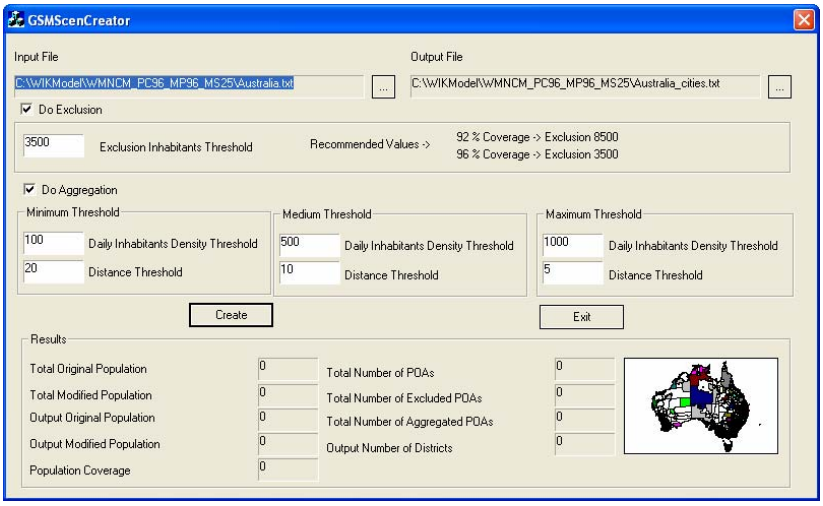
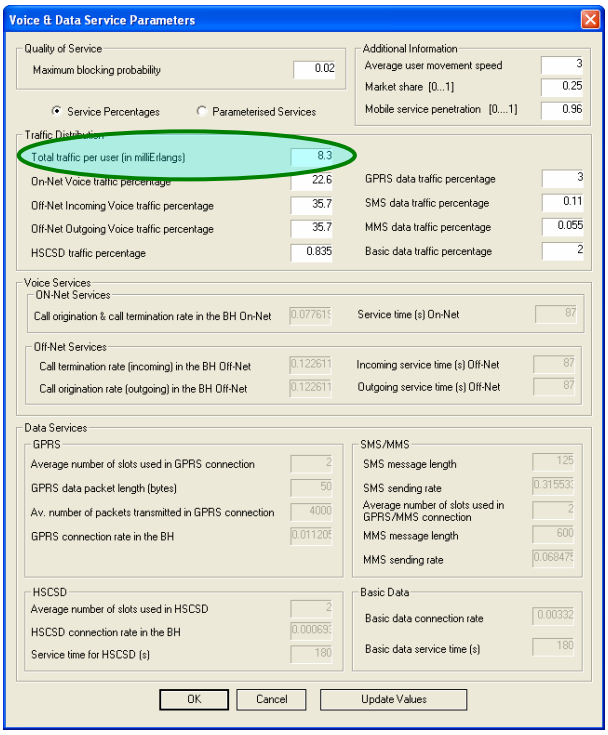
As discussed in the note written by WIK Consult, the WIK Model does take into account the fact that on-net services use more network elements than other services. Either the 'Australia_an_bsc.txt' or the 'Australia_outputBA.txt' file can be used to verify this. In this example you will be verifying that the increase in the dimensioning traffic has occurred at the BSC level. You can use Microsoft Excel to verify this by taking the following steps:

1) Open the WIK Model and use the default scenario provided on the CD. Follow the procedure explained in the User Manual and run the 'Scenario Creator' module without changing any of the values in the window.



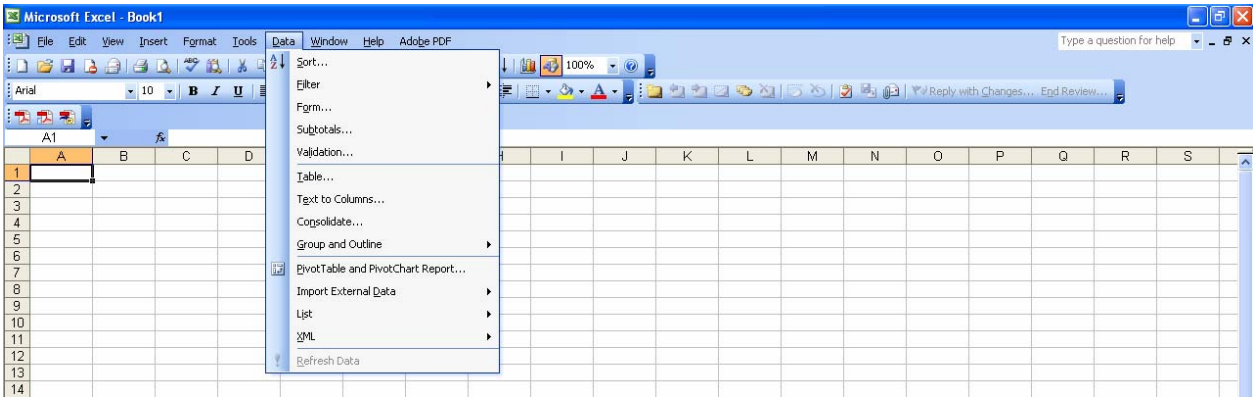
2) Once you have run the 'Scenario Creator', enter into the 'Cell Deployment' module and click on the 'Modify Voice & Data Services Parameters' section. Change the average milli-Erlang for service traffic in the Traffic Distribution section from 8.3 to 13.1. Then click on 'OK'.



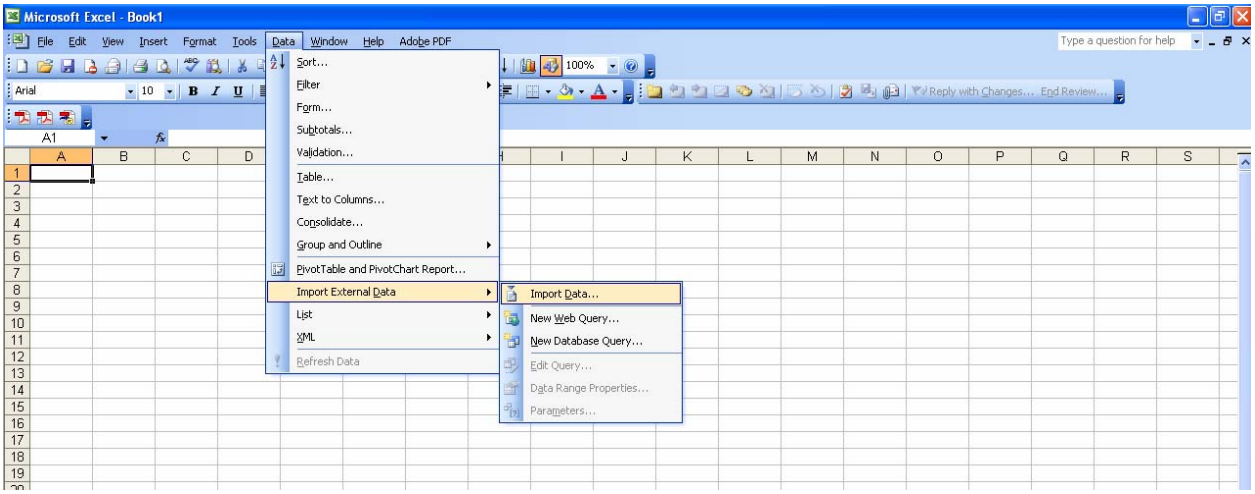
3) Then click on execute to calculate the cell deployment and then execute the aggregation network section of the WIK Model. Once you have executed this procedure, exit from the WIK Model.

4) Create a new workbook in Microsoft Excel.

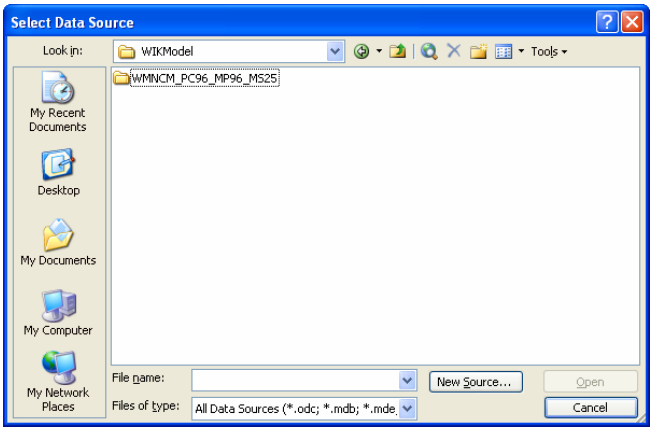
5) Click on 'Data' at the top of the window.



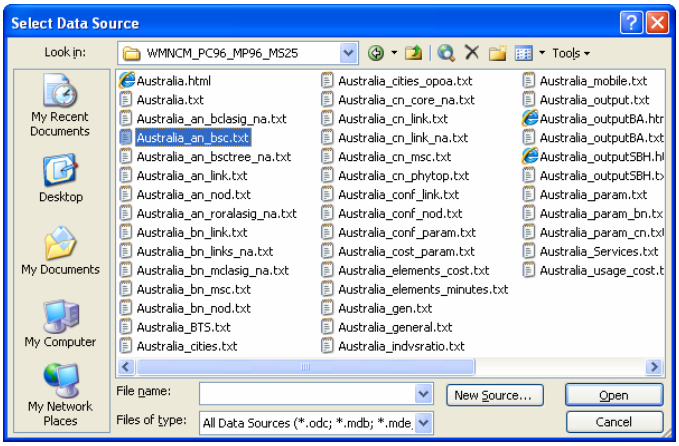
6) Click on 'Import Data'.



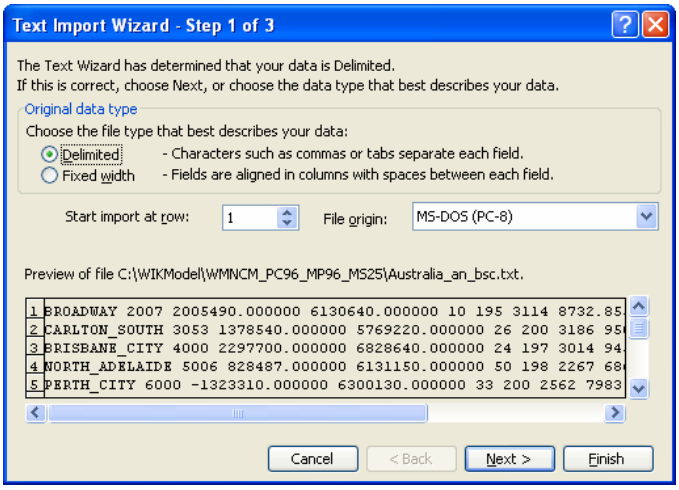
7) The following dialogue box will appear asking you to locate the file that you want to import. Go to the folder where you have installed the WIK Model.



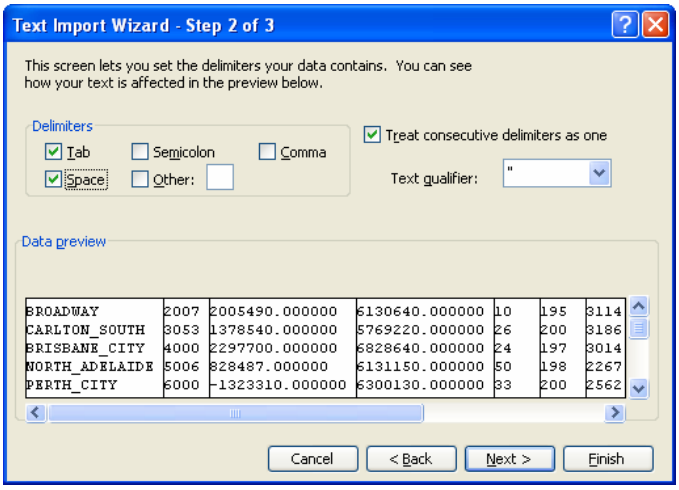
8) Open up the scenario folder you want to analyse and double click on either the 'Australia_an_bsc.txt' or the 'Australia_outputBA.txt' file.



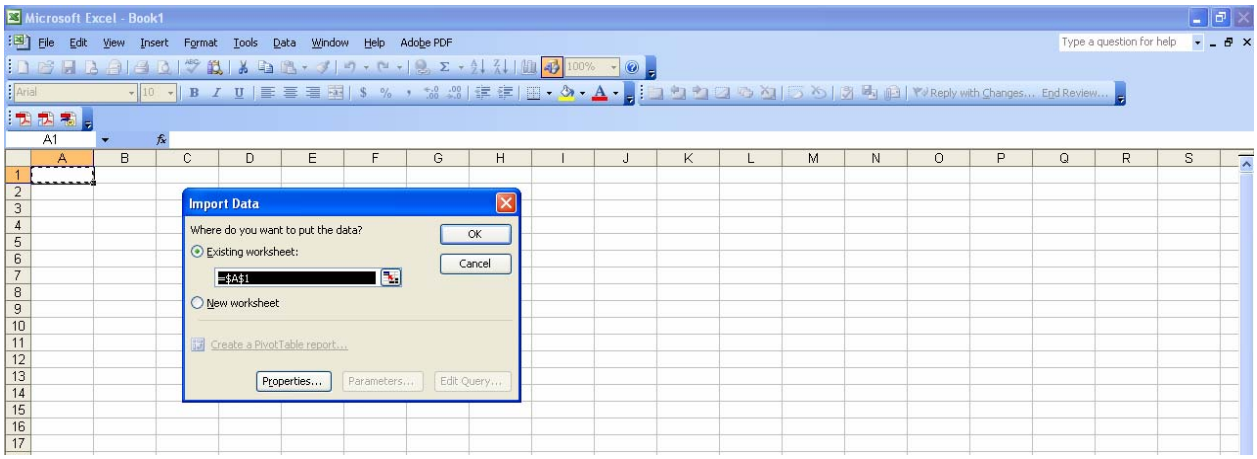
9) Select ‘Delimited’ and then click on ‘Next’.



10) Tick the box next to ‘Space’ and then click on ‘Next’. There is no need to specify column formats, therefore skip step 3 and click on ‘Finish’



11) Select where you want to paste the imported data and click on ‘OK’.



12) Pages 60 to 61 of the Technical Specification for the WIK Model refer to the ‘Australia_an_bsc.txt’ file and pages 55 to 56 of the Technical Specification for the WIK Model refer to the ‘Australia_outputBA.txt’ file. This information provides details on the data series by column in each of the files noted above. It is essential to refer to the manuals for data column order as no header information is recorded in the text files.

Table 1 - Australia_outputBA.txt Column Headings

Name	Type	Comment
int_districtid	Integer	Identifier of the District
sz_districtname	String	Name of the District
sz_BTSurb	String	Type of BTSs in urban zone
sz_BTSsub	String	Type of BTSs in suburban zone
sz_BTSres	String	Type of BTSs in rural zone
n_TRXnumber	Integer	Total number of TRXs
n_TRXurb	Integer	Number of TRXs in urban
n_TRXsub	Integer	Number of TRXs in suburban
n_TRXres	Integer	Number of TRXs in rural
n_BTSTotal	Integer	Total Number of BTSs
n_BTSurb	Integer	Number of BTSs in urban zone
n_BTSsub	Integer	Number of BTSs in suburban zone
n_BTSres	Integer	Number of BTSs in rural zone
fl_TrafficTotal	Float	total traffic in the District
fl_Trafficurb	Float	Traffic in urban zone
fl_Trafficsub	Float	Traffic in suburban zone
fl_Trafficres	Float	Traffic in rural zone
fl_X	Float	X coordinate in UTM or degrees
fl_Y	Float	Y coordinate in UTM or degrees

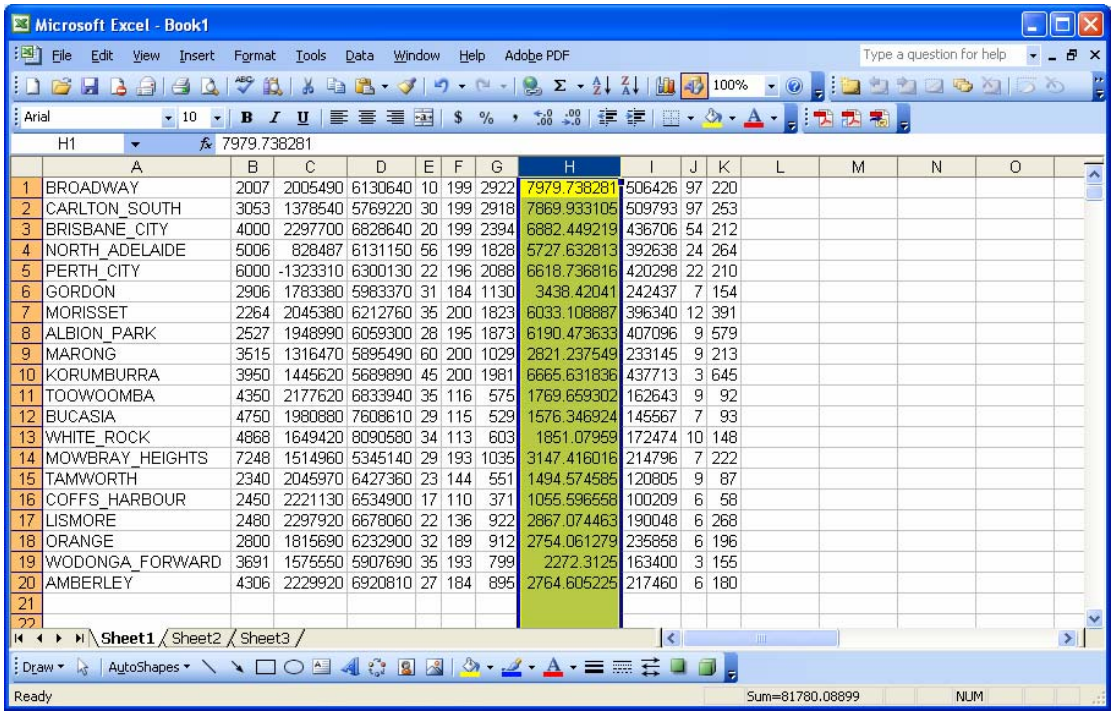
Name	Type	Comment
fl_urb_rad	Float	Radius of the urban zone
fl_sub_rad	Float	Radius of the suburban zone
fl_rural_rad	Float	Radius of the rural zone
n_urb_pop	Integer	Population of the urban zone
n_sub_pop	Integer	Population of the suburban zone
n_rural_pop	Integer	Population of the rural zone
n_districttype	Integer	Type of District 0-6
b_Doubleb_urban	Bool	Single/Double band (0/1) in urban zone
b_Doubleb_suburban	Bool	Single/Double band (0/1) in suburban zone
b_Doubleb_rural	Bool	Single/Double band (0/1) in rural zone

Table 2 - Australia_an_BSC.txt Column Headings

Value	Type	Comments
name	Character	BTS District name of the BSC location
code	Integer	BTS District code
x_coor	Real	Horizontal coordinate
y_coor	Real	Vertical coordinate
totbtsz_bcc	Integer	Number of BTS Districts aggregated to the BSC location
totbts_bsc	Integer	Number of aggregated BTSs to the BSC location
tottrx_bsc	Integer	Number of aggregated TRXs
totAbh_bsc	Real	BH traffic in Erlang aggregated at the BSC location
totnus_bsc	Integer	Number of users aggregated at the BSC location
ne1	Integer	Number of E1 DSGs from the BTS hub co-located with the BSC
totce1	Integer	Total number of E1 DSGs aggregated from the BTS hubs assigned

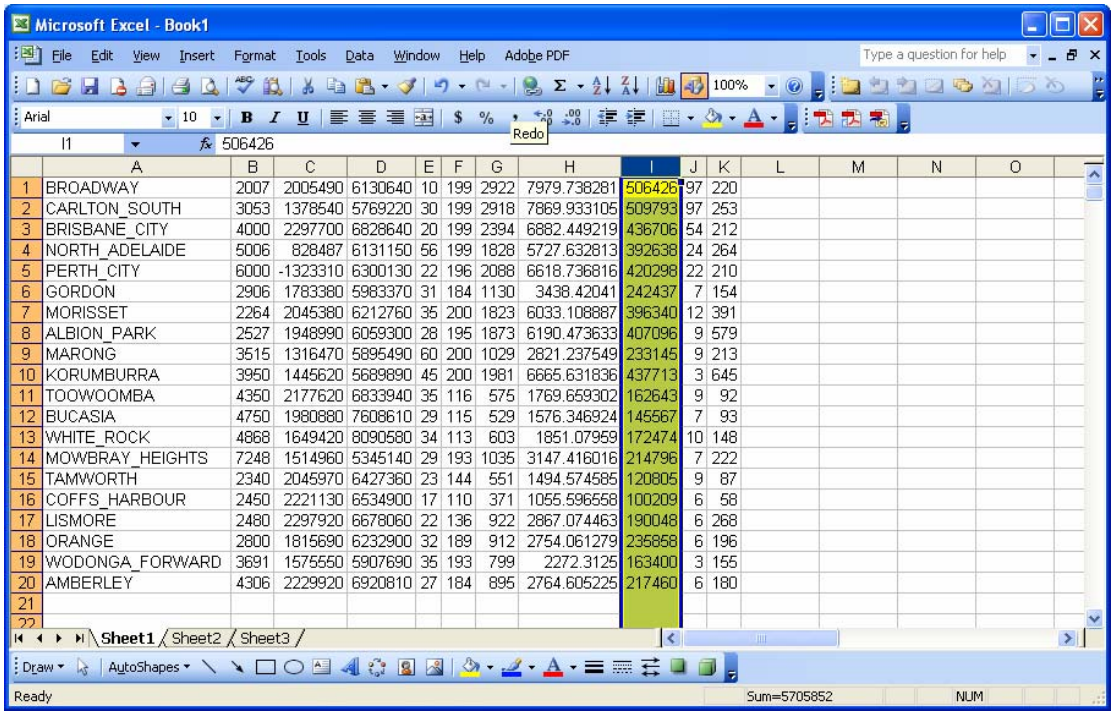
For this example, use Table 2 in this document which corresponds with pages 60 to 61 of the Technical Specification. For simplicity of exposition the 'Australia_an_BSC.txt' file has been used which is an output file in the WIK Model that shows the dimensioning parameters at the BSC level (Comprising 20 locations in this example). The 'Australia_outputBA.txt' is an output file in the WIK Model that shows the dimensioning parameters at the BTS deployment level (Comprising 640 locations). Recall that the BSC level is simply an aggregation of BTS districts.

13) As identified in Table 2 of this document, 'BH traffic in Erlang aggregated at the BSC location' corresponds with column H in your Microsoft Excel file that you have created.



	A	B	C	D	E	F	G	H	I	J	K
1	BROADWAY	2007	2005490	6130640	10	199	2922	7979.738281	506426	97	220
2	CARLTON_SOUTH	3053	1378540	5769220	30	199	2918	7869.933105	509793	97	253
3	BRISBANE_CITY	4000	2297700	6828640	20	199	2394	6882.449219	436706	54	212
4	NORTH_ADELAIDE	5006	828487	6131150	56	199	1828	5727.632813	392638	24	264
5	PERTH_CITY	6000	-1323310	6300130	22	196	2088	6618.736816	420298	22	210
6	GORDON	2906	1783380	5983370	31	184	1130	3438.42041	242437	7	154
7	MORISSET	2264	2045380	6212760	35	200	1823	6033.108887	396340	12	391
8	ALBION_PARK	2527	1948990	6059300	28	195	1873	6190.473633	407096	9	579
9	MARONG	3515	1316470	5895490	60	200	1029	2821.237549	233145	9	213
10	KORUMBURRA	3950	1445620	5689890	45	200	1981	6665.631836	437713	3	645
11	TOOWOOMBA	4350	2177620	6833940	35	116	575	1769.659302	162643	9	92
12	BUCASIA	4750	1980880	7608610	29	115	529	1576.346924	145567	7	93
13	WHITE_ROCK	4868	1649420	8090580	34	113	603	1851.07959	172474	10	148
14	MOWBRAY_HEIGHTS	7248	1514960	5345140	29	193	1035	3147.416016	214796	7	222
15	TAMWORTH	2340	2045970	6427360	23	144	551	1494.574585	120805	9	87
16	COFFS_HARBOUR	2450	2221130	6534900	17	110	371	1055.596558	100209	6	58
17	LISMORE	2480	2297920	6678060	22	136	922	2867.074463	190048	6	268
18	ORANGE	2800	1815690	6232900	32	189	912	2754.061279	235858	6	196
19	WODONGA_FORWARD	3691	1575550	5907690	35	193	799	2272.3125	163400	3	155
20	AMBERLEY	4306	2229920	6920810	27	184	895	2764.605225	217460	6	180
21											
22											

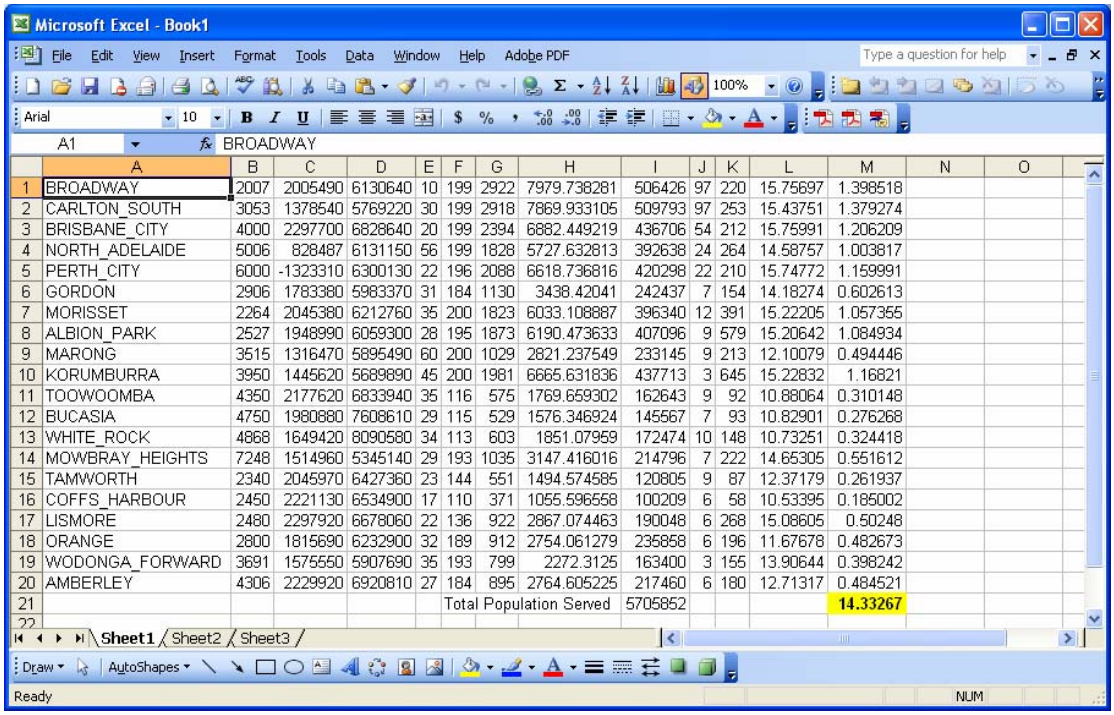
14) Note that the third-last entry on the table on page 61 is the 'Number of users aggregated at the BSC location'. This corresponds to column I in the example.



	A	B	C	D	E	F	G	H	I	J	K
1	BROADWAY	2007	2005490	6130640	10	199	2922	7979.738281	506426	97	220
2	CARLTON_SOUTH	3053	1378540	5769220	30	199	2918	7869.933105	509793	97	253
3	BRISBANE_CITY	4000	2297700	6828640	20	199	2394	6882.449219	436706	54	212
4	NORTH_ADELAIDE	5006	828487	6131150	56	199	1828	5727.632813	392638	24	264
5	PERTH_CITY	6000	-1323310	6300130	22	196	2088	6618.736816	420298	22	210
6	GORDON	2906	1783380	5983370	31	184	1130	3438.42041	242437	7	154
7	MORISSET	2264	2045380	6212760	35	200	1823	6033.108887	396340	12	391
8	ALBION_PARK	2527	1948990	6059300	28	195	1873	6190.473633	407096	9	579
9	MARONG	3515	1316470	5895490	60	200	1029	2821.237549	233145	9	213
10	KORUMBURRA	3950	1445620	5689890	45	200	1981	6665.631836	437713	3	645
11	TOOWOOMBA	4350	2177620	6833940	35	116	575	1769.659302	162643	9	92
12	BUCASIA	4750	1980880	7608610	29	115	529	1576.346924	145567	7	93
13	WHITE_ROCK	4868	1649420	8090580	34	113	603	1851.07959	172474	10	148
14	MOWBRAY_HEIGHTS	7248	1514960	5345140	29	193	1035	3147.416016	214796	7	222
15	TAMWORTH	2340	2045970	6427360	23	144	551	1494.574585	120805	9	87
16	COFFS_HARBOUR	2450	2221130	6534900	17	110	371	1055.596558	100209	6	58
17	LISMORE	2480	2297920	6678060	22	136	922	2867.074463	190048	6	268
18	ORANGE	2800	1815690	6232900	32	189	912	2754.061279	235858	6	196
19	WODONGA_FORWARD	3691	1575550	5907690	35	193	799	2272.3125	163400	3	155
20	AMBERLEY	4306	2229920	6920810	27	184	895	2764.605225	217460	6	180
21											
22											

15) By dividing 'column H' by 'column I' you will obtain the average milli-Erlang per user used to dimension the network and then multiplying this figure by 1,000, you can then see that the WIK Model has increased the dimensioning traffic in the network to account for on-net services. To obtain a

network-wide average, you need to apply a population weighting to the average milli-Erlang within each aggregated BTS location and sum the weighted figures.



Microsoft Excel - Book1

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A1 BROADWAY

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	BROADWAY	2007	2005490	6130640	10	199	2922	7979.738281	506426	97	220	15.75697	1.398518		
2	CARLTON_SOUTH	3053	1378540	5769220	30	199	2918	7869.933105	509793	97	253	15.43751	1.379274		
3	BRISBANE_CITY	4000	2297700	6828640	20	199	2394	6882.449219	436706	54	212	15.75991	1.206209		
4	NORTH_ADELAIDE	5006	828487	6131150	56	199	1828	5727.632813	392638	24	264	14.58757	1.003817		
5	PERTH_CITY	6000	-1323310	6300130	22	196	2088	6618.736816	420298	22	210	15.74772	1.159991		
6	GORDON	2906	1783380	5983370	31	184	1130	3438.42041	242437	7	154	14.18274	0.602613		
7	MORISSET	2264	2045380	6212760	35	200	1823	6033.108887	396340	12	391	15.22205	1.057355		
8	ALBION_PARK	2527	1948990	6059300	28	195	1873	6190.473633	407096	9	579	15.20642	1.084934		
9	MARONG	3515	1316470	5895490	60	200	1029	2821.237549	233145	9	213	12.10079	0.494446		
10	KORUMBURRA	3950	1445620	5689890	45	200	1981	6665.631836	437713	3	645	15.22832	1.16821		
11	TOOWOOMBA	4350	2177620	6833940	35	116	575	1769.659302	162643	9	92	10.88064	0.310148		
12	BUCASIA	4750	1980880	7608610	29	115	529	1576.346924	145567	7	93	10.82901	0.276268		
13	WHITE_ROCK	4868	1649420	8090580	34	113	603	1851.07959	172474	10	148	10.73251	0.324418		
14	MOWBRAY_HEIGHTS	7248	1514960	5345140	29	193	1035	3147.416016	214796	7	222	14.65305	0.551612		
15	TAMWORTH	2340	2045970	6427360	23	144	551	1494.574585	120805	9	87	12.37179	0.261937		
16	COFFS_HARBOUR	2450	2221130	6534900	17	110	371	1055.596558	100209	6	58	10.53395	0.185002		
17	LISMORE	2480	2297920	6678060	22	136	922	2867.074463	190048	6	268	15.08605	0.50248		
18	ORANGE	2800	1815690	6232900	32	189	912	2754.061279	235858	6	196	11.67678	0.482673		
19	WODONGA_FORWARD	3691	1575550	5907690	35	193	799	2272.3125	163400	3	155	13.90644	0.398242		
20	AMBERLEY	4306	2229920	6920810	27	184	895	2764.605225	217460	6	180	12.71317	0.484521		
21						Total Population Served			5705852				14.33267		
22															

Sheet1 Sheet2 Sheet3

Draw AutoShapes

Ready NUM

16) As can be seen the milli-Erlang at the BSC level of the network is greater (14.3 milli-Erlangs) than the service traffic parameter (13.1 milli-Erlangs) used in the 'Modify Voice & Data Services Parameters' section of the 'Cell Deployment' module. This clearly demonstrates that for dimensioning purposes milli-Erlang has been grossed up in the WIK Model to account for the differences between the usage of elements of each service (in particular on-net calls).

Across the various BTS districts (and subsequently BSC locations), even with the starting point of a uniform milli-Erlang demand per user for service traffic, will have different milli-Erlang values for dimensioning purposes for the following reason. BTS districts with a very low population density require less BTSs to serve customers in the district. As a result this has the tendency to pull the dimensioning milli-Erlang in the district down when dividing traffic handled by a BSC location by the number of all potential customers, as is done in the screenshot.