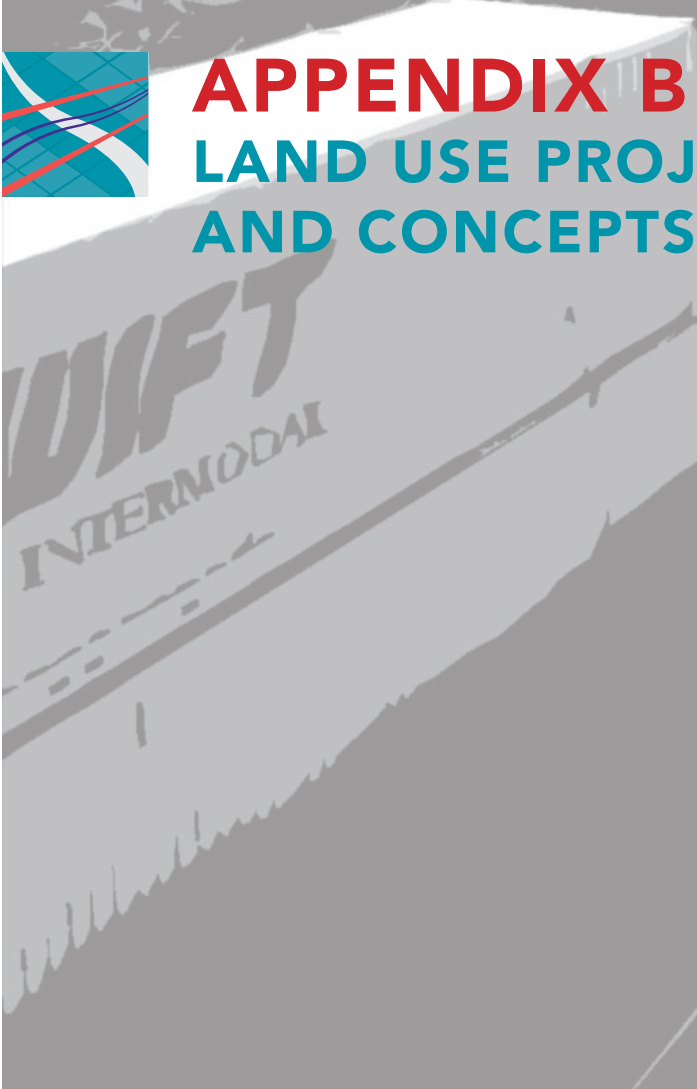




APPENDIX B
LAND USE PROJECTIONS
AND CONCEPTS



Intermodal Floor Area Ratios. The following tables calculate approximate floor area ratios (gross floor area of buildings divided by site area of parcel) for four intermodal facilities and logistics parks comparable to the Kansas City Intermodal Facility and Logistics Park. These calculations are used to project the potential yield of available land in the study area and balance this with probable market demand projected by project documentation and the experience of other facilities over time.

Intermodal FARs	Area (SF)
Elwood, IL BNSF	
Parcel 1	907,709.00
Parcel 2	1,082,000.00
Parcel 3	628,398.00
Parcel 4	602,098.00
Parcel 5	1,540,000.00
Parcel 6	1,663,654.00
Total Gross Floor Area (GFA)	6,423,859.00
Site Area	21,725,265.00
FAR	0.30
Denver BNSF	
Parcel 1	84,402.00
Parcel 2	175,158.00
Parcel 3	175,158.00
Parcel 4	123,216.00
Parcel 5	76,560.00
Parcel 6	314,640.00
Total GFA	949,134.00
Site area	2,533,414.00
FAR	0.37
Alliance BNSF	
Parcel 1	453,187.00
Parcel 2	163,682.00
Parcel 3	146,370.00
Parcel 4	143,096.00
Parcel 5	44,720.00
Total GFA	951,055.00
Site area	3,550,280.00
FAR	0.27

Intermodal FARs	Area (SF)
KCS Dallas	
Parcel 1	142,350.00
Parcel 2	140,530.00
Parcel 3	70,200.00
Parcel 4	42,976.00
Parcel 5	35,000.00
Parcel 6	24,600.00
Parcel 7	115,362.00
Parcel 8	179,600.00
Parcel 9	109,060.00
Parcel 10	278,952.00
Parcel 11	182,104.00
Parcel 12	32,400.00
Total GFA	1,353,134.00
Site area	3,627,284.00
FAR	0.37
Composite	
Composite GFA	9,677,182.00
Composite Site Area	31,436,243.00
FAR	0.31

Projected Employment/Building Area. This table reviews the results of an internet search performed as part of this project, comparing the gross floor area of various distribution facilities with claimed employment yield. This is then used to establish an average employment factor per square foot of gross building floor area. This in turn helps generate employment figures that are allocated by transportation analysis zone (TAZ) and used in the travel demand model. While these ratios vary widely among individual facilities, an overall average ratio is one job per 2,000-2,500 square feet of floor area. This is also generally consistent with required parking ratios in many zoning ordinances in communities across the country.

	Gross Floor Area (GFA)	Claimed Jobs	GFA/Job
Home Depot (AZ)	466,000	300	1,553
Deere (TN)	1,000,000	150	6,667
Site A	150,000	52	2,885
Site B	180,000	120	1,500
Menards	700,000	350	2,000
Site C	500,000	100	5,000
Rubbermaid	839,000	300	2,797
Ascena	834,000	240	3,475
Elizabeth NJ	524,000	350	1,497
Old Dominion (NC)	122,000	183	667
South Carolina	10,000,000	4,000	2,500
Dollar General	900,000	500	1,800
Madison Co IL	2,400,000	800	3,000
Amazon (IN)	1,000,000	1,200	833
	19,615,000	8,645	2,269

Projected Population and Area Growth. The upper table projects population in Gardner and Edgerton, based on observed trends over the last three decades. These tables indicate base forecast population growth within the context of the metropolitan area. The lower table adds residential growth derived specifically by development related to the intermodal facility and converts both to acreage requirements for future development. Only part of this growth potential will be realized within the study area.

Projected Population Growth								
Gardner Growth	1980	1990	2000	2010	Total 1980-2010	2020	2030	2040
Population	2392	3191	9396	19433		26116	31836	37867
Decade growth ratio		1.33	2.94	2.07	6.09	1.34	1.22	1.19
Avg Annual Growth Rate (%)		2.92	11.4	7.53	6.21	3	2	1.75
Edgerton Growth	1980	1990	2000	2010	Total 1990-2010	2020	2030	2040
Population		1244	1440	1671		1937	2244	2601
Decade growth ratio			1.16	1.16	1.34	1.16	1.16	1.16
Avg Annual Growth Rate (%)			1.47	1.50	1.49	1.49	1.49	1.49

Projected New Area	Added pop	Pop/hh	Added units	Density	New acres
	2010-2040		2010-2040	du/acre	
Gardner Growth	18434	2.8	6583	2.5	2633.39
Edgerton Growth	930	2.8	332	2.5	132.87
Total residential land needs					2766.27
Intermodal-derived growth					528.00
Total					3294.27

Land Use Assumptions. The table below summarizes household and employment density factors for the various land uses displayed in the scenario illustrations and calculations. For example, we assume that for business parks, 400 square feet of gross floor area corresponds to one employee. These assumptions then produce the employment and household estimates that, when assigned to transportation analysis zones, provide the foundation for the travel demand model.

General Assumptions				
Abbreviation	Use Category	Dwelling units/acre	Floor Area Ratio	SF/Employee
CONS	Conservation Residential	0.1		
RR	Rural Residential	0.5		
LDR	Low Density Residential	2.5		
MDR	Medium Density Residential	6		
HDR	High Density Residential	12		
MU	Mixed Use			
50% Retail	Retail Component		0.2	600
25% MDR	Medium Density Residential	6		
25% HDR	High Density Residential	12		
BP	Business Park		0.25	400
LI	Light Industry		0.15	1000
WD	Warehousing and Distribution		0.3	2500
C/Non-retail	Non-retail Commercial		0.15	600
C/Retail	Retail Commercial		0.2	600

Scenario Household, Population, and Employment Projection Tables. The following tables show backup calculations that produce 2040 employment, household, and population estimates for each of the four scenarios and the preferred scenario. The assumptions presented on the previous page are applied to each of the land use scenarios. The acreages and yields are divided by TAZ's to produce numerical inputs into the travel demand model. The tables presented here for each scenario include:

- Acreage of each land use category aggregated by TAZ.
- Households and gross floor area of buildings (using FAR and density factors) aggregated by TAZ.
- Households and employment estimates aggregated by TAZ.
- Resident population aggregated by TAZ.

Scenario One estimates

Scenario 1																
Acreage of Land Uses by TAZ																
TAZ	CONS	RR	LDR	IMDR	HDR	IMU	IMU Retail	MU MDR	MU HDR	BP	LI	WD	C (retail)	C (non-retail)	IMF	
258																
260	2432	35	110											15		
774									33				89			
776																
777		170	110		45				56			119	87			
779													23			
780			145	31												
781				88							109				29	
1005											70				87	
1006			192	159	38	33					143					
1007		17	132	117	13	52	13	6.5	6.5	6.5	72	178	483	52	238	
1009			197	30												
1010		320														
Total	2432	542	886	425	96	85	13	6.5	6.5	6.5	128	330	805	251	15	354

Households or Building Area by TAZ															
TAZ	CONS	RR	LDR	IMDR	HDR	IMU	IMU Retail	MU MDR	MU HDR	BP	LI	WD	C-R	C-NR	IMF
Unit	HH	HH	HH	HH	HH	HH	SF	HH	HH	SF	SF	SF	SF	SF	SF
258															
260	243	18	275	0	0										49005
774		0	0	0	0				215622				387684		
776															
777		85	275	0	540				609840			777546	378972		
779		0	0	0	0							0	100188		
780		0	363	186										0	
781		0	0	528										712206	0
1005		0	0	0										914760	0
1006		0	480											1868724	0
1007		9	330	702	156			39	78	78	784080	1163052	6311844	226512	0
1009		0	493												0
1010		160	0												0
Total	243	271	2215	1416	696	0	113256	39	78	1393920	2156220	9807534	1093556	49005	0

Scenario One estimates (continued)

Households or employees per TAZ															
TAZ	CONS	RR	LDR	MDR	HDR	MU	MU Retail	MU MDR	MU HDR	BP	LI	WD	C-R	C-NR	IMF
	HH	HH	HH	HH	HH		Emp	HH	HH	Emp	Emp	Emp	Emp	Emp	
258			0												
260	243	18	275	0	0										82
774		0	0	0	0				216				646		0
776															
777		85	275	0	540				778	1525			632		0
779		0	0	0	0								167		
780		0	363	186	0										
781		0	0	528	0								285		
1005		0	0	0	0								366		
1006		0	480	0	0			0	0	0			747		0
1007		9	330	702	156		189	39	78	1960		1163	2525	378	
1009		0	493	0	0								0		
1010		160	0	0	0								0		
Total	243	271	2215	1416	696	0	189	39	78	3485	2156	3923	1822	82	0

Resident Population per TAZ													
TAZ	CONS	RR	LDR	MDR	HDR	MU MDR	MU HDR						
Pop/HH													
258		3	3	2.5	2.25								
260	730	53	825	0	0								
774		0	0	0	0								
776													
777		0	255	825	1215								
779		0	0	0	0								
780		0	0	1088	465								
781		0	0	1320	0								
1005		0	0	0	0								
1006		0	1440	0	0								
1007		26	990	1755	351		0						
1009		0	1478	0	0		98						
1010		0	480	0	0		176						
Total	730	813	6645	3540	1566	0	98						

Scenario Two Estimates (continued)

TAZ	Households or employees per TAZ		LDR		MDR		HDR		IMU		MU Retail		MU MDR		MU HDR		BP		LI		WD		C-R		C-NR		IMF	
	CONS	RR	HH	HH	HH	HH	HH	HH	HH	HH	SF	SF	HH	HH	HH	HH	SF	SF	SF	SF	SF	SF	SF	SF	SF	SF	SF	SF
	258			0																								
	260	243		363		0	0	0													216			646			82	
	774			0		0	0	0																			0	
	776																											
	777			215		300	540														1525		632		167		0	
	779			0		0	0																					
	780			363		186																						
	781			0		528	0																285		0			
	1005			0		0	0																366		0			
	1006			0		0	0																2520		0			
	1007			383		192	336																457		2520		0	
	1009			333		0	0																1026		3157		378	
	1010			160		0	0																0		0			

Total	243	160	1655	1206	876	0	189	78	39	78	6915	3149	6328	1822	82	emp	emp	emp	emp	emp	emp	emp	emp	emp	emp	emp	emp	emp	emp	emp
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TAZ	Resident Population per TAZ		LDR		MDR		HDR		MU MDR		MU HDR	
	CONS	RR	HH	HH	HH	HH	HH	HH	HH	HH	HH	HH
Pop/HH	3	3	3	2.5	2.25							
258												
260	730	0	1088	0	0							
774	0	0	0	0	0							
776												
777	0	0	645	750	1215							
779	0	0	0	0	0							
780	0	0	1088	465	0							
781	0	0	1320	0	0							
1005	0	0	0	0	0							
1006	0	0	0	0	0							
1007	0	0	1148	480	756							
1009	0	0	998	0	0							
1010	0	480	0	0	0							

Total	730	480	4965	3015	1971	0	0	98	98	176	0	0
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Scenario Three Estimates

**Scenario 3
Acreage of Land Uses by TAZ**

TAZ	CONS	RR	LDR	MDR	HDR	MU	MU Retail	MU MDR	MU HDR	BP	LI	WD	C (retail)	c (non-retail)	IMF	
258																
260	2432			110											15	
774											33			89		
776																
777			182								27	119	219	58		
779														23		
780			145	31												
781				88									109		29	
1005		170											70		87	
1006											107		495	34		
1007		17	180	69	13	24	13	6.5	6.5	6.5	74	178	483	88	238	
1009			106	30							94					
1010		320														
Total	2432	507	613	328	13	24	13	6.5	6.5	6.5	302	330	1376	292	15	354

Households or Building Area by TAZ

TAZ	CONS	RR	LDR	MDR	HDR	MU	MU Retail	MU MDR	MU HDR	BP	LI	WD	C-R	C-NR	IMF	
Units	HH	HH	HH	HH	HH	SF	HH	HH	HH	SF	SF	SF	SF	SF		
258																
260	243	0	0	660	0										49005	
774	0	0	0	0	0						215622		387684			
776																
777	0	0	455	0	0						294030	777546	252648	100188		
779	0	0	0	0	0							0	0	0		
780	0	0	363	186	0							0	0	0		
781	0	0	0	528	0							712206	0	0		
1005	85	0	0	0	0							914760	0	0		
1006	0	0	0	0	0						1165230	0	6468660	148104	0	
1007	0	9	450	414	156						805860	1163052	6311844	383328		
1009	0	0	265	0	0						1023660	0	0	0		
1010	0	160	0	0	0						0	0	0	0		
Total	243	254	1533	1788	156	0	113256	39	78	78	3288780	2156220	14407470	1271952	49005	0

Scenario Three Estimates (continued)

Households or employees per TAZ															
TAZ	CONS	RR	LDR	MDR	HDR	MU	MU Retail	MU MDR	MU HDR	BP	LI	WD	C-R	C-NR	IMF
	HH	HH	HH	HH	HH		SF	HH	HH	SF	SF	SF	SF	SF	
258				0											
260	243	0	0	0	660	0									82
774		0	0	0	0	0			216				646		0
776															
777		0	455	0	0	0		735	778		421				0
779		0	0	0	0	0			0		167				
780		0	363	186	0	0			0		0				
781		0	528	0	0	0			0	285	0				
1005		85	0	0	0	0			0	366	0				
1006		0	0	0	0	0		0	0	2587	247				0
1007		9	450	414	156	189	39	78	2015	1163	2525	639			
1009		0	265	0	0	0			2559	0	0				
1010		160	0	0	0	0			0	0	0				
Total	243	254	1533	1788	156	0	189	39	78	8222	2156	5763	2120	82	0

Resident Population per TAZ													
TAZ	CONS	RR	LDR	MDR	HDR	MU MDR	MU HDR						
Pop/HH													
258	3	3	3	3	2.5	2.25							
260	730	0	0	0	1650	0							
774	0	0	0	0	0	0							
776													
777		0	1365	0	0	0							
779		0	0	0	0	0							
780		0	1088	465	0	0							
781		0	0	1320	0	0							
1005		0	255	0	0	0							
1006		0	0	0	0	0	0						
1007		0	26	1350	1035	351	98						
1009		0	0	795	0	0	176						
1010		0	480	0	0	0							
Total	730	761	4598	4470	351	0	98						

Scenario Four Estimates

Scenario 4 W&D N of Hwy 56 Acreage of Land Uses by TAZ

TAZ	CONS	RR	LDR	MDR	HDR	MU	MU Retail	MU MDR	MU HDR	BP	LI	WD	C (retail)	c (non-retail)	IMF	
258																
260	2432	36	118											89	17	
774											33					
776											138	219	34			
777			88													
779													23			
780			145	31												
781				88						109					29	
1005										70			6		87	
1006			41	108	36	34	17	8.5	8.5	133	72	262				
1007			148	24	48	52	26	13	13		152	626	70		238	
1009			133								94					
1010			320													
Total	2432	356	673	251	84	86	43	21.5	21.5	258	133	489	1286	222	17	354

Households or Building Area by TAZ

TAZ	CONS	RR	HH	LDR	MDR	HDR	MU	MU Retail	MU MDR	MU HDR	BP	LI	WD	C-R	C-NR	IMF
258																
260	243	18	295													
774												215622		387684		
776																
777			220									901692	2861892	148104		
779														100188		
780			363	186												
781				528									712206			
1005													914760	26136		
1006			103	432	432							1448370	470448	3423816		
1007			370	144	576							993168	8180568	304920		
1009			333									614196				
1010			160													
Total	243	178	1683	858	1008	0	374616	129	258	1448370	3195126	16093242	967032	55539	0	0

Scenario Four Estimates (continued)

Households or employees per TAZ															
TAZ	CONC	RR	LDR	MDR	HDR	MU	MU Retail	MU MDR	MU HDR	BP	LI	WD	C-R	C-NR	IMF
Units	HH	HH	HH	HH	HH	HH	SF	HH	HH	SF	SF	SF	SF	SF	
258			0												
260	243	18	295												93
774												216		646	
776															
777			220									902		247	
779														167	
780			363	186											
781				528									285		
1005													366	44	
1006			103		432		247	51	102		3621	470	1370		
1007			370	144	576		378	78	156			993	3272	508	
1009			333									614			
1010			160												
Total	243	178	1683	858	1008	0	624	129	258	3621	3195	5293	1612	93	0

Resident Population per TAZ															
TAZ	CONC	RR	LDR	MDR	HDR	MU	MU Retail	MU MDR	MU HDR	BP	LI	WD	C-R	C-NR	IMF
Pop/HH	HH	HH	HH	HH	HH	HH	SF	HH	HH	SF	SF	SF	SF	SF	
258															
260	730	54	885												
774															
776															
777			660												
779															
780			1088	465											
781				1320											
1005															
1006			308		972										230
1007			1110	360	1296										351
1009			998												
1010			480												
Total	730	534	5048	2145	2268	0	0	323	581	3621	3195	5293	1612	93	0

Preferred Scenario Estimates

2040 Preferred Scenario Acreage of Land Uses by TAZ

TAZ	CONS	RR	LDR	MDR	HDR	IMU	IMU Retail	IMU MDR	IMU HDR	BP	LI	WD	C (retail)	c (non-retail)	IMF	
258																
260	2432	45	57	26											17	
774		140	26						146					79		
776																
777		296												18		
779														23		
780			87	45										4		
781									45		22	131	85	26		
1005											59	572	32		90	
1006											68	508	58			
1007			64	182		53	26	13	6.5	6.5	82				250	
1009			16	138												
1010			275													
Total	2432	772	372	253	53	26	13	6.5	6.5	6.5	231	470	1296	240	17	340

Households or Building Area by TAZ

TAZ	CONS	RR	LDR	MDR	HDR	IMU	IMU Retail	IMU MDR	IMU HDR	BP	LI	WD	C-R	C-NR	IMF
Units	HH	HH	HH	HH	HH	HH	SF	HH	HH	SF	SF	SF	SF	SF	SF
258															
260	243	23	143	156											55539
774		70	156						953964				344124		
776															
777		148	0						607662				78408		
779													100188		
780			218	270									17424		
781													855954	113256	
1005										239580	294030		113256	0	
1006											642510		7474896	139392	
1007		0	160	1092	636		113256	39	78	740520	1215324		6638544	252648	
1009		8	345							892980					
1010			138												
Total	243	386	1021	1518	636	39	113256	39	78	2515590	3070980	16080174	1045440	55539	0

Opening Day and Interim Scenarios. Two subsets of the preferred scenario were developed to analyze evolving transportation needs at different points of time. This suggests how transportation improvements could be phased in over time, as well as indicating thresholds that require completion of specific projects. These “in-progress” subsets include:

- An opening day condition, assuming completion of the intermodal facility and distribution projects currently announced and under construction. The intermodal facility opened in September, 2013 and the Homestead Lane interchange and the connecting road system began operation in October, 2013. The opening day scenario assumes completion of about 800,000 square feet of warehousing and distribution space currently under development.
- A midpoint scenario, projecting the quantity of development approximately midway through the 2040 planning horizon (corresponding to about 2027). This midpoint assumes full development of the Logistics Park Kansas City and about 35% development of sites proposed for warehousing outside of the Logistics Park development, together corresponding to about 60% of the full warehousing development yield of the study area; and about 50% completion of associated development in the study area (including business park, light industry, commercial, and residential uses).

Opening Day

**Opening Preferred Scenario
Acres of Land Uses by TAZ**

TAZ	CONS	RR	LDR	MDR	HDR	MU	MU Retail	MU MDR	MU HDR	BP	LI	WD	C (retail)	C (non-retail)	IMF	
258																
260	400	45													17	
774		140											27			
776																
777		113														
779																
780																
781																
1005																
1006																
1007					12								40	18	250	
1009		16														
1010		83														
Total	400	397	0	0	12	0	0	0	0	0	0	0	40	45	17	250

Households or Building Area by TAZ

TAZ	CONS	RR	LDR	MDR	HDR	MU	MU Retail	MU MDR	MU HDR	BP	LI	WD	C-R	C-NR	IMF
Units	HH	HH	HH	HH	HH	HH	SF	HH	HH	SF	SF	SF	SF	SF	
258															
260	40	23	0	0	0										55539
774		70	0									0	117612		
776															
777		57	0									0	0		
779															
780				0											
781										0	0	0	0	0	
1005													0	0	
1006													0	0	
1007		0	0	0	144		0	0	0	0	0	822720	78408		
1009		8	0												
1010		42													
Total	40	199	0	0	144	0	0	0	0	0	0	822720	196020	55539	0

Opening Day (continued)

Households or employees per TAZ																
TAZ	CONC	RR	MDR	LDR	HDR	MU	MU Retail	MU MDR	MU HDR	BP	LI	WD	C-R	C-NR	IMF	
Units	HH	HH	HH	HH	HH	HH	SF	HH	HH	SF	SF	SF	SF	SF		
258		40	0	0	0	0										
260		23	0	0	0	0									93	
774		70	0	0	0	0							196		0	
776																
777		57	0	0	0	0									0	
779		0	0	0	0	0									0	
780		0	0	0	0	0									0	
781		0	0	0	0	0									0	
1005		0	0	0	0	0									60	
1006		0	0	0	0	0									0	
1007		0	0	0	144	0							329	131	170	
1009		8	0	0	0	0									0	
1010		42	0	0	0	0									0	
Total	40	199	0	0	144	0	0	0	0	0	0	0	329	327	93	230

Resident Population per TAZ									
TAZ	CONC	RR	MDR	LDR	HDR	MU MDR	MU HDR		
Pop/HH									
258	3	3	3	2.5	2.25				
260	120	68	0	0	0				
774	210	0	0	0	0				
776									
777	170	170	0	0	0				
779									
780		0	0	0	0				
781									
1005									
1006									
1007	0	0	0	0	324	0	0	0	0
1009		24	0	0	0				
1010		125							
Total	120	596	0	0	324	0	0	0	0

Midpoint Preferred

Midpoint Preferred Scenario Acceage of Land Uses by TAZ

TAZ	CONS	RR	LDR	MDR	HDR	MU	MU Retail	MU MDR	MU HDR	BP	LI	WD	C (retail)	c (non-retail)	IMF	
258																
260	1216	45	37	26										27	17	
774		140									35					
776																
777		296	49								27					
779																
780			87	45										4		
781													131	26		
1005													85		90	
1006											30		226	12		
1007			64	140	53	13	6.5	3.25	3.25	3.25	64	111	508	51	250	
1009			16	40							30					
1010			150													
Total	1216	647	277	211	53	13	6.5	3.25	3.25	3.25	124	173	950	120	17	340

Households or Building Area by TAZ

TAZ	CONS	RR	LDR	MDR	HDR	MU	MU Retail	MU MDR	MU HDR	BP	LI	WD	C-R	C-NR	IMF
Units	HH	HH	HH	HH	HH	HH	SF	HH	HH	SF	SF	SF	SF	SF	
258															
260	122	23	93	156											55539
774		70	0								228690			117612	
776															
777		148	123								176418			0	
779														0	
780			218	270										17424	
781											0		855954	113256	
1005														1110780	0
1006											326700			2953368	52272
1007		0	160	840	636		56628	20	39	696960	725274	6638544	222156		
1009		8	100								326700				
1010			75												
Total	122	324	693	1266	636	0	56628	20	39	1350360	1130382	11558646	522720	55539	0

