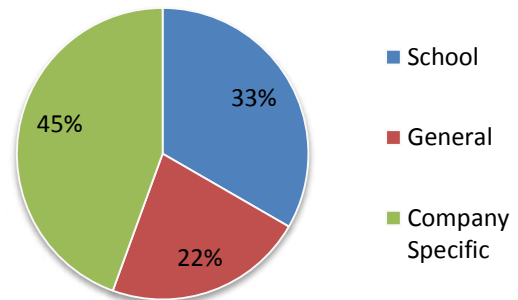
STATION 5 (Avian Park) - Bus Profile



Total number of buses counted: 14

Figure 40: Station 5 Bus Profile

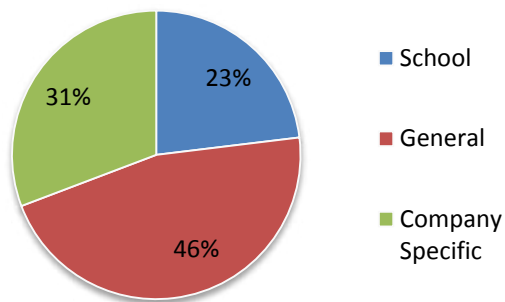
STATION 7 (Riverview: Residential) - Bus Profile



Total number of buses counted: 9

Figure 41: Station 7 Bus Profile

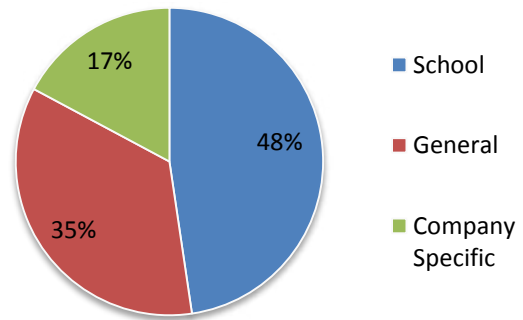
STATION 8 (Riverview: Community Learning Centre) - Bus Profile



Total number of buses counted: 13

Figure 42: Station 8 Bus Profile

COMPOSITE - Bus Profile



Total number of buses counted: 128

Figure 43: Composite Bus Profile

Figures 38 to 42 above illustrate the bus profile according to bus ownership at each survey station followed by the composite results for all eight stations in Figure 43. At stations 2 and 3, school buses were the most predominant while, at stations 7 and 8, company-specific buses and general buses were most predominant, respectively. At station 5, both general and school buses made up the majority of buses. Overall, there were 61 school buses (48%), 45 general buses (35%) and 22 company-specific buses (17%).

3.5 Bus Distribution

i. Station 2 (Zwelethemba: Industrial)

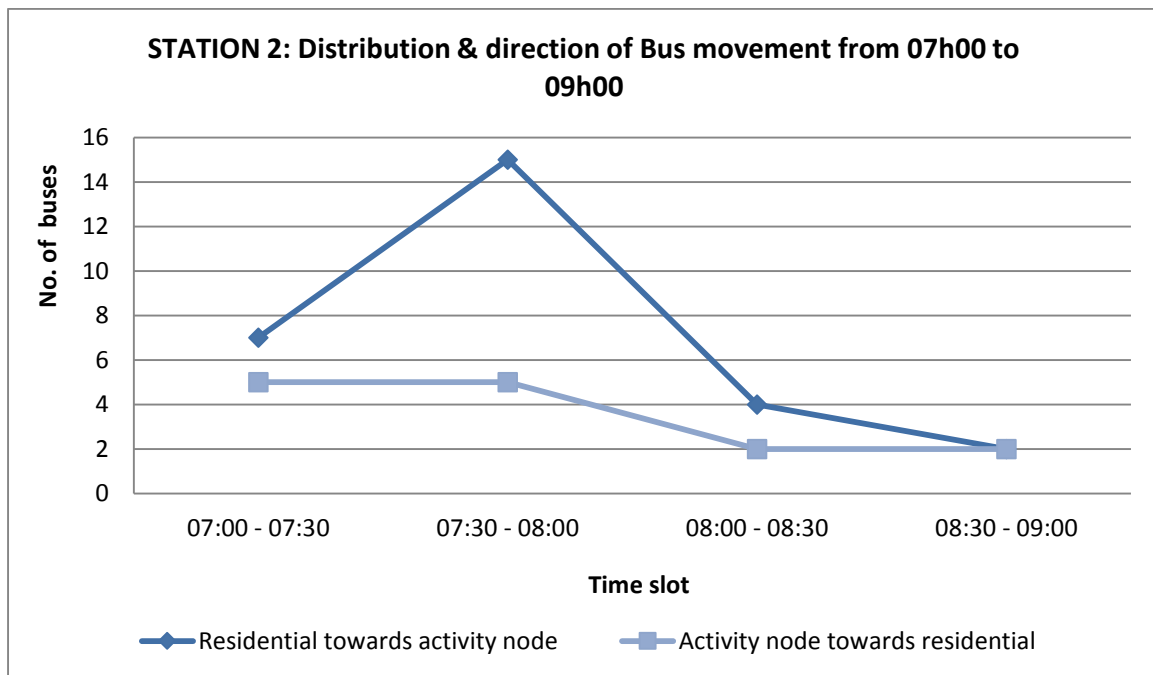


Figure 44: Station 2 distribution & direction of bus movement from 07h00 to 09h00.

Figure 44 above illustrates the distribution and direction of bus movement between 07h00 and 09h00 at survey station 2. The line graph shows that there was a higher level of bus movement from residential areas towards activity nodes during the 07h30 to 08h00 period during which 15 buses were counted. From 08h00, bus movement from residential areas to activity nodes dropped drastically, with only 2 buses being recorded between 08h30 and 09h00.

There was less bus movement observed from activity nodes towards residential areas during the survey period. The peak time was 07h00 to 08h00 during which 10 buses (5+5) buses were counted driving from activity nodes to residential areas. There was a decrease in the number of buses from activity nodes towards residential areas from 08h00 to 09h00.

ii. Station 3 (Roodewal: Intersection)

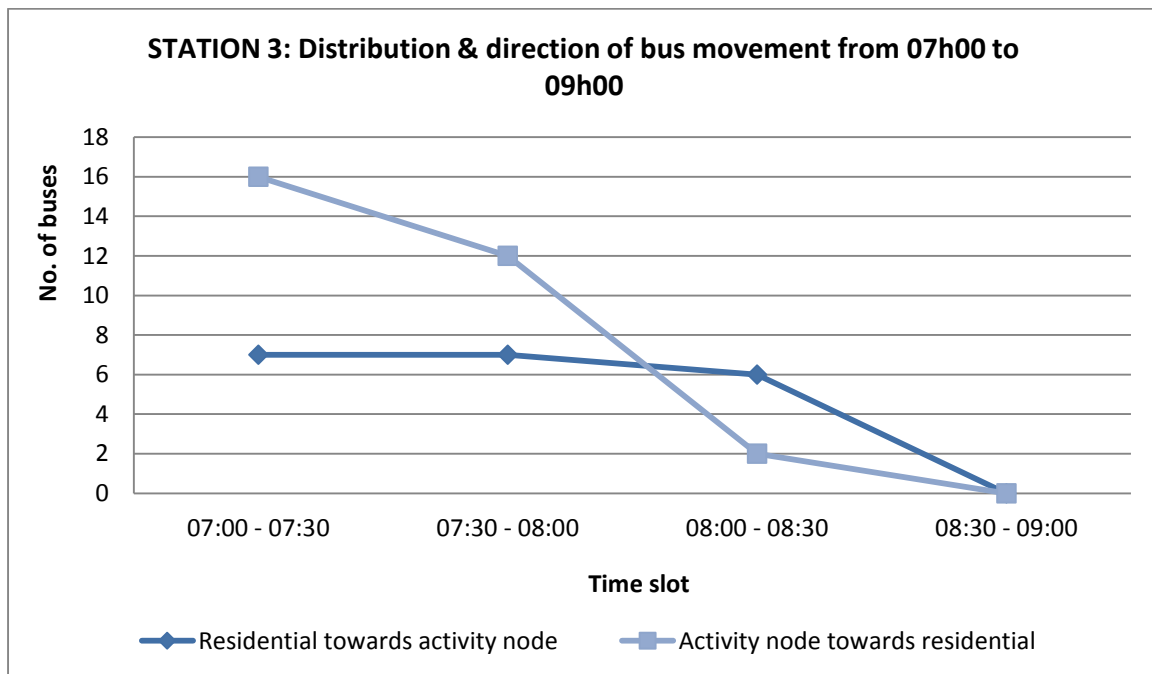


Figure 45: Station 3 distribution & direction of bus movement from 07h00 to 09h00.

Figure 45 above illustrates the distribution and direction of bus movement between 07h00 and 09h00 at survey station 3. The line graph shows that there was a higher level of bus movement from residential areas towards activity nodes during the 07h00 to 08h00 period during which 14 (7+7) buses were counted. From 08h00, bus movement from residential areas to activity nodes dropped, with 6 buses being recorded between 08h00 and 08h30 and no buses recorded after 08h30.

There was more bus movement observed from activity nodes towards residential areas during the survey period. The peak time was 07h00 to 07h30 during which 16 buses were counted driving from activity nodes to residential areas. There was a decrease in the number

of buses from 08h00 to 09h00, with only 2 buses being counted between 08h00 and 08h30 and no buses being counted after 08h30.

iii. Station 5 (Avian Park)

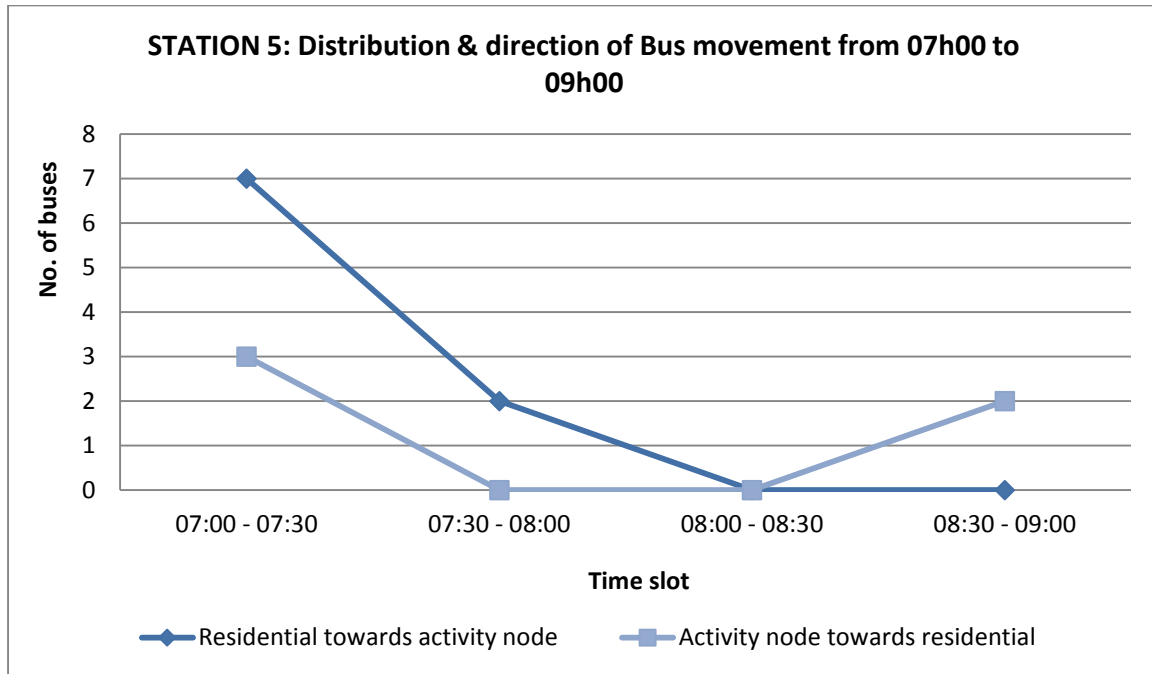


Figure 46: Station 5 distribution & direction of bus movement from 07h00 to 09h00.

Figure 46 above illustrates the distribution and direction of bus movement between 07h00 and 09h00 at survey station 5. The line graph shows that there was a higher level of bus movement from residential areas towards activity nodes during the 07h00 to 07h30 period during which 7 buses were counted. From 08h00, bus movement from residential areas to activity nodes declined, with only 2 buses being recorded between 07h30 and 08h00 and no buses being counted after 08h00.

There was less bus movement observed from activity nodes towards residential areas during the survey period. The peak time was 07h00 to 07h30 during which 3 buses were counted driving from activity nodes to residential areas. There was no buses counted between 07h30 and 08h30 but there was an increase between 08h30 and 09h00 where 2 buses were counted.

iv. Station 7 (Riverview: Residential)

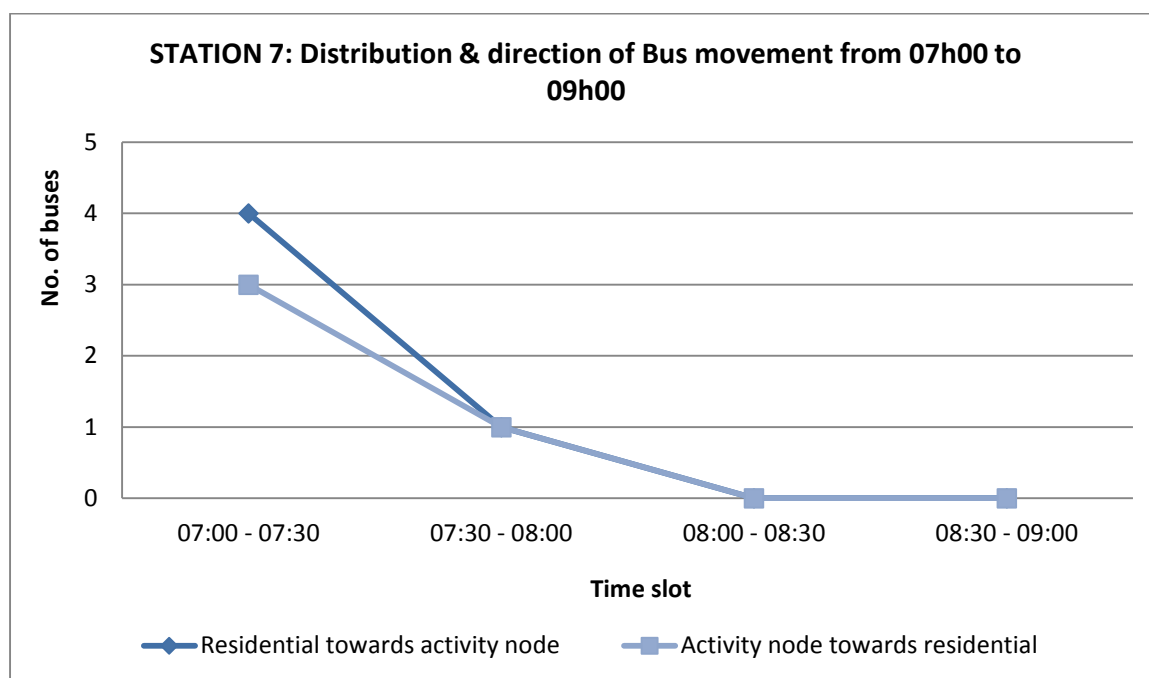


Figure 47: Station 7 distribution & direction of bus movement from 07h00 to 09h00.

Figure 47 above illustrates the distribution and direction of bus movement between 07h00 and 09h00 at survey station 7. The line graph shows that there was a higher level of bus movement from residential areas towards activity nodes during the 07h00 to 07h30 period during which 4 buses were counted. From 07h30, bus movement from residential areas to activity nodes decreased, with only 1 bus being recorded between 07h30 and 08h00 and no buses being counted between 08h00 and 09h00.

There was slightly less bus movement observed from activity nodes towards residential areas during the survey period but a similar pattern was observed. The peak time was 07h00 to 07h30 during which 3 buses were counted driving from activity nodes to residential areas. There was a decrease in the number of buses from activity nodes towards residential areas from 07h30 to 09h00 with no buses being counted between 08h00 and 09h00.

v. **Station 8 (Riverview: Community Learning Centre)**

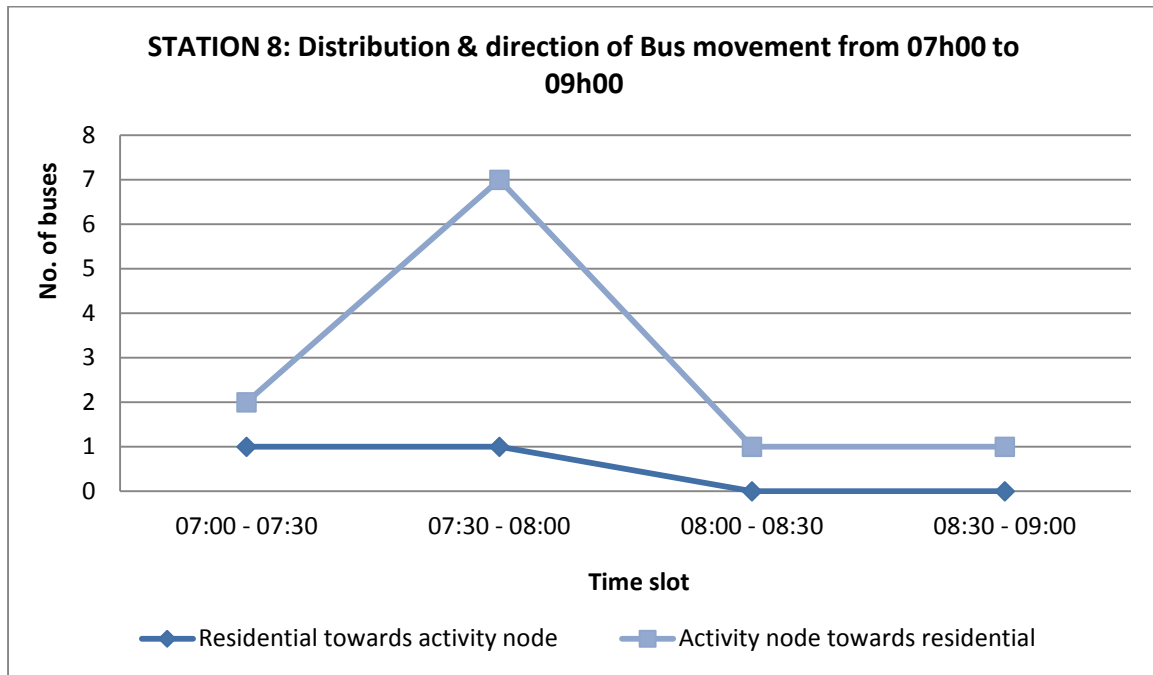


Figure 48: Station 8 distribution & direction of bus movement from 07h00 to 09h00.

Figure 48 above illustrates the distribution and direction of bus movement between 07h00 and 09h00 at survey station 8. The line graph shows that only 2 buses travelling from residential areas towards activity nodes were counted during the 07h00 to 08h00 period. From 08h00, there was no bus movement from residential areas to activity nodes.

There was more bus movement observed from activity nodes towards residential areas during the survey period. The peak time was 07h30 to 08h00 during which 7 buses were counted driving from activity nodes to residential areas. There was then a decrease in the number of buses travelling from activity nodes towards residential areas with only 2 buses being counted between 08h00 and 09h00.

vi. Composite

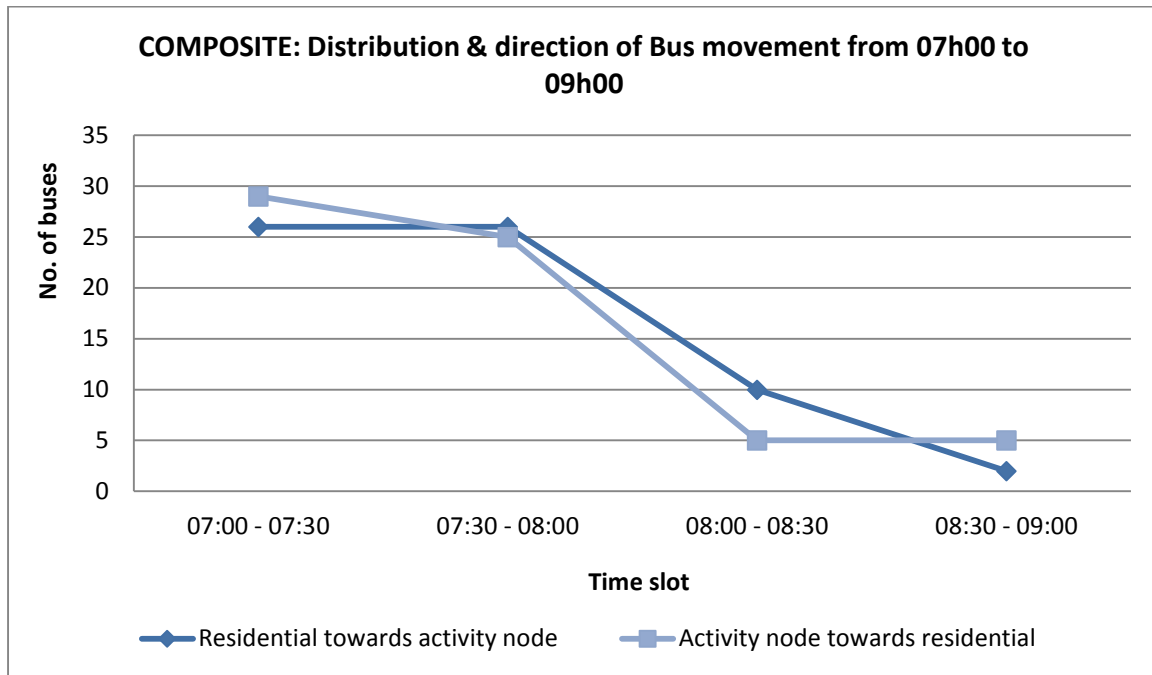


Figure 49: Composite distribution & direction of bus movement from 07h00 to 09h00.

Figure 49 above illustrates a composite representation of the distribution and direction of bus movement at survey stations 2, 3, 5, 7 and 8 between 07h00 to 09h00. There was an equal amount of buses moving from residential areas towards activity nodes as those moving in the opposite direction. The line graph shows that bus movement from residential areas towards activity nodes was highest between 07h00 and 08h00 during which 52 (26+26) buses were recorded. From 08h00 onwards, bus movement from residential areas to activity nodes dropped with only 2 buses counted in the 08h30 to 09h00 time slot.

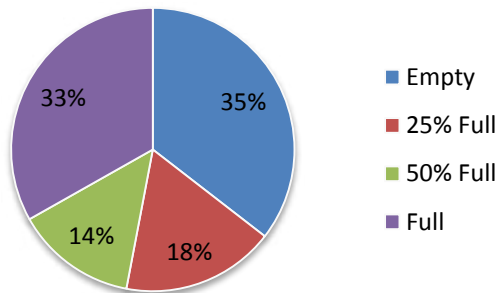
The peak time for buses moving from activity nodes towards residential areas was between 07h00 and 07h30 during which a total of 29 buses were recorded. There was a drastic drop in bus numbers between 08h00 and 08h30 during which only 5 buses were recorded.

3.6 Taxi Profile

As mentioned earlier, no taxi count was done at station 1 (Zwelethemba) because Station 2 captured all traffic on the only access road into and out of Zwelethemba. Station 2, therefore, represents the taxi profile for Zwelethemba.

The figures below indicate the number of taxis per category as indicated. Paragraphs 3.8 and 3.9 below translate these figures into estimated number of people travelling by taxi through these stations.

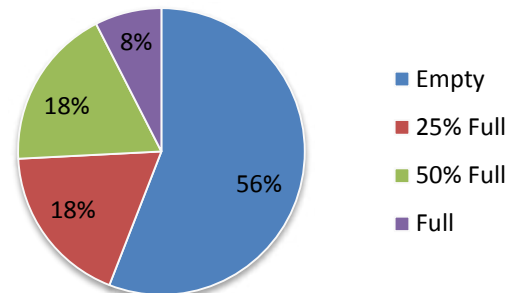
STATION 2 (Zwelethemba: Industrial) - Taxi Profile



Total number of taxis counted: 217

Figure 50: Station 2 Taxi Profile

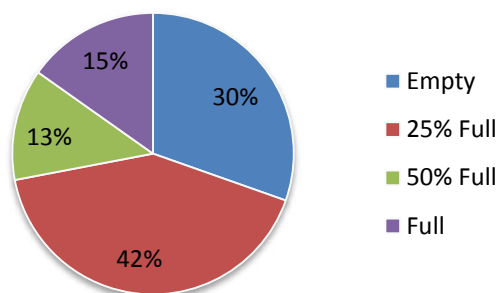
STATION 3 (Roodewal: Intersection) - Taxi Profile



Total number of taxis counted: 93

Figure 51: Station 3 Taxi Profile

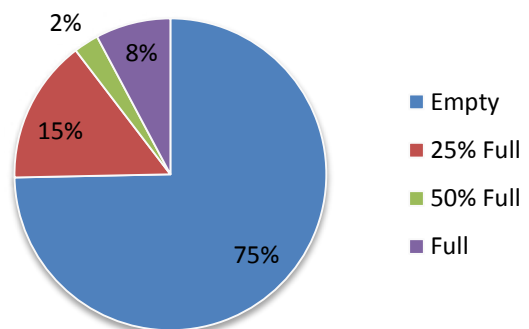
STATION 4 (Roodewal: Residential) - Taxi Profile



Total number of taxis counted: 125

Figure 52: Station 4 Taxi Profile

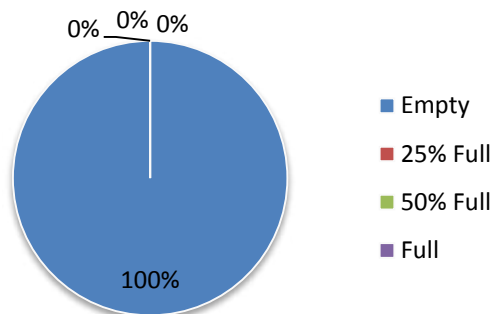
STATION 5 (Avian Park) - Taxi Profile



Total number of taxis counted: 154

Figure 53: Station 5 Taxi Profile

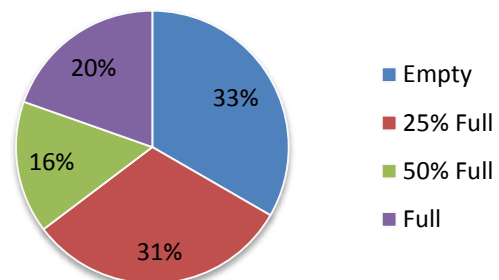
STATION 6 (Riverview: Boland College) - Taxi Profile



Total number of taxis counted: 38

Figure 54: Station 6 Taxi Profile

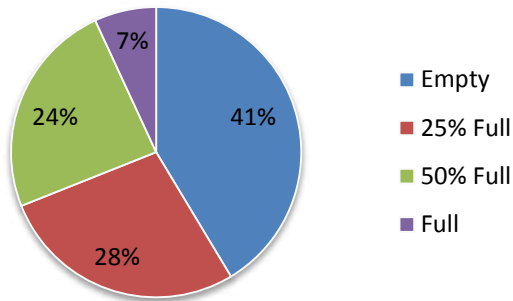
STATION 7 (Riverview: Residential) - Taxi Profile



Total number of taxis counted: 51

Figure 55: Station 7 Taxi Profile

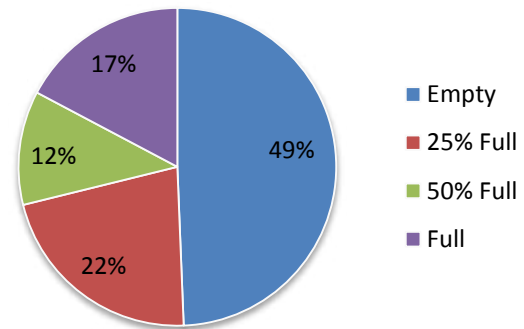
STATION 8 (Riverview: Community Learning Centre) - Taxi Profile



Total number of taxis counted: 29

Figure 56: Station 8 Taxi Profile

COMPOSITE - Taxi Profile



Total number of taxis counted: 707

Figure 57: Composite Taxi Profile

Figures 50 to 56 above illustrate the taxi profile according to how full/empty the taxis were at each survey station followed by the composite results for all seven stations in Figure 57. At stations 2, 3, 5, 7 and 8, the majority of taxis counted were empty. At station 6, only empty taxis were counted. In total, there were 349 empty taxis (49%), 154 taxis that were estimated to be 25% full (22%), 112 full taxis (17%) and 82 taxis that were estimated to be 50% full (12%) counted at all seven survey stations.

3.7 Taxi Distribution

i. Station 2 (Zwelethemba: Industrial)

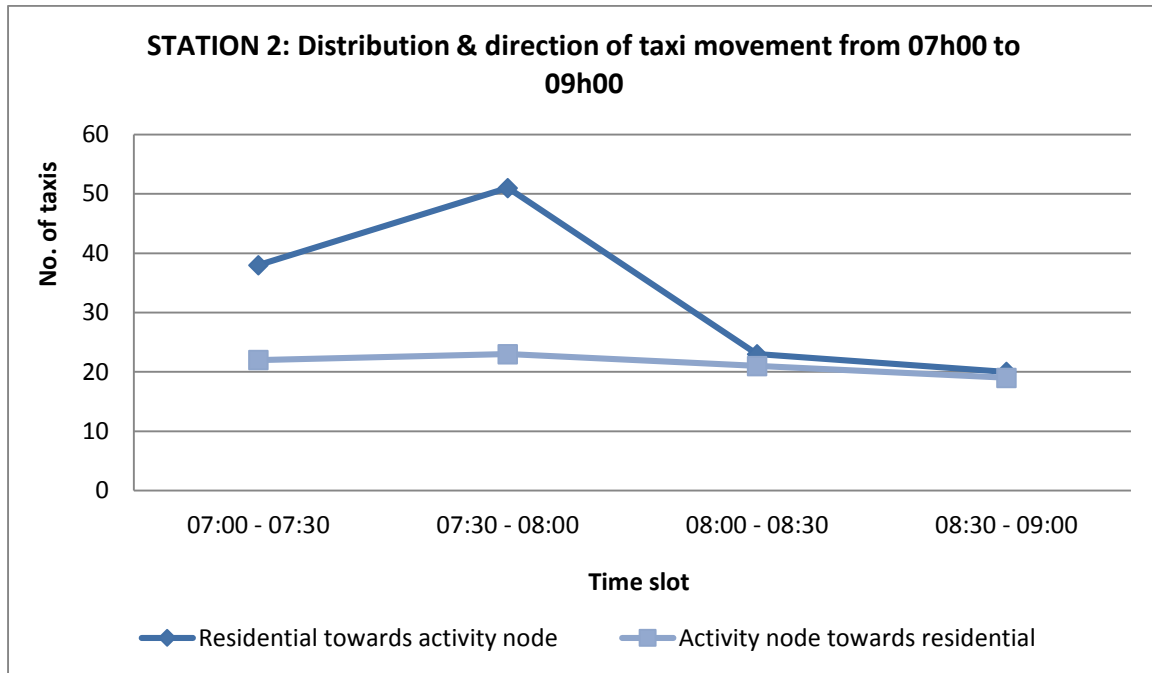


Figure 58: Station 2 distribution & direction of taxi movement from 07h00 to 09h00.

Figure 58 above illustrates the distribution and direction of taxi movement between 07h00 and 09h00 at survey station 2. The line graph shows that there was a higher level of taxi movement from residential areas towards activity nodes during the 07h30 to 08h00 period during which 51 taxis were counted. From 08h00 to 08h30, taxi movement dropped to 23 taxis and, from 08h30 to 09h00, 20 taxis were counted driving from residential areas towards activity nodes.

There were much fewer taxis observed driving from activity nodes towards residential areas during the survey period. The number of taxis moving from activity nodes to residential areas was fairly consistent throughout the survey period, with the peak being between 07h30 and 08h00 during which 23 taxis were counted. The least taxi movement was observed between 08h00 and 09h00, with only 19 taxis counted during this period.

ii. Station 3 (Roodewal: Intersection)

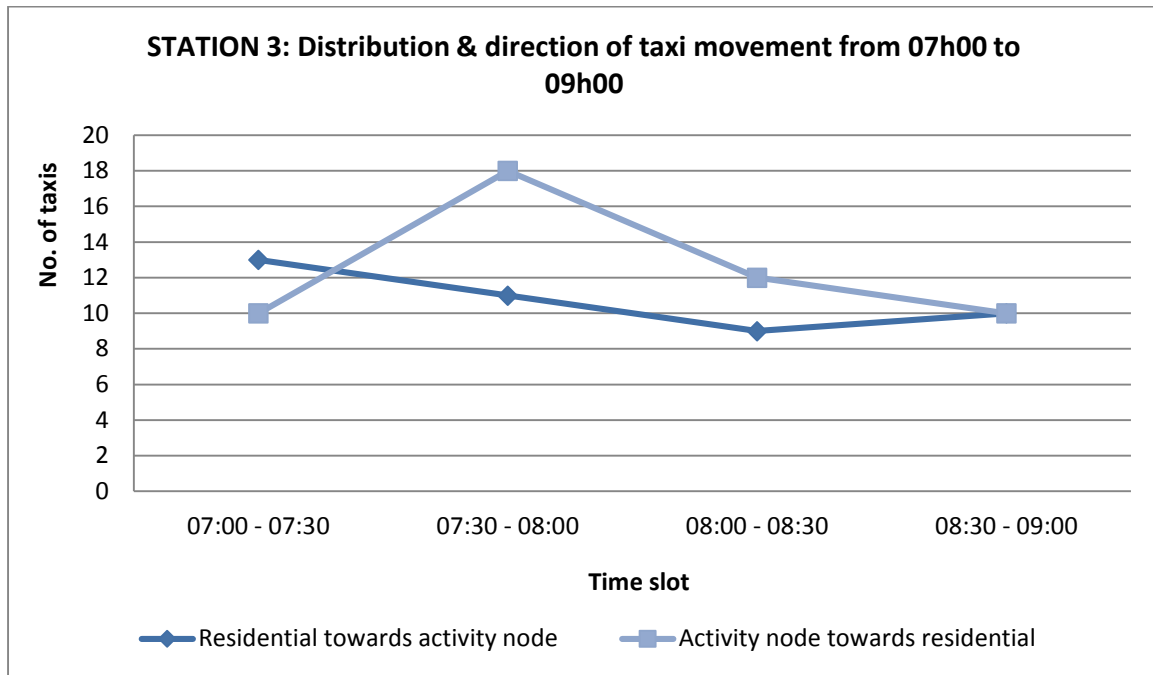


Figure 59: Station 3 distribution & direction of taxi movement from 07h00 to 09h00.

Figure 59 above illustrates the distribution and direction of pedestrian movement between 07h00 and 09h00 at survey station 3. The line graph shows that there was a higher level of pedestrian movement from residential areas towards activity nodes during the 07h00 to 07h30 period during which 13 taxis were counted. There was a slight decrease in pedestrian movement from 07h30 to 08h30 followed by a slight increase between 08h30 to 09h00 where 10 taxis were counted.

In general, there was more taxi movement from activity nodes towards residential areas than taxi movement from residential areas to activity nodes, except for the 07h00 to 07h30 period. The peak time was 07h30 to 08h00 during which 18 taxis were counted driving from activity nodes to residential areas.

iii. Station 4 (Roodewal: Residential)

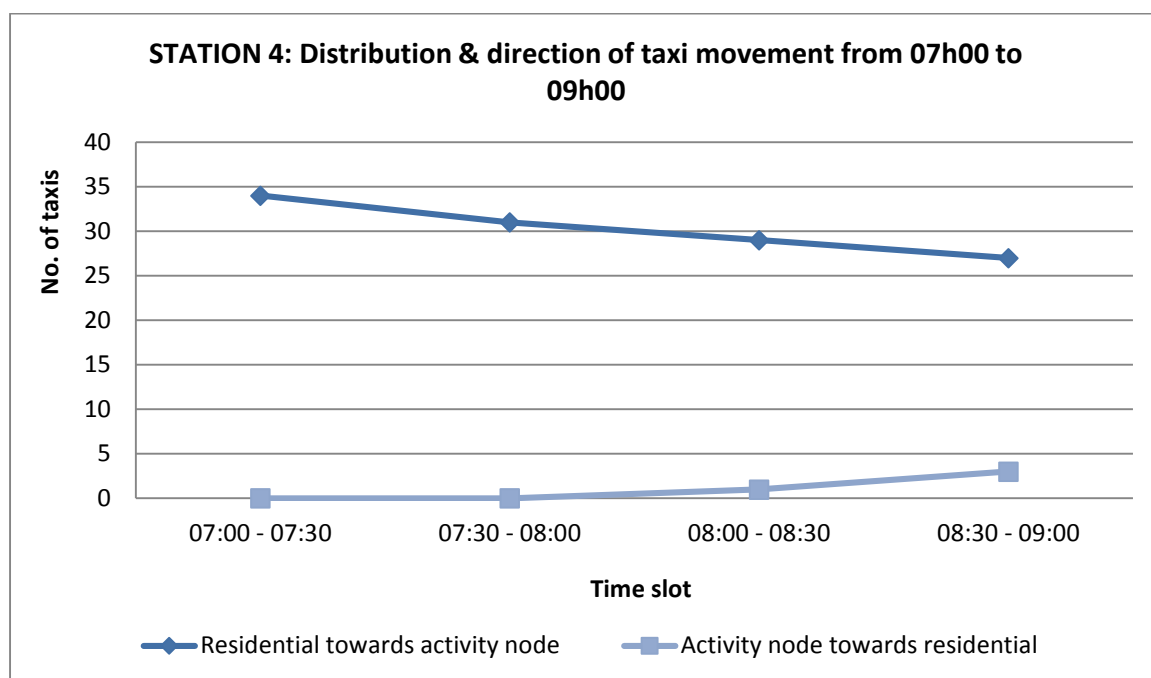


Figure 60: Station 4 distribution & direction of taxi movement from 07h00 to 09h00.

Figure 60 above illustrates the distribution and direction of taxi movement between 07h00 and 09h00 at survey station 4. The line graph shows that there was a higher level of taxi movement from residential areas towards activity nodes between 07h00 to 07h30 during which 34 taxis were recorded driving in that direction. From 07h30 onwards, taxi movement progressively decreased, with 29 taxis being counted between 08h00 and 08h30 and 27 taxis being counted between 08h30 and 09h00.

In comparison, the number of taxis driving from activity nodes towards residential areas was much lower. Between 07h00 and 08h00, there were no taxis counted. The peak time was 08h30 to 09h00; however only 3 taxis were recorded.

iv. Station 5 (Avian Park)

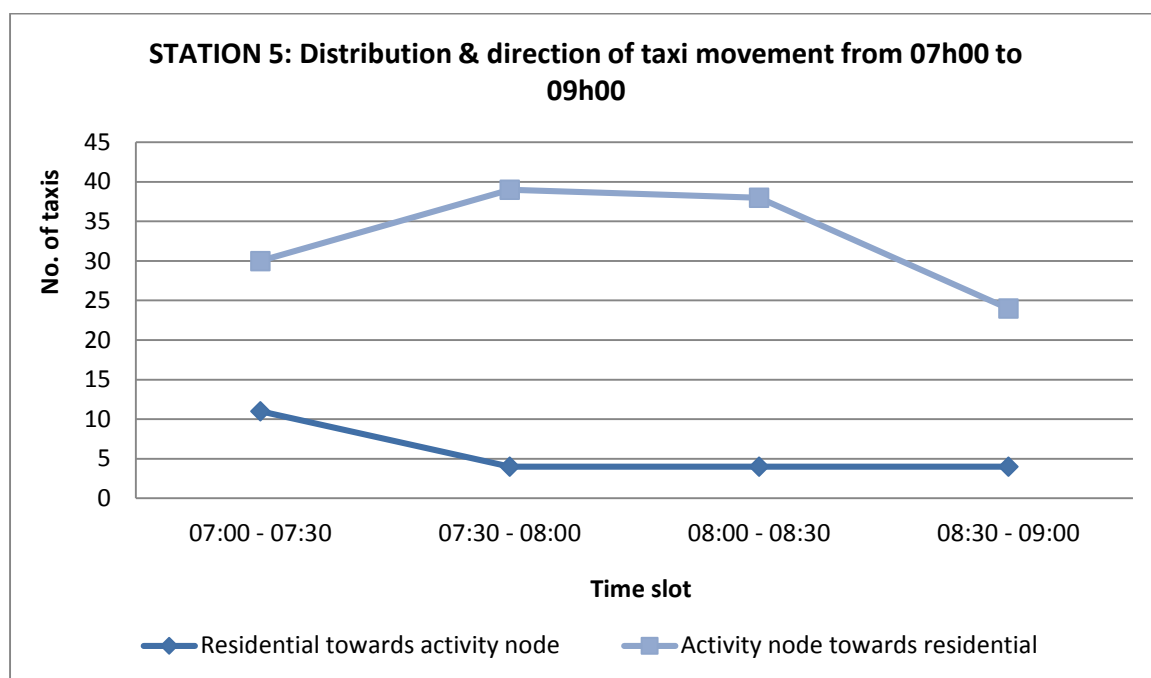


Figure 61: Station 5 distribution & direction of taxi movement from 07h00 to 09h00.

Figure 61 above illustrates the distribution and direction of taxi movement between 07h00 and 09h00 at survey station 5. The line graph shows that there was a higher level of pedestrian movement from residential areas towards activity nodes during the 07h00 to 07h30 period during which 11 taxis were counted. There were 4 taxis counted during the next three time slots.

In comparison, there were significantly more taxis observed driving from activity nodes towards residential areas during the survey period. The peak time was 07h30 to 08h00 during which 39 taxis were counted. There was a decrease from 08h30 to 09h00 during which only 24 taxis were counted.

v. Station 6 (Riverview: Boland College)

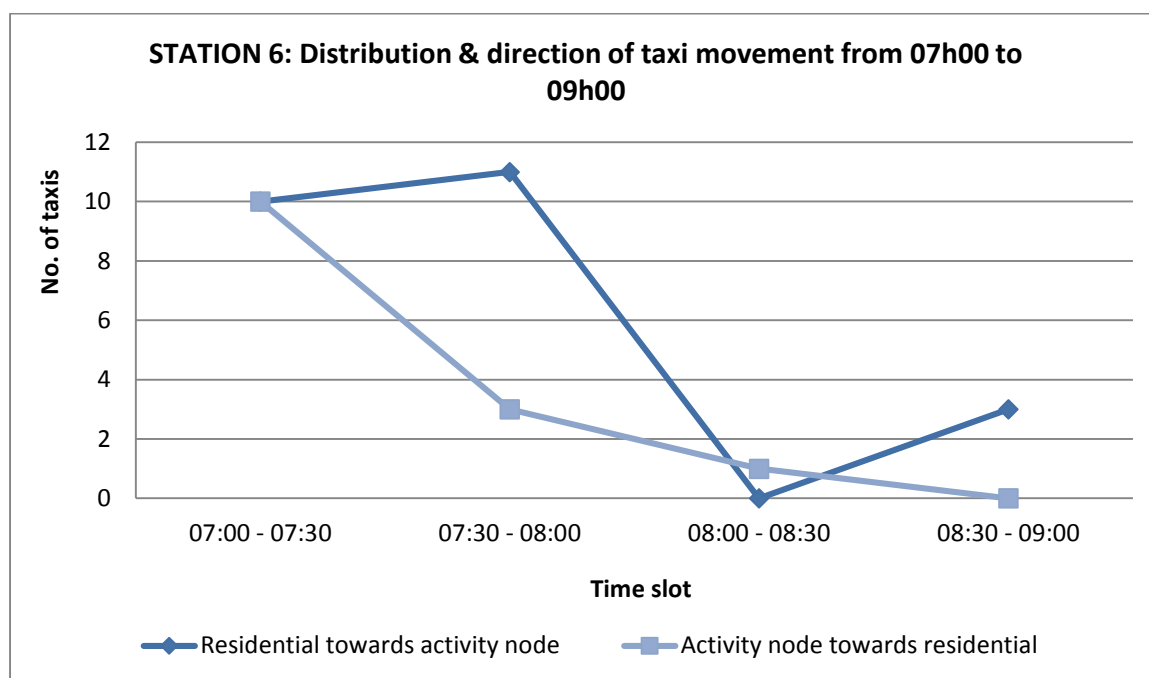


Figure 62: Station 6 distribution & direction of taxi movement from 07h00 to 09h00.

Figure 62 above illustrates the distribution and direction of taxi movement between 07h00 and 09h00 at survey station 6. The line graph shows that there was a higher level of taxi movement from residential areas towards activity nodes during the 07h30 to 08h00 period during which 11 taxis were counted. There was then a sharp decrease in taxi movement, with no taxis being counted from 08h00 to 08h30 and only 3 taxis being counted between 08h30 and 09h00.

There were much fewer taxis observed driving from activity nodes towards residential areas during the survey period. The peak time was 07h00 to 07h30 during which 10 taxis were counted. Between 07h30 and 09h00, only a few taxis were observed, with only 1 taxi being recorded between 08h00 and 08h30 and no taxis being recorded from 08h30 onwards.

vi. Station 7 (Riverview: Residential)

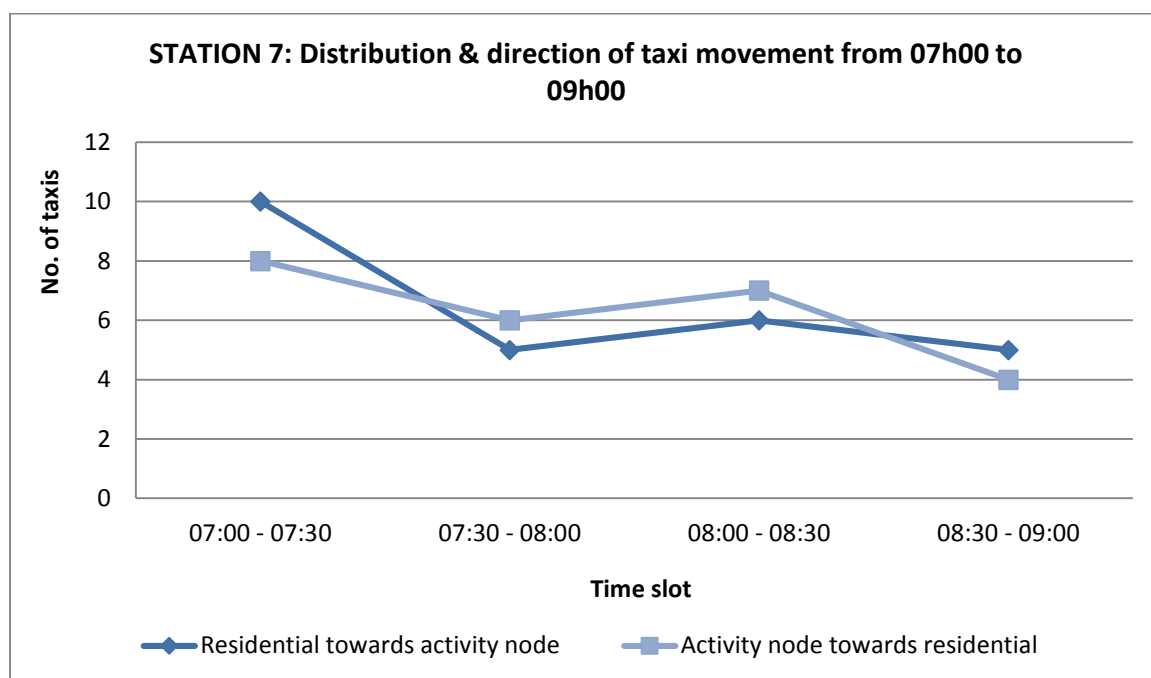


Figure 63: Station 7 distribution & direction of taxi movement from 07h00 to 09h00.

Figure 63 above illustrates the distribution and direction of taxi movement between 07h00 and 09h00 at survey station 7. There were almost an equal number of taxis moving in both directions during the survey period. The line graph shows that there was a higher level of taxi movement from residential areas towards activity nodes during the 07h00 to 07h30 period during which 10 taxis were counted.

Similarly, the peak time for taxis moving from activity nodes towards residential areas was 07h00 to 07h30 during which 8 taxis were counted.

vii. Station 8 (Riverview: Community Learning Centre)

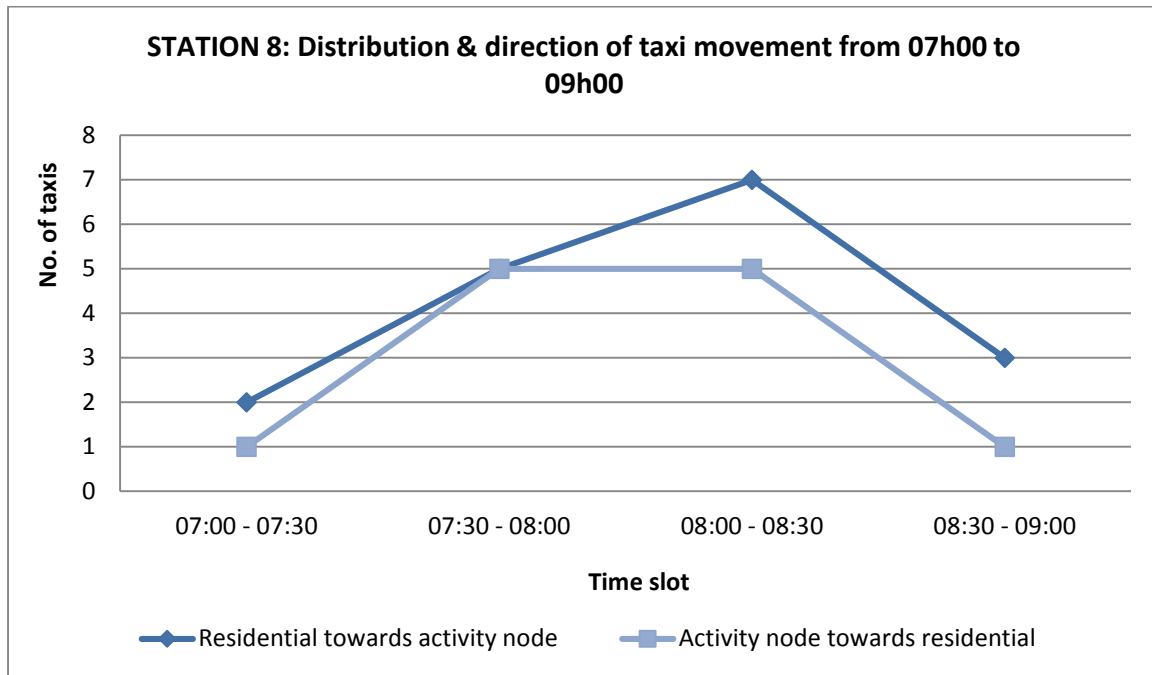


Figure 64: Station 8 distribution & direction of taxi movement from 07h00 to 09h00.

Figure 64 above illustrates the distribution and direction of taxi movement between 07h00 and 09h00 at survey station 8. The line graph shows that there was a higher level of taxi movement from residential areas towards activity nodes during the 08h00 to 08h30 period during which 7 taxis were counted. There was a sharp increase in taxi movement from 07h00 to 08h00 followed by a sharp decrease between 08h30 and 09h00.

There was less taxi movement observed from activity nodes towards residential areas during the survey period. The number of taxis was very low early in the morning but there was a sharp increase between 07h30 and 08h30 during which 10 (5+5) taxis were counted. There was then a drop in the number of taxis between 08h30 and 09h00.

viii. Composite

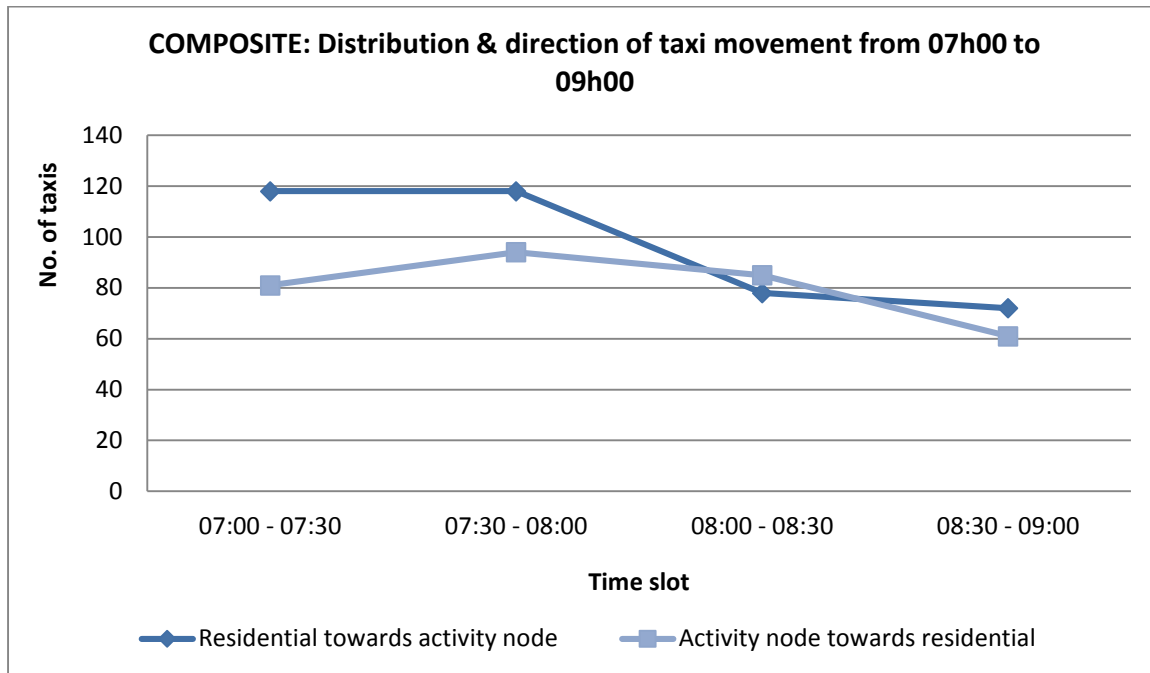


Figure 65: Composite distribution & direction of taxi movement from 07h00 to 09h00.

Figure 65 above illustrates a composite representation of the distribution and direction of taxi movement at survey stations 1 to 8 between 07h00 to 09h00. The line graph shows that, in general, there was a higher level of taxi movement from residential areas towards activity nodes compared to taxi movement in the opposite direction. The peak time for taxis traveling from residential areas towards activity nodes was between 07h00 to 07h30 and 07h30 to 08h00 during which a total of 118 taxis were recorded. From 08h00 onwards, taxi movement from residential areas to activity nodes decreased, with only 72 taxis counted in the 08h30 to 09h00 time slot.

The peak time for taxis moving from activity nodes towards residential areas during the survey period was between 07h30 and 08h00 during which a total of 94 taxis were recorded. There was then a steady drop in taxi numbers from 08h00 onwards.

3.8 Number of people using taxis

It has been assumed that a full taxi will carry 16 people, a taxi that is 50% full will carry 8 people and a taxi that is 25% full will carry 4 people. Using these assumptions, it was possible to calculate the estimated number of people who used taxis at each station. See Figure 66 below.

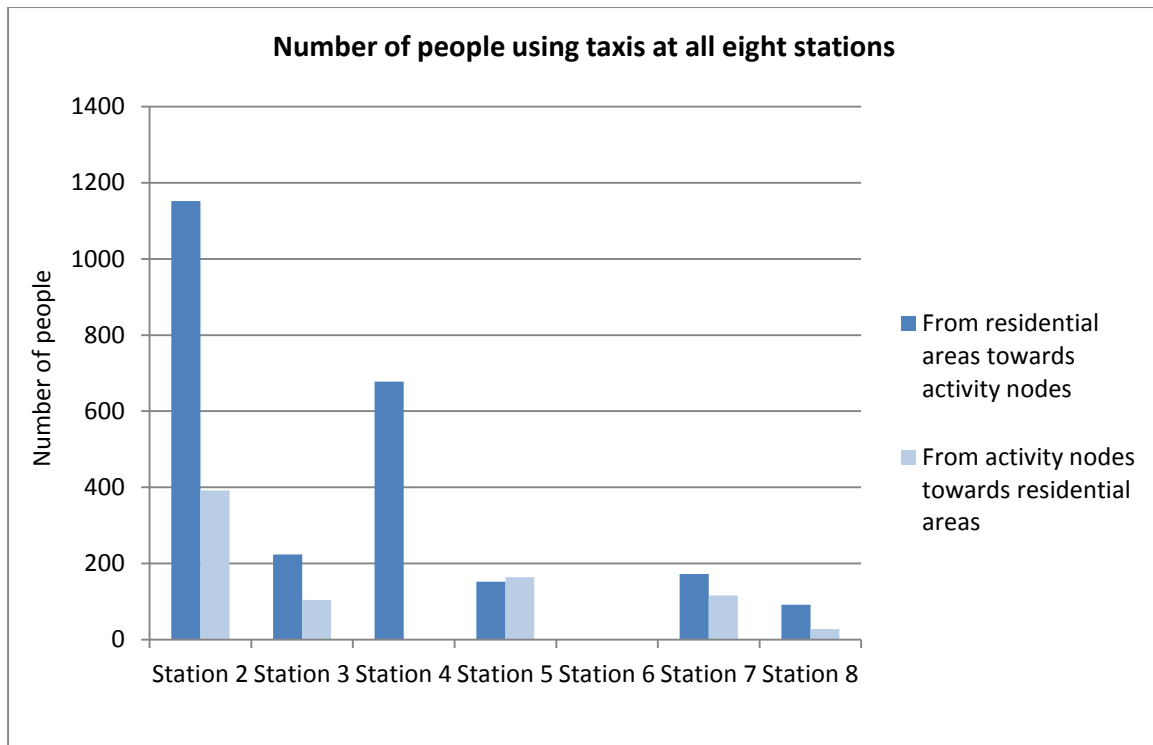


Figure 66: Number of people using taxis at all eight stations.

Figure 66 above illustrates the number of people that use taxis and the direction that they are travelling at survey stations 2 to 8 between 07h00 and 09h00. The graph shows that most people travelling by taxi passed station 2, with approximately 1152 people travelling towards activity nodes and 395 people travelling towards residential areas. At station 6, there were only empty taxis recorded that drove past the station. Overall, there were an estimated total of 3274 people using taxis at all eight stations.

i. Number of pedestrians compared to number of people using taxis

A comparison was done between the number of pedestrians and the approximate number of people using taxis during the survey period. For both Figures 67 and 68 below, the pedestrian count for station 1 was excluded because a taxi count was not done at the survey station. Therefore, only information from stations 2 to 8 was used for the comparison below.

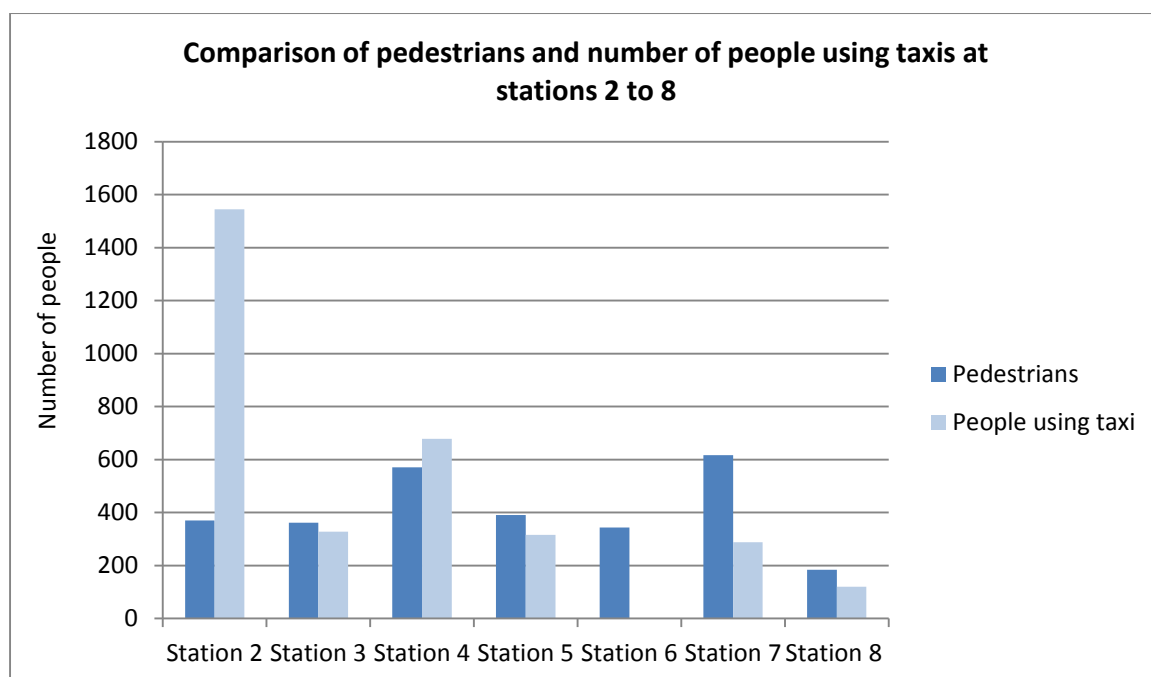


Figure 67: Comparison of pedestrians and number of people using taxis at stations 2 to 8.

Figure 67 above illustrates a comparison between the number of pedestrians and approximate number of people using taxis at survey stations 2 to 8 between 07h00 and 09h00. At station 2, there were significantly more people using taxis (1554) than people walking (370) and, at station 4, there were also more people counted using taxis (678) than people walking (570). At stations 6 and 7, there were significantly more people walking than people using taxis while, at stations 3, 5 and 8, there was an almost 50:50 split; however, there were still more people counted walking than using taxis.

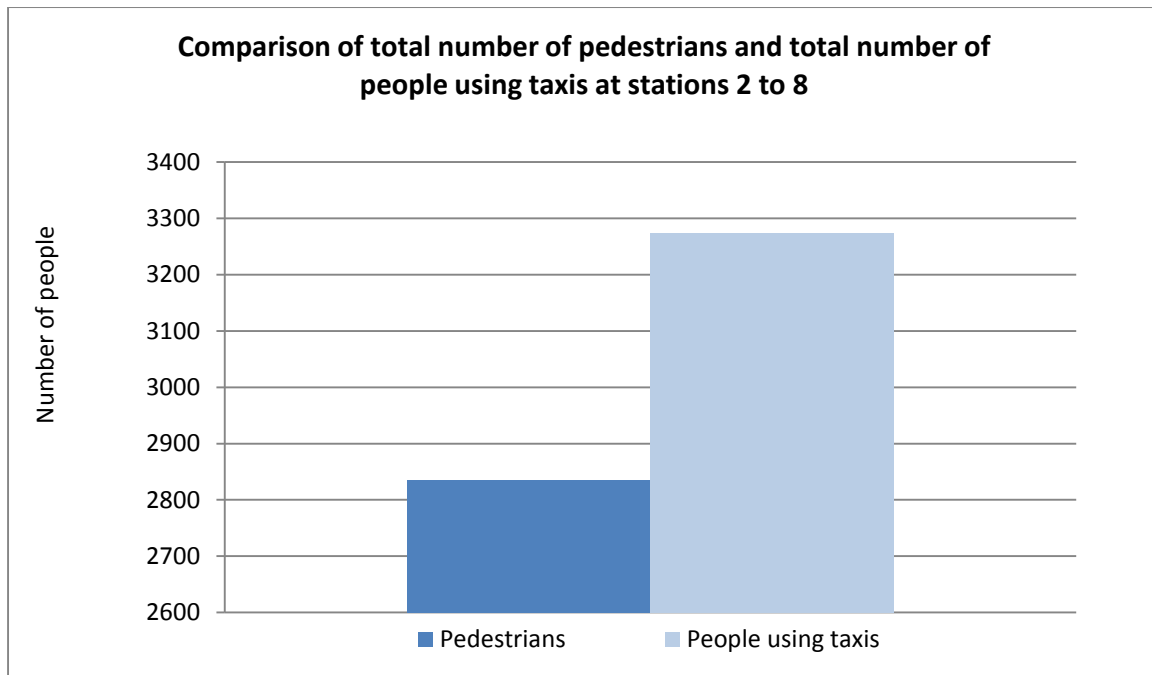


Figure 68: Comparison of total number of pedestrians and total number of people using taxis at stations 2 to 8.

Figure 68 above illustrates a comparison between the total number of pedestrians and approximate total number of people using taxis at survey stations 2 to 8 between 07h00 and 09h00. Overall, there were an estimated total of 3274 people using taxis and a total number of 2836 pedestrians counted; therefore, there were 438 more people using taxis. This is not a significant difference as it is expected that many people would use taxis rather than having to walk to their destinations.

ii. Number of people using taxis compared to number of people that can use taxis

A comparison was done between the approximate numbers of people counted using taxis compared to the potential number of people that the taxis counted at each station could have transported if they were all full (carrying 16 passengers each). For Figure 69 below, the pedestrian count for station 1 was excluded because a taxi count was not done at the survey station. Therefore, only information from stations 2 to 8 was used for the comparison below.

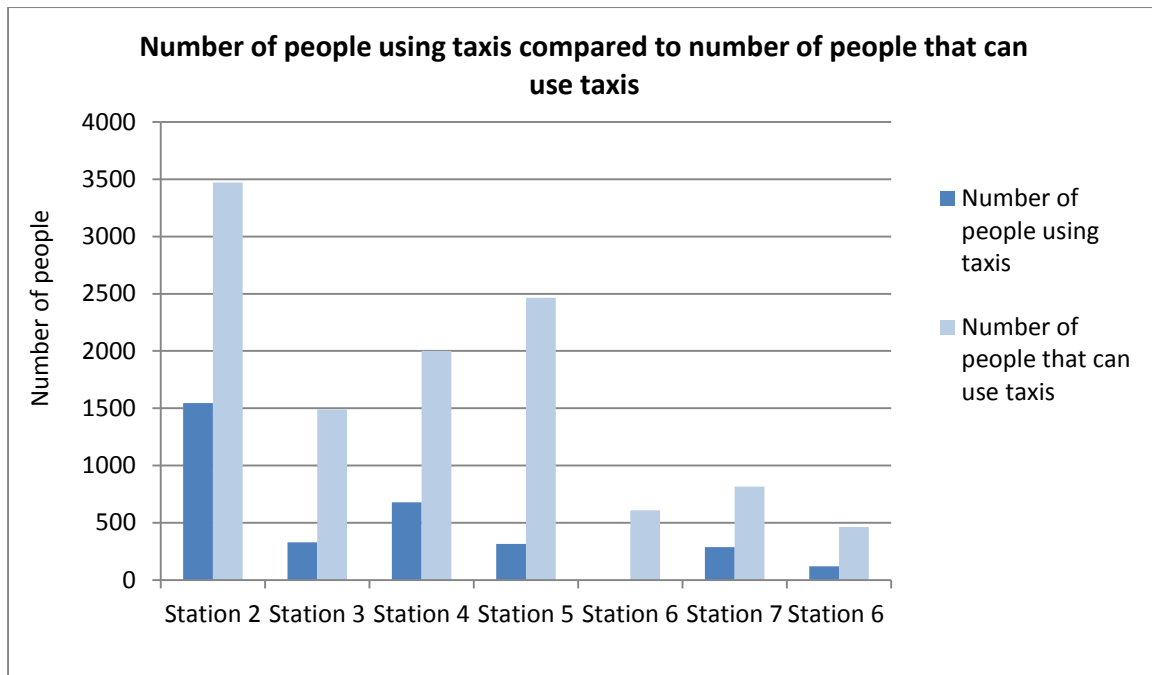


Figure 69: Comparison of total number of pedestrians and total number of people using taxis at stations 2 to 8.

Figure 69 shows the potential number of people that the taxis counted at each station could have transported if they were all full compared to the approximate number of people that used the taxis at each survey station between 07h00 and 09h00. It is clear from Figure 69 that, although there were many people counted using the taxis, there is potential for more people to use the existing taxis travelling past the survey stations. There were approximately 1544 people counted using taxis at station 2 but there is potential for 3472 people to use the 217 taxis counted at station 2. Out of the 11312 possible passengers that the 707 counted taxis could transport, only 3274 people were estimated to use the taxis. Therefore, only 29% of the recorded taxi full capacity was utilised.

4 DISCUSSION

It was observed that the survey should perhaps have started 30 minutes earlier as many people started to walk earlier than 07h00, especially pedestrians from Zwelethemba who have to walk the longest distances to reach places of work and social facilities. Although starting the survey earlier would not necessarily have changed the outcomes of the survey, it would have provided more data to inform the results and discussion.

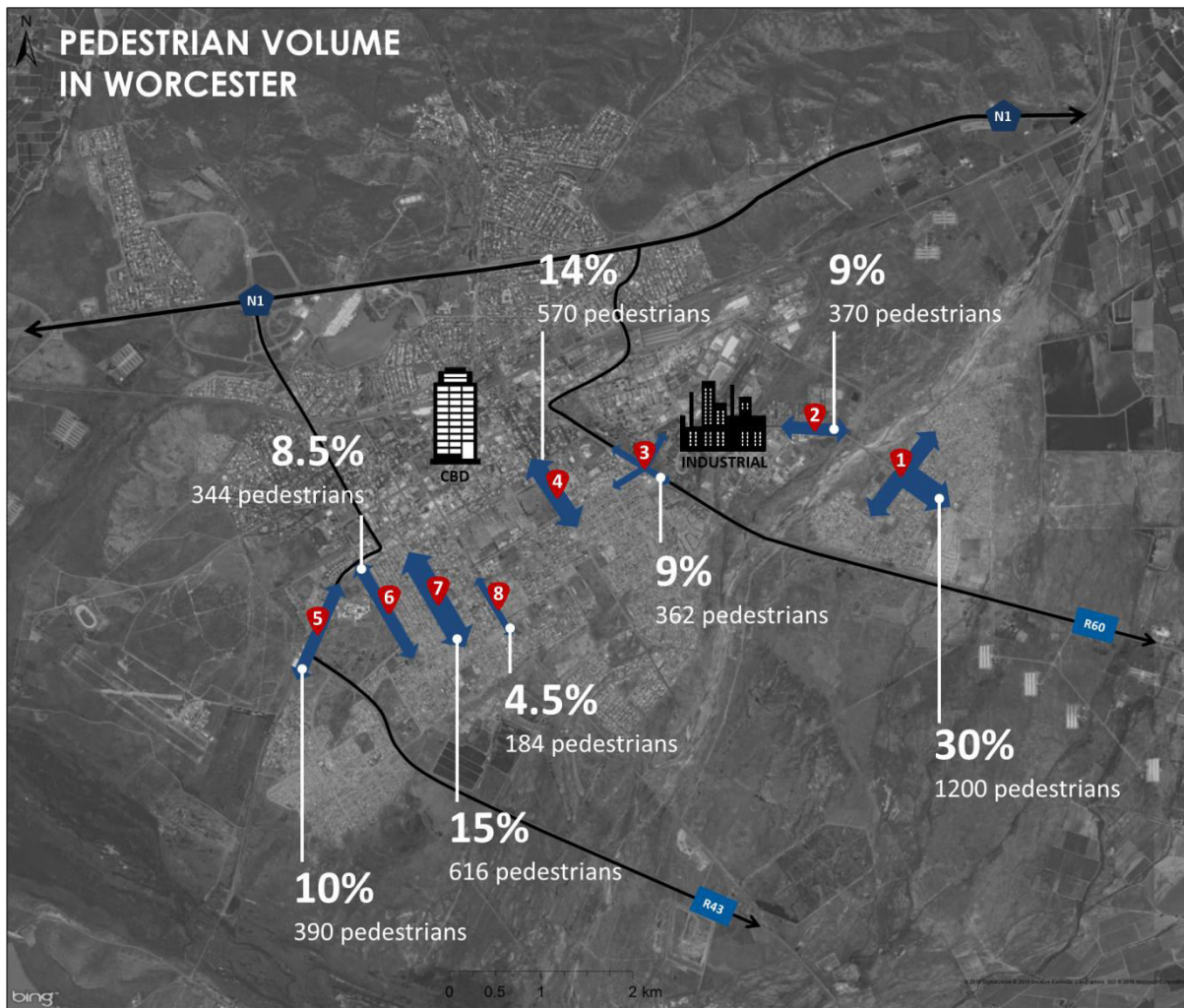


Figure 70: Composite Pedestrian Volume for Worcester

It is clear from the results that Station 1 experiences far greater pedestrian activity than the other stations as 30% of the 4036 pedestrians counted were recorded at Station 1 while only 5% were recorded at Station 8. Station 1 is an important gateway between the low income residential area of Zwelethemba and social and economic opportunities, including shops, schools, government buildings and community facilities, most of which are located in Worcester’s CBD and northern areas. It should also be noted that Station 1 counted pedestrians moving in three directions and cumulating at the intersection, which most probably contributed to a higher figure for this station. See Figure 70 above. With regards to the distribution and direction of pedestrian movement throughout the morning, the trends observed were to be expected. It was anticipated that there would be high pedestrian volumes in the morning from residential areas towards activity nodes as adults travel to their places of work and youth walk to school.

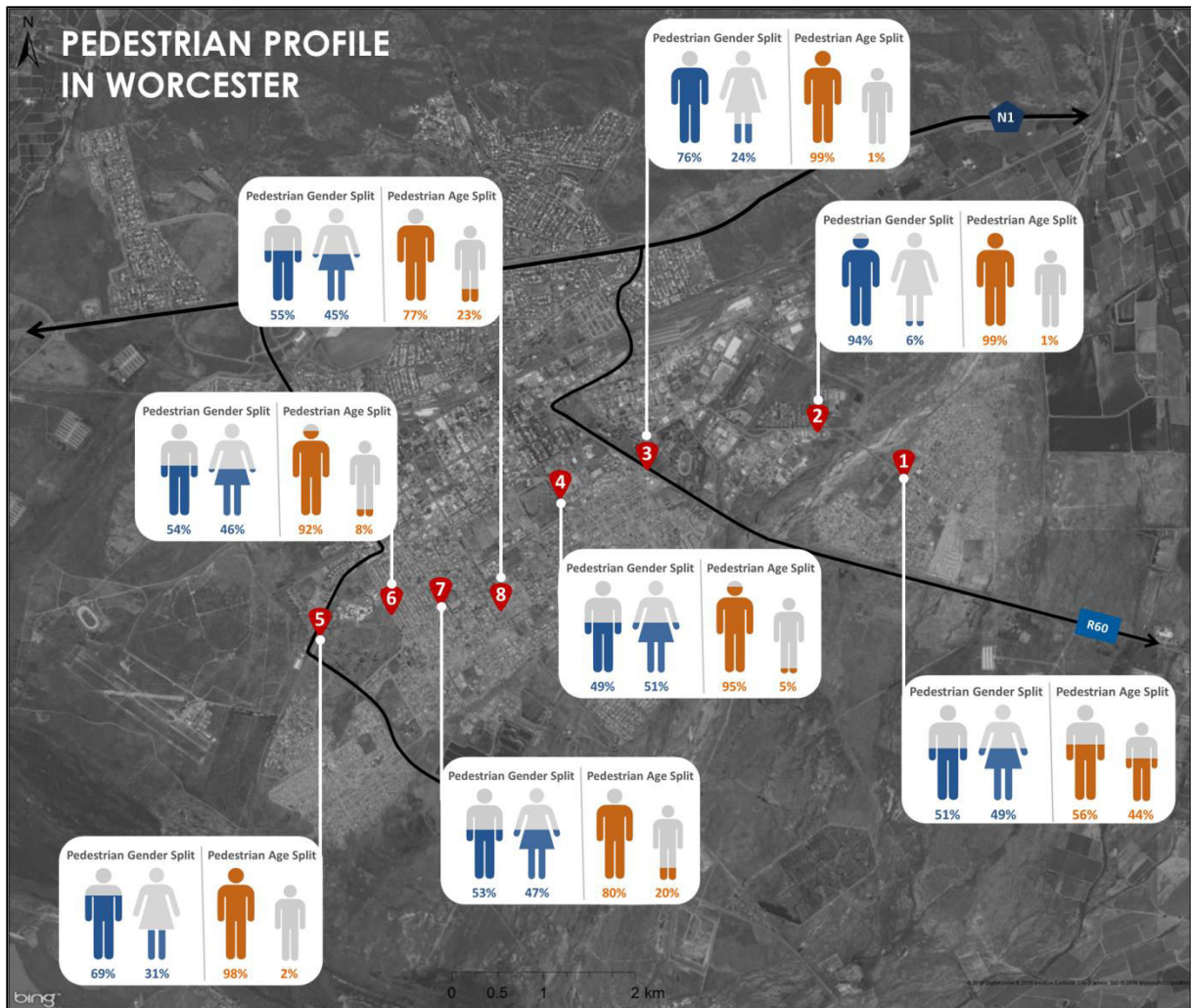


Figure 71: Composite Pedestrian Profile

With regards to the age profile of pedestrians, the majority of pedestrians counted at the survey stations were adults who are older than 18 years old, see Figure 71 above. This could be attributed to the fact that many adults walked to go to work in town, drop off children at school or to do routine activities, including shopping or visiting the post office. The majority of buses counted were school buses, which indicates that many children take buses to school and do not necessary walk to school. This could explain why there were significantly more adults counted than children/youth at all eight survey points.

At all the survey stations, there were more males walking past the stations compared to females, see Figure 71 above. This could be attributed to the fact that men may feel safer walking compared to women, particularly when walking alone, in the dark or along quiet routes.

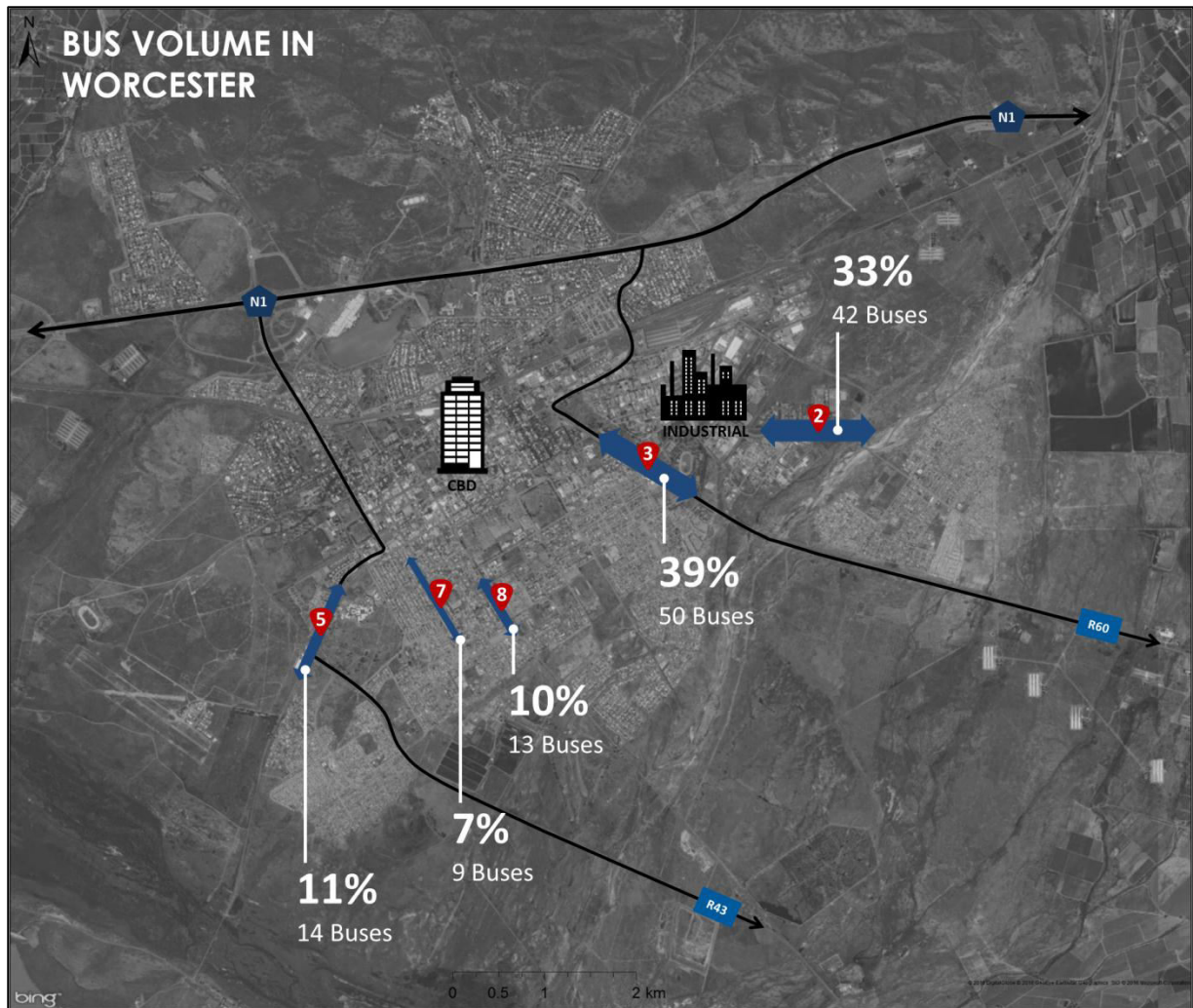


Figure 72: Composite Bus Volume

From the results it can be seen that Station 2 and 3 experiences far greater bus movement than the other stations as 33% of the 128 buses counted were recorded at Station 2 and 39% were recorded at Station 3. Only 7% were recorded at Station 7, see Figure 72. When looking at all the survey stations, more buses were counted traveling from residential areas towards activity nodes and fewer buses counted travelling from activity nodes towards residential areas. An exception was survey station 8 where there were more buses travelling from activity nodes towards residential areas, this could be because there is a bus depot located further south of the survey station in Breerivier Crescent. There were significantly less buses counted overall compared to taxis, and this suggests that taxis are the main form of public transport in Worcester.

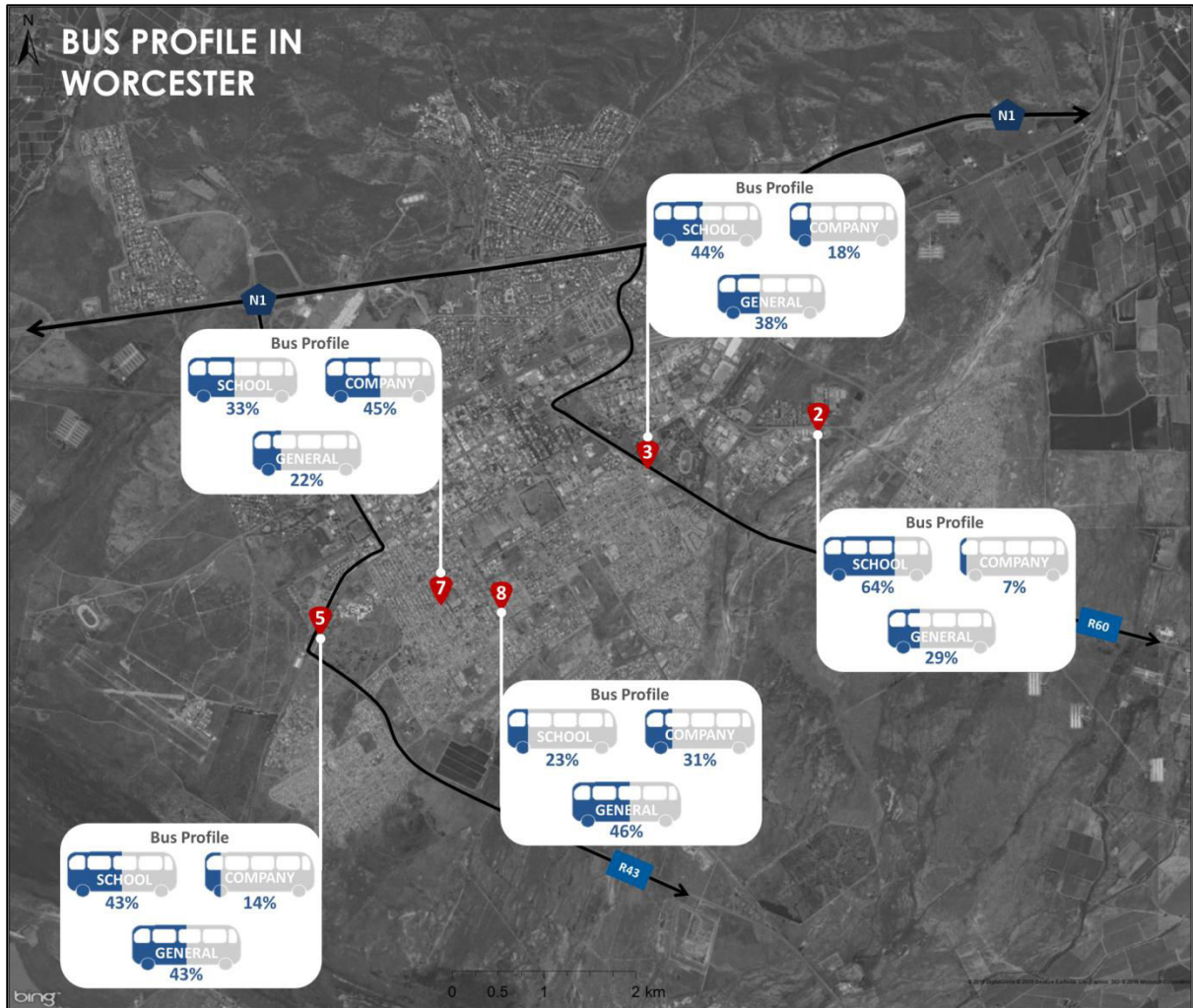


Figure 73: Composite Bus Profile

There are no formal bus services in Worcester. The buses counted under the category “general” could be school or company-owned buses that displayed no branding to indicate the ownership category. The majority of buses counted were school buses. These are most likely buses owned by private bus companies who are on contract with the Western Cape Education Department to provide this service to the schools. A few company-owned buses were counted, which are used to transport workers to and from work. See Figure 73 above.

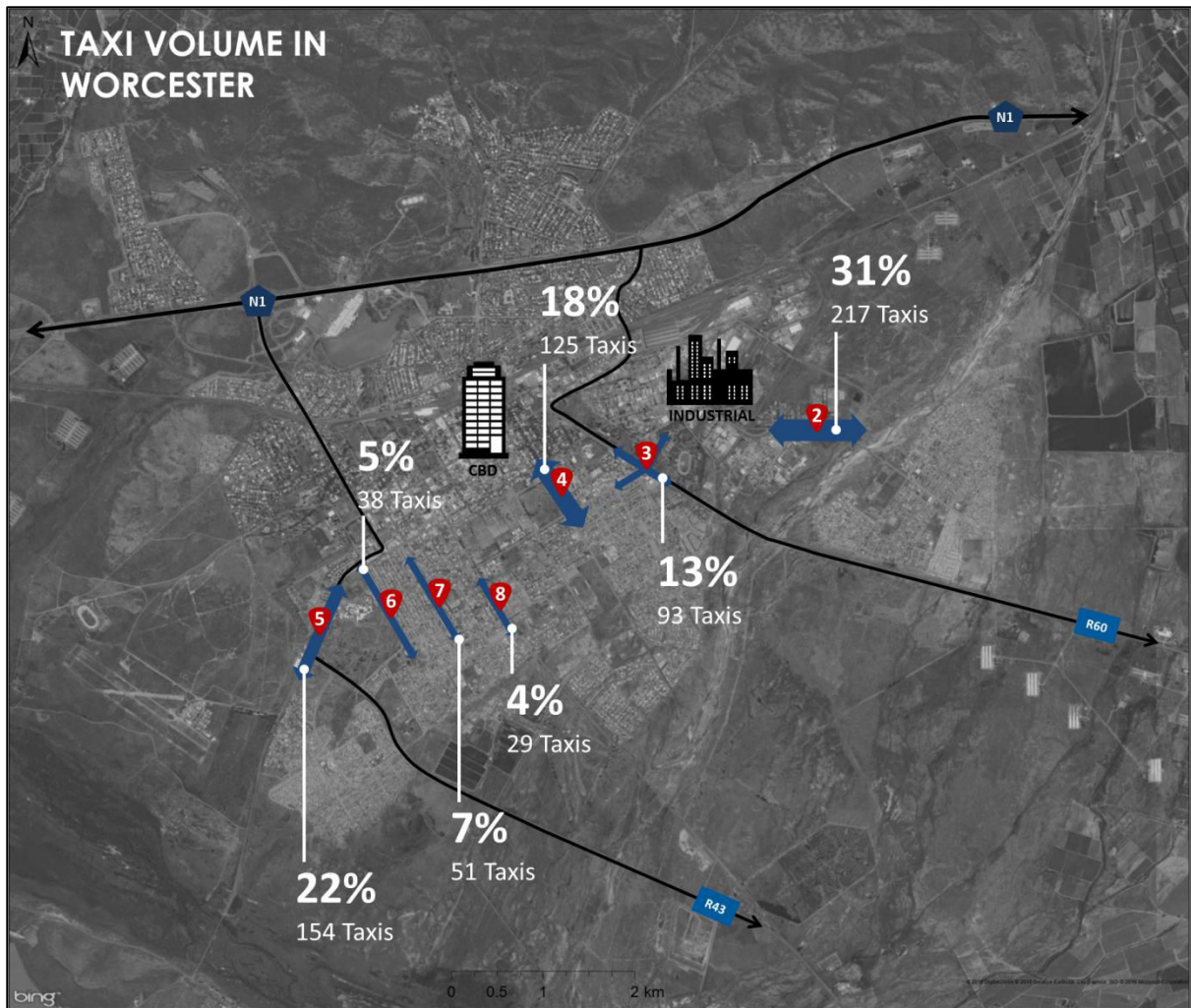


Figure 74: Composite Taxi Volume

It is clear from the results that Station 2 experiences far greater taxi movement than the other stations as 31% of the 707 taxis counted were recorded at Station 2 while only 4% were recorded at Station 8, see Figure 74. One possibility why there were so many more taxis counted driving past Station 2 is because there is a taxi rank located further south of the survey station in Raymond Pollet Drive. When looking at all the survey stations, more taxis were counted traveling from residential areas towards activity nodes and less taxis counted travelling from activity nodes towards residential areas, but which could be explained as people are going to work. At Stations 3 and 5 the opposite trend was observed, there were more taxis counted travelling from activity nodes towards residential areas.

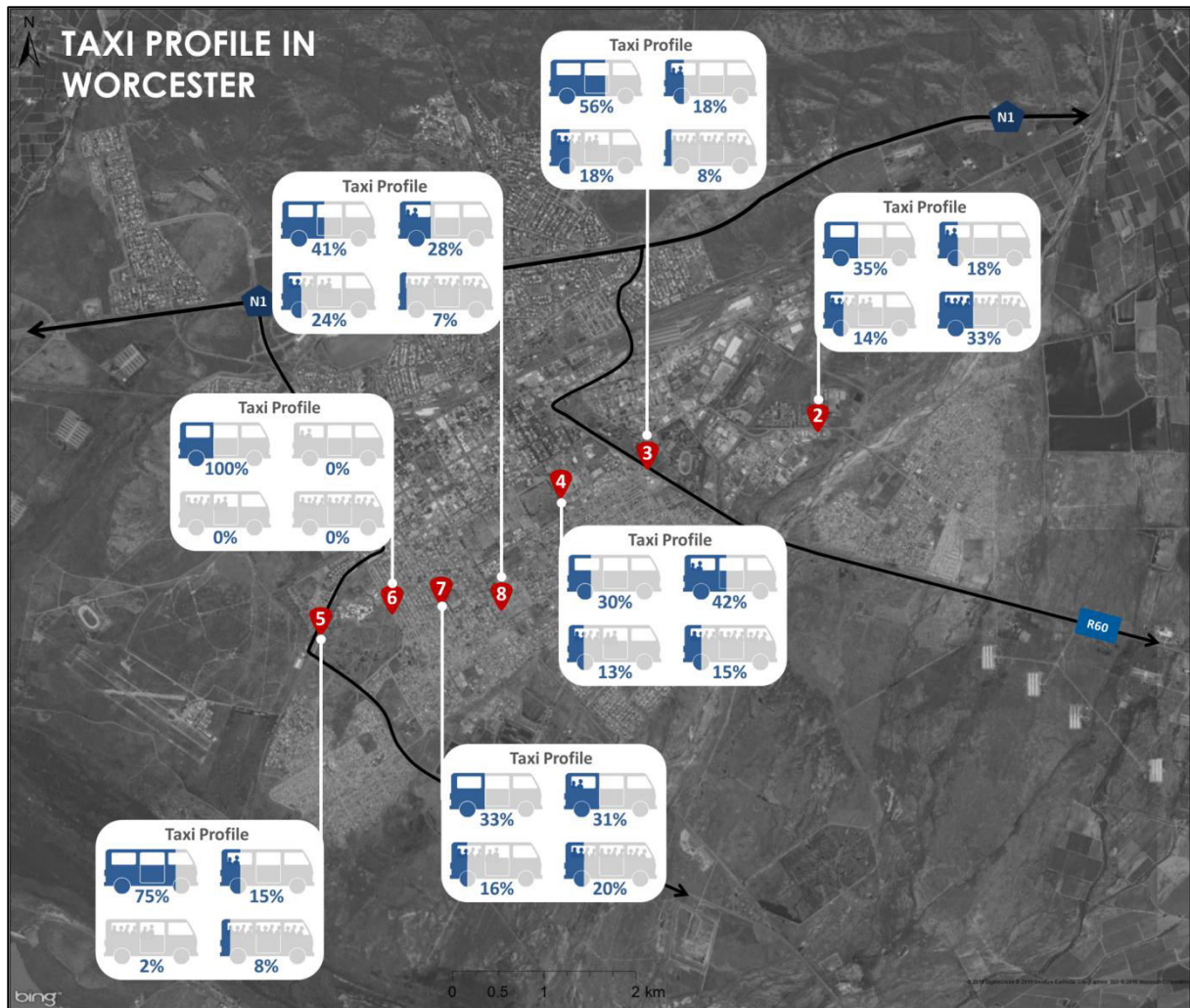


Figure 75: Composite Taxi Profile

With regards to the comparison done between the number of people walking and the number of people using taxis, it is clear from Figure 60 that more people use taxis than walking; however, the difference was rather small. There is also potential for the taxis counted at the stations to carry more people as the majority of the taxis counted at all stations were empty or only had a few passengers in them (see Figure 75). This could mean that public transport in Worcester is too expensive for residents or that the public transport system available is unreliable. Improving access to reliable and convenient public transport systems is a possible point of intervention for Worcester in the future.

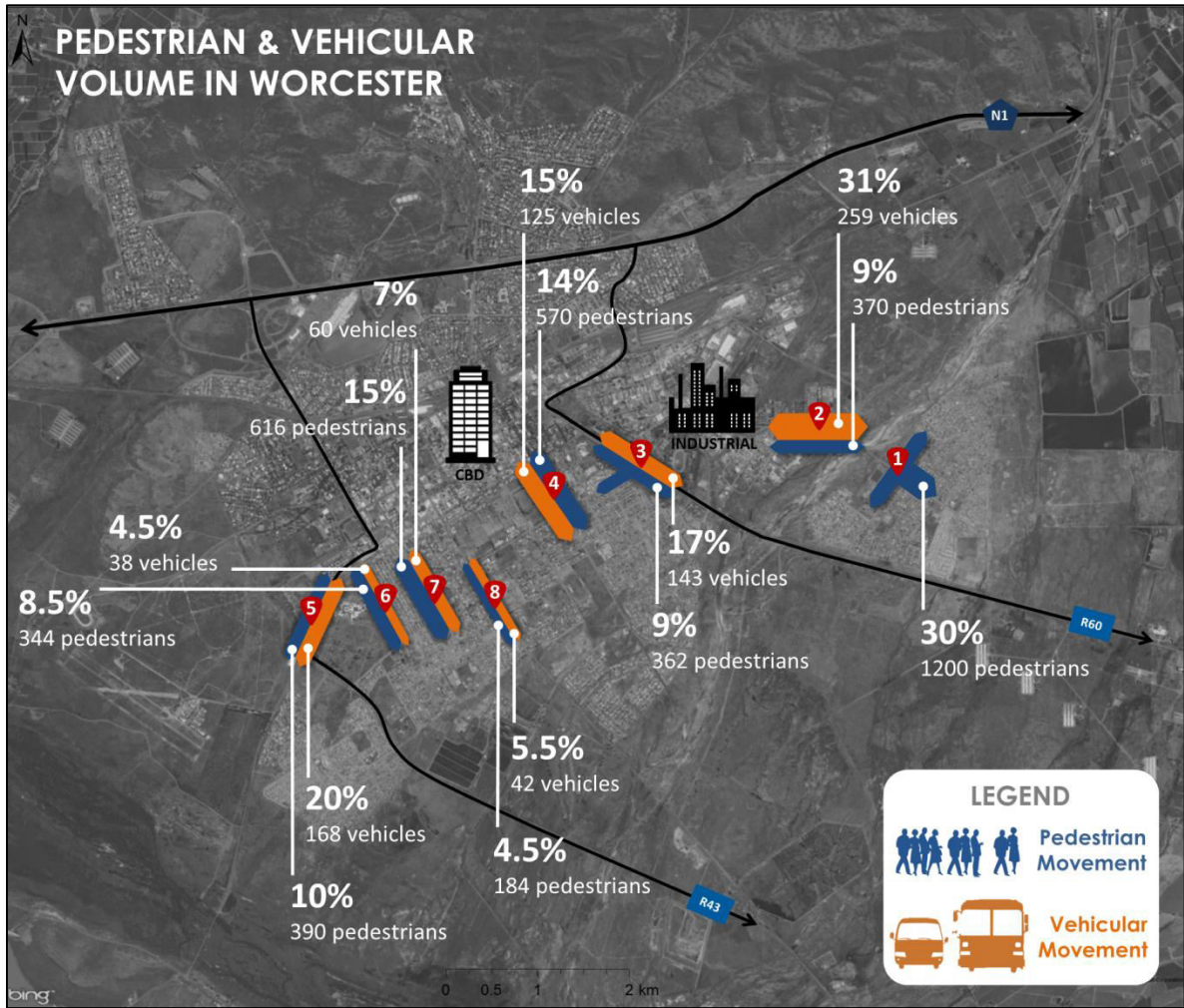


Figure 76: Pedestrian and vehicular volume in Worcester

Figure 76 shows a composite map with the overall pedestrian movement and vehicular movement (taxis and buses) at all eight survey stations. From the map it is clear that the most movement was observed at Stations 2 with 370 pedestrian and 259 vehicles counted at the station. Station 5 received the second most overall movement with 390 pedestrians and 168 vehicles counted at the station. Although a bus and taxi count was not done at Station 1, the intersection also experienced very high pedestrian movement with 1 200 pedestrians counted at the station. This high volume of pedestrian and vehicular movement at Stations 1;2 and 5 could indicate the emergence of ‘activity corridors’ from Zwelethemba (Stations 1 and 2) to the CBD as well as from Avian park (Station 5) to the CBD. These emerging ‘activity corridors’ could play a crucial role in connecting these isolated neighbourhoods to the rest of the town.

In order to develop settlements that work well for the majority of people, particularly in small-to-medium sized towns that have insufficient thresholds and resources to provide public transport, there is a need to enhance pedestrian movement through design interventions and providing pedestrian amenities along footways, pathways and roadways. The following interventions could apply in Worcester (in the identified RSEP neighbourhoods):

- Configure footways into multi-directional networks, which enable pedestrians to choose direct or equidistant routes;
- Cut corners and keep routes as direct as possible as pedestrians are likely to opt for travel lines of least resistance;
- On roadways with high traffic flow, provide pedestrian crossings at regular intervals and at points where pedestrian desire lines cross the roadway in order to maintain adequate levels of pedestrians safety;
- Incorporate design initiatives (preferably those that require little to no maintenance), such as planting, landscaping, paving, lighting and rest places along pedestrian routes;
- Ensure accessibility and convenience for different user groups;
- Create diversity and choice through providing a combination of hard and soft surfaces; and
- Bear in mind varying weather conditions (excessive heat, rain and wind).

5 CONCLUSIONS

Through the pedestrian survey, valuable information has been obtained about the movement patterns of pedestrians, buses and taxis in the RSEP focus area in Worcester as well as pedestrian, taxi and bus volumes at the eight stations in the identified neighbourhoods; therefore, the survey meets its intended objectives.

It is clear from the results that a large number of pedestrians travel between the low income residential areas of Worcester and the town's activity nodes, which are mainly situated in Worcester's CBD and northern areas. It is assumed that many pedestrians walk very long distances everyday between their residence and places of work and that many of these pedestrians are unable to afford public transport. This highlights the need to make provisions for pedestrians along key pedestrian routes in order to improve their daily experiences.

The planned construction of pedestrian walkways for the selected RSEP neighbourhoods in Worcester will play a significant role in improving pedestrian safety in these areas, and this survey and report will hopefully assist in identifying priority areas for implementation.

6 COMPARISON BETWEEN WORCESTER AND VREDENBURG SURVEYS

In 2015 the RSEP/VPUU programme did a similar study in Vredenburg where pedestrians were counted from 06h00 to 16h30 at three survey stations. A comparison has been done between the Vredenburg and Worcester pedestrian survey to get an idea of pedestrian volumes in the two different towns. For the purpose of this comparison only the number of pedestrians counted between 07h00 and 09h00 from the Vredenburg Stations was compared with the Worcester Stations. In Worcester Station 1 has been excluded from the comparison as Station 1 counted people walking through the intersection and not necessarily to the Industrial area and CBD, where-as Station 2 picked up the pedestrians that walked past Station 1 to the Industrial area and CBD

Stations 2 to 8 in Worcester was compared to the Wesbank, Mall and Vink Street Stations in Vredenburg to get a sense of the overall number of pedestrians counted in the two towns. The cumulative number of pedestrians counted at the Vredenburg Stations was 1 183 while the cumulative number of pedestrians counted at the Worcester Stations was 2 836. It is clear from these figures that there were more pedestrians counted at the Worcester Stations than at the Vredenburg Stations between 07h00 and 09h00.

In Vredenburg the Wesbank Station was compared with Station 7 in Worcester as they both had the most pedestrian movement in the two towns. At the Wesbank Station there were 765 pedestrians counted while at Station 7 there were 616 pedestrians counted (see Table 23). More pedestrian movement was observed at Wesbank Station than at Station 7 between 07h00 and 09h00.

At the Stations in Vredenburg the peak time was 07h30 to 08h00 while in Worcester the peak time for the Stations in Worcester (excluding Station 6) was 07h00 to 07h30, this can be seen highlighted in orange in Table 23. At all stations pedestrian movement declined after the peak times. The difference in peak times in the two towns could mean that the pedestrians counted in Vredenburg don't have to travel as far as the pedestrians from Worcester and therefore can start walking a bit later to their destinations.

COMPARISON OF WORCESTER AND VREDENBURG PEDESTRIAN SURVEY												
TIMESLOT	VREDENBURG STATIONS				WORCESTER STATIONS							
	Wesbank	Mall	Vink	Total	2	3	4	5	6	7	8	Total
07:00 – 07:30	175	14	33	222	249	200	216	170	89	240	79	1243
07:30 – 08:00	283	73	84	440	72	86	157	116	151	181	40	803
08:00 – 08:30	190	63	43	296	20	42	109	57	73	96	37	434
08:30 – 09:00	117	70	38	225	29	34	88	47	31	99	28	356
TOTAL	765	220	198	1183	370	362	570	390	344	616	184	2836

Table 23: Comparison of Worcester and Vredenburg Pedestrian Survey



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