

Zenith Model of Victoria

Technical Note 8 Destination Choice

Zenith Version 2.0.0

VEITCH LISTER CONSULTING PTY LTD

Date: 26-03-2013

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Technical Note 8: Destination Choice

Date	Revision	Prepared By	Checked By	Approved By	Description
23-05-2011	A	MV/TV	MV	MV	Draft
06-02-2012	B	TV	AA	MV	Final Report



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1 Introduction

The Zenith travel model of Victoria is one of a family of models developed by Veitch Lister Consulting (VLC) for transport planning in Australian cities and regions.

This document is one in a series of technical notes that collectively describe the Zenith Model of Victoria.

1.1 Related Documents

This technical note is the eighth of eleven. The other technical notes are:

- Working Paper 1: Model Validation Framework and Data Sources
- Working Paper 2: Review of VISTA07
- Working Paper 3: Home Based Trip Production Model
- Working Paper 4: Non-Home Based Trip Production Model
- Working Paper 5: Household Segmentation & Travel Market Segmentation Models
- Working Paper 6: Period Allocation and Vehicle Occupancy Models
- Working Paper 7: Mode Choice Model
- Working Paper 8: Destination Choice
- Working Paper 9: Overall Model Validation
- Working Paper 10: Backcasting and Sensitivity Testing
- Working Paper 11: Reference Case Model Assumptions

1.2 Scope of This Document

This document describes a new and upgraded Destination Choice model that has been implemented within the Zenith model of Melbourne and the regional cities of Ballarat, Bendigo and Geelong. The upgraded model includes restructured implementation procedures and revised calibration parameters for all home based travel purposes.

The remainder of this document is structured as follows:

- Section 2 describes the data sources available for recalibration and validation;
- Section 3 describes the theoretical background of the adopted Destination Choice model, the method used for its calibration;
- Section 4 lists the resulting model calibration parameters; and
- Section 5 describes the validation of the new model's outputs against observed destination choice data.



2 Data Sources for Model Calibration and Validation

The primary source of information used to calibrate the Destination Choice model was the Victorian Integrated Survey of Travel and Activity 2007 (VISTA07). Version 1.3.1 of VISTA07 was made available to VLC. The VISTA07 survey was used to estimate model parameters, and to validate the resulting model at various levels of aggregation.

The VISTA07 sample comprises 43,822 people, from 17,715 households. In total there are 128,744 reported trips, a very healthy sample from which to estimate a strategic travel model.

Not all of the survey responses are usable for our purposes. In the case of destination choice, trips must have their origin and destination within the Zenith model area to be of use (the model does not currently cover Shepparton and the LaTrobe Valley). Travel made on weekends and public holidays and during school holidays were also excluded. That leaves a sample of 8,540 households (48% of the total sample) and over 60,000 trips; still a very healthy sample from which to calibrate a model.

We also intend to validate Home Based Work demands against ABS Census 2006 Place of Work data in the near future.



3 Methodology

3.1 Background

One of the key decisions made by every trip maker is: “to where shall I travel?”. The answer to this question may depend on a wide range of factors, some of which can be included in a strategic travel model such as Zenith, and some which cannot.

Factors which *have* been included in the Zenith model are:

- **The reason (purpose) for the trip.** For example, a trip made for shopping will likely have a different destination to a trip made for education,
- **The spatial distribution of businesses, shops, other services, housing, schools, universities, parks, etc.** Different trips will be attracted to different types of landmarks. For example, shopping trips will generally be attracted to shopping centres, while education trips will be attracted to educational institutions,
- **The structure of the transport network, and the ease with which it facilitates travel to different locations.** Trip makers will generally choose destinations that are easily reached.
- **The cost of travel.** Travel costs such as petrol, tolls or public transport fares can affect the attractiveness of certain destinations.
- **Access to a car or bicycle.** Inability to access a car or bicycle can make certain locations less accessible.

By taking these factors into consideration, the model is able to test the sensitivity of destination choices to changes in these factors, and to measure the resulting impact on network patronage and performance.



3.2 Model Form

The Zenith Destination Choice model employs a "Gravity Model". The "Gravity Model" owes its name to Newton's Law of Gravity, which states that the Gravitational force of attraction towards an object is proportional to the object's mass, and inversely proportional to the square of the distance to the object.

In other words, the pull of gravity is stronger towards larger (heavier) objects, and also stronger towards objects that are close.

This concept is easily translated to destination choice. For a given activity, such as shopping, one is more likely to travel to destinations which provide many opportunities to undertake that activity, and one is more likely to travel to destinations which are close.

The mathematical form of the Zenith Gravity Model is:

$$P_d = \frac{F_d}{\sum_k F_k}$$

where:

P_d is the probability of choosing destination d

F_d is the "force of attraction" to destination d

The force of attraction, F_d , is given by:

$$F_d = \frac{A_d}{C_{od}^\alpha \times e^{\beta C_{od} + U_d}}$$

where:

A_d is the attractiveness of destination d , in terms of the opportunities provided to participate in a particular activity

C_{od} is the cost of travel from origin, o , to destination d , including travel time and other costs

U_d is a destination specific constant which increases or decreases the likelihood of travel to that destination

α and β are calibration parameters, which control the rate at which attraction decreases as the cost of travel, C_{od} increases



Separate models are estimated for each combination of trip purpose and household car ownership level.

3.3 Model Estimation

The model is estimated by noting that the gravity model can be equivalently expressed as a multinomial logit model, with alternatives given by the set of possible destinations.

Expressed as a logit model, the observed component of the utility for each destination is:

$$V_d = \beta C_{od} + U_d + \ln(A_d) + \alpha \ln(C_{od})$$

Expressed as a logit model, we can estimate the parameters α , β and U_d using maximum likelihood techniques.

3.4 Trip Attractions

A key input to the Zenith Destination Choice model is the "attractiveness" of each destination. In the mathematics of Section 3.2, the attractions were represented by A_d .

The attractiveness of a destination depends on the purpose for which the trip is made; a university is not a very attractive destination for primary school or shopping trips. Because of this, a separate measure of the "attractiveness" of each destination is calculated *for each trip purpose*.

For each trip purpose, the attractiveness of a destination is modelled as a linear function of the set of modelled land use variables.

The land use variables included in the model are:

- Number of households
- Number of full time equivalent *white collar* jobs
- Number of full time equivalent *blue collar* jobs
- Number of jobs by 13 ANZSIC categories
 - Agriculture
 - Manufacturing
 - Mining
 - Electricity, gas and water
 - Construction
 - Communications
 - Wholesaling
 - Retailing
 - Transport and storage
 - Finance & business
 - Public administration
 - Community services
 - Recreation and personal services
- Number of (equivalent full time) enrolments in:



- Primary schools
- Secondary schools
- Tertiary institutions

The Zenith Trip Attraction parameters are presented in Table 1 below.

Trip Purpose	Variable	Parameter
Home Based Work - Blue	Households	0.0833
Home Based Work - Blue	Jobs Blue - FTE	0.871
Home Based Work - White	Jobs White - FTE	1.2351
Home Based Education - Secondary	Enrolments - secondary	1.0884
Home Based Education - Tertiary	Enrolments - tertiary	0.4953
Home Based Shopping	Jobs - Wholesale	0.4713
Home Based Shopping	Jobs - Retail	6.9009
Home Based Shopping	Jobs - Recreation & Personal Services	3.4068
Home Based Recreation	Households	0.6165
Home Based Recreation	Enrolments - secondary	0.2063
Home Based Recreation	Enrolments - tertiary	0.0384
Home Based Recreation	Jobs - Retail	0.3247
Home Based Recreation	Jobs - Community Services	0.3816
Home Based Recreation	Jobs - Recreation & Personal Services	0.9513
Home Based Other	Households	0.6913
Home Based Other	Enrolments - primary	2.0889
Home Based Other	Enrolments - secondary	0.3642
Home Based Other	Enrolments - tertiary	0.1075
Home Based Other	Jobs - Retail	1.0685
Home Based Other	Jobs - Recreation & Personal Services	1.0338

Table 1 - Trip Attraction Parameters

As an example, a travel zone comprising 100 households, 80 Jobs Blue – FTE, 120 Jobs White – FTE, and 300 Jobs Retail would have the following "attractiveness" for Home Based Work (Blue Collar):

$$\text{Attractiveness for Home Based Work (Blue)} = 100 \times 0.0833 + 80 \times 0.871 = 78.01$$

Importantly, the attractiveness of a destination, as calculated above, *is only meaningful in a relative sense*; ie. relative to other destinations. A different destination with an attraction measure of 39.005 (half of 78.01) would be only half as attractive (and only half as likely to attract trips, all other things being equal). The attraction measure is not in any way a measure of the number of trips which choose the destination.

The Zenith Trip Attraction model has not been updated as part of the recalibration project, but may be in the future.

3.5 Travel Costs



Travel Costs are a key input to the Destination Choice model. Travel costs are calculated between each origin and each destination, to form a "matrix", or table of travel costs.

A separate travel cost is computed for each:

- Trip purpose
- Level of household car ownership
- Journey departure time
- Intended return time

Importantly, the travel cost is not separately defined per mode. Rather, the travel costs for the various modes are combined into a single measure of travel cost, which represents the average perceived travel cost, assuming that each traveller chooses his or her preferred travel mode. The motivation for combining the by-mode travel costs is that (in Zenith) Destination Choice is undertaken before the choice of mode; hence, the choice of destination must be made based on the costs of all the available modes.

3.6 Destination Specific Constants

The measure of attractiveness used for Home Based Work trips is the number of Full Time Equivalent (FTE) Jobs present at the destination. This measure implicitly assumes that all jobs are of equal attractiveness (ignoring the travel cost to reach each job).

However, in reality, some jobs are more attractive, due to their industry / occupation / salary / prestige. In time, we would like to include some of these variables. For now, however, we have collectively represented the variables by a "constant", which boosts the attractiveness of certain destinations.

In general, destination specific constants have been estimated for each of four distinct regions:

- CBD Core
- CBD NonCore
- CBD Frame
- CBD Outer Frame

The regions, which are shown in Figure 1 below, are identical to those used to represent parking costs in the Mode Choice model.

In the case of tertiary education, two additional areas were defined:

- Melbourne University, and
- Large NonCBD Universities, which includes Monash and Latrobe.

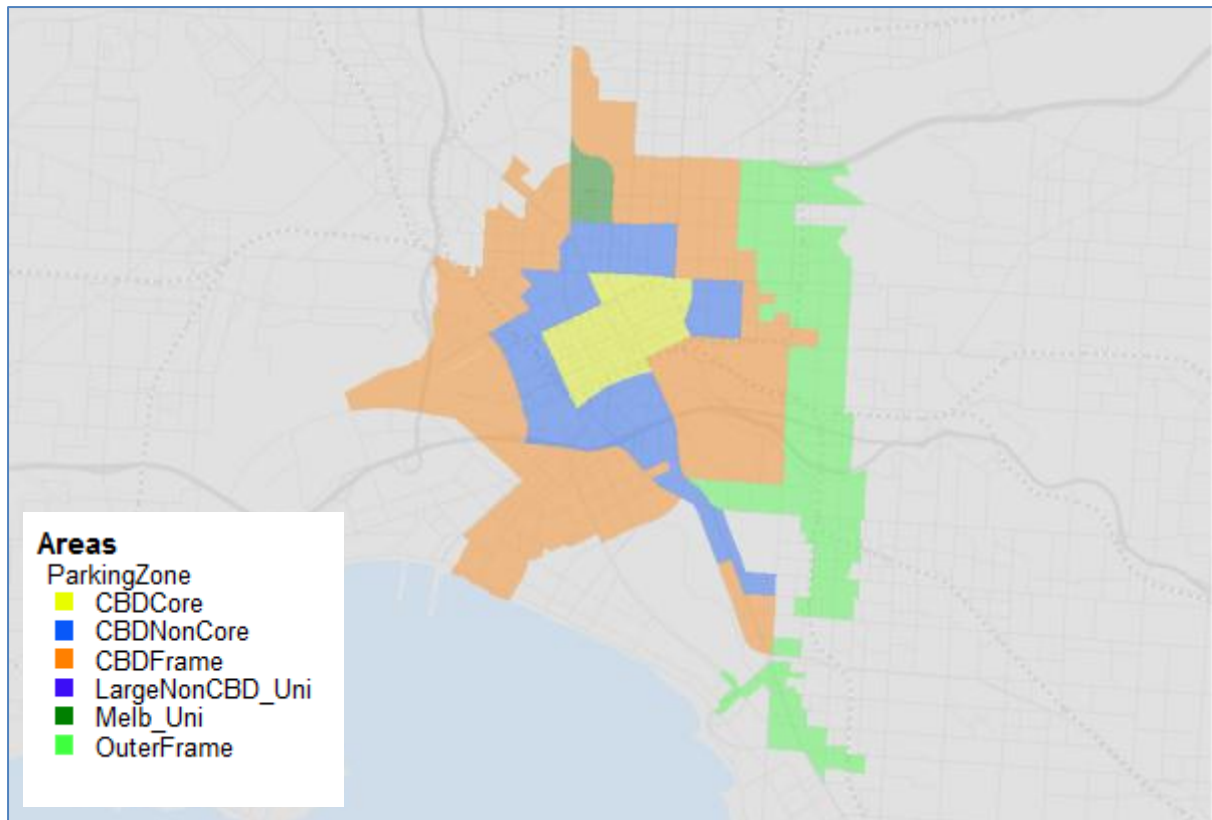


Figure 1 - Destination Constant Regions



4 Model Parameters

Destination choice parameters were estimated for each "Travel Market Segment", which represents a combination of trip purpose, and household car ownership level (0,1,2,3+). For each travel market segment, an alpha and beta are estimated. Destination specific constants for each of six regions (CBD Core, CBD NonCore, etc) have also been estimated, and included in the model where such a parameter was significant.

The estimated parameters are presented in Table 2 below.

The alpha and beta values do not lend themselves to a simple numerical interpretation. However, the destination constants can easily be interpreted; the constants are defined in 2008 cents, with a *negative* value indicating a reduction in cost to the destination (representing an *increase* in its overall attractiveness).

Therefore, a value of -100 indicates a \$1 boost to the attractiveness of the destination. Generally speaking, larger constants are associated with higher high car ownership. This is because households with no car already find the CBD very attractive as a destination due to its accessibility by public transport. Indeed, the decision to not own a car is often facilitated by one's ability to take public transport or walk to work.

Segment	Alpha	Beta	CBD - Core	CBD - NonCore	CBD - Frame	CBD - Outer Frame	Large Non CBD Unis	Melbourne Uni
Home Based Work - white - 0 car	1.152	-0.0034	-75	-50	-40	-30		
Home Based Work - white - 1 car	-0.079	-0.00298	-620	-565	-470	-165		
Home Based Work - white - 2 car	-0.148	-0.00292	-885	-660	-685	-185		
Home Based Work - white - 3+ car	-0.156	-0.003	-925	-730	-810	-322		
Home Based Work - blue - 0 car	-0.315	-0.00257	100	100	100			
Home Based Work - blue - 1 car	-0.232	-0.00276	-772	-738	-582	-163		
Home Based Work - blue - 2 car	-0.0814	-0.0029	-885	-940	-835	-230		
Home Based Work - blue - 3+ car	-0.136	-0.00285	-870	-835	-750	-230		
Home Based Education - secondary - 0 car	1.456	-0.014	1000	1000	300			
Home Based Education - secondary - 1 car	3.335	-0.016	1000	1000	300			
Home Based Education - secondary - 2 car	2.224	-0.0132	1000	1000	300			
Home Based Education - secondary - 3+ car	3.432	-0.0156	1000	1000	300			
Home Based Education - tertiary - 0 car	1.458	-0.00433	-200	-150	-120	-100	-280	-250
Home Based Education - tertiary - 1 car	1.458	-0.00433	-200	-150	-120	-100	-280	-250
Home Based Education - tertiary - 2 car	0.859	-0.0047	-300	-200	-150	-100	-450	-600
Home Based Education - tertiary - 3+ car	-0.99	-0.00164	-300	-200	-150	-100	-450	-600
Home Based Shopping - 0 car	0.0888	-0.00455						
Home Based Shopping - 1 car	-0.0822	-0.00697	-840	-565	-595			
Home Based Shopping - 2 car	-0.373	-0.00544	-1200	-920	-815			
Home Based Shopping - 3+ car	-0.351	-0.00562	-1175	-900	-850			
Home Based Recreation - 0 car	-0.361	-0.00481	-170	-150	-130	-70		
Home Based Recreation - 1 car	0.178	-0.00824	-400	-290	-300	-150		
Home Based Recreation - 2 car	0.0927	-0.00953	-400	-300	-320	-200		
Home Based Recreation - 3+ car	0.114	-0.00981	-470	-400	-320	-190		
Home Based Other - 0 car	-0.239	-0.00323	-200	-125	-100	-50		
Home Based Other - 1 car	0.114	-0.00608	-540	-340	-280	-200		
Home Based Other - 2 car	-0.374	-0.00434	-700	-680	-670	-580		
Home Based Other - 3+ car	-0.371	-0.00397	-815	-745	-720	-580		

Table 2 - Destination Choice Parameters



5 Model Validation

This section of the report examines how well the updated Zenith Destination Choice model replicates travel demands and patterns revealed in the VISTA07 household travel survey.

The new Destination Choice model has been run for all the 8,540 households in the usable survey sample. The modelled outcome, and all the trips reported being made in VISTA07, were then expanded to reflect the total community using the VATS person trip weights. It is these expanded trip matrices (modelled and observed) that have been used in the model validation.

The validation process has involved comparing modelled and observed destination choice demands in terms of:

- average trip lengths by home-based journey purpose;
- sector to sector home-based person trip movements (for a 22 sector system) covering the modelled area;
- trip length frequency by home-based journey purpose; and
- cumulative trip length frequency by home-based journey purpose.

5.1 Average Trip Length by Journey Purpose

The average trip length by home-based journey purpose, as predicted by the Zenith model, is compared with VISTA07 in Table 3 below.

Journey Purpose	Average Trip Length (kms)		Difference (%)
	VISTA07	Zenith	
HWW	16.05	16.30	+1.6
HWB	18.36	18.40	+0.2
HSE	7.59	7.71	+1.6
HTE	16.00	17.75	+10.9
HBS	6.05	5.95	-1.7
HBR	3.02	3.45	+14.2
HBO	5.99	6.08	+1.5
All Purposes	9.94	10.11	+1.7

Table 3 - Average Trip Length by Journey Purpose

For the 8.65 million home based person trips (all purposes combined) made within the modelled area each weekday, the Zenith model's average trip length is 1.7 percent longer than reported in VISTA07 – 10.11 kms versus 9.94 kms.

The largest discrepancies between modelled and observed average trip length are for home-based tertiary education (HTE) and home-based recreation (HBR) – the modelled trip length being longer by 10.9 percent and 14.2 percent respectively.

The modelled average trip length for all other home based journey purposes is within 1.7 percent of the observed.



5.2 Sector to Sector Home-Based Person Trip Movements

Modelled and observed sector to sector home-based person trip movements, by journey purpose, are contained in a series of tables in Appendix A (Tables A1 through A8), for the sector system shown in Figure 2 and Figure 3.

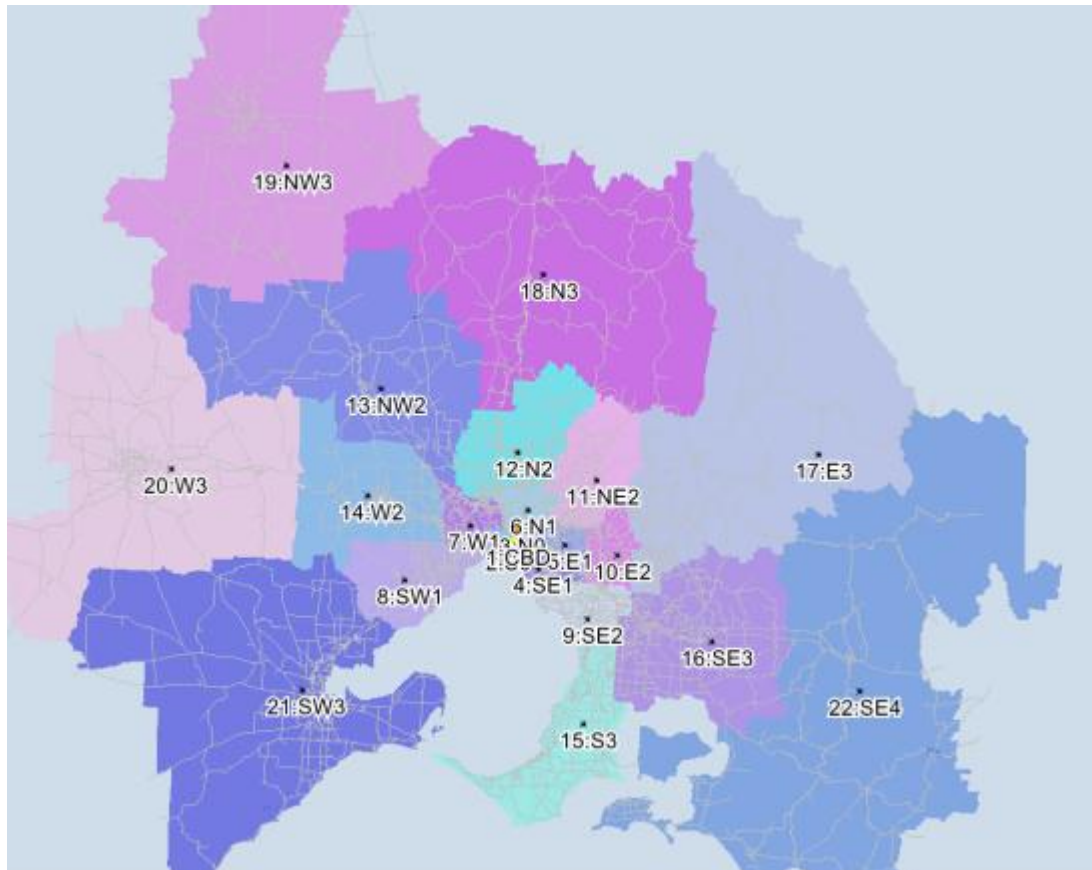


Figure 2 - 22 Sectors

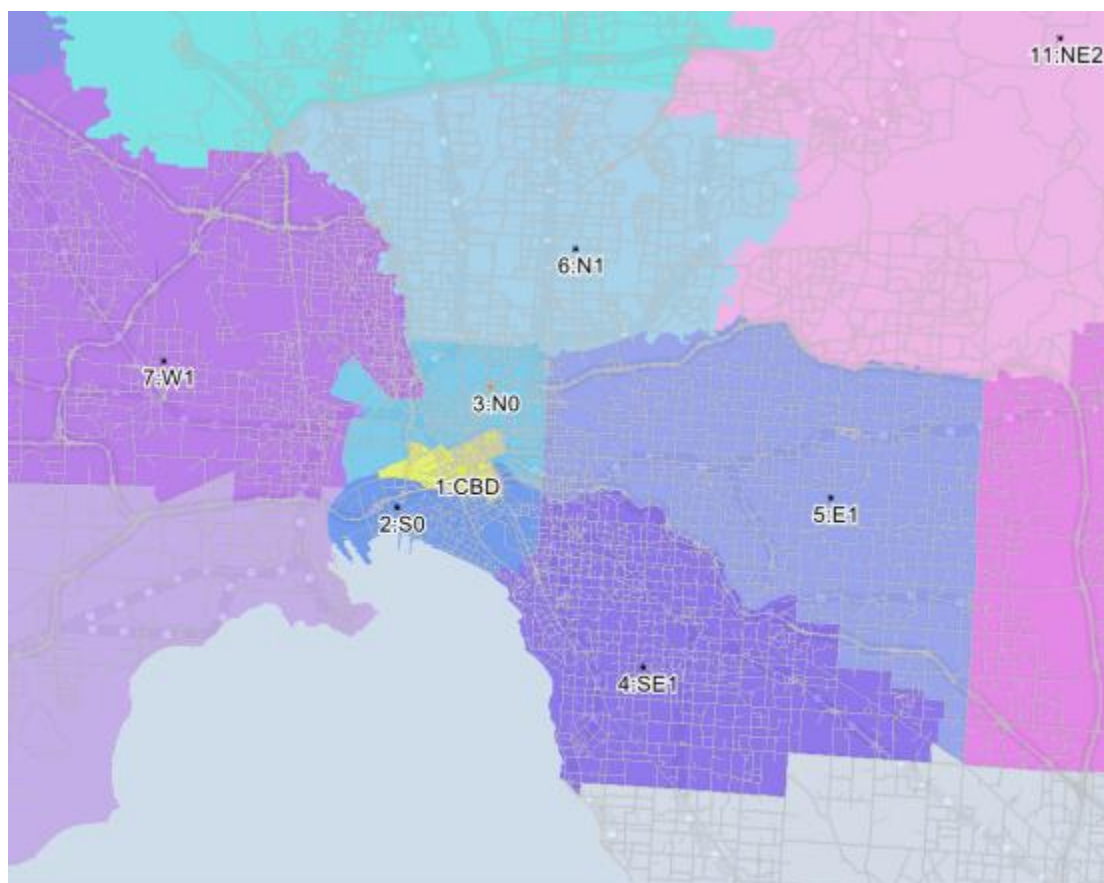


Figure 3 - 22 Sectors (Inner Melbourne)

The sector table for all trip purposes combined is shown in Table 4 and Table 5 below.

When interpreting these tables at the individual cell level it should be appreciated that, as VISTA07 is only a sample survey (approximately 0.5 percent of households included in the survey frame used for model calibration), a cell reporting 20,000 person trips is based on the expansion of only approximately 100 reported trips in VISTA.

A better appreciation of the level of correspondence between modelled and observed sector to sector person movements is provided by the R^2 regression scatter-plots in Appendix B (Figures B1 through B8). The scatter plots for all trips (all trip purposes) are also presented in Figure 4 and Figure 5 below, which relate to *intra*-sector, and *inter*-sector movements respectively.

The performance of the model, in terms of replicating observed intra-sector and inter-sector movements by purpose, is shown in the R^2 regression coefficients and slopes in Table 6 and Table 7 below. There is very high correlation between modelled and observed intra-sector travel demands ($R^2 = 0.9952$). Inter-sector flows are also highly correlated with an R^2 value of 0.9506.



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	CBD		E1		E2		E3		N0		N1		N2		N3		NE2		NW2		NW3	
	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith
CBD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E1	62,740	54,225	500,963	448,188	26,292	48,559	2,426	2,784	42,708	44,586	20,059	35,574	10,229	4,795	545	30	26,069	38,698	240	149	0	0
E2	28,255	15,957	124,076	117,857	449,088	443,031	36,545	35,095	11,335	11,755	6,372	10,044	4,934	2,484	70	36	19,717	23,439	110	19	298	9
E3	7,047	6,292	16,223	20,872	94,704	107,690	197,466	169,948	1,713	4,579	1,556	3,700	1,566	1,111	2,266	49	4,484	8,097	0	26	0	0
N0	40,693	58,345	15,779	15,772	2,099	673	1,280	139	98,132	94,595	18,722	12,627	293	1,549	0	28	879	1,404	0	37	0	0
N1	66,378	66,376	41,973	55,038	7,215	6,773	487	618	67,820	65,776	431,757	368,434	43,327	59,056	257	136	19,813	28,891	984	812	0	7
N2	9,501	14,066	8,671	10,993	2,767	1,883	0	446	11,741	15,298	37,504	59,372	267,182	215,925	983	376	18,442	22,630	1,310	1,420	0	0
N3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NE2	20,728	15,289	55,395	66,948	21,497	36,766	2,630	4,283	16,037	14,556	28,566	42,264	20,018	21,724	157	72	256,001	215,368	0	217	0	25
NW2	3,552	4,468	381	1,538	262	240	0	8	3,955	3,650	1,274	3,579	7,910	6,251	206	35	628	518	68,769	63,454	0	29
NW3	864	210	61	44	0	4	0	0	448	215	302	40	101	40	335	47	0	4	502	235	204,404	207,391
S0	18,164	23,941	2,977	6,971	0	573	0	26	10,895	8,495	722	2,218	2,066	522	0	0	320	106	0	0	0	0
S3	7,023	5,579	7,679	6,467	6,887	5,870	366	469	4,195	3,189	374	958	580	126	0	0	1,574	651	179	15	691	0
SE1	62,519	64,846	81,676	94,887	15,009	19,314	920	741	43,058	36,160	5,332	12,830	3,717	2,597	0	21	3,946	4,572	0	84	0	0
SE2	45,483	27,111	33,165	52,721	38,561	46,062	3,312	1,945	9,155	17,197	4,114	5,353	2,186	1,236	226	15	1,422	3,137	0	6	0	0
SE3	9,882	10,734	9,447	14,207	13,501	15,555	0	2,309	9,929	4,814	0	1,647	4,930	460	747	0	210	1,134	0	90	0	0
SE4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SW1	26,161	23,877	8,994	9,253	564	1,080	208	79	13,909	16,338	2,530	7,513	3,969	6,734	0	5	706	1,014	0	503	0	41
SW3	4,829	3,694	1,003	843	0	96	0	9	1,742	2,042	96	520	1,272	479	0	0	115	66	513	61	0	0
W1	56,509	53,936	12,905	17,376	2,752	2,312	0	200	35,613	49,771	26,724	50,637	14,854	35,298	0	132	1,146	4,486	1,869	2,194	0	37
W2	7,456	5,954	1,476	1,975	0	285	0	25	5,708	4,656	2,713	4,355	2,279	6,569	0	22	3,136	491	5,155	3,766	0	0
W3	732	658	0	151	0	12	0	0	224	520	86	102	210	968	0	0	0	1	104	238	60	80
Grand Total	478,516	455,578	922,844	942,101	681,198	736,778	245,640	219,124	382,317	398,192	588,803	621,767	391,423	367,054	5,792	1,004	358,288	354,921	79,841	73,326	205,453	207,619

Table 4 - Sector to Sector Table, All Trip Purposes (PART 1)

	S0		S3		SE1		SE2		SE3		SE4		SW1		SW3		W1		W2		W3		Grand Total	
	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith
CBD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0
E1	23,550	15,971	2,020	1,497	70,340	85,943	21,881	23,982	1,416	2,374	0	30	1,994	3,167	1,886	105	5,180	9,674	362	196	107	11	821,007	820,538
E2	6,049	5,350	3,915	2,711	31,065	34,695	25,316	40,670	3,701	8,328	149	78	1,664	936	774	82	607	3,069	0	72	179	11	754,219	755,728
E3	2,201	1,700	1,159	837	2,562	6,955	4,459	8,581	3,031	4,549	0	15	3,246	353	282	10	582	743	710	33	0	0	345,257	346,140
N0	15,992	5,626	0	68	6,772	6,672	203	1,513	0	54	1,202	0	0	1,030	0	16	4,015	6,385	624	69	0	0	206,685	206,602
N1	16,267	15,217	812	279	14,842	20,880	3,534	4,531	212	487	0	0	4,613	4,269	504	217	33,997	57,472	1,999	1,360	147	0	756,938	756,629
N2	2,324	4,950	861	67	3,817	4,949	2,095	1,423	0	98	0	0	5,068	4,138	0	198	33,250	45,406	231	1,816	0	26	405,747	405,480
N3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0
NE2	6,998	4,556	894	404	9,784	12,914	4,297	5,455	836	655	0	0	2,175	1,132	307	79	3,098	7,136	0	199	0	17	449,418	450,059
NW2	2,129	1,231	0	27	151	1,048	0	284	0	9	0	0	1,222	1,856	130	75	7,651	9,006	1,098	1,888	240	46	99,558	99,240
NW3	0	20	0	0	428	72	0	5	0	5	39	3	55	28	251	0	203	74	53	20	70	19	208,116	208,476
S0	34,728	36,792	0	52	26,510	14,879	1,446	1,505	106	88	0	0	454	1,424	0	39	2,560	2,744	0	47	0	0	100,734	100,636
S3	3,249	1,377	430,084	437,538	11,813	9,345	37,930	40,687	12,031	14,693	1,256	62	462	327	0	85	1,645	520	0	0	0	39	527,818	527,997
SE1	39,283	36,280	3,419	2,402	452,082	419,772	49,655	63,927	1,217	2,375	284	16	2,764	3,889	2,446	241	7,295	9,715	0	253	483	0	775,105	774,922
SE2	14,392	11,171	17,798	21,127	100,874	120,381	526,174	482,521	20,365	26,609	0	46	1,438	1,953	1,236	96	875	3,971	544	124	586	9	821,906	822,791
SE3	4,792	2,264	11,215	17,760	13,250	13,854	63,143	66,215	319,233	300,708	10,709	13,115	0	412	0	41	1,392	896	0	49	0	16	466,380	466,300
SE4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0
SW1	12,598	11,797	173	165	6,681	11,436	2,406	2,290	0	117	0	0	278,054	253,430	3,076	2,568	40,907	51,877	1,968	3,844	0	58	402,904	404,019
SW3	2,860	869	0	29	866	892	111	270	0	21	0	0	4,043	3,345	464,558	468,595	1,792	1,980	802	388	778	202	485,380	484,597
W1	16,607	15,933	0	233	10,552	15,032	1,469	3,039	0	359	0	0	35,302	35,438	3,706	845	453,434	383,916	10,047	11,862	917	185	684,406	683,221
W2	1,750	2,444	0	48	1,178	2,027	820	496	0	68	0	0	9,360	7,944	427	411	26,033	29,522	86,337	82,317	217	395	154,045	153,770
W3	0	121	0	4	0	124	0	29	0	5	54	0	786	151	1,206	426	106	224	495	202	186,762	187,330	190,805	190,474
Grand Total	205,769	173,669	472,350	485,248	763,567	781,870	744,939	747,423	362,148	361,600	13,673	13,365	352,700	325,220	480,789	474,127	624,622	624,330	105,270	104,739	190,486	188,364	8,656,428	8,657,419

Table 5 - Sector to Sector Table, All Trip Purposes (PART 2)

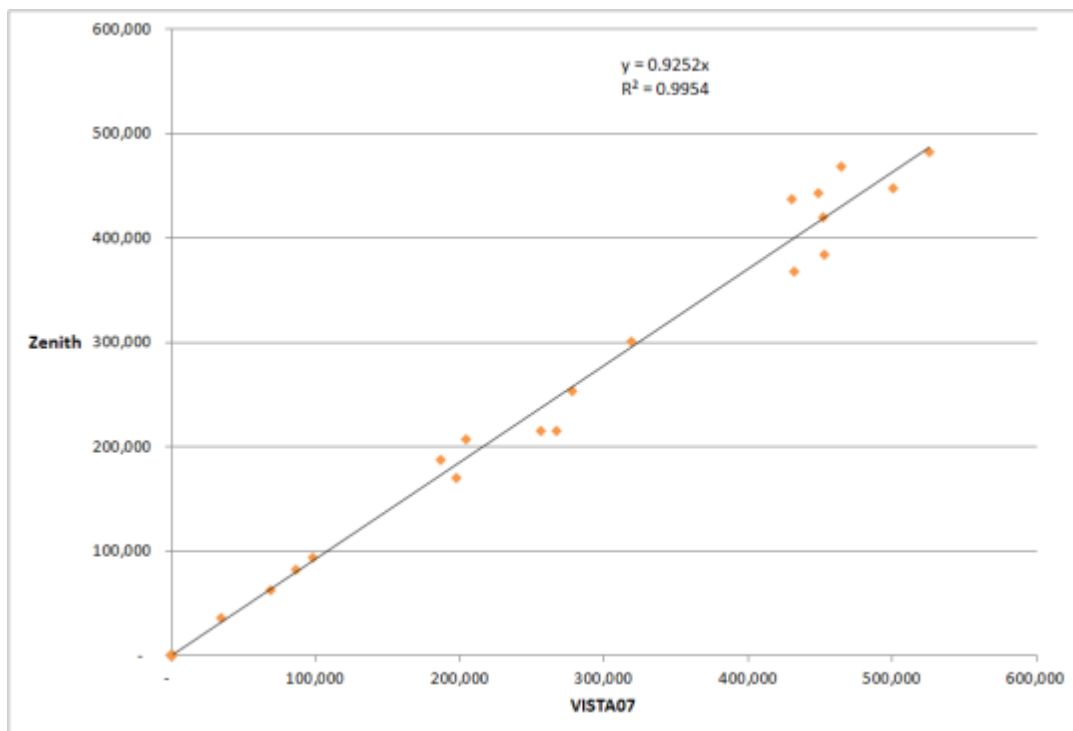


Figure 4 - Intra-Sector Movements - All Home Based Purposes

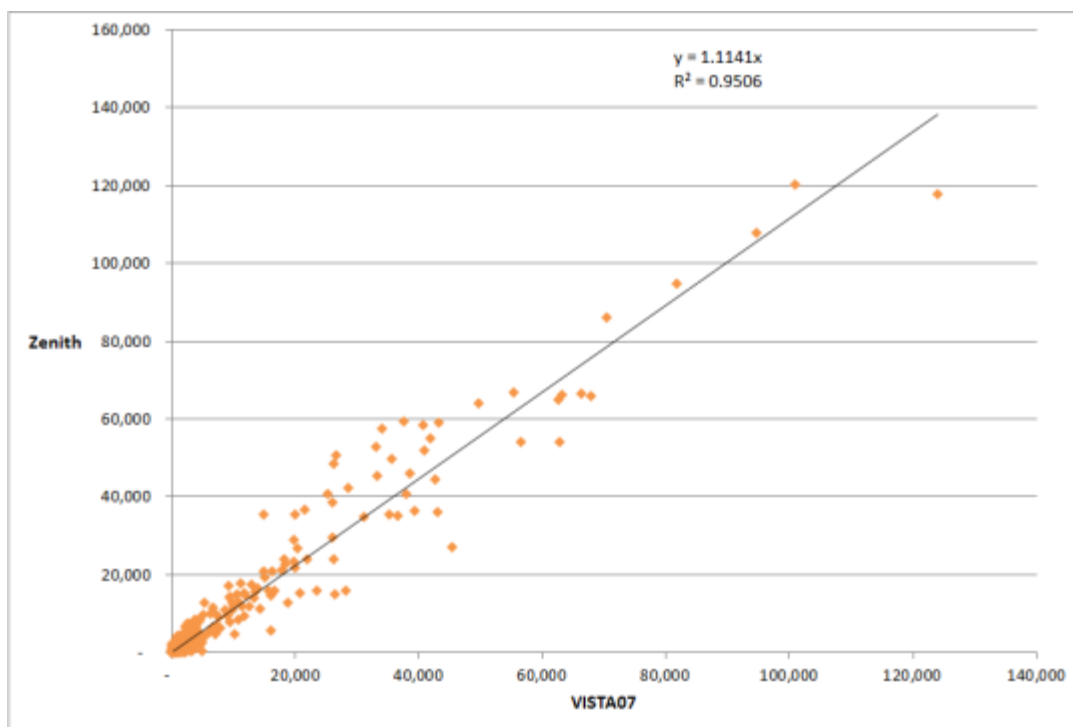


Figure 5 - Inter-Sector Movements - All Home Based Purposes



Journey Purpose	R ²	Slope
HWW	0.9863	0.9283
HWB	0.9934	0.9500
HSE	0.9921	0.9802
HTE	0.8589	0.8135
HBS	0.9951	0.9251
HBR	0.9860	0.8976
HBO	0.9942	0.9348
All Purposes	0.9954	0.9252

Table 6 - Intra-Sector Person Movements - R² Correlation

Journey Purpose	R ²	Slope
HWW	0.9478	0.9658
HWB	0.8748	0.9031
HSE	0.7060	0.7131
HTE	0.7963	1.0739
HBS	0.8907	1.2972
HBR	0.8107	1.0632
HBO	0.8525	1.2036
All Purposes	0.9506	1.1141

Table 7 - Inter-Sector Person Movements - R² Correlation

Referring to Table 6 and Table 7, it is apparent that that the recalibrated Destination Choice model is under-estimating intra-sector person travel overall by about 7.5 percent, and over-estimating inter-sector travel by about 11.4 percent.

Referring to Table 7, the most significant contributor to the higher Zenith estimates of inter-sector travel is home-based shopping (HBS). Shopping trips comprise 22 percent of all home based travel, and the Zenith Destination Choice model estimate of inter-sector HBS travel is higher than VISTA by about by 30 percent.

VLC believes that to resolve this discrepancy may require the home based shopping travel market to split into two – grocery shopping and white goods/comparison shopping/other shopping. This will be further explored at a later date.

Similarly, the home based secondary school model might be improved if further split into public school and private school travel.



5.3 Trip Length Frequency Validation

Table 8 shows a trip length frequency comparison between modelled and observed person movements for all home based trip purposes combined.

Trip Length (km)	VISTA07	Zenith
0	9.2%	7.8%
2	23.3%	21.8%
4	16.5%	17.0%
6	11.0%	9.7%
8	8.4%	7.8%
10	5.8%	6.3%
12	4.5%	5.3%
14	3.9%	4.3%
16	3.1%	3.6%
18	2.3%	3.0%
20	2.0%	2.4%
22	1.8%	2.1%
24	1.7%	1.9%
26	1.8%	1.6%
28	1.1%	1.3%
30	0.9%	1.0%
32	0.7%	0.8%
34	0.7%	0.7%
36	0.7%	0.6%
38	0.5%	0.5%
40	0.3%	0.4%
Grand Total	100.0%	100.0%

Table 8 - Trip Length Frequency Distribution for Combined Home-Based Purposes

The trip length frequency distribution data presented in Table 8 is also shown in graphical form in Figure 6 below.

It is evident that VISTA07 reported trips in the short 0-10 kilometre range are slightly higher than Zenith's estimates, while Zenith's estimated trips in the mid-range (10-24 kilometres) are slightly higher than VISTA07. This is consistent with the results of the previous section, which indicated that the Zenith model is slightly under-estimating intra-sector movements (short in length), and over-estimating inter-sector movements (medium – long in length).

The same data is presented in cumulative form in Table 9 and Figure 7.

By purpose trip length frequency distributions (and cumulative frequency distributions) can be found in Appendices C and D.

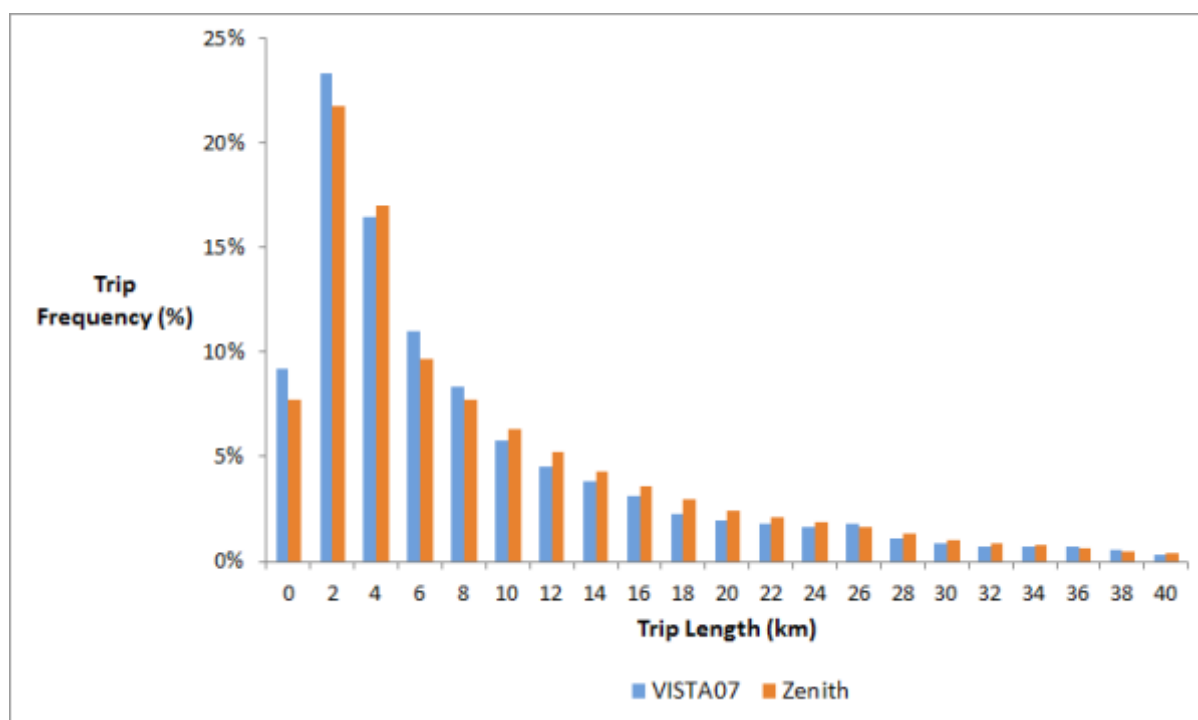


Figure 6 - Trip Length Frequency Distribution for Combined Home-based Trip Purposes

Trip Length (km)	VISTA07	Zenith
0	9.2%	7.8%
2	32.5%	29.5%
4	49.0%	46.6%
6	60.0%	56.2%
8	68.3%	64.0%
10	74.1%	70.3%
12	78.6%	75.5%
14	82.5%	79.8%
16	85.6%	83.4%
18	87.9%	86.4%
20	89.9%	88.8%
22	91.7%	90.9%
24	93.3%	92.8%
26	95.1%	94.5%
28	96.2%	95.8%
30	97.0%	96.8%
32	97.8%	97.7%
34	98.5%	98.4%
36	99.1%	99.1%
38	99.7%	99.6%
40	100.0%	100.0%

Table 9 - Cumulative Trip Length Frequency for Combined Home-based Trip Purposes

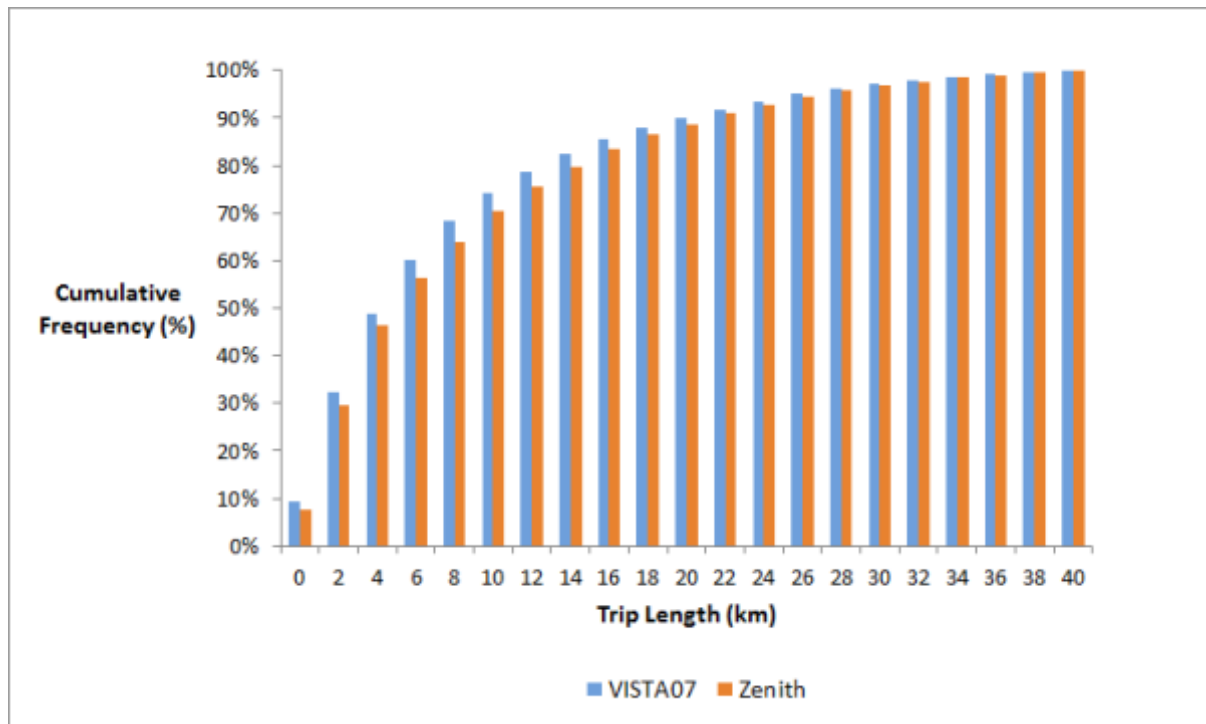


Figure 7 - Cumulative Trip Length Frequency for Combined Home-based Trip Purposes

6 ABS Census JTW CBD Adjustments

During final model calibration, it became apparent that the model was slightly lacking in demand to the CBD. This deficit was most pronounced when inspecting loads on the CBD cordon.

To remedy this, we analysed modelled demands for commuter travel (Home Based Work) with respect to Journey To Work (JTW) data, which is collected as part of the ABS Census.

Using JTW 2006, we calibrated a series of "skim adjustment factors", which alter the generalised cost of travel from each SLA to the CBD for Home Based Work.

The vector of Home Based Work factors is illustrated in Figure 8 below.

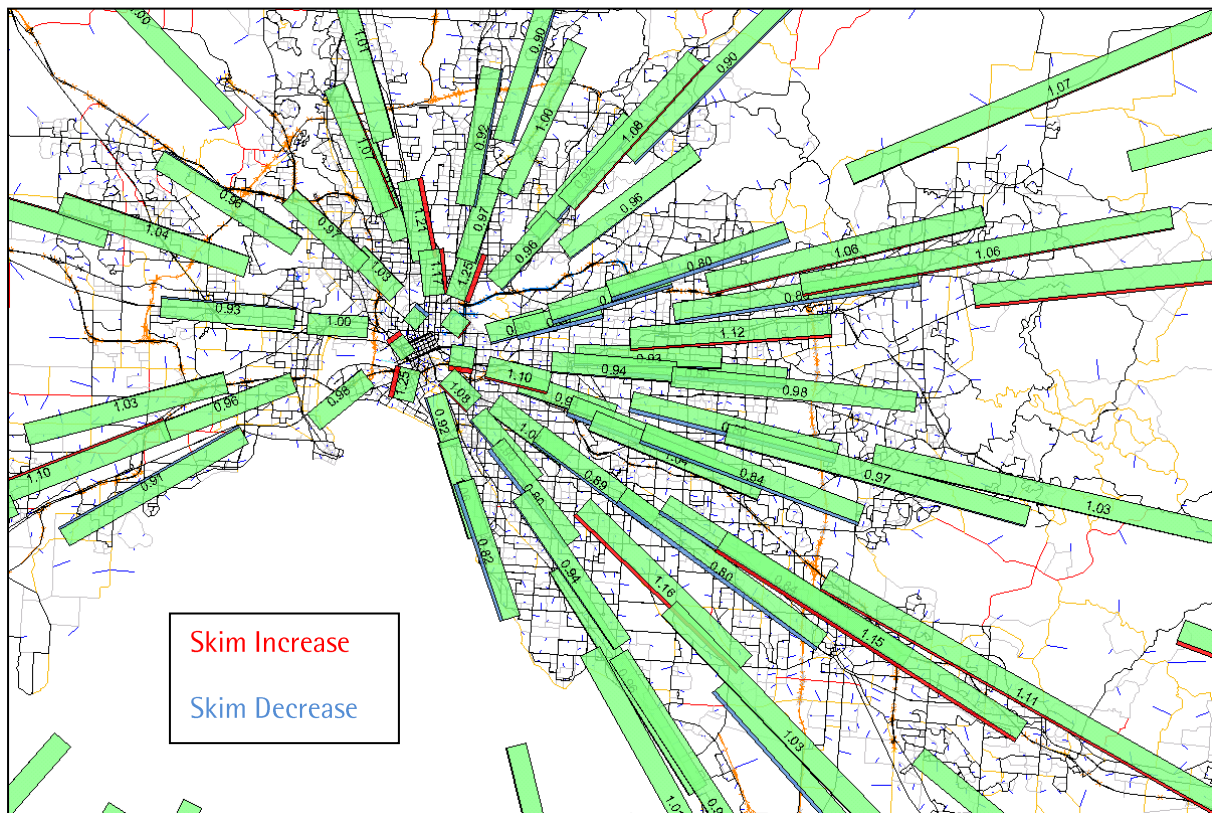


Figure 8 – HBW Skim Adjustment Factors per SLA to the CBD

The model wide impact of the implementation of the HBW to the CBD skim adjustment factors can be seen in Table 10.

Trip Type	AM Peak	Daily
Total Person Trips	0.0%	0.0%
Total Person Car Trips	-0.3%	-0.1%
Total PT Trips	+2.5%	+1.5%
HBW Trips	+0.2%	+0.0%
HBW Trips to Melbourne LGA	+6.3%	+5.5%

Table 10 - Global Impacts of the HBW to the CBD skim adjustment factors by Time Period



Overall, there is a net increase in HBW trips to Melbourne (LGA) in both the peak (+6.3%) and across the day (+5.5%), but the impacts on person car trips across the model are very small, less than 0.5% in the AM peak and across the day.

The impact on the CBD rail cordon is presented in Table 11 and Figure 9 below. Zenith v1 refers to "pre skim factoring", and Zenith v2 refers to "post skim factoring".

Line Group	Count - 2008	Zenith - v1	Zenith - v2
Northern	35,150	36,887	38,903
Clifton Hill	17,019	14,739	15,393
Burnley	31,137	21,793	25,442
Caulfield	36,741	25,907	35,434
TOTAL	120,047	99,326	115,172

Table 11 - CBD Rail Cordon Loads by Line Group (AM Peak)

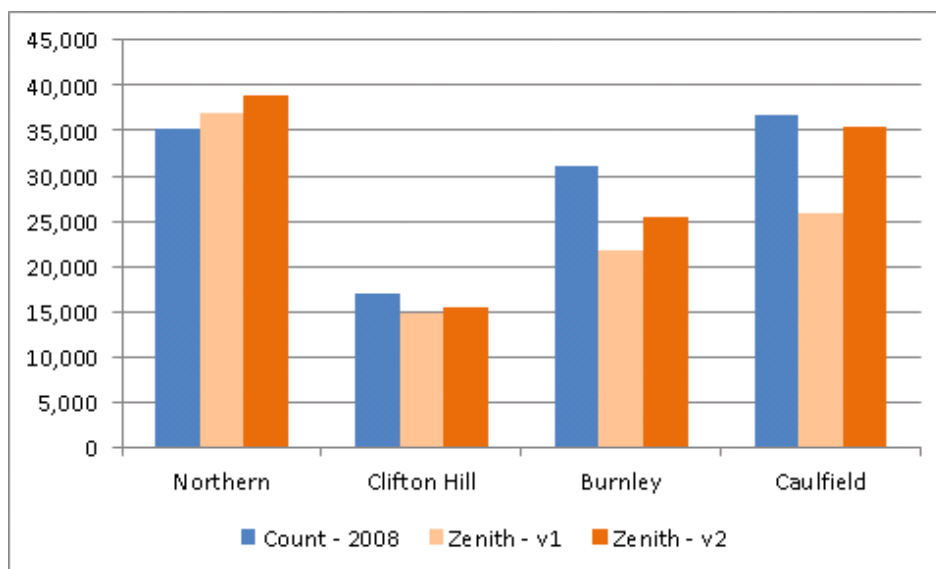


Figure 9 - CBD Rail Cordon Loads by Line Group (AM Peak)

Consistent with an increase in HBW trips to the CBD, the CBD rail cordon loads have also increased in the AM peak. The impact is greatest on the Burnley and Caulfield rail line groups.



Appendix A – Sector to Sector Person Movement Tables (24-hour weekday)



A1 – All Home Based Purposes

	CBD		E1		E2		E3		N0		N1		N2		N3		NE2		NW2		NW3	
	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith
CBD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E1	62,740	54,225	500,963	448,188	26,292	48,559	2,426	2,784	42,708	44,586	20,059	35,574	10,229	4,795	545	30	26,069	38,698	240	149	0	0
E2	28,255	15,957	124,076	117,857	449,088	443,031	36,545	35,095	11,335	11,755	6,372	10,044	4,934	2,484	70	36	19,717	23,439	110	19	298	9
E3	7,047	6,292	16,223	20,872	94,704	107,690	197,466	169,948	1,713	4,579	1,556	3,700	1,566	1,111	2,266	49	4,484	8,097	0	26	0	0
N0	40,693	58,345	15,779	15,772	2,099	673	1,280	139	98,132	94,595	18,722	12,627	293	1,549	0	28	879	1,404	0	37	0	0
N1	66,378	66,376	41,973	55,038	7,215	6,773	487	618	67,820	65,776	431,757	368,434	43,327	59,056	257	136	19,813	28,891	984	812	0	7
N2	9,501	14,066	8,671	10,993	2,767	1,883	0	446	11,741	15,298	37,504	59,372	267,182	215,925	983	376	18,442	22,630	1,310	1,420	0	0
N3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NE2	20,728	15,289	55,395	66,948	21,497	36,766	2,630	4,283	16,037	14,556	28,566	42,264	20,018	21,724	157	72	256,001	215,368	0	217	0	25
NW2	3,552	4,468	381	1,538	262	240	0	8	3,955	3,650	1,274	3,579	7,910	6,251	206	35	628	518	68,769	63,454	0	29
NW3	864	210	61	44	0	4	0	0	448	215	302	40	101	40	335	47	0	4	502	235	204,404	207,391
S0	18,164	23,941	2,977	6,971	0	573	0	26	10,895	8,495	722	2,218	2,066	522	0	0	0	320	106	0	0	0
S3	7,023	5,579	7,679	6,467	6,887	5,870	366	469	4,195	3,189	374	958	380	126	0	0	1,574	651	179	15	691	0
SE1	62,519	64,846	81,676	94,887	15,009	19,314	920	741	43,058	36,160	5,332	12,830	3,717	2,597	0	21	3,946	4,572	0	84	0	0
SE2	45,483	27,111	33,165	52,721	38,561	46,062	3,312	1,945	9,155	17,197	4,114	5,353	2,186	1,236	226	15	1,422	3,137	0	6	0	0
SE3	9,882	10,754	9,447	14,207	13,501	15,555	0	2,309	3,929	4,814	0	1,647	4,930	460	747	0	210	1,134	0	90	0	0
SE4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SW1	26,161	23,877	8,994	9,253	564	1,080	208	79	13,909	16,338	2,530	7,513	3,969	6,734	0	5	706	1,014	0	503	0	41
SW3	4,829	3,694	1,003	843	0	96	0	9	1,742	2,042	96	520	1,272	479	0	0	115	66	513	61	0	0
W1	56,509	53,936	12,905	17,376	2,752	2,312	0	200	35,613	49,771	26,724	50,637	14,854	35,298	0	132	1,146	4,486	1,869	2,194	0	37
W2	7,456	5,954	1,476	1,975	0	285	0	25	5,708	4,656	2,713	4,355	2,279	6,569	0	22	3,136	491	5,155	3,766	0	0
W3	732	658	0	151	0	12	0	0	224	520	86	102	210	98	0	0	0	1	104	238	60	80
Grand Total	478,516	455,578	922,844	942,101	681,198	736,778	245,640	219,124	382,317	398,192	588,803	621,767	391,423	367,054	5,792	1,004	358,288	354,921	79,841	73,326	205,453	207,619

	S0		S3		SE1		SE2		SE3		SE4		SW1		SW3		W1		W2		W3		Grand Total	
	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith
CBD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0
E1	23,550	15,971	2,020	1,497	70,340	85,943	21,881	23,982	1,416	2,374	0	30	1,994	5,167	1,886	105	5,180	9,674	362	196	107	11	821,007	820,538
E2	6,049	5,350	3,915	2,711	31,065	34,695	25,316	40,670	3,701	8,328	149	78	1,664	936	774	82	607	3,069	0	72	179	11	754,219	755,728
E3	2,201	1,700	1,159	837	2,562	6,955	4,459	8,581	3,031	4,549	0	15	3,246	353	282	10	582	743	710	33	0	0	345,257	346,140
N0	15,992	5,626	0	68	6,772	6,672	203	1,513	0	54	1,202	0	0	1,030	0	16	4,015	6,385	624	69	0	0	206,685	206,602
N1	16,267	15,217	812	279	14,842	20,880	3,534	4,531	212	487	0	0	4,613	4,269	504	217	33,997	57,472	1,999	1,360	147	0	756,938	756,629
N2	2,324	4,950	861	67	3,817	4,949	2,095	1,423	0	98	0	0	5,068	4,138	0	198	33,250	45,406	231	1,816	0	26	405,747	405,480
N3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0
NE2	6,998	4,556	894	404	9,784	12,914	4,297	5,455	836	655	0	0	2,175	1,132	307	79	3,098	7,136	0	199	0	17	449,418	450,059
NW2	2,129	1,231	0	27	151	1,048	0	284	0	9	0	0	1,222	1,856	130	75	7,651	9,006	1,098	1,888	240	46	99,558	99,240
NW3	0	20	0	0	428	72	0	5	0	5	39	3	55	28	251	0	203	74	53	20	70	19	208,116	208,476
S0	34,728	36,792	0	52	26,510	14,879	1,446	1,505	106	88	0	0	454	1,424	0	39	2,560	2,744	0	47	0	0	100,734	100,636
S3	3,249	1,377	430,084	437,558	11,813	9,345	37,930	40,687	12,031	14,693	1,256	62	462	327	0	85	1,645	520	0	0	0	39	527,818	527,997
SE1	39,283	36,280	3,419	2,402	452,082	419,772	49,655	63,927	1,217	2,375	284	16	2,764	3,889	2,446	241	7,295	9,715	0	253	483	0	775,105	774,922
SE2	14,392	11,171	17,798	21,127	100,874	120,381	526,174	482,521	20,365	26,609	0	46	1,438	1,953	1,236	96	875	3,971	544	124	586	9	821,906	822,791
SE3	4,792	2,264	11,215	17,760	13,250	13,854	63,143	66,215	319,233	300,708	10,709	13,115	0	412	0	41	1,392	896	0	49	0	16	466,380	466,300
SE4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0
SW1	12,598	11,797	173	165	6,681	11,436	2,406	2,290	0	117	0	0	278,054	253,430	3,076	2,568	40,907	51,877	1,968	3,844	0	58	402,904	404,019
SW3	2,860	869	0	29	866	892	111	270	0	21	0	0	4,043	3,345	464,558	468,595	1,792	1,980	802	388	778	202	485,380	484,597
W1	16,607	15,933	0	233	10,552	15,032	1,469	3,039	0	359	0	0	35,302	35,438	3,706	845	453,434	383,916	10,047	11,862	917	185	684,406	683,221
W2	1,750	2,444	0	48	1,178	2,027	820	496	0	68	0	0	9,360	7,944	427	411	26,033	29,522	86,337	82,317	217	395	154,045	153,770
W3	0	121	0	4	0	124	0	29	0	5	54	0	786	151	1,206	426	106	224	495	202	186,762	187,330	190,805	190,474
Grand Total	205,769	173,669	472,350	485,248	763,567	781,870	744,939	747,425	362,148	361,600	13,673	13,365	352,700	325,220	480,789	474,127	624,622	624,330	105,270	104,739	190,486	188,364	8,656,428	8,657,419



A2 – Home Based Work – White Collar

	CBD		E1		E2		E3		N0		N1		N2		N3		NE2		NW2		NW3	
	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith
CBD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E1	41,699	37,093	59,483	56,883	7,306	11,325	698	916	14,318	18,107	4,488	9,173	2,851	2,161	486	30	4,642	5,590	0	63	0	0
E2	20,145	12,387	29,992	30,141	48,691	52,472	7,326	6,321	4,004	6,139	2,697	3,851	1,082	855	0	23	3,563	5,000	0	0	0	0
E3	4,281	4,734	7,280	7,957	22,130	21,067	19,134	12,730	638	2,384	492	1,575	0	354	984	0	765	2,072	0	18	0	0
N0	25,450	32,121	2,321	5,345	631	305	1,280	62	20,336	17,704	3,858	3,402	0	585	0	28	548	488	0	17	0	0
N1	43,314	45,010	14,970	17,165	1,624	2,837	0	203	25,714	24,903	44,247	33,186	10,606	10,848	0	45	4,649	4,865	0	348	0	0
N2	5,711	9,215	4,299	4,604	2,268	800	0	198	5,369	6,923	9,472	11,114	25,399	18,779	0	44	3,824	3,743	922	275	0	0
N3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NE2	12,487	10,919	13,897	18,044	4,690	7,477	1,782	917	6,390	6,913	6,994	10,637	6,687	5,556	0	22	18,628	13,790	0	107	0	8
NW2	2,828	3,637	250	989	0	158	0	8	2,858	1,876	1,044	1,414	4,278	2,362	0	0	0	283	5,172	3,790	0	12
NW3	284	147	0	0	0	4	0	0	0	48	0	6	47	13	0	21	0	0	98	32,506	32,485	0
S0	13,700	12,071	1,571	2,474	0	233	0	12	3,256	3,380	0	600	132	161	0	0	0	69	106	0	0	0
S3	3,422	4,241	3,551	3,274	1,285	2,304	0	230	588	1,253	0	338	0	35	0	0	0	293	179	7	0	0
SE1	38,119	45,695	28,505	26,825	2,500	6,094	0	288	20,161	16,060	3,292	4,182	2,912	1,129	0	0	2,163	1,514	0	57	0	0
SE2	30,432	19,059	10,702	16,447	5,292	9,181	674	648	4,375	7,073	384	1,864	447	419	0	0	188	796	0	0	0	0
SE3	7,646	7,581	5,666	6,090	5,965	4,797	0	810	1,369	2,447	0	645	436	109	0	0	210	358	0	22	0	0
SE4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SW1	17,216	15,276	2,782	4,459	0	571	0	6	3,679	7,162	1,794	2,310	964	2,581	0	0	0	469	0	207	0	0
SW3	3,909	2,803	689	431	0	22	0	0	1,007	1,068	0	239	0	190	0	0	115	22	0	50	0	0
W1	38,830	36,761	9,214	7,726	2,566	827	0	117	17,024	21,174	10,005	10,484	3,786	10,229	0	70	698	1,407	602	522	0	0
W2	4,756	3,996	656	893	0	92	0	25	1,050	1,731	356	1,197	749	1,878	0	22	0	243	621	611	0	0
W3	336	500	0	40	0	3	0	0	194	155	0	42	104	35	0	0	0	1	104	151	60	34
Grand Total	314,565	303,246	195,828	209,787	104,948	120,569	30,894	23,491	132,330	146,500	89,123	96,259	60,480	58,279	1,470	305	39,993	41,003	7,706	6,343	32,566	32,539

	S0		S3		SE1		SE2		SE3		SE4		SW1		SW3		W1		W2		W3		Grand Total	
	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith
CBD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0
E1	14,147	9,873	0	674	21,978	19,783	8,630	8,135	416	773	0	0	1,344	1,359	522	66	2,514	3,535	362	137	0	0	185,884	185,676
E2	3,622	3,544	2,188	1,129	13,777	11,427	10,735	13,046	1,292	2,250	0	42	850	444	613	36	124	1,445	0	40	0	0	150,701	150,592
E3	968	1,209	0	486	1,318	2,835	1,470	3,550	394	1,239	0	15	1,651	177	282	10	582	388	355	0	0	0	62,724	62,800
N0	10,480	3,692	0	6	3,089	2,563	0	649	0	0	0	0	0	647	0	5	978	2,057	624	21	0	0	69,595	69,697
N1	9,187	9,589	0	115	5,012	7,421	2,721	2,086	212	214	0	0	1,862	1,484	313	62	7,493	11,283	282	373	0	0	172,206	172,037
N2	1,592	2,710	0	39	674	2,067	1,478	607	0	27	0	0	1,778	1,104	0	88	7,595	7,669	0	302	0	20	70,381	70,328
N3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0
NE2	5,671	2,784	328	274	4,740	4,614	2,539	2,193	137	257	0	0	1,386	387	0	30	1,562	2,846	0	71	0	0	87,918	87,846
NW2	0	887	0	7	151	582	0	160	0	9	0	0	994	867	0	28	2,045	2,886	798	547	240	38	20,658	20,540
NW3	0	20	0	0	0	17	0	0	0	0	0	0	0	7	90	0	0	13	53	8	70	11	33,050	32,898
S0	5,403	6,326	0	52	4,317	2,941	236	745	106	60	0	0	0	566	0	15	1,682	817	0	5	0	0	30,509	30,527
S3	576	1,041	45,638	43,174	4,780	4,054	12,564	13,746	4,205	3,613	0	16	462	99	0	20	861	179	0	0	0	0	78,111	77,917
SE1	16,549	18,527	970	852	52,273	46,243	15,376	15,300	592	856	155	5	1,107	1,338	402	179	4,318	3,795	0	104	0	0	189,394	189,043
SE2	7,116	6,661	6,968	4,776	23,885	23,574	50,424	50,581	4,643	3,971	0	22	443	598	0	12	611	1,334	319	43	0	9	146,903	147,068
SE3	3,911	1,215	1,269	4,652	4,646	4,930	19,705	16,962	22,663	20,171	0	2,224	0	122	0	0	0	305	0	0	0	0	73,486	73,440
SE4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0
SW1	4,124	6,332	0	66	2,089	3,695	1,832	850	0	40	0	0	27,263	19,499	1,574	1,095	12,905	11,545	684	878	0	51	76,906	77,092
SW3	1,928	616	0	8	416	385	0	64	0	11	0	0	1,571	1,301	57,673	59,285	190	877	173	161	234	64	67,905	67,597
W1	3,696	9,110	0	50	6,096	4,996	971	1,229	0	131	0	0	11,215	8,453	0	367	44,877	36,877	2,829	1,571	0	117	152,409	152,218
W2	1,202	1,569	0	8	556	807	410	289	0	34	0	0	2,967	1,901	132	144	6,764	5,257	4,973	4,286	0	157	25,192	25,140
W3	0	98	0	0	0	60	0	10	0	0	0	0	278	70	228	194	72	104	446	81	33,305	33,337	35,127	34,915
Grand Total	90,172	85,803	57,361	56,368	149,797	142,994	129,091	130,202	34,660	33,656	155	2,324	55,171	40,423	61,829	61,636	95,173	93,212	11,898	8,628	33,849	33,804	1,729,059	1,727,371



A3 – Home Based Work – Blue Collar

	CBD		E1		E2		E3		N0		N1		N2		N3		NE2		NW2		NW3	
	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith
CBD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E1	5,779	3,024	13,480	12,471	4,944	4,398	328	337	4,063	2,275	535	2,284	899	880	0	0	2,417	2,135	0	30	0	0
E2	1,126	1,672	11,777	10,138	26,175	24,718	2,730	3,505	974	1,501	2,116	1,731	676	858	0	0	1,418	2,284	110	8	0	0
E3	374	772	2,838	3,080	10,420	11,130	8,364	7,167	0	738	0	882	612	538	0	13	1,312	1,281	0	8	0	0
N0	2,544	4,007	69	1,269	0	166	0	77	4,530	4,823	3,056	1,605	0	525	0	0	0	251	0	0	0	0
N1	7,554	4,868	2,171	4,599	1,270	1,356	396	230	4,725	4,693	15,817	15,256	6,122	8,562	0	43	1,372	2,353	362	136	0	0
N2	1,626	2,298	1,711	2,139	499	734	0	178	3,408	2,238	5,790	9,818	23,114	21,388	0	104	2,957	3,048	388	346	0	0
N3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NE2	2,227	1,622	3,797	5,169	2,140	4,227	348	600	2,790	1,345	5,321	4,856	3,645	3,923	0	31	8,959	5,726	0	25	0	0
NW2	0	365	0	165	0	67	0	0	452	336	0	809	1,954	1,623	0	35	628	152	3,345	1,738	0	0
NW3	53	28	0	14	0	0	0	0	0	29	0	8	0	18	116	23	0	0	92	19,574	19,363	0
S0	232	752	0	330	0	54	0	0	0	298	722	236	0	58	0	0	0	0	0	0	0	0
S3	1,556	691	2,650	1,755	2,656	1,774	0	168	770	597	0	314	580	66	0	0	0	247	0	0	0	0
SE1	2,293	4,820	5,379	6,290	3,950	2,419	920	142	6,500	3,056	469	2,216	0	789	0	21	454	658	0	0	0	0
SE2	5,142	3,082	9,276	8,900	8,513	7,887	918	477	145	1,892	1,022	1,182	732	493	0	0	616	912	0	6	0	0
SE3	2,236	2,561	1,964	4,353	4,153	5,294	0	811	865	812	0	748	3,480	340	747	0	0	517	0	55	0	0
SE4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SW1	2,779	2,735	2,257	1,527	452	387	0	50	3,729	2,111	0	1,860	1,477	2,553	0	5	0	224	0	114	0	0
SW3	0	588	0	208	0	45	0	0	64	264	0	146	166	240	0	0	0	44	0	11	0	0
W1	5,882	5,114	1,947	2,325	0	687	0	48	3,477	4,619	4,631	7,277	8,301	9,636	0	23	0	964	491	456	0	0
W2	2,093	1,146	0	513	0	193	0	0	1,370	1,156	2,218	1,529	1,530	3,002	0	0	0	150	187	723	0	0
W3	90	78	0	53	0	8	0	0	0	50	0	31	0	43	0	0	0	0	41	0	40	0
Grand Total	43,586	40,223	59,316	65,298	65,172	65,544	14,004	13,790	37,862	32,833	41,697	52,788	53,088	55,535	863	298	20,133	20,946	4,883	3,789	19,574	19,403

	S0		S3		SE1		SE2		SE3		SE4		SW1		SW3		W1		W2		W3		Grand Total	
	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith
CBD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0
E1	2,062	1,617	0	218	3,202	4,405	1,646	3,827	0	410	0	21	100	819	0	26	1,078	1,311	0	28	0	11	40,533	40,527
E2	1,857	982	324	607	5,387	4,315	7,512	8,226	0	1,581	0	5	814	329	0	9	153	684	0	32	0	11	63,149	63,196
E3	394	287	334	149	818	948	1,552	1,922	1,268	681	0	0	1,595	122	0	0	0	189	0	33	0	0	29,881	29,940
N0	3,520	732	0	44	1,908	848	203	557	0	27	0	0	0	209	0	11	69	696	0	0	0	0	15,899	15,847
N1	3,726	2,180	0	61	3,968	1,959	256	1,025	0	110	0	0	1,089	1,472	191	76	4,479	5,555	1,389	258	0	0	54,887	54,792
N2	732	1,253	0	17	2,721	1,110	617	507	0	71	0	0	3,290	1,918	0	69	8,721	7,600	0	550	0	6	55,574	55,392
N3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0
NE2	495	881	224	69	0	1,621	1,310	1,446	346	133	0	0	789	503	0	25	1,264	1,482	0	50	0	0	33,655	33,734
NW2	1,875	194	0	20	0	168	0	117	0	0	0	0	0	637	0	35	666	2,070	0	401	0	8	8,920	8,940
NW3	0	0	0	0	0	0	0	0	0	5	0	0	0	21	0	0	0	50	0	7	0	0	19,743	19,658
S0	964	530	0	0	1,026	494	0	74	0	0	0	0	0	120	0	24	254	186	0	18	0	0	3,198	3,174
S3	1,537	208	28,627	29,417	1,560	2,198	10,171	11,368	1,649	2,817	0	6	0	205	0	9	784	140	0	0	0	0	52,140	51,980
SE1	682	3,917	1,059	498	16,094	14,194	7,796	8,129	0	354	0	0	880	1,048	1,628	12	2,272	1,812	0	67	0	0	50,376	50,442
SE2	1,355	2,026	1,882	3,733	9,412	11,252	42,923	37,762	2,032	3,815	0	15	748	855	468	55	0	1,077	0	41	0	0	85,184	85,462
SE3	0	865	2,828	5,579	2,860	3,715	27,591	23,188	22,081	20,176	3,076	3,476	0	239	0	7	1,392	437	0	49	0	0	73,273	73,240
SE4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0
SW1	3,995	2,008	0	53	1,267	1,771	200	733	0	31	0	0	17,157	17,042	642	955	8,902	8,292	600	907	0	7	43,457	43,365
SW3	510	235	0	0	384	263	0	162	0	10	0	0	1,342	1,311	38,814	37,321	248	813	331	185	0	94	41,859	41,940
W1	6,581	2,668	0	64	1,291	2,374	270	861	0	120	0	0	13,444	7,970	2,140	351	22,163	25,214	1,770	1,888	553	63	72,941	72,722
W2	548	661	0	40	622	644	0	155	0	8	0	0	6,119	2,939	0	200	5,845	6,079	2,860	4,109	0	123	23,392	23,370
W3	0	21	0	0	0	9	0	13	0	3	34	0	0	74	520	191	34	81	0	78	16,528	16,445	17,206	17,259
Grand Total	30,633	21,263	35,278	40,569	52,520	52,288	102,047	100,072	27,376	30,352	3,110	3,523	47,367	37,853	44,403	39,376	58,324	63,768	6,950	8,701	17,081	16,768	785,267	784,980



A4 – Home Based Education – Secondary

	CBD		E1		E2		E3		N0		N1		N2		N3		NE2		NW2		NW3	
	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith
CBD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E1	0	-	32,527	29,890	622	2,890	0	303	0	297	0	922	0	98	0	0	730	1,502	0	0	0	0
E2	0	-	7,626	5,764	26,150	28,316	4,669	2,955	0	15	0	234	0	62	0	0	919	928	0	0	0	0
E3	0	-	686	925	7,385	3,545	8,498	11,735	0	9	0	93	0	14	0	0	278	230	0	0	0	0
N0	0	-	0	528	0	20	0	0	2,794	1,008	74	573	0	95	0	0	0	84	0	20	0	0
N1	0	-	3,283	2,875	0	135	0	27	2,113	1,114	17,091	14,718	1,600	3,361	0	8	1,136	1,412	0	32	0	0
N2	0	-	0	603	0	51	0	0	584	126	980	2,726	18,416	16,274	851	17	2,111	3,638	0	63	0	0
N3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NE2	1,466	-	4,789	3,443	2,360	2,260	0	267	0	112	97	1,882	0	360	0	0	14,989	15,610	0	0	0	0
NW2	724	-	0	29	0	0	0	0	0	27	0	47	927	105	0	0	0	0	4,194	6,386	0	0
NW3	0	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	9,316	9,337	0
S0	0	-	0	849	0	30	0	0	0	302	0	113	0	136	0	0	0	42	0	0	0	0
S3	0	-	0	202	0	151	0	0	0	0	0	54	0	0	0	0	0	10	0	0	0	0
SE1	394	-	4,759	3,128	0	664	0	71	0	96	0	437	0	106	0	0	0	70	0	11	0	0
SE2	177	-	0	1,990	4,033	2,503	212	114	0	171	0	383	0	36	0	0	0	142	0	0	0	0
SE3	0	-	0	260	0	308	0	34	0	0	0	29	0	0	0	0	0	13	0	0	0	0
SE4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SW1	0	-	0	371	0	25	0	11	246	112	0	303	0	141	0	0	0	53	0	16	0	0
SW3	0	-	0	10	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0
W1	0	-	0	829	0	67	0	0	2,632	433	656	2,098	376	1,427	0	0	0	156	572	170	0	0
W2	0	-	0	54	0	0	0	0	0	0	0	76	0	13	0	0	0	25	265	55	0	0
W3	0	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0
Grand Total	2,761	0	53,670	51,750	40,550	40,965	13,379	15,517	8,369	3,822	18,898	24,688	21,319	22,236	851	25	20,163	23,915	5,031	6,763	9,316	9,337

	S0		S3		SE1		SE2		SE3		SE4		SW1		SW3		W1		W2		W3		Grand Total	
	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith
CBD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0
E1	280	245	0	47	6,917	3,755	0	588	0	78	-	-	0	54	0	0	0	291	0	0	0	0	41,076	40,960
E2	0	37	0	98	1,100	907	298	1,199	0	170	-	-	0	8	0	0	0	127	0	0	0	0	40,762	40,820
E3	0	0	0	0	0	169	0	81	0	9	-	-	0	25	0	0	0	25	0	0	0	0	16,847	16,860
N0	0	53	0	0	0	425	0	20	0	0	-	-	0	0	0	0	0	94	0	0	0	0	2,868	2,920
N1	1,016	342	0	6	921	1,530	0	185	0	6	-	-	0	80	0	12	2,009	3,268	0	9	0	0	29,169	29,120
N2	0	130	0	11	0	314	0	50	0	0	-	-	0	56	0	0	2,883	1,869	0	12	0	0	25,825	25,940
N3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0
NE2	0	55	0	0	1,066	398	0	84	0	17	-	-	0	27	0	0	0	285	0	0	0	0	24,767	24,800
NW2	0	15	0	0	0	53	0	0	0	0	-	-	0	24	0	0	1,440	539	0	15	0	0	7,285	7,240
NW3	0	0	0	0	0	0	0	0	0	0	-	-	0	0	0	0	0	0	0	0	0	0	9,316	9,340
S0	2,093	899	0	0	1,492	1,744	1,080	165	0	16	-	-	0	12	0	0	0	312	0	0	0	0	4,665	4,620
S3	0	17	28,039	25,955	0	426	620	1,657	522	705	-	-	0	23	0	0	0	30	0	0	0	0	29,181	29,220
SE1	1,231	448	0	40	14,733	14,753	1,107	2,073	0	169	-	-	0	10	0	0	0	204	0	0	0	0	22,224	22,280
SE2	2,955	208	0	1,027	6,538	7,088	29,897	28,814	1,118	1,988	-	-	0	51	0	0	0	265	0	0	0	0	44,930	44,780
SE3	371	21	0	108	682	517	412	1,453	18,079	17,137	-	-	0	0	0	0	0	0	0	0	0	0	19,544	19,680
SE4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0
SW1	778	79	0	0	518	694	0	104	0	0	-	-	14,001	13,638	612	20	956	1,547	0	66	0	0	17,111	17,180
SW3	0	0	0	0	0	24	0	0	0	0	-	-	584	45	22,984	23,550	0	23	0	0	0	0	23,568	23,660
W1	314	260	0	0	1,834	1,106	0	108	0	0	-	-	400	906	0	10	25,159	26,576	3,176	974	0	0	35,119	35,120
W2	0	0	0	0	0	25	0	0	0	0	-	-	0	76	0	0	1,066	344	4,872	5,552	0	0	6,205	6,220
W3	0	0	0	0	0	0	0	0	0	0	-	-	0	0	0	0	0	2	0	7	9,413	9,704	9,413	9,720
Grand Total	9,038	2,809	28,039	27,292	35,801	33,728	33,414	36,581	19,719	20,295	0	0	14,985	15,035	23,596	23,592	33,513	35,791	8,048	6,635	9,413	9,704	409,873	410,480



A5 – Home Based Education – Tertiary

	CBD		E1		E2		E3		N0		N1		N2		N3		NE2		NW2		NW3	
	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith
CBD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E1	3,133	1,695	7,384	8,361	1,028	48	0	74	7,363	7,567	2,739	1,925	0	232	-	0	0	13	0	0	0	0
E2	882	500	3,477	3,253	3,148	122	316	156	1,481	2,126	862	568	0	80	-	0	0	33	0	0	0	9
E3	0	249	1,255	1,332	1,742	77	898	400	672	1,124	0	343	192	60	-	0	0	71	0	0	0	0
N0	108	1,190	136	560	0	0	0	0	4,834	6,885	4,440	572	0	25	-	0	0	0	0	0	0	0
N1	2,881	2,187	1,606	2,270	0	19	0	25	8,345	11,873	7,402	6,928	3,036	967	-	0	937	28	0	58	0	0
N2	0	517	881	328	0	0	0	0	1,514	2,437	2,311	2,243	972	729	-	0	0	37	0	12	0	0
N3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NE2	253	454	2,002	2,712	0	16	330	15	3,451	2,207	1,767	2,248	354	468	-	8	740	228	0	0	0	17
NW2	0	207	0	10	0	0	0	0	394	1,029	0	169	0	140	-	0	0	0	844	411	0	0
NW3	110	18	0	25	0	0	0	0	0	128	0	20	0	5	-	0	0	0	108	0	4,297	4,509
S0	0	416	0	184	0	0	0	14	1,916	1,698	0	48	0	0	-	0	0	0	0	0	0	0
S3	332	274	263	291	0	0	0	0	444	1,070	0	69	0	9	-	0	0	0	0	8	0	0
SE1	3,754	1,892	1,738	2,170	0	0	0	0	6,449	8,859	0	796	0	47	-	0	0	11	0	10	0	0
SE2	2,126	1,166	2,755	2,224	0	118	412	9	4,114	5,497	0	500	329	105	-	15	0	7	0	0	0	0
SE3	0	225	403	532	0	0	0	0	189	1,275	0	39	0	0	-	0	0	0	0	13	0	0
SE4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SW1	2,374	933	0	438	0	0	0	12	1,303	3,509	0	250	959	109	-	0	165	0	0	10	0	41
SW3	0	187	0	91	0	0	0	0	550	640	0	56	0	15	-	0	0	0	0	0	0	0
W1	2,491	1,718	0	1,043	0	12	0	7	2,664	6,609	953	1,238	344	356	-	0	0	0	0	37	0	37
W2	0	271	820	239	0	0	0	0	889	1,185	0	117	0	22	-	0	0	0	0	126	0	0
W3	52	53	0	53	0	0	0	0	0	292	86	15	0	17	-	0	0	0	0	2	0	6
Grand Total	18,496	14,152	22,720	26,116	5,918	412	1,956	712	46,572	66,010	20,560	18,144	6,186	3,386	0	23	1,842	428	952	687	4,297	4,619

	S0		S3		SE1		SE2		SE3		SE4		SW1		SW3		W1		W2		W3		Grand Total	
	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith
CBD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0
E1	0	0	0	113	3,539	5,649	870	495	0	111	-	9	0	30	323	0	0	178	0	0	0	0	26,379	26,500
E2	0	0	0	85	1,064	3,559	0	579	0	76	-	8	0	23	0	32	0	51	0	0	0	0	11,230	11,260
E3	256	15	0	31	255	1,247	0	272	0	59	-	0	0	15	0	0	0	5	0	0	0	0	5,270	5,300
N0	0	0	0	0	0	228	0	0	0	0	-	0	0	0	0	0	0	40	0	0	0	0	9,518	9,500
N1	314	10	0	66	1,971	1,443	0	155	0	48	-	0	0	48	0	8	0	351	0	16	0	0	26,492	26,500
N2	0	0	0	0	422	287	0	41	0	0	-	0	0	35	0	0	474	154	231	0	0	0	6,805	6,820
N3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0
NE2	107	7	0	27	891	1,393	0	96	0	12	-	0	0	4	0	17	145	54	0	0	0	17	10,040	10,000
NW2	0	0	0	0	0	46	0	0	0	0	-	0	0	0	0	0	800	28	0	0	0	0	2,038	2,040
NW3	0	0	0	0	0	55	0	0	0	0	-	0	0	0	161	0	0	0	0	0	0	0	4,676	4,760
S0	0	6	0	0	0	530	319	0	21	0	0	0	0	0	0	0	276	14	0	0	0	0	2,722	2,720
S3	0	8	4,388	2,352	0	796	0	337	0	204	-	0	0	0	0	22	0	0	0	0	0	0	5,427	5,440
SE1	352	22	0	233	9,896	7,254	258	788	178	54	-	0	0	11	0	0	0	213	0	0	0	0	22,425	22,360
SE2	0	43	0	585	4,863	7,430	4,488	2,803	978	254	-	0	0	140	0	21	264	83	0	0	586	0	20,915	21,000
SE3	510	0	890	281	1,569	1,917	1,354	510	674	644	-	0	0	14	0	34	0	36	0	0	0	0	5,589	5,520
SE4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0
SW1	0	50	0	12	364	727	374	123	0	21	-	0	560	667	0	22	1,108	456	127	0	0	0	7,334	7,380
SW3	0	0	0	14	0	102	0	24	0	0	-	0	0	30	4,805	4,360	0	49	0	0	181	12	5,536	5,580
W1	0	53	0	107	450	1,146	0	164	0	15	-	0	581	39	0	23	6,047	1,008	0	8	0	0	13,530	13,620
W2	0	0	0	0	0	264	0	12	0	21	-	0	0	0	0	33	616	63	1,614	1,516	0	71	3,939	3,940
W3	0	2	0	4	0	36	0	0	0	0	-	0	0	6	96	21	0	6	0	0	4,442	4,087	4,676	4,600
Grand Total	1,539	216	5,278	3,910	25,614	33,898	7,344	6,420	1,830	1,519	0	17	1,141	1,062	5,385	4,593	9,730	2,789	1,972	1,540	5,209	4,187	194,541	194,840



A6 – Home Based Shopping

	CBD		E1		E2		E3		N0		N1		N2		N3		NE2		NW2		NW3	
	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith
CBD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E1	5,528	5,300	143,111	123,569	4,043	9,685	706	260	5,277	5,477	2,436	5,385	0	211	0	0	2,983	8,740	0	31	0	0
E2	1,726	371	19,529	26,408	128,418	120,824	6,178	6,016	879	426	410	698	494	97	0	0	2,417	3,628	0	0	298	0
E3	2,199	170	518	1,993	14,365	24,366	56,638	48,701	0	64	151	98	0	14	984	0	705	775	0	0	0	0
N0	3,227	8,970	1,455	1,584	0	24	0	0	21,198	15,170	1,061	1,217	0	0	0	0	0	132	0	0	0	0
N1	5,370	7,330	5,236	8,706	574	430	91	18	7,362	8,132	135,192	115,183	10,473	13,023	0	6	3,076	6,787	0	37	0	0
N2	691	806	1,013	871	0	47	0	21	866	1,067	7,009	7,700	54,159	48,527	0	10	3,425	3,750	0	106	0	0
N3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NE2	1,807	977	9,820	11,160	3,259	7,659	0	622	1,436	1,021	4,390	4,784	1,637	2,489	0	0	70,818	64,157	0	21	0	0
NW2	0	81	131	178	262	0	0	0	131	88	230	247	236	488	206	0	0	7	18,922	20,023	0	0
NW3	32	0	61	0	0	0	0	0	91	0	154	0	0	0	0	0	0	0	170	0	49,091	49,960
S0	2,065	4,767	723	1,132	0	68	0	0	1,239	706	0	233	0	32	0	0	0	0	0	0	0	0
S3	508	98	464	241	342	418	0	4	904	53	0	0	0	0	0	0	0	13	0	0	0	0
SE1	6,797	5,515	15,630	19,861	1,824	3,059	0	11	2,680	2,173	105	687	0	84	0	0	0	354	0	0	0	0
SE2	4,795	1,751	2,736	8,005	9,323	10,656	365	79	301	624	0	176	0	43	0	0	618	263	0	0	0	0
SE3	0	133	150	534	420	1,172	0	100	510	13	0	66	1,014	0	0	0	0	0	0	0	0	0
SE4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SW1	1,167	2,322	1,804	797	0	33	208	0	1,403	1,085	546	506	187	219	0	0	0	43	0	52	0	0
SW3	340	5	314	0	0	0	0	0	0	0	49	0	298	0	0	0	0	0	172	0	0	0
W1	3,944	5,270	0	1,578	0	117	0	0	4,336	5,861	3,361	6,393	363	4,680	0	0	0	468	204	324	0	0
W2	351	294	0	79	0	0	0	0	1,459	168	0	283	0	662	0	0	915	0	2,509	981	0	0
W3	0	1	0	0	0	0	0	0	30	0	0	0	106	0	0	0	0	0	0	5	0	0
Grand Total	40,547	44,161	202,695	206,696	162,830	178,558	64,186	55,832	50,102	42,128	155,094	143,656	68,967	70,569	1,190	16	84,957	89,117	21,977	21,580	49,389	49,960

	S0		S3		SE1		SE2		SE3		SE4		SW1		SW3		W1		W2		W3		Grand Total	
	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith
CBD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0
E1	1,296	1,179	0	39	11,846	17,175	2,995	2,946	258	141	0	0	278	80	188	0	0	778	0	0	0	0	180,945	180,996
E2	406	170	414	106	2,459	3,254	2,279	4,218	631	784	0	0	0	19	161	0	0	121	0	0	179	0	166,878	167,140
E3	0	85	281	26	171	329	0	493	1,369	506	0	0	0	0	0	0	0	0	0	0	0	0	77,381	77,620
N0	223	221	0	0	986	467	0	41	0	0	0	0	0	33	0	0	660	959	0	0	0	0	28,810	28,798
N1	700	1,185	115	17	1,448	2,703	91	248	0	0	0	0	712	402	0	0	8,484	14,405	0	96	0	0	178,924	178,708
N2	0	220	255	0	0	295	0	44	0	0	0	0	0	233	0	17	7,087	10,595	0	41	0	0	74,505	74,350
N3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0
NE2	257	136	0	0	1,021	1,067	0	252	0	25	0	0	0	0	307	0	0	430	0	0	0	0	94,752	94,800
NW2	254	0	0	0	0	4	0	0	0	0	0	0	0	33	0	0	1,565	726	0	65	0	0	21,937	21,940
NW3	0	0	0	0	198	0	0	0	0	0	0	0	0	0	0	0	39	0	0	0	0	0	49,836	49,960
S0	6,773	9,834	0	0	9,112	2,619	0	92	0	0	0	0	0	104	0	0	0	302	0	6	0	0	19,912	19,895
S3	914	56	123,772	129,269	888	247	5,652	3,632	2,568	1,712	0	6	0	0	0	0	0	11	0	0	0	0	135,812	135,740
SE1	6,051	4,203	671	135	133,876	125,525	7,473	14,089	155	158	129	0	777	315	0	0	363	699	0	0	483	0	177,014	176,868
SE2	130	676	1,556	3,254	15,273	18,374	138,854	129,120	2,292	3,979	0	0	247	31	493	0	0	210	0	0	0	0	176,983	177,241
SE3	0	53	0	1,243	174	434	3,096	7,694	75,463	70,097	3,866	3,141	0	0	0	0	0	0	0	0	0	0	84,693	84,660
SE4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0
SW1	798	1,324	0	17	1,672	1,066	0	114	0	25	0	0	72,217	69,834	248	44	6,610	9,151	0	338	0	0	86,860	86,970
SW3	66	0	0	0	0	5	0	0	0	0	0	0	546	93	122,743	124,326	0	5	0	0	233	6	124,761	124,440
W1	540	1,591	0	0	200	1,412	0	111	0	0	0	0	2,498	6,684	0	0	140,721	120,506	143	951	0	5	156,310	155,951
W2	0	78	0	0	0	9	0	0	0	0	0	0	274	808	0	0	2,549	6,730	27,874	25,956	217	12	36,148	36,060
W3	0	0	0	0	0	0	0	0	0	0	0	0	252	0	236	2	0	0	0	2	45,895	46,430	46,519	46,440
Grand Total	18,408	20,971	127,064	134,106	179,324	174,985	160,440	163,094	82,536	77,427	3,995	3,147	77,801	78,669	124,376	124,389	168,078	165,608	28,017	27,455	47,007	46,453	1,918,980	1,918,577



A7 – Home Based Recreation

	CBD		E1		E2		E3		N0		N1		N2		N3		NE2		NW2		NW3	
	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith
CBD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E1	5,112	4,545	95,472	83,697	6,310	10,645	514	663	6,952	6,336	6,507	9,648	0	808	59	0	8,900	8,185	240	25	0	0
E2	3,999	823	27,104	20,435	71,611	69,144	6,020	7,155	3,289	1,142	0	2,322	212	446	70	0	5,344	5,786	0	11	0	0
E3	193	261	2,449	3,661	15,701	16,794	35,102	29,644	408	215	913	615	0	102	0	31	608	2,296	0	0	0	0
N0	6,061	9,369	10,617	4,005	668	144	0	0	28,578	36,103	5,524	2,167	0	170	0	0	331	251	0	0	0	0
N1	5,587	4,122	7,527	10,403	2,942	1,460	0	77	11,854	8,167	76,232	66,755	6,586	8,424	257	34	5,825	7,595	622	110	0	7
N2	794	613	127	1,710	0	179	0	41	0	1,727	3,090	9,810	40,752	24,846	0	180	2,856	3,507	0	298	0	0
N3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NE2	2,488	847	7,974	12,946	4,324	7,146	170	1,135	978	1,776	5,451	10,063	3,994	4,509	0	8	51,254	35,472	0	64	0	0
NW2	0	178	0	167	0	15	0	0	0	279	0	545	515	855	0	0	0	57	11,856	9,073	0	17
NW3	197	17	0	5	0	0	0	0	357	10	84	6	0	4	0	3	0	4	224	28	35,111	36,411
S0	1,760	3,674	259	861	0	110	0	0	2,132	1,311	0	588	1,682	44	0	0	0	186	0	0	0	0
S3	635	275	170	583	565	919	366	56	1,337	216	374	183	0	16	0	0	1,574	88	0	0	0	0
SE1	9,697	4,670	10,621	18,234	2,881	4,001	0	194	5,419	4,487	1,225	3,650	0	427	19	0	972	1,555	0	0	0	0
SE2	1,265	1,752	5,436	8,642	2,634	7,052	520	437	0	1,444	2,186	1,015	0	129	0	0	0	818	0	0	0	0
SE3	0	215	744	1,974	411	2,784	0	417	996	225	0	111	0	11	0	0	0	129	0	0	0	0
SE4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SW1	1,805	1,374	1,899	1,279	0	58	0	0	1,318	1,650	190	1,798	0	893	0	0	165	198	0	99	0	0
SW3	424	111	0	103	0	29	0	9	0	66	0	79	0	26	0	0	0	0	341	0	0	0
W1	2,940	2,859	1,744	2,669	0	487	0	13	2,726	5,970	4,223	10,113	664	3,876	0	39	214	1,142	0	329	0	0
W2	256	198	0	174	0	0	0	0	0	298	139	804	0	696	0	0	1,880	54	480	387	0	0
W3	126	26	0	5	0	1	0	0	0	23	0	14	0	3	0	0	0	0	29	0	0	0
Grand Total	42,939	35,929	172,143	171,553	108,047	120,968	42,692	39,841	66,339	71,445	106,138	120,286	54,405	46,285	386	295	79,923	67,323	13,763	10,453	35,111	36,435

	S0		S3		SE1		SE2		SE3		SE4		SW1		SW3		W1		W2		W3		Grand Total	
	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith
CBD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0
E1	3,043	1,944	1,280	336	13,202	19,795	5,843	5,558	742	639	0	0	272	641	567	13	1,184	2,721	0	31	107	0	156,306	156,230
E2	0	490	876	541	4,942	7,256	2,072	8,014	657	2,056	149	23	0	105	0	5	0	526	0	0	0	0	125,945	126,280
E3	0	69	544	134	0	1,017	1,143	1,525	0	1,206	0	0	0	14	0	0	0	136	355	0	0	0	57,411	57,720
N0	1,769	725	0	0	586	1,293	0	197	0	27	1,202	0	0	94	0	0	0	745	0	30	0	0	55,336	55,320
N1	709	1,256	697	14	0	4,115	0	708	0	109	0	0	0	550	0	59	3,677	8,686	328	426	147	0	122,990	123,077
N2	0	402	422	0	0	664	0	148	0	0	0	0	0	543	0	24	3,618	6,534	0	494	0	0	51,659	51,720
N3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0
NE2	468	435	342	16	1,412	2,714	448	1,034	353	175	0	0	0	196	0	7	127	1,428	0	56	0	0	79,783	80,027
NW2	0	97	0	0	0	192	0	7	0	0	0	0	228	220	130	12	696	1,475	300	491	0	0	13,725	13,680
NW3	0	0	0	0	230	0	0	5	0	0	0	3	55	0	0	0	164	11	0	5	0	8	36,422	36,520
S0	13,884	12,165	0	0	2,852	2,687	0	276	0	12	0	0	454	419	0	0	0	667	0	0	0	0	23,023	23,000
S3	422	67	69,889	70,974	1,780	1,344	4,939	6,501	1,282	3,569	1,256	26	0	0	0	34	0	170	0	0	0	39	84,589	84,860
SE1	7,342	5,916	243	571	104,921	98,213	12,645	10,987	292	591	0	11	0	1,050	416	50	342	2,520	0	82	0	0	157,016	157,209
SE2	1,300	1,052	5,875	4,810	16,000	21,671	91,087	74,870	3,358	5,092	0	9	0	230	275	8	0	882	225	27	0	0	130,161	129,940
SE3	0	120	3,490	3,046	2,206	2,021	3,848	8,997	50,802	43,983	2,651	1,013	0	0	0	0	0	118	0	0	0	16	65,128	65,180
SE4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0
SW1	2,571	1,000	173	17	354	2,620	0	323	0	0	0	0	42,626	95,375	0	317	5,716	9,187	187	1,082	0	0	57,004	57,270
SW3	356	18	0	7	66	105	0	20	0	0	0	0	0	429	95,807	96,814	976	191	168	27	130	26	98,268	98,060
W1	2,159	1,334	0	12	258	2,947	228	459	0	93	0	0	2,801	4,105	1,566	77	65,592	48,242	1,231	1,741	364	0	86,710	86,507
W2	0	60	0	0	0	222	410	40	0	5	0	0	0	1,501	0	21	3,854	4,488	16,166	14,140	0	32	23,185	23,120
W3	0	0	0	0	0	19	0	6	0	0	0	0	90	1	126	18	0	31	49	30	30,889	31,034	31,280	31,240
Grand Total	34,023	27,150	83,831	80,478	148,809	168,895	122,663	119,675	57,486	57,357	5,238	1,085	46,526	45,473	98,887	97,459	85,946	88,758	19,009	18,662	31,637	31,155	1,455,941	1,456,960



A8 – Home Based Other

	CBD		E1		E2		E3		N0		N1		N2		N3		NE2		NW2		NW3	
	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith
CBD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E1	1,489	2,568	149,506	133,317	2,039	9,568	180	231	4,735	4,527	3,354	6,237	6,479	405	0	0	6,397	12,533	0	0	0	0
E2	777	204	24,571	21,718	144,895	147,435	9,306	8,987	708	406	287	640	2,470	86	0	13	6,056	5,780	0	0	0	0
E3	0	106	1,197	1,924	22,961	30,711	68,832	59,571	0	45	0	94	762	29	298	5	816	1,372	0	0	0	0
N0	3,303	2,688	1,181	2,481	800	14	0	0	15,862	12,902	709	3,091	293	149	0	0	0	198	0	0	0	0
N1	1,672	2,859	7,180	9,020	805	536	0	38	7,707	6,894	135,776	116,408	4,904	13,871	0	0	2,818	5,851	0	91	0	0
N2	679	617	640	738	0	72	0	8	0	780	8,852	15,961	104,370	85,382	132	21	3,269	4,907	0	320	0	0
N3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NE2	0	470	13,116	13,474	4,724	7,981	0	727	992	1,182	4,546	7,794	3,701	4,419	157	3	90,613	80,385	0	0	0	0
NW2	0	0	0	0	0	0	0	0	120	15	0	348	0	678	0	0	0	19	24,436	22,033	0	0
NW3	188	0	0	0	0	0	0	0	0	0	64	0	54	0	219	0	0	0	14	54,509	55,326	0
S0	407	2,261	424	1,141	0	78	0	0	2,352	800	0	400	252	91	0	0	0	23	0	0	0	0
S3	570	0	581	121	2,039	304	0	11	152	0	0	0	0	0	0	0	0	0	0	691	0	0
SE1	1,465	2,254	15,044	18,379	3,854	3,077	0	35	1,849	1,429	241	862	805	15	0	0	357	410	0	6	0	0
SE2	1,546	301	2,260	6,513	8,766	8,665	211	181	220	496	522	233	678	11	226	0	0	199	0	0	0	0
SE3	0	39	520	464	2,552	1,200	0	137	0	42	0	9	0	0	0	0	0	117	0	0	0	0
SE4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SW1	820	1,237	252	382	112	6	0	0	2,231	709	0	486	382	238	0	0	376	27	0	5	0	0
SW3	156	0	0	0	0	0	0	0	121	4	47	0	808	0	0	0	0	0	0	0	0	0
W1	2,422	2,214	0	1,206	186	115	0	15	2,754	5,105	2,895	13,034	1,020	5,094	0	0	234	349	0	356	0	0
W2	0	49	0	23	0	0	0	0	940	118	0	349	0	296	0	0	341	19	1,093	883	0	0
W3	128	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0
Grand Total	15,622	17,867	216,472	210,901	193,733	209,762	78,529	69,941	40,743	35,454	157,293	165,946	126,978	110,764	1,032	42	111,277	112,189	25,529	23,711	55,200	55,326

	S0		S3		SE1		SE2		SE3		SE4		SW1		SW3		W1		W2		W3		Grand Total	
	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith	VISTA	Zenith
CBD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0
E1	2,722	1,113	740	70	9,656	15,381	1,897	2,433	0	222	0	0	0	184	286	0	404	860	0	0	0	0	189,884	189,649
E2	164	127	113	145	2,336	3,977	2,420	5,388	1,121	1,411	0	0	0	8	0	0	330	115	0	0	0	0	195,554	196,440
E3	583	35	0	11	0	410	294	738	0	849	0	0	0	0	0	0	0	0	0	0	0	0	95,743	95,900
N0	0	205	0	18	203	848	0	49	0	0	0	0	0	47	0	0	2,308	1,814	0	18	0	0	24,659	24,520
N1	615	655	0	0	1,522	1,709	466	124	0	0	0	0	950	233	0	0	7,855	13,924	0	182	0	0	172,270	172,395
N2	0	235	184	0	0	212	0	26	0	0	0	0	0	249	0	0	2,872	10,985	0	417	0	0	120,998	120,930
N3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0
NE2	0	258	0	18	654	1,107	0	350	0	36	0	0	0	15	0	0	0	611	0	22	0	0	118,503	118,852
NW2	0	38	0	0	0	3	0	0	0	0	0	0	0	75	0	0	439	1,282	0	369	0	0	24,995	24,860
NW3	0	0	0	0	0	0	0	0	0	0	39	0	0	0	0	0	0	0	0	0	0	0	55,073	55,340
S0	5,611	7,032	0	0	7,181	4,075	130	132	0	0	0	0	0	203	0	0	348	446	0	18	0	0	16,705	16,700
S3	0	0	129,731	196,997	2,805	280	3,984	3,446	2,005	2,273	0	8	0	0	0	0	0	0	0	0	0	0	142,558	142,840
SE1	7,076	3,247	476	73	120,489	113,590	5,000	12,561	0	193	0	0	0	117	0	0	0	472	0	0	0	0	156,656	156,720
SE2	1,536	505	1,517	2,942	24,903	30,992	168,501	158,571	5,944	7,510	0	0	0	48	0	0	0	120	0	13	0	0	216,830	217,300
SE3	0	12	2,758	2,851	1,115	520	7,137	7,411	129,471	128,500	1,156	5,261	0	17	0	0	0	0	0	0	0	0	144,667	144,580
SE4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0
SW1	332	1,004	0	0	417	863	0	43	0	0	0	0	104,230	97,375	0	115	4,710	11,699	370	573	0	0	114,232	114,762
SW3	0	0	0	0	0	8	111	0	0	0	0	0	0	134	121,732	122,937	378	22	130	15	0	0	123,483	123,120
W1	3,317	917	0	0	423	1,051	0	107	0	0	0	0	4,363	7,281	0	17	148,875	125,493	898	4,729	0	0	167,387	167,083
W2	0	76	0	0	0	56	0	0	0	0	0	0	0	719	295	13	5,339	6,561	27,978	26,758	0	0	35,986	35,920
W3	0	0	0	0	0	0	0	0	0	0	0	0	166	0	0	0	0	0	0	4	46,290	46,293	46,584	46,300
Grand Total	21,956	15,457	135,499	142,525	171,702	175,082	189,940	191,379	138,541	140,994	1,175	3,269	109,709	106,705	122,313	123,082	173,858	174,404	29,376	33,118	46,290	46,293	2,162,767	2,164,211



Appendix B – Scatter Plots of Sector to Sector Movements

B1 – All Home Based Purposes

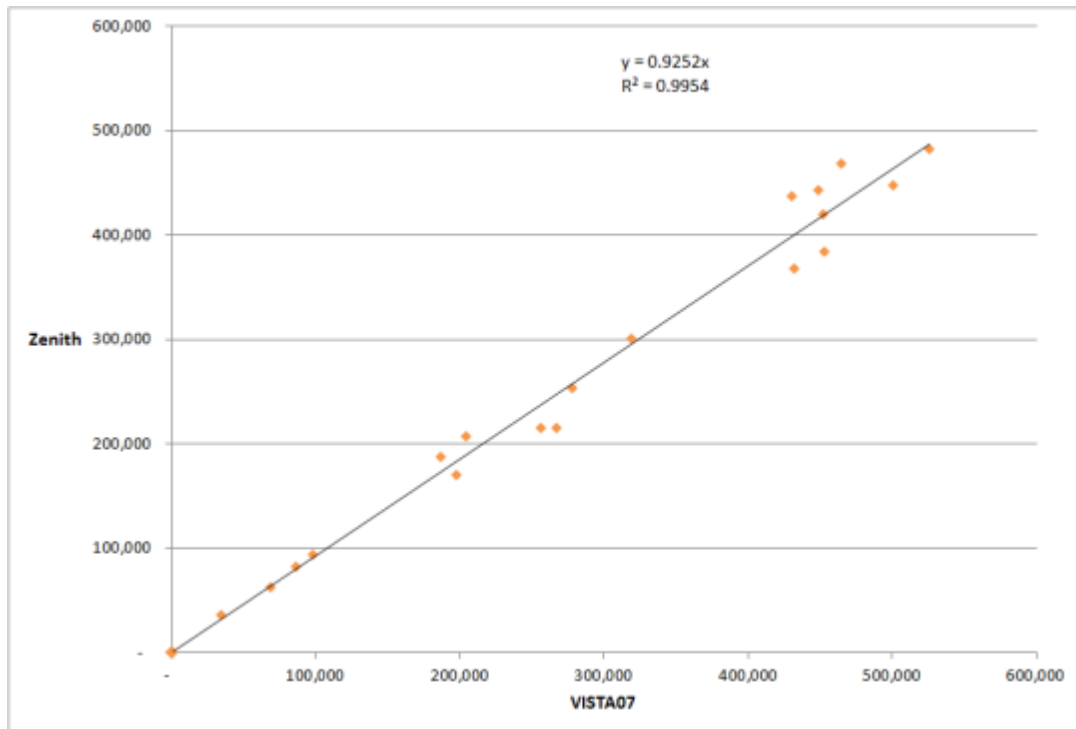


Figure B1 (a) - Intra-Sector Movements - All Home Based Purposes

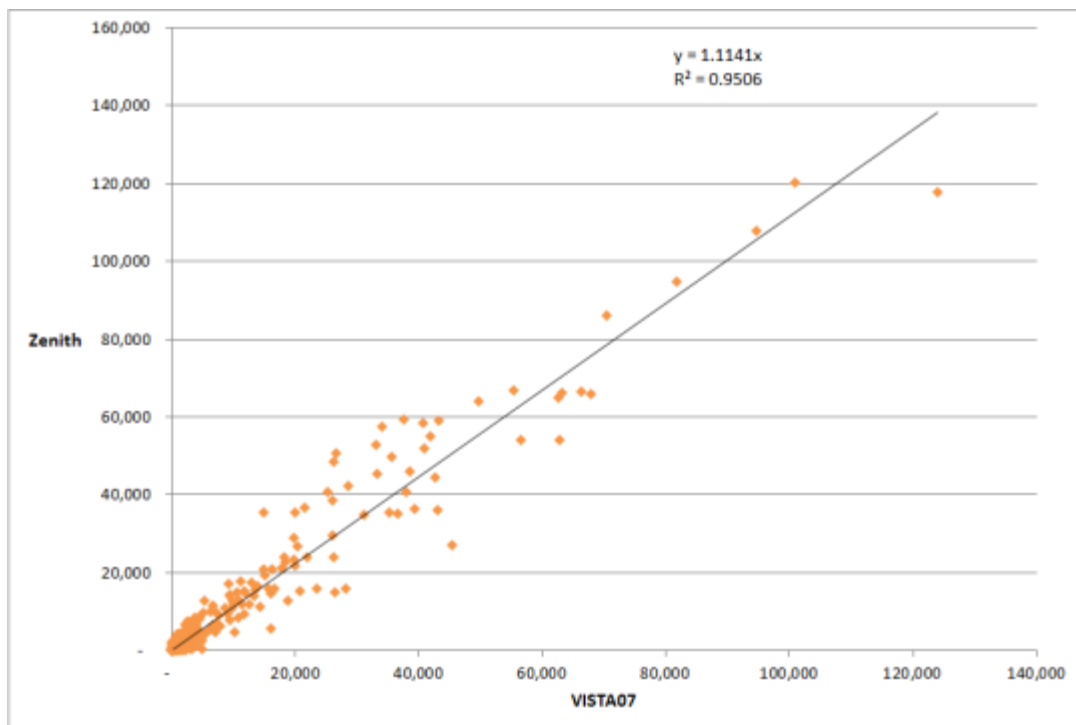


Figure B1 (b) - Inter-Sector Movements - All Home Based Purposes



B2 – Home Based Work – White Collar

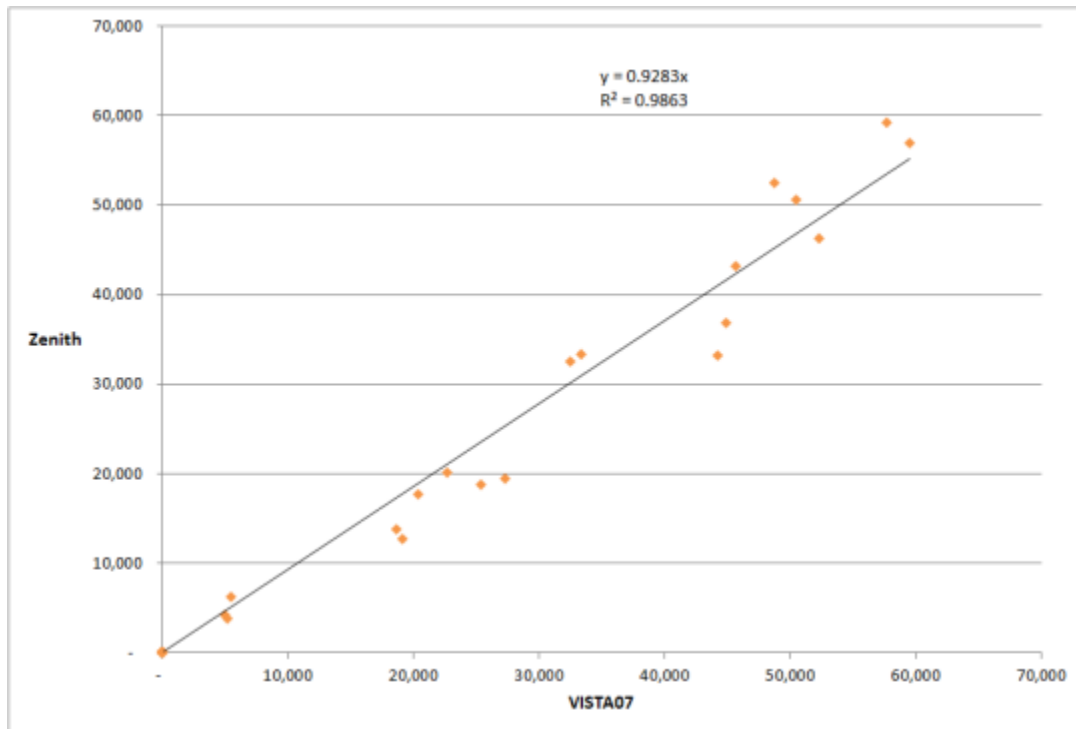


Figure B2 (a) - Intra-Sector Movements - Home Based Work (White Collar)

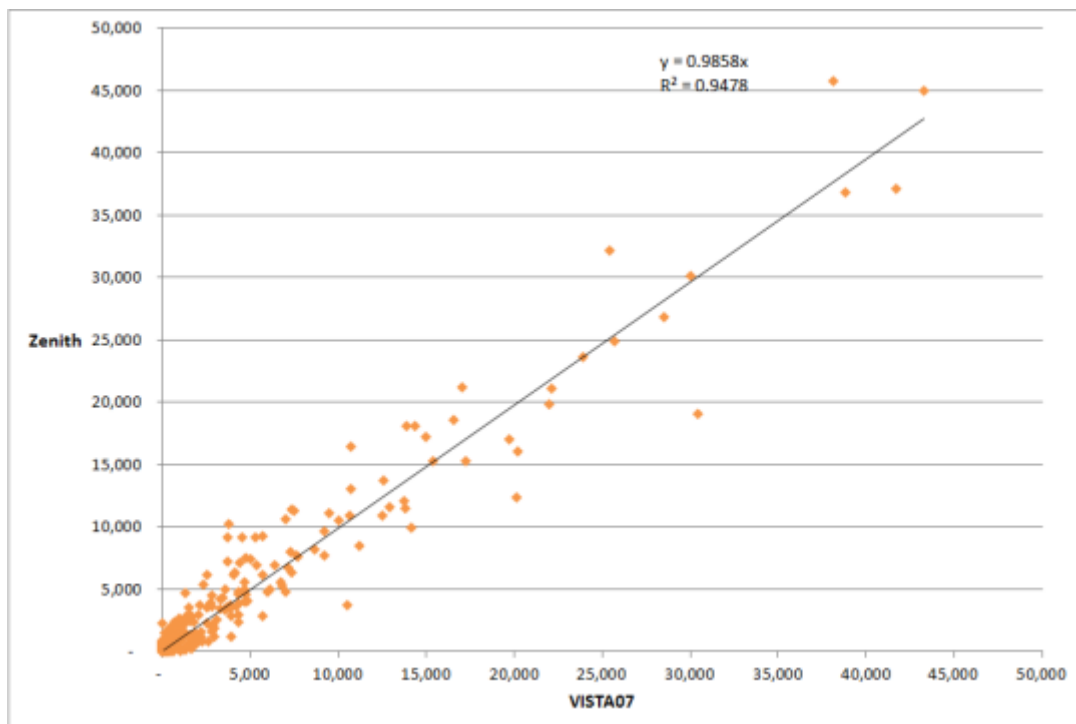


Figure B2 (b) - Inter-Sector Movements - Home Based Work (Blue Collar)



B3 – Home Based Work – Blue Collar

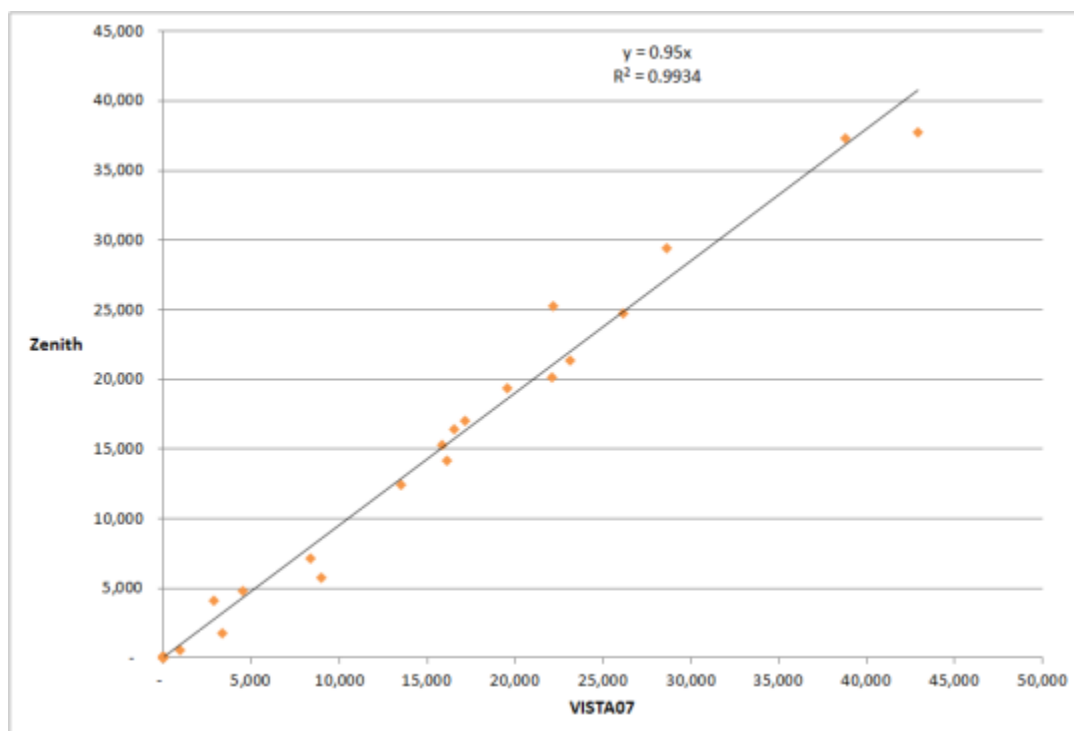


Figure B3 (a) - Intra-Sector Movements - Home Based Work (Blue Collar)

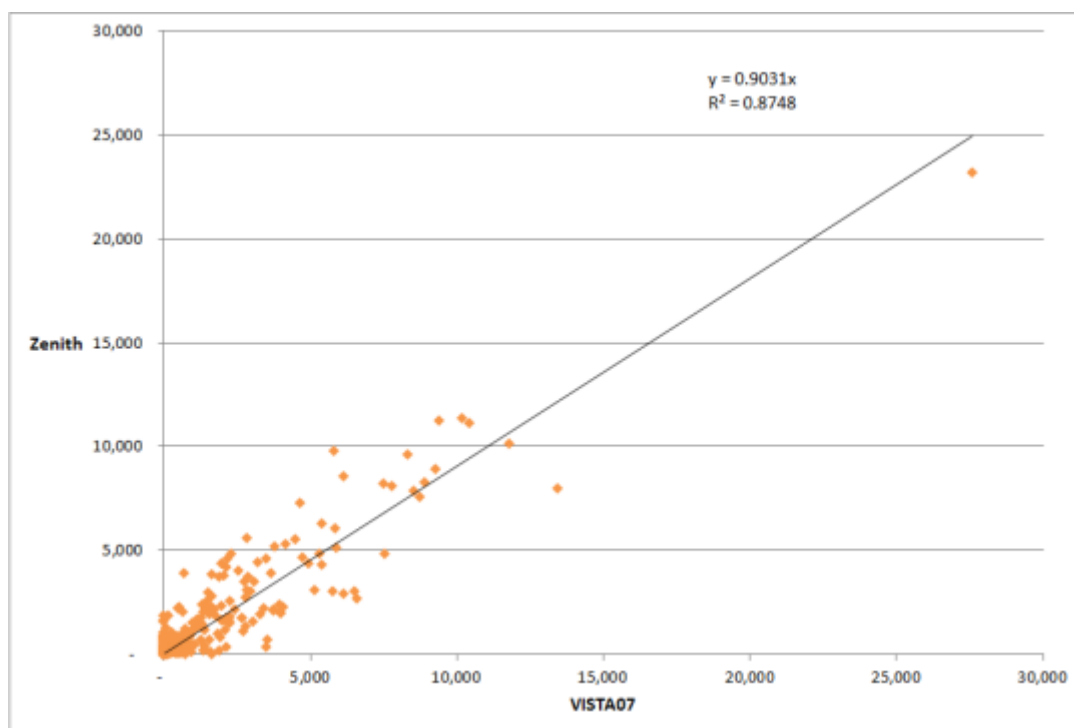


Figure B3 (b) - Inter-Sector Movements - Home Based Work (Blue Collar)



B4 – Home Based Education – Secondary

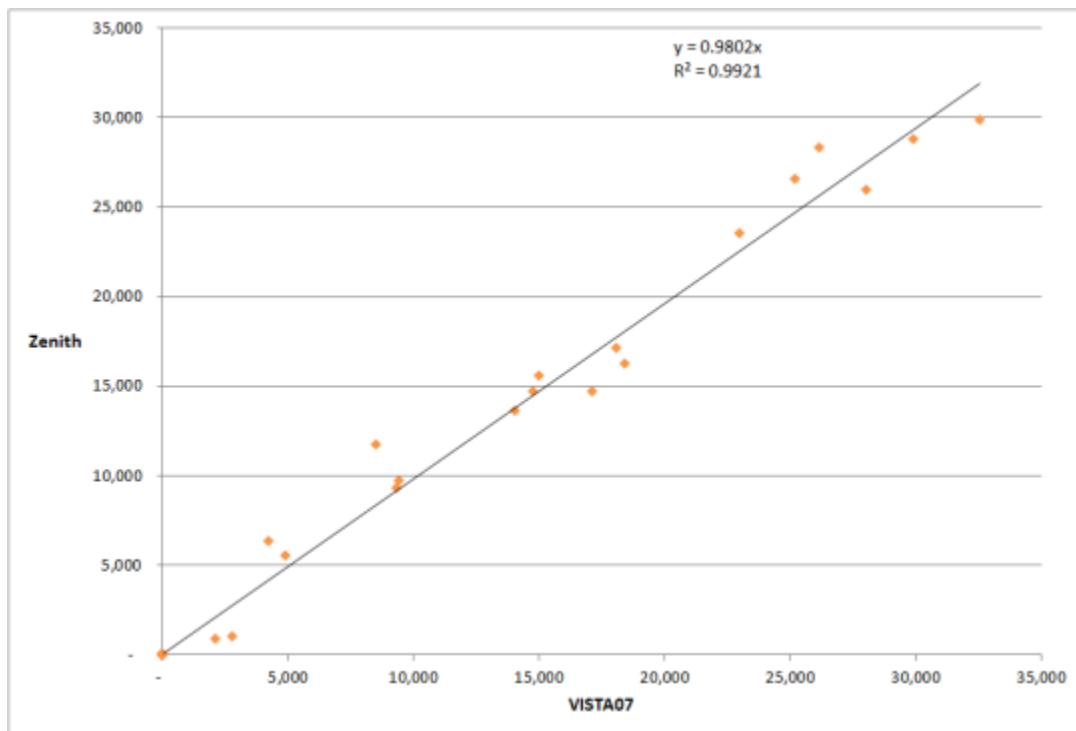


Figure B4 (a) - Intra-Sector Movements - Home Based Education (Secondary)

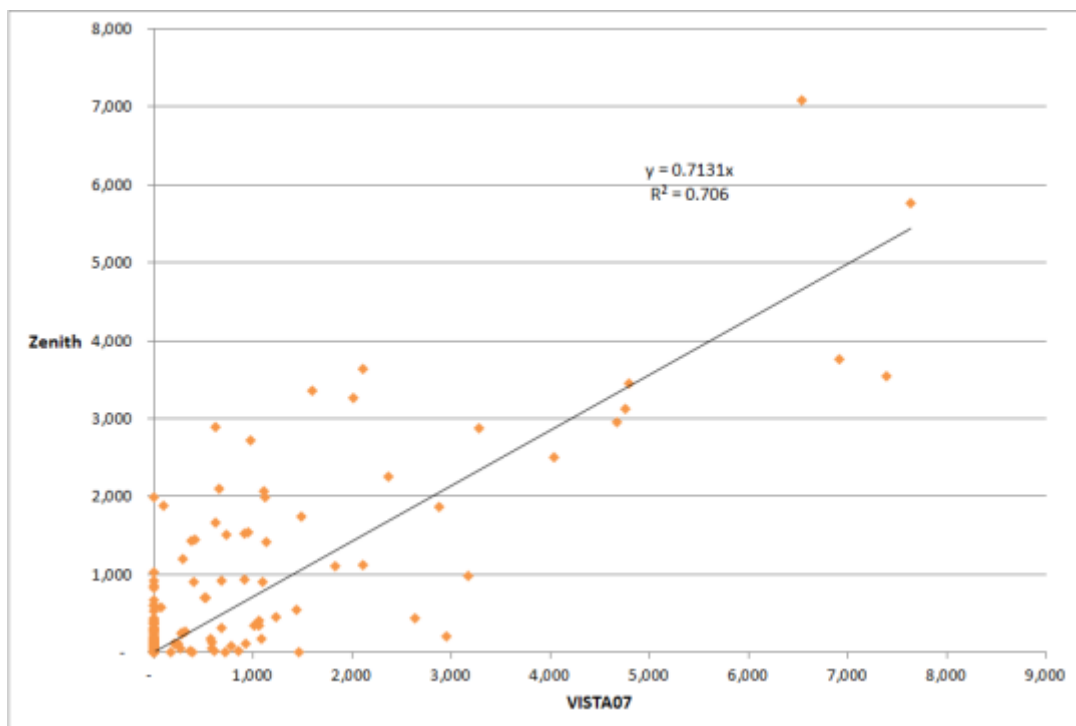


Figure B4 (b) - Inter-Sector Movements - Home Based Education (Secondary)



B5 – Home Based Education – Tertiary

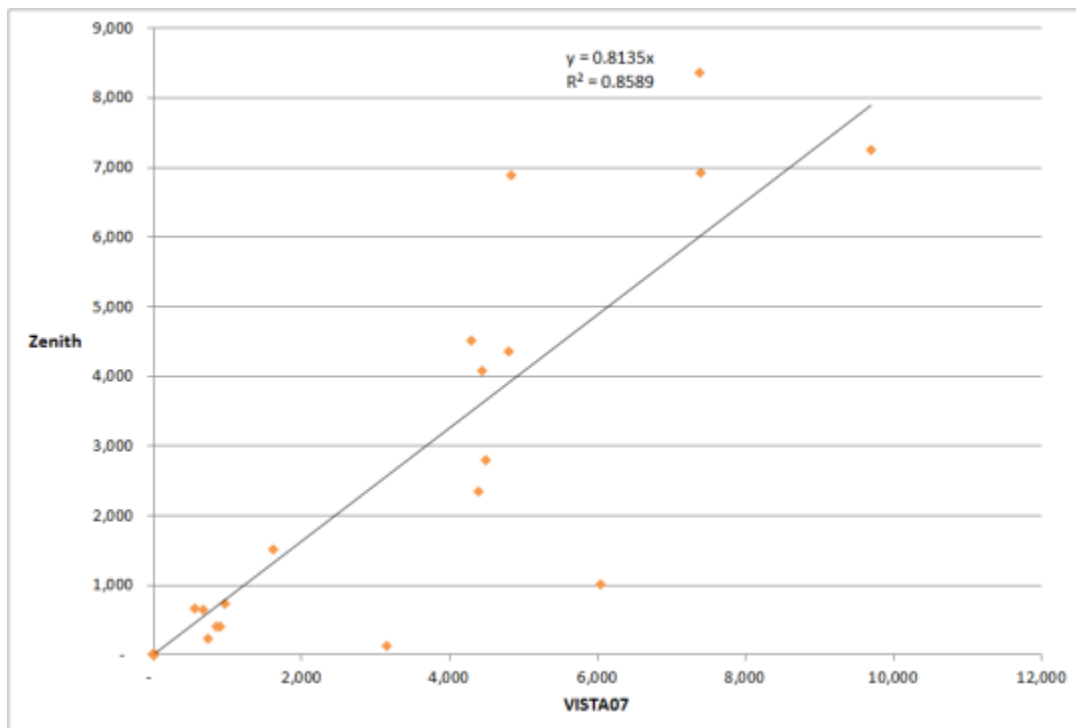


Figure B5 (a) - Intra-Sector Movements - Home Based Education (Tertiary)

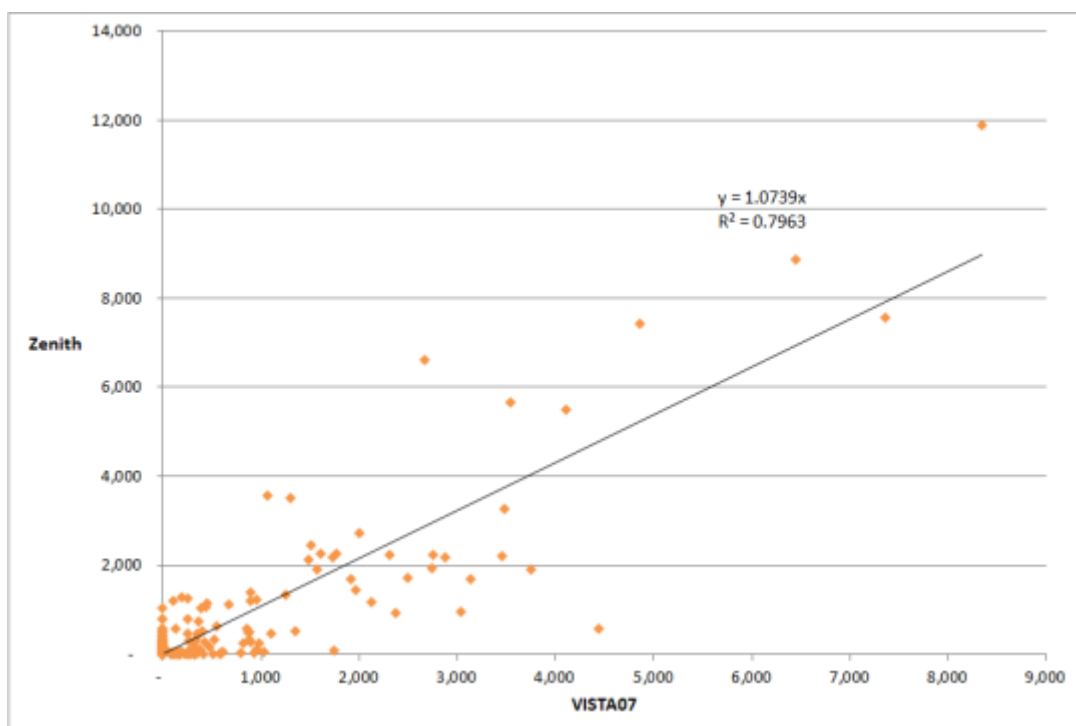


Figure B5 (b) - Inter-Sector Movements - Home Based Education (Tertiary)



B6 – Home Based Shopping

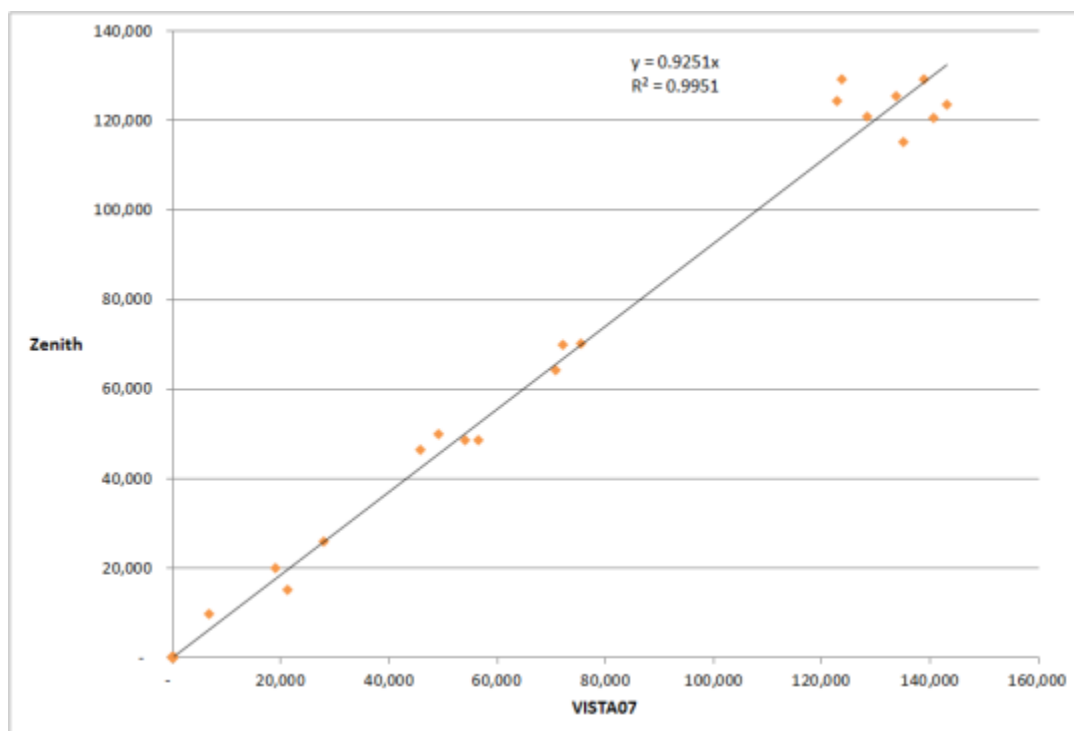


Figure B6 (a) - Intra-Sector Movements - Home Based Shopping

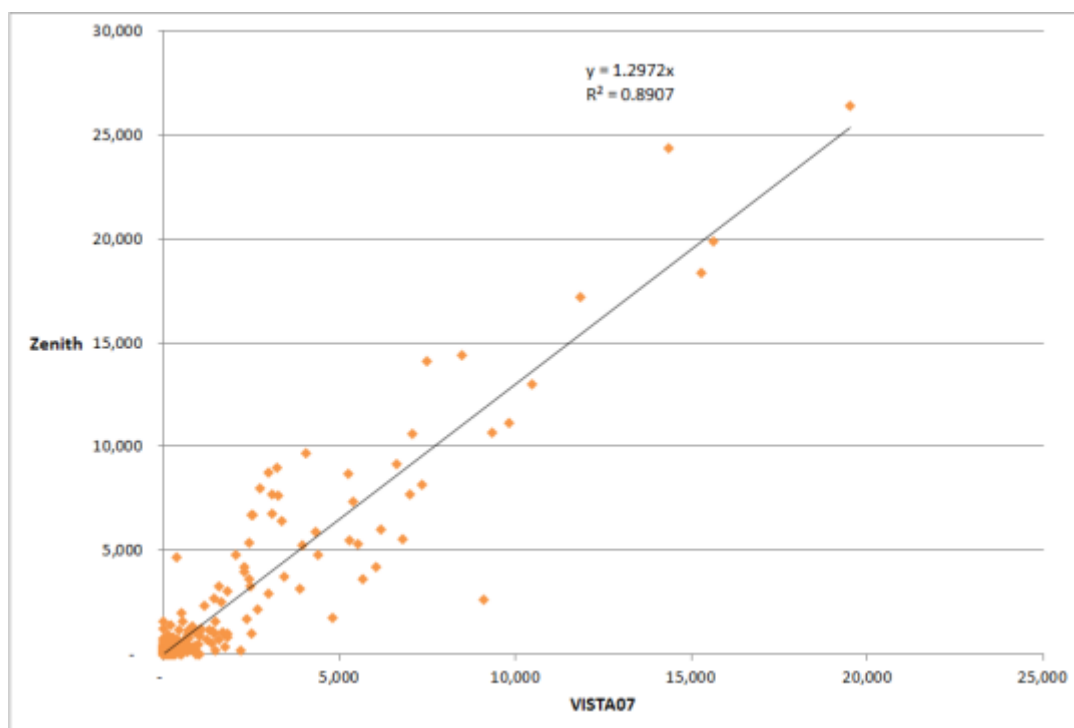


Figure B6 (b) - Inter-Sector Movements - Home Based Shopping



B7 – Home Based Recreation

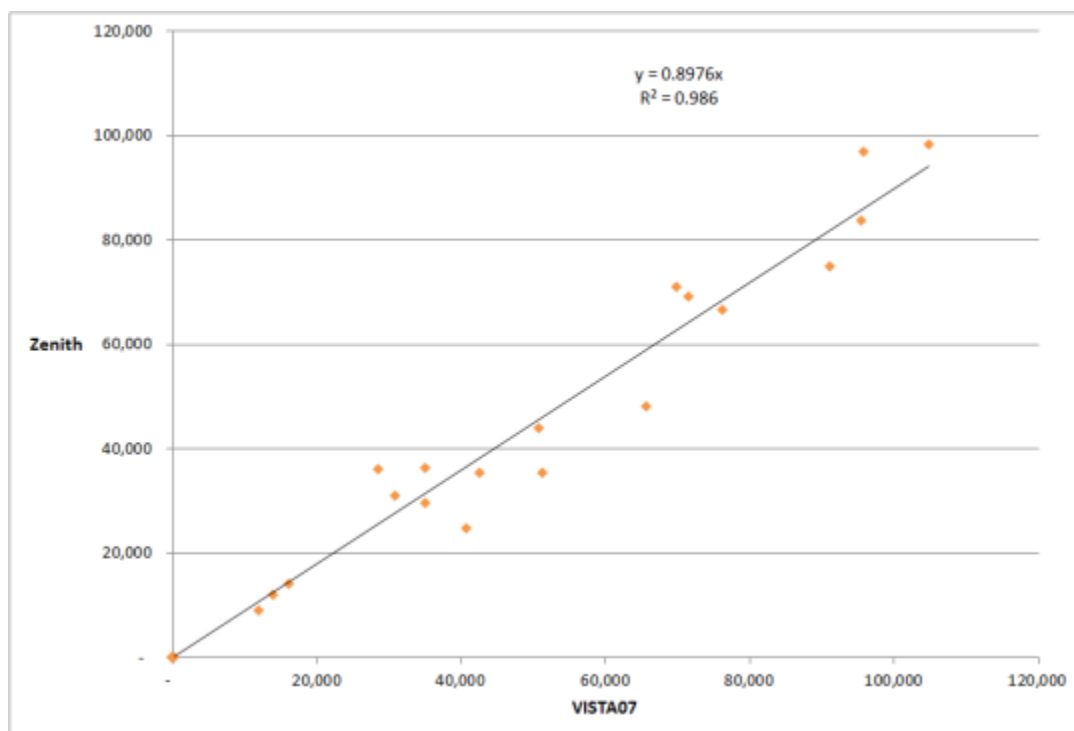


Figure B7 (a) - Intra-Sector Movements - Home Based Recreation

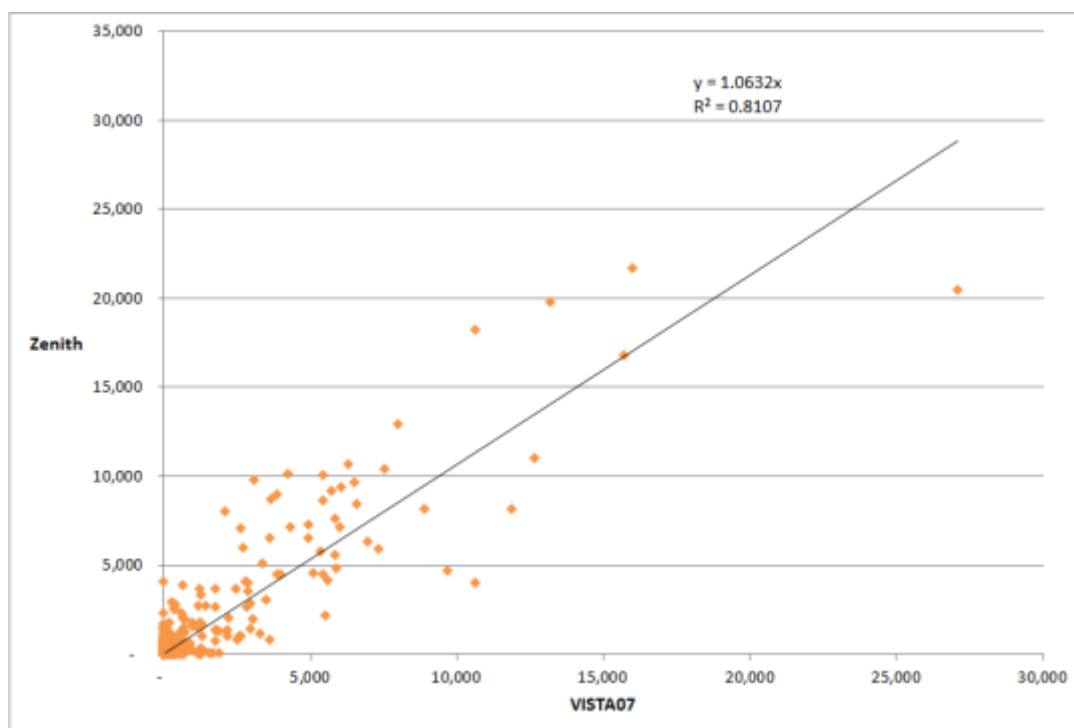


Figure B7 (b) - Inter-Sector Movements - Home Based Recreation



B8 – Home Based Other

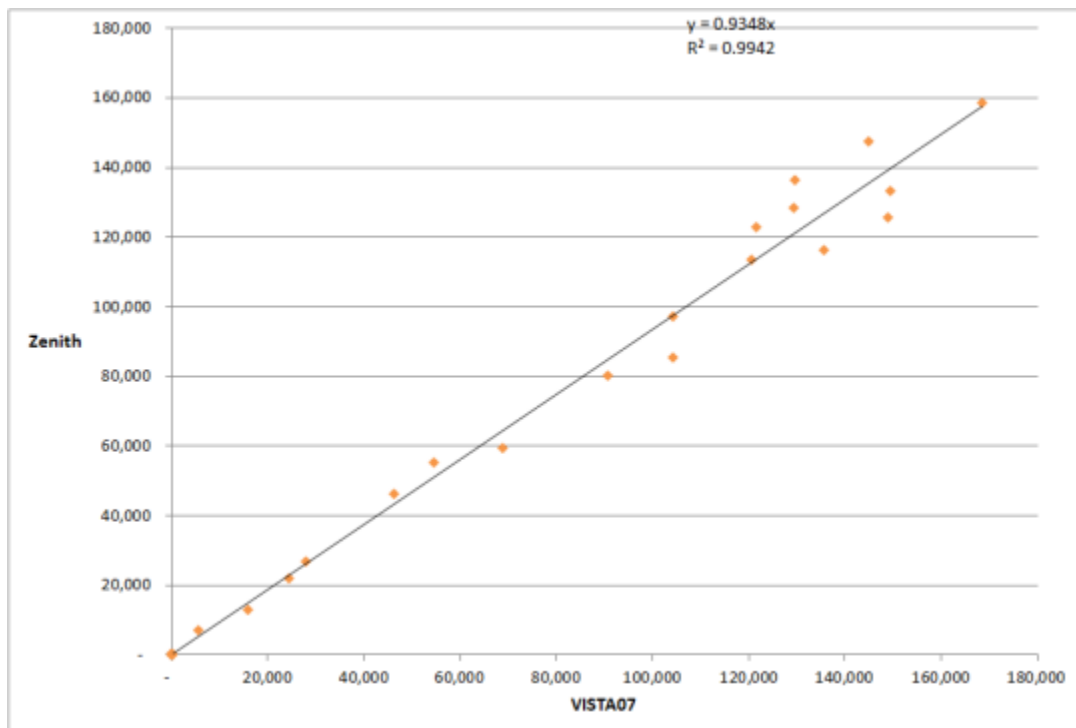


Figure B8 (a) - Intra-Sector Movements - Home Based Other

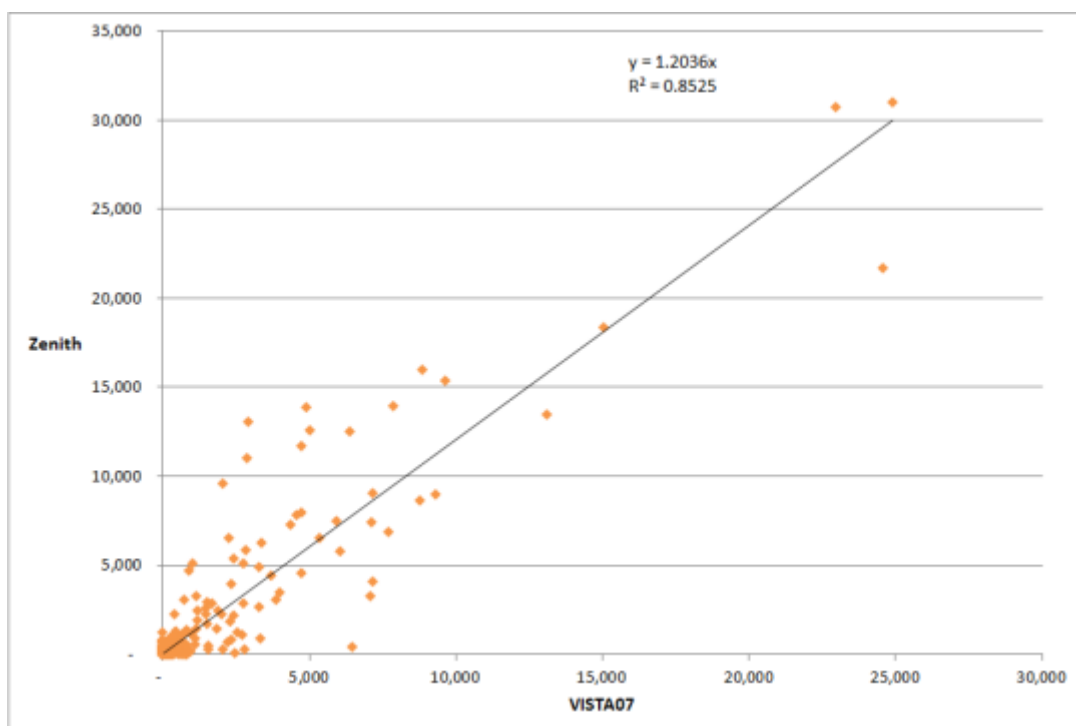


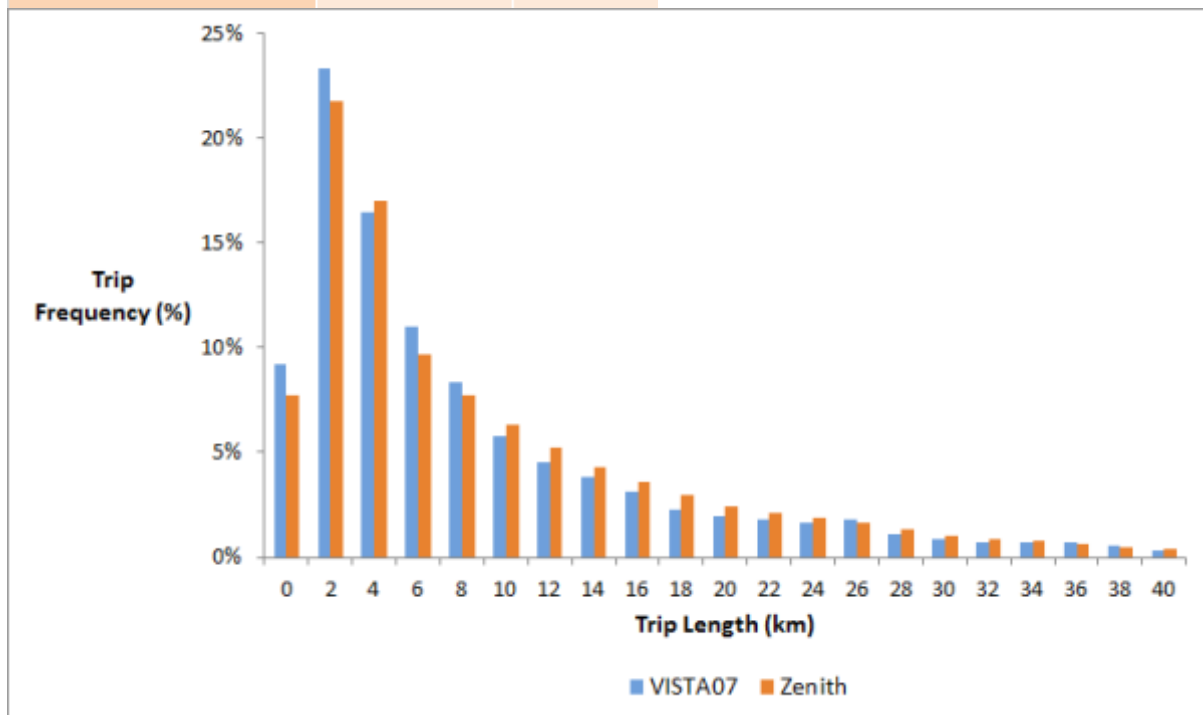
Figure B8 (b) - Inter-Sector Movements - Home Based Other



Appendix C – Trip Length Frequency Distributions

C1 – All Home Based Purposes

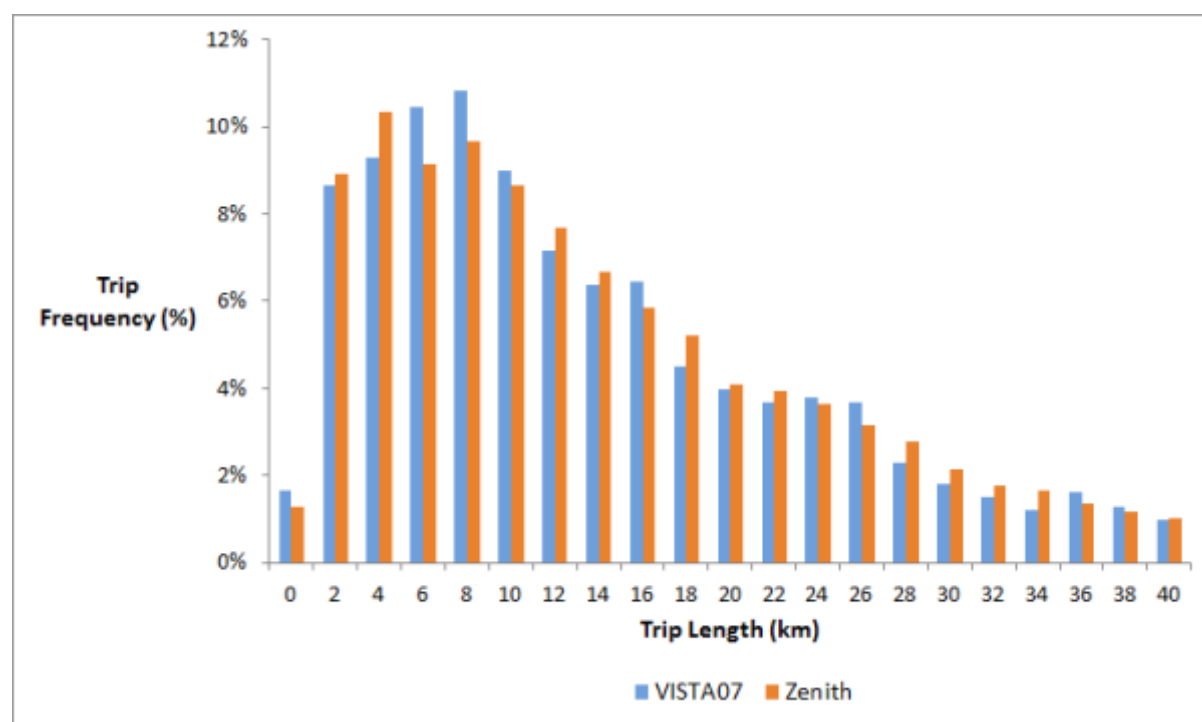
Trip Length (km)	VISTA07	Zenith
0	9.2%	7.8%
2	23.3%	21.8%
4	16.5%	17.0%
6	11.0%	9.7%
8	8.4%	7.8%
10	5.8%	6.3%
12	4.5%	5.3%
14	3.9%	4.3%
16	3.1%	3.6%
18	2.3%	3.0%
20	2.0%	2.4%
22	1.8%	2.1%
24	1.7%	1.9%
26	1.8%	1.6%
28	1.1%	1.3%
30	0.9%	1.0%
32	0.7%	0.8%
34	0.7%	0.7%
36	0.7%	0.6%
38	0.5%	0.5%
40	0.3%	0.4%
Grand Total	100.0%	100.0%





C2 – Home Based Work – White Collar

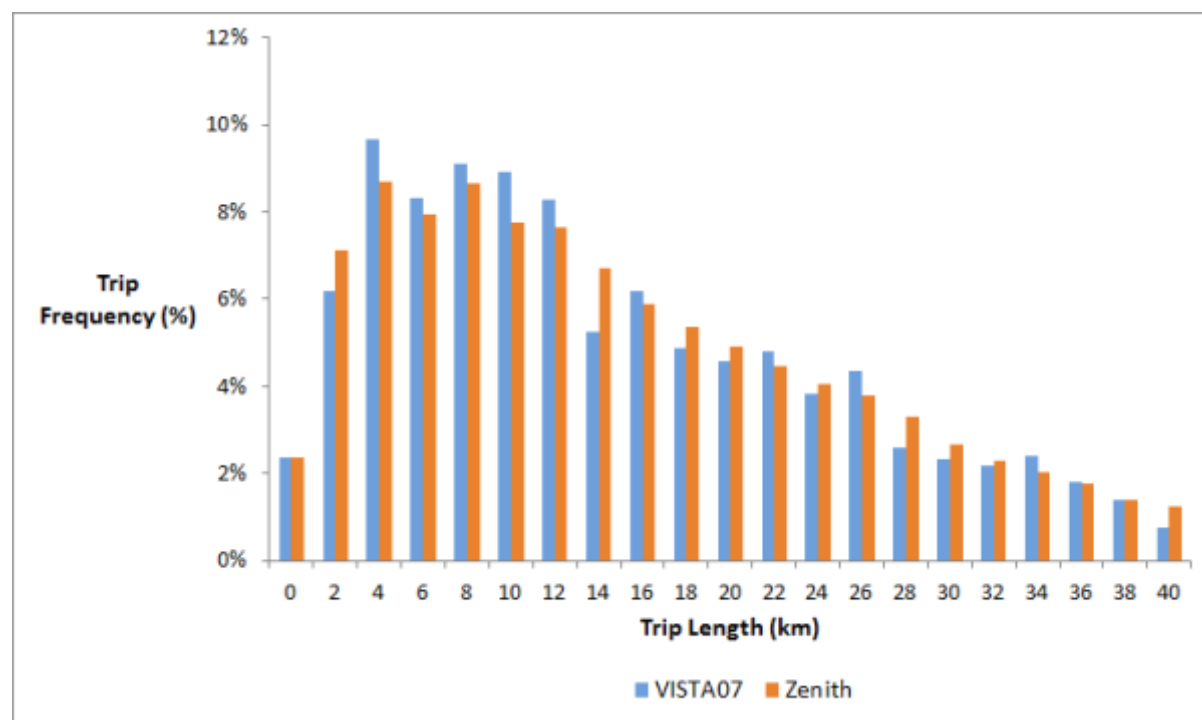
Trip Length (km)	VISTA07	Zenith
0	1.7%	1.3%
2	8.7%	8.9%
4	9.3%	10.4%
6	10.5%	9.1%
8	10.8%	9.7%
10	9.0%	8.6%
12	7.2%	7.7%
14	6.4%	6.7%
16	6.4%	5.8%
18	4.5%	5.2%
20	4.0%	4.1%
22	3.7%	3.9%
24	3.8%	3.6%
26	3.7%	3.1%
28	2.3%	2.8%
30	1.8%	2.1%
32	1.5%	1.8%
34	1.2%	1.7%
36	1.6%	1.4%
38	1.3%	1.2%
40	1.0%	1.0%
Grand Total	100.0%	100.0%





C3 – Home Based Work – Blue Collar

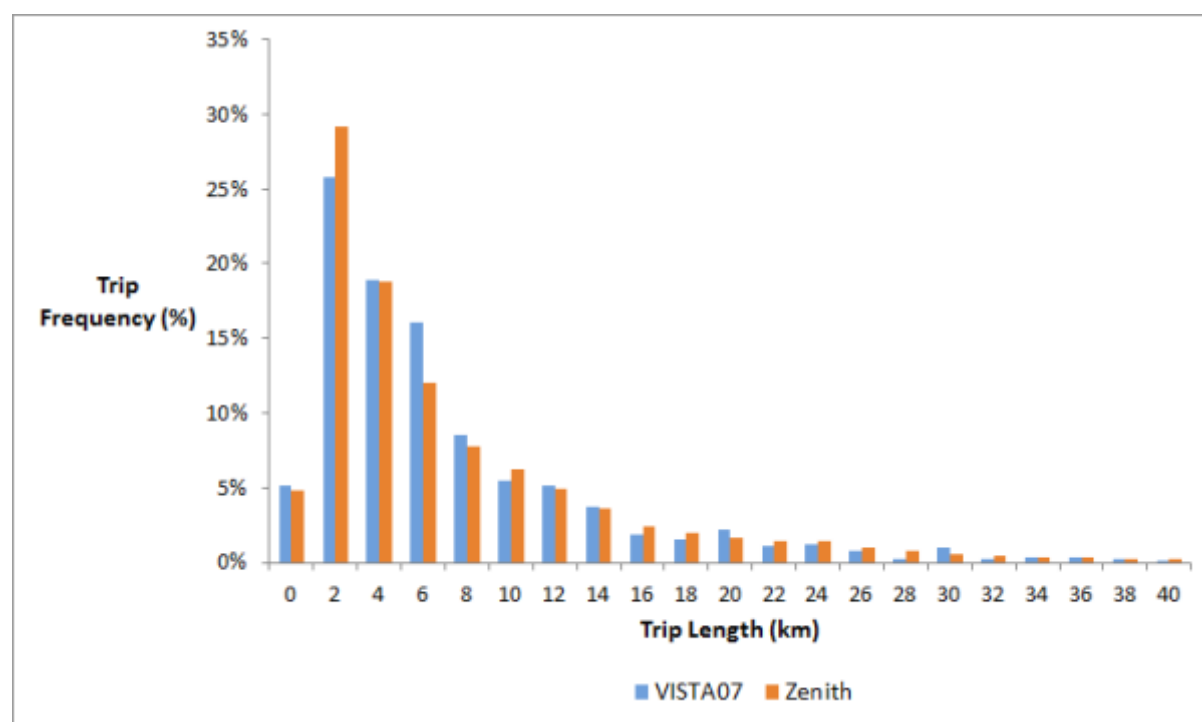
Trip Length (km)	VISTA07	Zenith
0	2.4%	2.4%
2	6.2%	7.1%
4	9.7%	8.7%
6	8.3%	7.9%
8	9.1%	8.6%
10	8.9%	7.8%
12	8.3%	7.6%
14	5.3%	6.7%
16	6.2%	5.9%
18	4.9%	5.3%
20	4.6%	4.9%
22	4.8%	4.5%
24	3.8%	4.1%
26	4.3%	3.8%
28	2.6%	3.3%
30	2.3%	2.7%
32	2.2%	2.3%
34	2.4%	2.0%
36	1.8%	1.8%
38	1.4%	1.4%
40	0.8%	1.2%
Grand Total	100.0%	100.0%





C4 – Home Based Education – Secondary

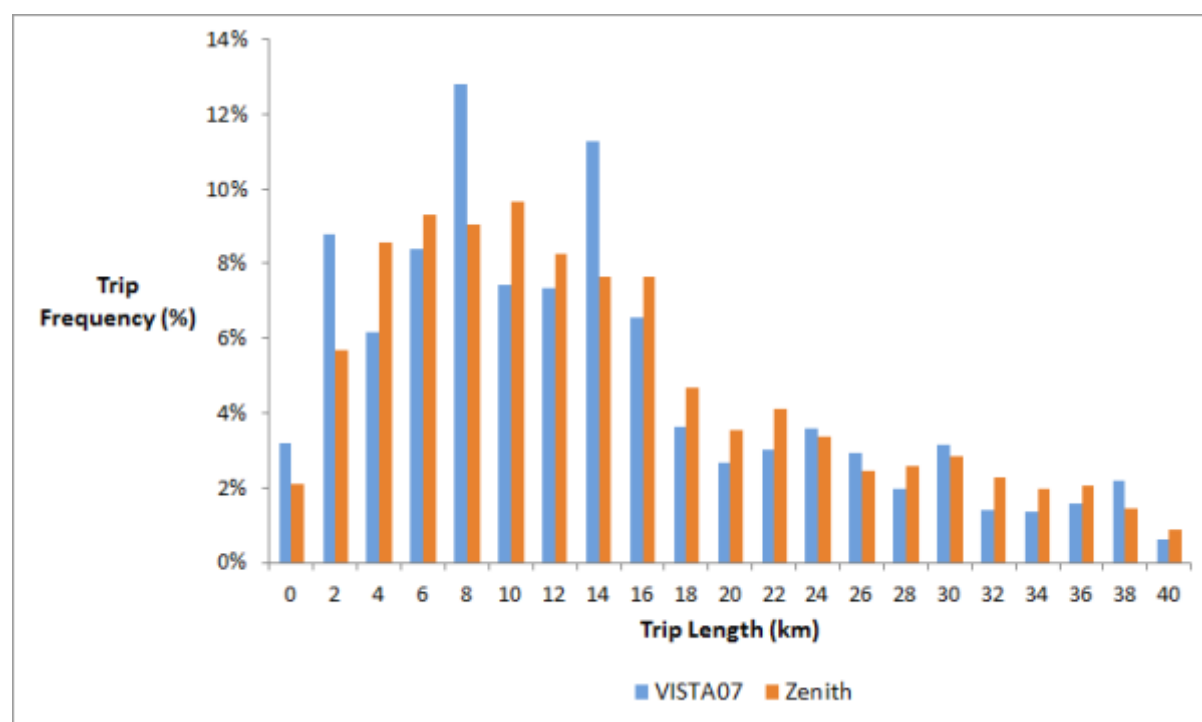
Trip Length (km)	VISTA07	Zenith
0	5.1%	4.8%
2	25.8%	29.2%
4	18.9%	18.8%
6	16.1%	12.0%
8	8.5%	7.8%
10	5.4%	6.2%
12	5.1%	4.9%
14	3.8%	3.7%
16	1.9%	2.4%
18	1.5%	1.9%
20	2.2%	1.6%
22	1.1%	1.5%
24	1.2%	1.4%
26	0.7%	1.0%
28	0.3%	0.8%
30	1.0%	0.5%
32	0.3%	0.4%
34	0.3%	0.4%
36	0.3%	0.4%
38	0.3%	0.2%
40	0.1%	0.2%
Grand Total	100.0%	100.0%





C5 – Home Based Education – Tertiary

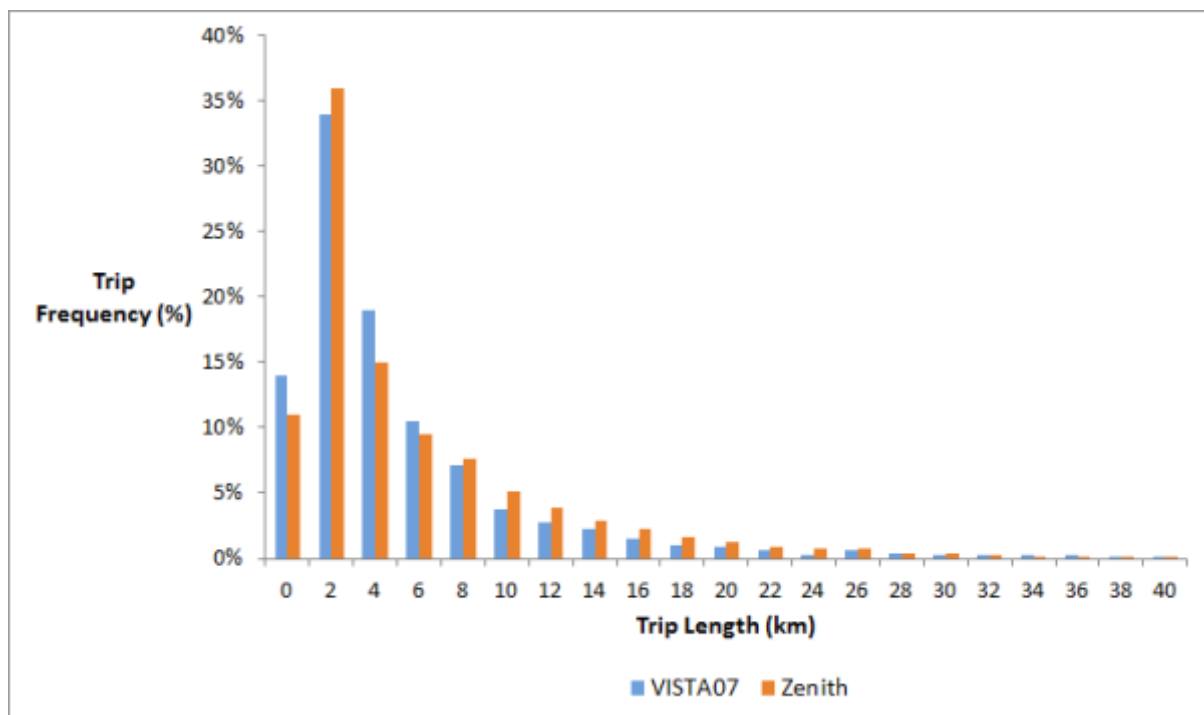
Trip Length (km)	VISTA07	Zenith
0	3.2%	2.1%
2	8.8%	5.7%
4	6.1%	8.5%
6	8.4%	9.3%
8	12.8%	9.0%
10	7.4%	9.6%
12	7.3%	8.2%
14	11.3%	7.7%
16	6.6%	7.6%
18	3.6%	4.7%
20	2.7%	3.5%
22	3.0%	4.1%
24	3.6%	3.4%
26	2.9%	2.5%
28	2.0%	2.6%
30	3.2%	2.8%
32	1.4%	2.3%
34	1.3%	2.0%
36	1.6%	2.0%
38	2.2%	1.4%
40	0.6%	0.9%
Grand Total	100.0%	100.0%





C6 – Home Based Shopping

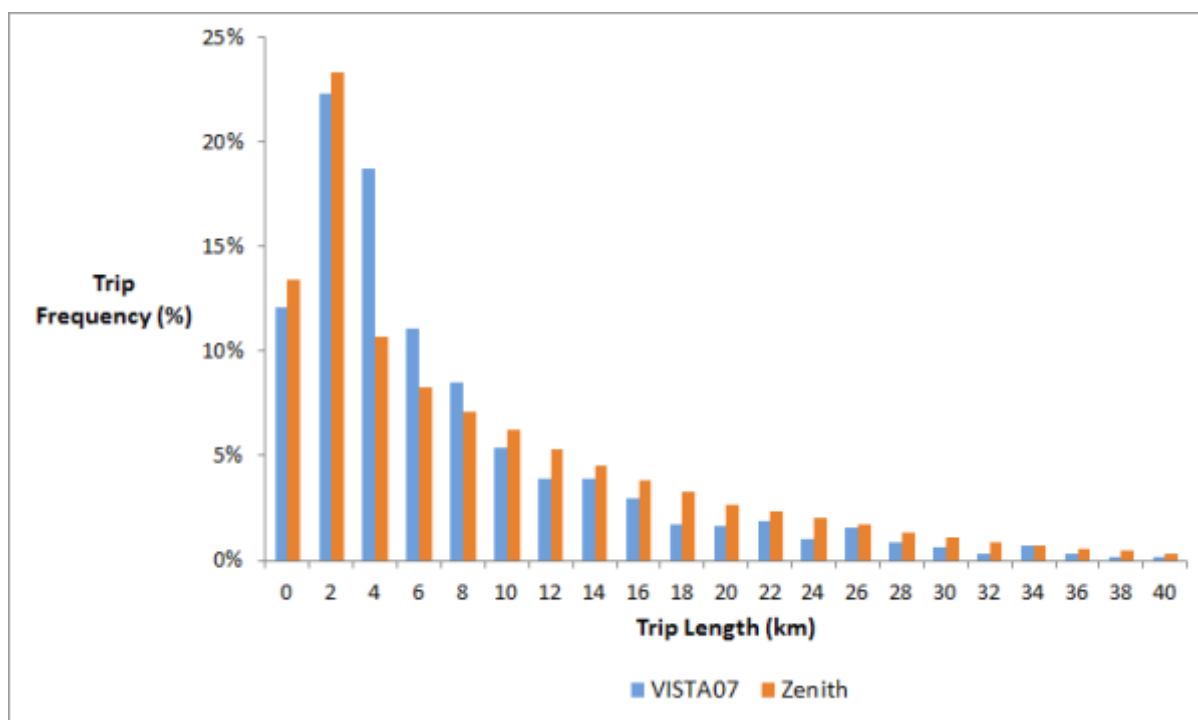
Trip Length (km)	VISTA07	Zenith
0	14.0%	11.0%
2	34.0%	36.0%
4	19.0%	15.0%
6	10.5%	9.5%
8	7.2%	7.6%
10	3.8%	5.1%
12	2.7%	3.9%
14	2.3%	2.9%
16	1.5%	2.2%
18	1.1%	1.6%
20	0.8%	1.2%
22	0.6%	0.9%
24	0.3%	0.8%
26	0.6%	0.7%
28	0.4%	0.4%
30	0.3%	0.3%
32	0.2%	0.2%
34	0.2%	0.2%
36	0.3%	0.2%
38	0.2%	0.1%
40	0.0%	0.1%
Grand Total	100.0%	100.0%





C6 – Home Based Recreation

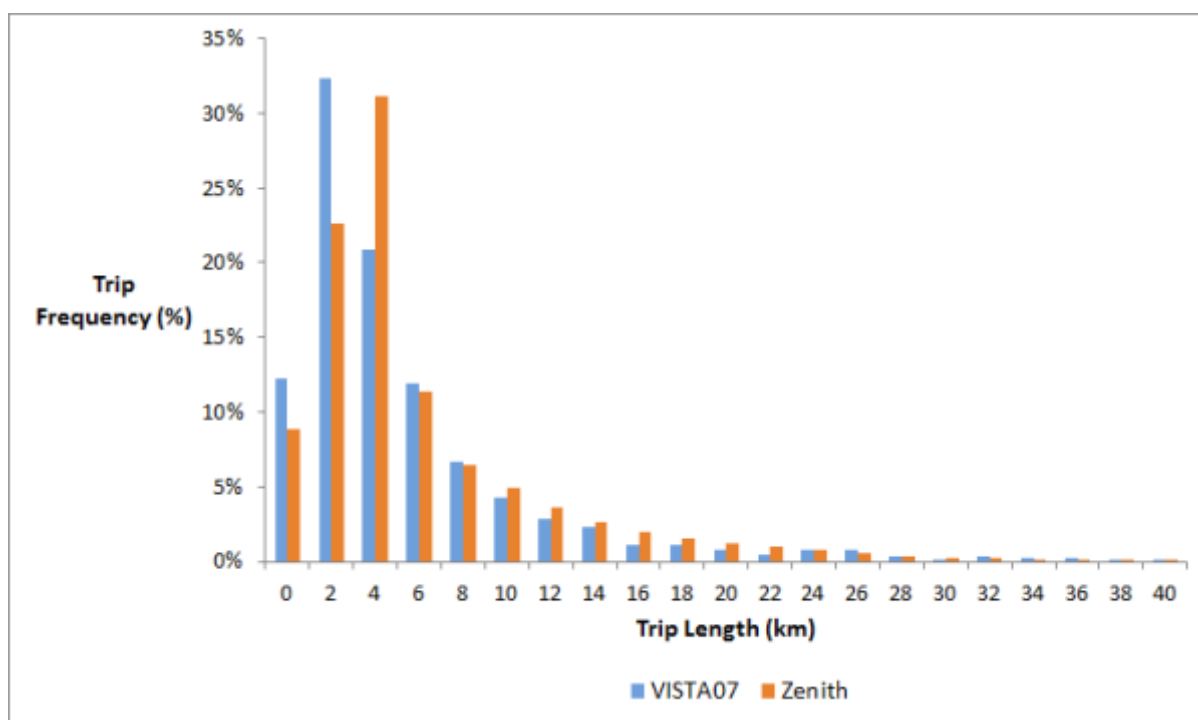
Trip Length (km)	VISTA07	Zenith
0	12.1%	13.4%
2	22.3%	23.3%
4	18.7%	10.7%
6	11.1%	8.3%
8	8.5%	7.1%
10	5.4%	6.2%
12	3.9%	5.3%
14	3.9%	4.5%
16	3.0%	3.8%
18	1.8%	3.3%
20	1.6%	2.7%
22	1.9%	2.3%
24	1.0%	2.0%
26	1.5%	1.7%
28	0.9%	1.3%
30	0.6%	1.1%
32	0.3%	0.8%
34	0.7%	0.7%
36	0.3%	0.6%
38	0.2%	0.5%
40	0.2%	0.3%
Grand Total	100.0%	100.0%





C6 – Home Based Other

Trip Length (km)	VISTA07	Zenith
0	12.2%	8.9%
2	32.3%	22.7%
4	20.9%	31.2%
6	11.9%	11.3%
8	6.7%	6.5%
10	4.3%	4.9%
12	2.9%	3.6%
14	2.3%	2.6%
16	1.0%	2.0%
18	1.1%	1.6%
20	0.7%	1.2%
22	0.5%	0.9%
24	0.8%	0.8%
26	0.8%	0.6%
28	0.4%	0.4%
30	0.2%	0.3%
32	0.4%	0.2%
34	0.2%	0.1%
36	0.2%	0.1%
38	0.1%	0.1%
40	0.1%	0.1%
Grand Total	100.0%	100.0%

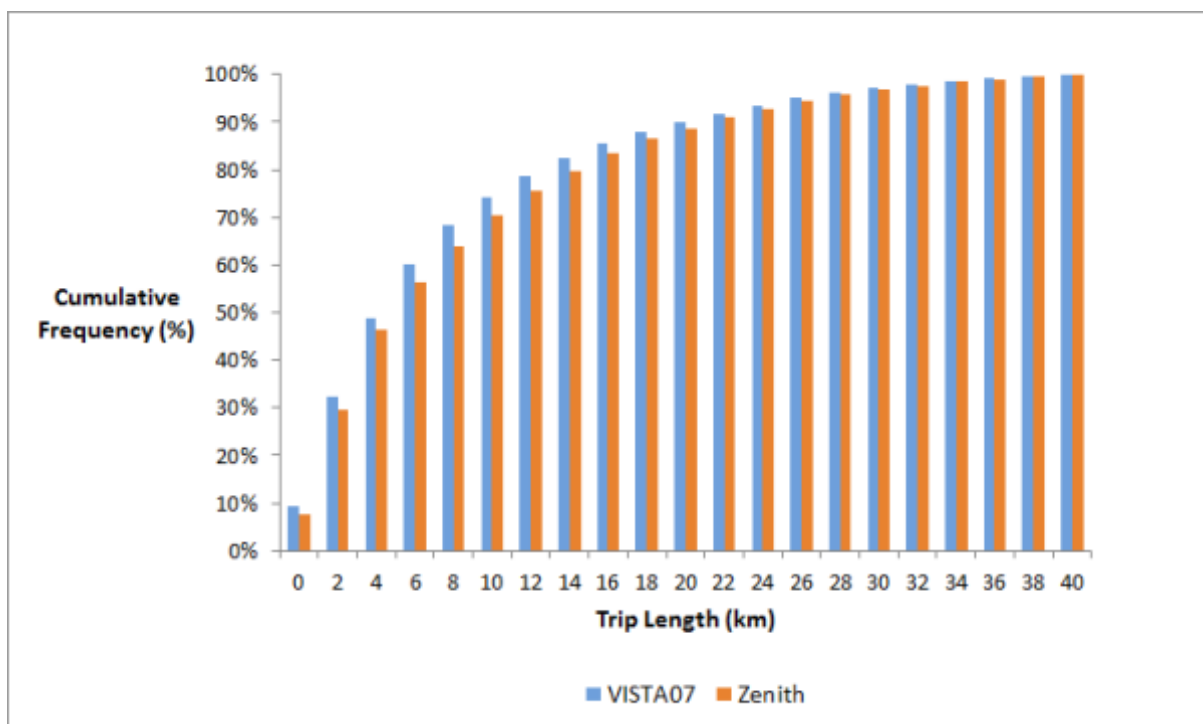




Appendix D – Cumulative Trip Length Frequency Distributions

D1 – All Home Based Purposes

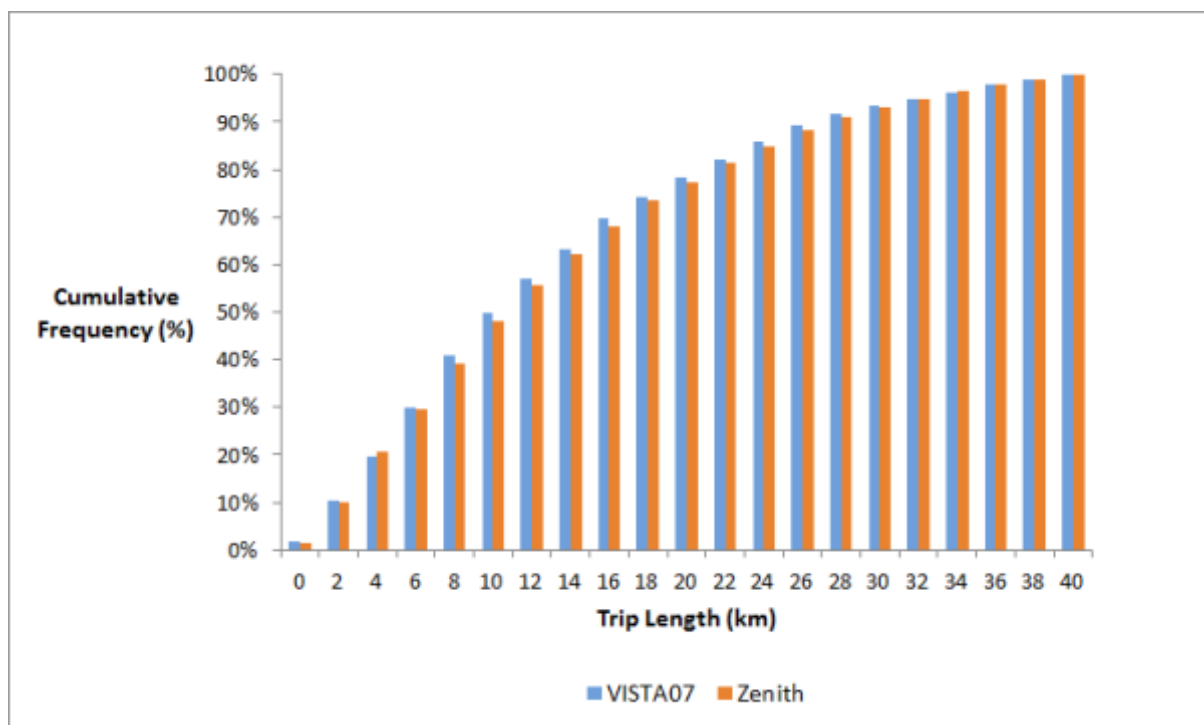
Trip Length (km)	VISTA07	Zenith
0	9.2%	7.8%
2	32.5%	29.5%
4	49.0%	46.6%
6	60.0%	56.2%
8	68.3%	64.0%
10	74.1%	70.3%
12	78.6%	75.5%
14	82.5%	79.8%
16	85.6%	83.4%
18	87.9%	86.4%
20	89.9%	88.8%
22	91.7%	90.9%
24	93.3%	92.8%
26	95.1%	94.5%
28	96.2%	95.8%
30	97.0%	96.8%
32	97.8%	97.7%
34	98.5%	98.4%
36	99.1%	99.1%
38	99.7%	99.6%
40	100.0%	100.0%





D2 – Home Based Work – White Collar

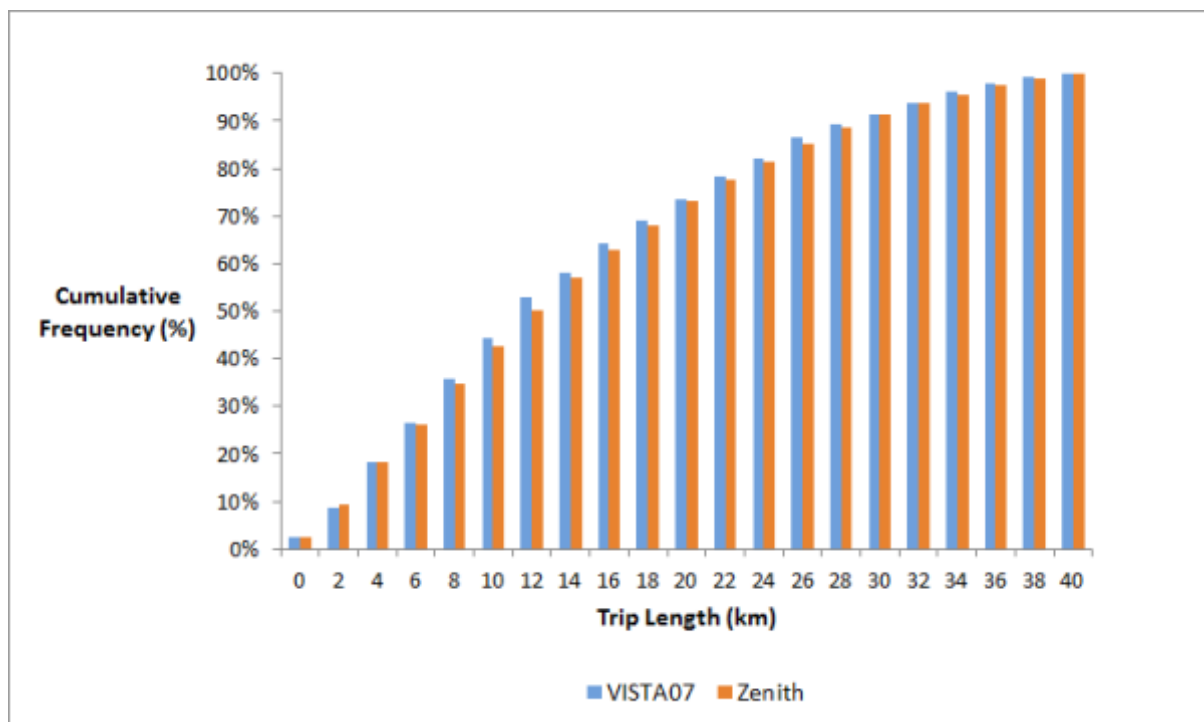
Trip Length (km)	VISTA07	Zenith
0	1.7%	1.3%
2	10.3%	10.2%
4	19.6%	20.5%
6	30.0%	29.7%
8	40.9%	39.3%
10	49.9%	48.0%
12	57.0%	55.7%
14	63.4%	62.3%
16	69.8%	68.2%
18	74.3%	73.4%
20	78.3%	77.4%
22	81.9%	81.4%
24	85.7%	85.0%
26	89.4%	88.1%
28	91.7%	90.9%
30	93.5%	93.0%
32	95.0%	94.8%
34	96.2%	96.4%
36	97.8%	97.8%
38	99.0%	99.0%
40	100.0%	100.0%





D3 – Home Based Work – Blue Collar

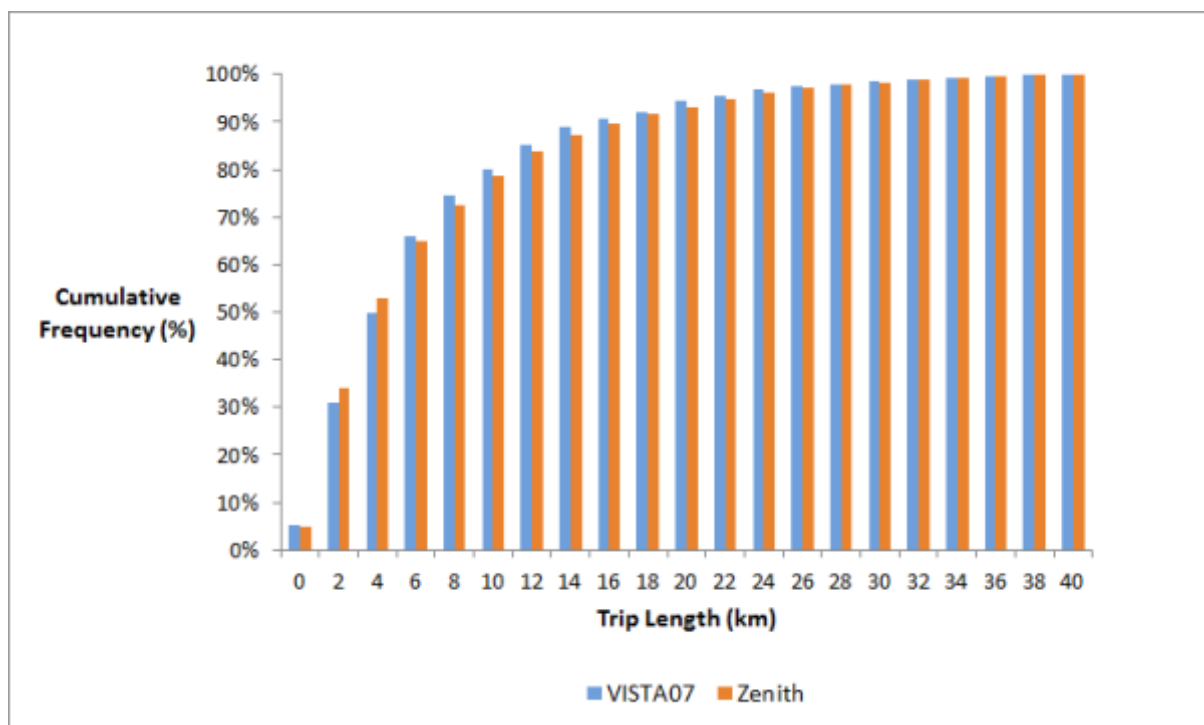
Trip Length (km)	VISTA07	Zenith
0	2.4%	2.4%
2	8.5%	9.5%
4	18.2%	18.2%
6	26.5%	26.1%
8	35.6%	34.8%
10	44.5%	42.5%
12	52.8%	50.2%
14	58.0%	56.9%
16	64.2%	62.8%
18	69.1%	68.1%
20	73.7%	73.0%
22	78.4%	77.5%
24	82.3%	81.5%
26	86.6%	85.3%
28	89.2%	88.6%
30	91.5%	91.3%
32	93.7%	93.6%
34	96.1%	95.6%
36	97.8%	97.4%
38	99.2%	98.8%
40	100.0%	100.0%





D4 – Home Based Education – Secondary

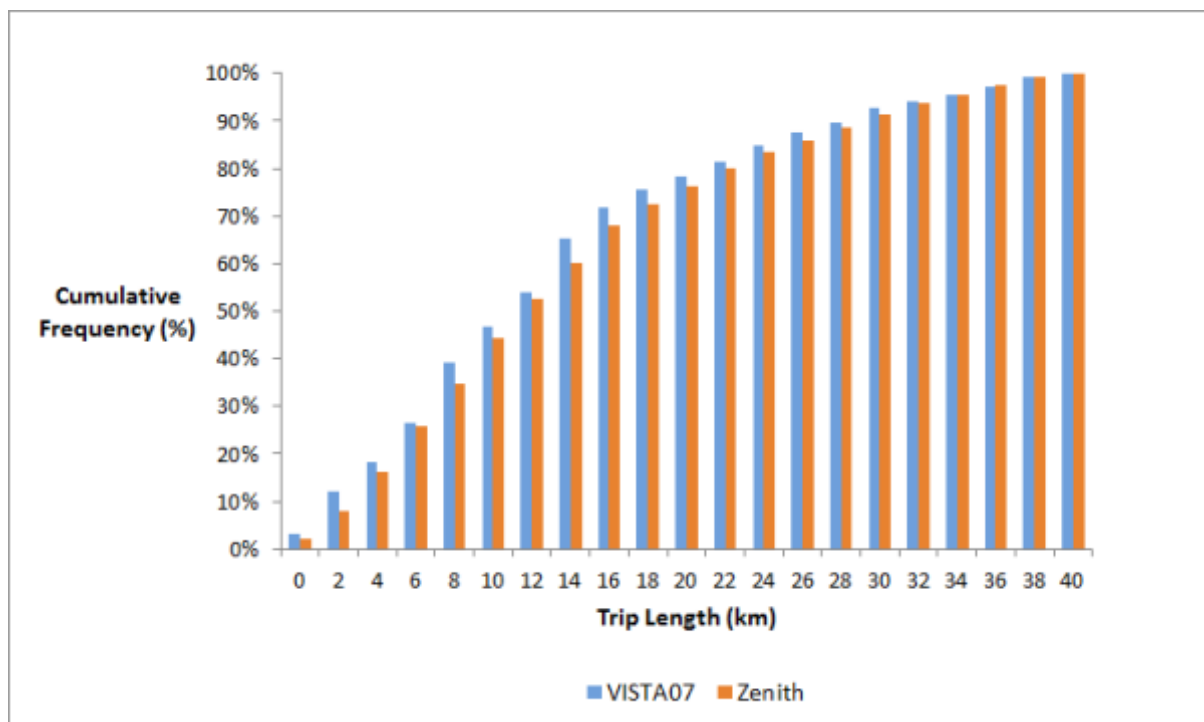
Trip Length (km)	VISTA07	Zenith
0	5.1%	4.8%
2	30.9%	34.0%
4	49.9%	52.8%
6	66.0%	64.8%
8	74.5%	72.6%
10	79.9%	78.8%
12	85.0%	83.7%
14	88.8%	87.3%
16	90.7%	89.7%
18	92.2%	91.7%
20	94.4%	93.2%
22	95.5%	94.7%
24	96.8%	96.1%
26	97.5%	97.0%
28	97.7%	97.9%
30	98.7%	98.4%
32	99.0%	98.8%
34	99.3%	99.2%
36	99.6%	99.5%
38	99.9%	99.8%
40	100.0%	100.0%





D5 – Home Based Education – Tertiary

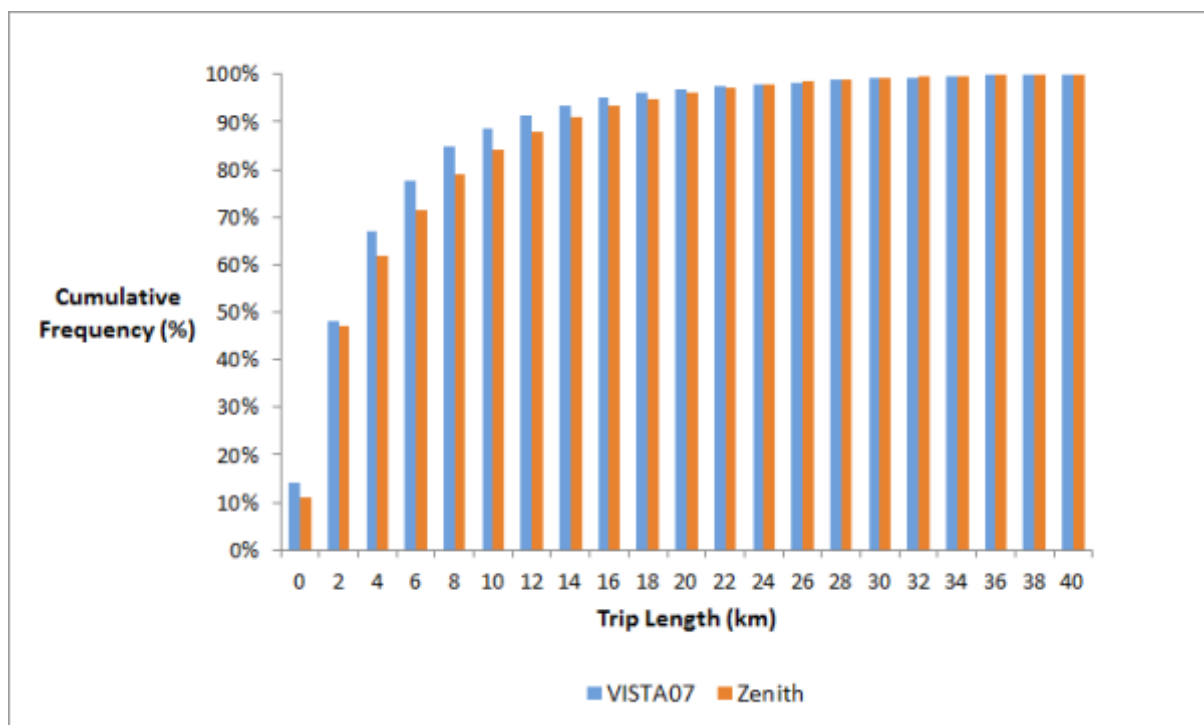
Trip Length (km)	VISTA07	Zenith
0	3.2%	2.1%
2	12.0%	7.8%
4	18.2%	16.3%
6	26.5%	25.6%
8	39.3%	34.7%
10	46.8%	44.3%
12	54.1%	52.6%
14	65.4%	60.2%
16	71.9%	67.9%
18	75.5%	72.6%
20	78.2%	76.1%
22	81.2%	80.2%
24	84.8%	83.6%
26	87.7%	86.0%
28	89.7%	88.6%
30	92.9%	91.4%
32	94.3%	93.7%
34	95.6%	95.7%
36	97.2%	97.7%
38	99.4%	99.1%
40	100.0%	100.0%





D6 – Home Based Shopping

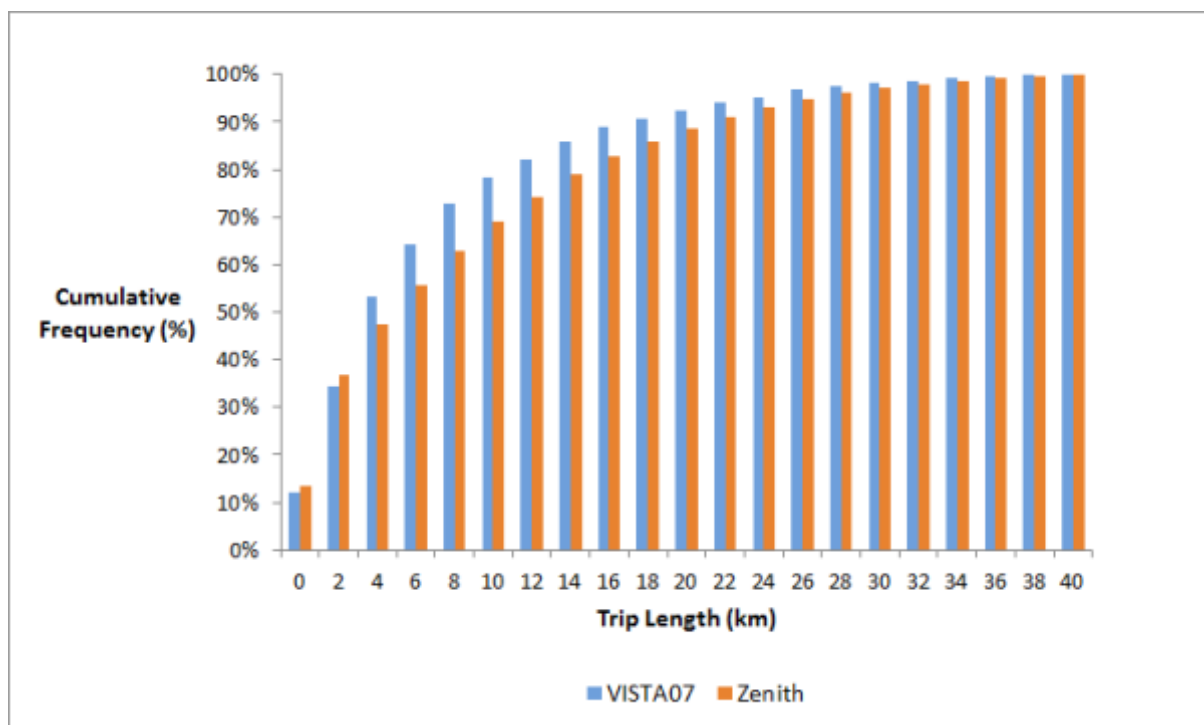
Trip Length (km)	VISTA07	Zenith
0	14.0%	11.0%
2	48.0%	47.0%
4	67.0%	62.0%
6	77.6%	71.5%
8	84.7%	79.0%
10	88.5%	84.2%
12	91.2%	88.1%
14	93.5%	91.0%
16	95.0%	93.3%
18	96.1%	94.9%
20	96.9%	96.1%
22	97.5%	97.1%
24	97.8%	97.8%
26	98.4%	98.5%
28	98.8%	99.0%
30	99.1%	99.3%
32	99.3%	99.5%
34	99.6%	99.7%
36	99.8%	99.8%
38	100.0%	99.9%
40	100.0%	100.0%





D7 – Home Based Recreation

Trip Length (km)	VISTA07	Zenith
0	12.1%	13.4%
2	34.4%	36.7%
4	53.1%	47.4%
6	64.2%	55.7%
8	72.8%	62.8%
10	78.2%	69.1%
12	82.1%	74.4%
14	86.0%	78.9%
16	89.0%	82.7%
18	90.7%	86.0%
20	92.4%	88.6%
22	94.3%	90.9%
24	95.3%	93.0%
26	96.8%	94.7%
28	97.7%	96.0%
30	98.3%	97.1%
32	98.6%	97.9%
34	99.3%	98.6%
36	99.6%	99.2%
38	99.8%	99.7%
40	100.0%	100.0%





D8 – Home Based Other

Trip Length (km)	VISTA07	Zenith
0	12.2%	8.9%
2	44.6%	31.6%
4	65.5%	62.7%
6	77.4%	74.1%
8	84.1%	80.6%
10	88.4%	85.4%
12	91.3%	89.0%
14	93.5%	91.7%
16	94.6%	93.7%
18	95.7%	95.3%
20	96.4%	96.4%
22	96.9%	97.4%
24	97.7%	98.1%
26	98.5%	98.7%
28	98.8%	99.1%
30	99.0%	99.4%
32	99.4%	99.6%
34	99.6%	99.7%
36	99.8%	99.8%
38	99.9%	99.9%
40	100.0%	100.0%

