determining feasible options for increasing residential densities. There is also little attempt to highlight the strengths and weaknesses of each policy.

In South Africa, the strategy of compaction through higher residential densities has become part of the new planning orthodoxy. The literature reflects that recent political developments have seen a move to redress the existing pattern of residential development, which consists of low-income households living in high density townships on the periphery, and higher income households in low density suburbs close to work opportunities. While most South African literature on urban issues refer to the need to increase residential densities, no comprehensive methodology has been documented on how this could be achieved. The implementation of ideas relating to higher residential densities is not possible until such a model is in place to guide planners and local authorities.

Set against the increasing recognition of the advantages of high residential densities in inner city areas, this thesis offers a model to test the feasibility of increasing residential densities in inner city areas. The suburb of Jeppestown, Johannesburg was used to illustrate the model. The model includes four main steps: the description of existing conditions, the identification and quantification of land suitable for densification and the development and evaluation of scenarios. For each of these steps, the data types, data sources and calculations associated with each, were described.

Concerning the description of existing conditions, land use, ownership, densities and socio-economic information was required in order to understand current dynamics in the study area. Potential land suitable for densification (infill, potential land through demolition and redevelopment and subdivision opportunities) was identified and quantified. Criteria that were used to identify land suitable for densification include building condition, property values and erf size.

The socio-economic characteristics of the potential population in Jeppestown were determined in order to inform the decision concerning appropriate housing types to be used in Jeppestown. A variety of housing options, based primarily on income criteria, were selected to suit differing family sizes and stages in life. For the purpose of this study, the

target population consisted of those having a household income of at least R3 000 a month, similar to that of the existing inhabitants of the area.

Alternative scenarios were generated based on allocating various percentages of appropriate housing types to the available land. The efficiency of each housing option was assessed in terms of land consumption, densities and quality of life achieved. By allocating each housing option to all available land, the model showed which housing types resulted in the greatest additional population and which resulted in the best quality of life indicators. For the purposes of the study, the following quality of life indicators were chosen: people per habitable room, floor space rate and garden space per person. Seven scenarios were developed: two low density scenarios; a scenario containing an equal proportion of dwellings; three scenarios emphasising quality of life aspects and one high density scenario.

The model made use of spreadsheets and GIS technology which greatly facilitated the testing of the implication of densification scenarios. While the data collection, analysis and presentation could have been done manually, GIS technology enabled the rapid updating and editing of maps. Since the identification of densification opportunities is at erf level, the land use, ownership and property maps were mapped at erf, not block level.

In evaluating the scenarios, the scenarios were compared by assessing which achieved the best balance between additional people, quality of life and costs. Trade-offs were therefore made between the change in net and gross residential densities, building and population densities, the dwelling unit cost and the quality of life indicators.

In Jeppestown, the model showed that no one scenario scored well in all the criteria. In all scenarios, however, the population could be approximately doubled whilst maintaining reasonable levels of privacy, living space and private recreational space. In terms of densities achieved, there is little variation between the scenarios. The high density scenario which results in the highest increase in population due to the high proportion of three and four storey flats, results in the best result for people per habitable room but the worst for Floor Space Rate and garden space per person. The costs associated with the high density scenario are the highest - double that of the low density scenario. The scenario which targeted the

best quality of life aspects, resulted in a middle-range density and dwelling unit cost. This scenario, which contained a high proportion of two storey row housing, resulted in the best overall results in terms of density, quality of life aspects and costs.

It should be noted that the model forms only a small part of the total development planning process. The broader planning process includes aspects relating to the provision of social facilities, infrastructure and financing. This broader framework must be done with full stakeholder involvement. Another point to note is that the tool presented in this thesis for planners to determine the feasibility of higher residential densities, is restricted to suburb level. At metropolitan level, the model would need to be adapted to include factors that operate at a metropolitan level, such as tertiary education facilities. Even at local level, the model may require minor modifications due to specific local conditions.

Finally, the thesis has shown that while there is abundant literature on the theory of urban planning, there is a paucity of literature on *how* to increase residential densities and compact the city. While this thesis has described a tool for planners to determine the feasibility of increasing residential densities, further research is required to supplement this study, especially technical issues relating to densification. A further avenue for research therefore, is the testing or application of this model in a range of suburbs so that limitations can be identified and modifications made. The application of the model within the context of an integrated local development plan, will be beneficial in identifying further refinements, particularly as relating to building links to other components of the planning process. As South Africa is presently in a transitional phase, it is a fitting moment to apply densification policies and thereby contribute towards the nations' reconstruction and development.

APPENDICES

	PEOPLE	BED-SPACES	HABITABLE ROOMS	DWELLINGS	FLOOR-SPACE	SITE-SPACE
PEOPLE		Bedspaces per person	Habitable rooms per person	Dwellings per person	Floorspace per person	Sitespace per person
BED-SPACE	Persons per bedspace		Habitable rooms per bedspace	Dwellings per bedspace	Floorspace per bedspace	Sitespace per bedspace
HABITABLE ROOMS	Persons per habitable room	Bedspaces per habitable room		Dwellings per habitable room	Floorspace per habitable room	Sitespace per habitable room
DWELLINGS	Persons per dwelling	Bedspaces per dwelling	Habitable rooms per dwelling		Floorspace per dwelling	Sitespace per dwelling
FLOORSPACE	Persons per floorspace	Bedspaces per floorspace	Habitable room per floorspace	Dwellings per floorspace		Sitespace per floorspace
SITESPACE	Persons per sitespace	Bedspace per sitespace	Habitable rooms per sitespace	Dwellings per sitespace	Floorspace per sitespace	

Appendix 10: Matrix of Density Measures (Source: Evans, 1973)

Appendix 11: Conversion of Raw Score into a Comparable Score (%) - People per Habitable Room

1. The values on Table 4.7 for People per Habitable Room were summed
e.g.. 1.2+1.2+1.1+1.3+1.1+1.1=7

2. Percentages were calculated.
e.g. 1.2 / 7= 17%
1.2 / 7= 17%
1.1 / 7= 15.7%
1.3 / 7= 18.5%
1.1 / 7= 15.7%
1.1 / 7= 15.7%

3. Each percentage was subtracted from 100 to invert its value.
e.g..100-17%=83%
100-17%=83%
100-15.7%=84.3%
100-18.5%=81.5%
100-15.7%=84.3%
100-15.7%=84.3%

4. The answers obtained above were summed.
e.g. 83+83+84.3+81.5+84.3+84.3=500.4

5. The final percentages shown on Table 4.8 were calculated.
e.g. 83/500.4=**16.6%**
83/500.4=**16.6%**
84.3/500.4=**16.8%**
81.5/500.4=**16.2%**
84.3/500.4=**16.8%**
84.3/500.4=**16.8%**

RECORD	STAND NUMBER	STAND AREA	LAND VALUE	IMPROVEMENT VALUE	TOTAL PROPERTY VALUE	TOTAL VALUE/ AREA	LAND VALUE/ AREA	IMPROVEMENT VALUE/ AREA	SOURCE	RATIO: IMPROVEMENT TO LAND	RATIO: (IMPROVEMENT TO LAND)/AREA
3	602	496	22000	28500	50500	101.81	44.35	57.46	ORIGINAL	1.3	0.0026
4	791	248	13000	32000	45000	181.45	52.42	129.03	ORIGINAL	2.5	0.0099
5	904	248	13000	47000	60000	241.94	52.42	189.52	ORIGINAL	3.6	0.0146
7	905	248	13000	47000	60000	241.94	52.42	189.52	ORIGINAL	3.6	0.0146
8	974	496	22000	43000	65000	131.05	44.35	86.69	ORIGINAL	2.0	0.0039
9	1449	995	43000	120000	163000	163.82	43.22	120.60	ORIGINAL	2.8	0028
10	1788	992	43000	73000	116000	116.94	43.35	73.59	ORIGINAL	1.7	0.0017
11	1295	248	13000	30000	43000	173.39	52.42	120.97	ORIGINAL	2.3	0.0093
12	1376	992	48000	87000	135000	136.09	48.39	87.70	ORIGINAL	1.8	0.0018
13	1910	248	13000	57500	70500	284.27	52.42	231.85	ORIGINAL	4.4	0.0178
14	2374	992	43000	62500	105500	106.35	43.35	63.00	ORIGINAL	1.5	0.0015
15	2273	992	20000	89000	109000	109.88	20.16	89.72	ORIGINAL	4.5	0.0045
16	2130	496	23000	113000	136000	274.19	46.37	227.82	ORIGINAL	4.9	0.0099
17	2058	992	43000	67500	110500	111.39	43.35	68.04	ORIGINAL	1.6	0.0016
18	1570	248	13000	56500	69500	280.24	52.42	227.82	SUBST	4.3	0.0175
19	2673	992	46000	108000	154000	155.24	46.37	108.87	ORIGINAL	2.3	0.0024
20	984	496	22000	52500	74500	150.20	44.35	105.85	ORIGINAL	2.4	0.0048
21	1367	992	45000	104000	149000	150.20	45.36	104.84	SUBST	2.3	0.0023
22	1648	992	43000	111000	154000	155.24	43.35	111.90	ORIGINAL	2.6	0.0026
23	1987	992	43000	54500	97500	98.29	43.35	54.94	ORIGINAL	1.3	0.0013
25	2278	992	43000	116500	159500	160.79	43.35	117.44	ORIGINAL	2.7	0.0027
27	2455	496	22000	48000	70000	141.13	44.35	96.77	ORIGINAL	2.2	0.0044
28	2599	496	22000	58000	80000	161.29	44.35	116.94	ORIGINAL	2.6	0.0053
29	2533	248	13000	43000	56000	225.81	52.42	173.39	ORIGINAL	3.3	0.0133
30	2346	248	13000	46000	59000	237.90	52.42	185.48	ORIGINAL	3.5	0.0143
31	2349	248	13000	52500	65500	264.11	52.42	211.69	ORIGINAL	4.0	0.0163
32	2291	248	13000	51000	64000	258.06	52.42	205.65	ORIGINAL	3.9	0.0158
33	2159	496	22000	48000	70000	141.13	44.35	96.77	ORIGINAL	2.2	0.0044
35	1997	496	22000	48000	70000	141.13	44.35	96.77	ORIGINAL	2.2	0.0044
36	1909	248	13000	51500	64500	260.08	52.42	207.66	SUBST	4.0	0.0160
37	1831	496	22000	130000	152000	306.45	44.35	262.10	ORIGINAL	5.9	0.0119
38	1826	248	13000	57000	70000	282.26	52.42	229.84	ORIGINAL	4.4	0.0177

Appendix 1: Property Values for a Selected Number of Residential Stands in Jeppestown (Source: Extracted from the Valuation Roll, Johannesburg City Council)

39	1742	248	13000	55000	68000	274.19	52.42	221.77	ORIGINAL	4.2	0.0171
40	1574	496	22000	70500	92500	186.49	44.35	142.14	ORIGINAL	3.2	0.0065
41	1079	496	22000	48000	70000	141.13	44.35	96.77	ORIGINAL	2.2	0.0044
42	1402	248	13000	57000	70000	282.26	52.42	229.84	ORIGINAL	4.4	0.0177
43	1262	248	13000	47000	60000	241.94	52.42	189.52	ORIGINAL	3.6	0.0146
45	1352	248	9500	32000	41500	167.34	38.31	129.03	ORIGINAL	3.4	0.0136
46	1421	248	9500	35500	45000	181.45	38.31	143.15	ORIGINAL	3.7	0.0151
47	1590	248	13000	45500	58500	235.89	52.42	183.47	ORIGINAL	3.5	0.0141
48	1672	248	9500	55500	65000	262.10	38.31	223.79	ORIGINAL	5.8	0.0236
49	1740	248	13000	60000	73000	294.35	52.42	241.94	SUBST	4.6	0.0186
50	1846	248	13000	49500	62500	252.02	52.42	199.60	ORIGINAL	3.8	0.0154
51	1929	248	13000	45500	58500	235.89	52.42	183.47	ORIGINAL	3.5	0.0141
53	2365	248	13000	48500	61500	247.98	52.42	195.56	ORIGINAL	3.7	0.0150
54	2512	248	13000	48500	61500	247.98	52.42	195.56	ORIGINAL	3.7	0.0150
55	2584	496	26000	102500	128500	259.07	52.42	206.65	ORIGINAL	3.9	0.0079
56	2645	248	13000	64000	77000	310.48	52.42	258.06	ORIGINAL	4.9	0.0199
58	2485	248	13000	64000	77000	310.48	52.42	258.06	ORIGINAL	4.9	0.0199
61	1852	496	16500	43500	60000	120.97	33.27	87.70	ORIGINAL	2.6	0.0053
62	1768	496	22000	42500	64500	130.04	44.35	85.69	ORIGINAL	1.9	0.0039
63	1979	496	22000	35000	57000	114.92	44.35	70.56	ORIGINAL	1.6	0.0032
64	1685	248	13000	45500	58500	235.89	52.42	183.47	ORIGINAL	3.5	0.0141
65	1597	496	22000	57500	79500	160.28	44.35	115.93	ORIGINAL	2.6	0.0053
66	1523	248	13000	62500	75500	304.44	52.42	252.02	SUBST	4.8	0.0194
67	1511	248	9500	30000	39500	159.27	38.31	120.97	SUBST	3.2	0.0127
68	1425	248	9500	30000	39500	159.27	38.31	120.97	ORIGINAL	3.2	0.0127
69	1357	496	16500	32000	48500	97.78	33.27	64.52	ORIGINAL	1.9	0.0039
70	1146	248	9500	39500	49000	197.58	38.31	159.27	ORIGINAL	4.2	0.0168
71	1689	248	13000	54000	67000	270.16	52.42	217.74	ORIGINAL	4.2	0.0167
73	187	248	32000	32000	64000	258.06	129.03	129.03	ORIGINAL	1.0	0.0040
74	182	248	13000	47000	60000	241.94	52.42	189.52	ORIGINAL	3.6	0.0146
75	150	248	30000	17000	47000	189.52	120.97	68.55	ORIGINAL	0.6	0.0023
76	137	248	30000	17000	47000	189.52	120.97	68.55	ORIGINAL	0.6	0.0023
77	24	347	16500	35000	51500	148.41	47.55	100.86	ORIGINAL	2.1	0.0061
78	32	347	42000	70000	112000	322.77	121.04	201.73	ORIGINAL	1.7	0.0048

79	79	347	52000	90000	142000	409.22	149.86	259.37	ORIGINAL	1.7	0.0050
101	1181	1736	83000	327000	410000	236.18	47.81	188.36	ORIGINAL	3.9	0.0023
103	536	1984	96000	430000	526000	265.12	48.39	216.73	ORIGINAL	4.5	0.0023
106	1401	248	13000	99000	112000	451.61	52.42	399.19	ORIGINAL	7.6	0.0307
107	1004	992	47000	223000	270000	272.18	47.38	224.80	ORIGINAL	4.7	0.0048
109	2785	25320	633000	4277000	4910000	193.92	25.00	168.92	ORIGINAL	6.8	0.0003
133	2445	496	16500	100000	116500	234.88	33.27	201.61	ORIGINAL	6.1	0.0122
134	2482	248	9500	79000	88500	356.85	38.31	318.55	ORIGINAL	8.3	0.0335
137	2510	992	78500	225000	303500	305.95	79.13	226.81	ORIGINAL	2.9	0.0029
138	2548	992	38000	357000	395000	398.19	38.31	359.88	ORIGINAL	9.4	0.0095
144	28	347	17000	153000	170000	489.91	48.99	440.92	ORIGINAL	9.0	0.0259
150	2391	248	13000	56500	69500	280.24	52.42	227.82	EXTRA	4.3	0.0175
151	2395	496	22000	47000	69000	139.11	44.35	94.76	EXTRA	2.1	0.0043
152	2397	496	22000	101000	123000	247.98	44.35	203.63	EXTRA	4.6	0.0093
153	2393	248	13000	61000	74000	298.39	52.42	245.97	EXTRA	4.7	0.0189
155	833	496	21000	54000	75000	151.21	42.34	108.87	EXTRA	2.6	0.0052
157	836	496	26000	35000	61000	122.98	52.42	70.56	EXTRA	1.3	0.0027
158	831	496	22000	52500	74500	150.20	44.35	105.85	EXTRA	2.4	0.0048
159	1829	496	22000	106500	128500	259.07	44.35	214.72	EXTRA	4.8	0.0098
160	1830	496	22000	48000	70000	141.13	44.35	96.77	EXTRA	2.2	0.0044
161	1827	248	13000	48500	61500	247.98	52.42	195.56	EXTRA	3.7	0.0150
162	2092	248	13000	49500	62500	252.02	52.42	199.60	EXTRA	3.8	0.0154
163	2093	248	13000	55500	68500	276.21	52.42	223.79	EXTRA	4.3	0.0172
164	2090	248	13000	50500	63500	256.05	52.42	203.63	EXTRA	3.9	0.0157
165	2644	313	14000	69500	83500	266.77	44.73	222.04	EXTRA	5.0	0.0159
166	2643	554	22500	55000	77500	139.89	40.61	99.28	EXTRA	2.4	0.0044
167	2642	546	17500	43000	60500	110.81	32.05	78.75	EXTRA	2.5	0.0045
170	2312	244	13000	50000	63000	258.20	53.28	204.92	EXTRA	3.8	0.0158
171	2314	248	13000	54000	67000	270.16	52.42	217.74	EXTRA	4.2	0.0167
172	2315	248	13000	50000	63000	254.03	52.42	201.61	EXTRA	3.8	0.0155
173	2249	248	13000	48500	61500	247.98	52.42	195.56	EXTRA	3.7	0.0150
174	2248	248	13000	62000	75000	302.42	52.42	250.00	EXTRA	4.8	0.0192
175	2252	496	22000	25500	47500	95.77	44.35	51.41	EXTRA	1.2	0.0023
176	1523	248	13000	62000	75000	302.42	52.42	250.00	EXTRA	4.8	0.0192

177	1524	248	13000	50500	63500	256.05	52.42	203.63	EXTRA	3.9	0.0157
178	248	992	152500	27000	179500	180.95	153.73	27.22	EXTRA	0.2	0.0002
179	1403	248	13000	11000	24000	96.77	52.42	44.35	EXTRA	0.8	0.0034
180	1404	248	12500	53000	65500	264.11	50.40	213.71	EXTRA	4.2	0.0171
181	1405	496	22000	52500	74500	150.20	44.35	105.85	EXTRA	2.4	0.0048
182	2481	248	9500	65000	74500	300.40	38.31	262.10	EXTRA	6.8	0.0276
183	2480	248	9500	65000	74500	300.40	38.31	262.10	EXTRA	6.8	0.0276
184	2479	248	9500	85000	94500	381.05	38.31	342.74	EXTRA	8.9	0.0361
185	2268	992	43000	113000	156000	157.26	43.35	113.91	EXTRA	2.6	0.0026
186	2322	992	43000	98500	141500	142.64	43.35	99.29	EXTRA	2.3	0.0023
187	2202	992	43000	91500	134500	135.58	43.35	92.24	EXTRA	2.1	0.0021
188	1452	992	43000	82000	125000	126.01	43.35	82.66	EXTRA	1.9	0.0019
189	1703	992	43000	105500	148500	149.70	43.35	106.35	EXTRA	2.5	0.0025
190	1717	992	43000	122000	165000	166.33	43.35	122.98	EXTRA	2.8	0.0029
191	1629	1984	86000	145500	231500	116.68	43.35	73.34	EXTRA	1.7	0.0009
192	1635	992	43000	88500	131500	132.56	43.35	89.21	EXTRA	2.1	0.0021
193	1257	248	11500	77000	88500	356.85	46.37	310.48	EXTRA	6.7	0.0270
194	1197	992	43000	91500	134500	135.58	43.35	92.24	EXTRA	2.1	0.0021
197	1301	992	43000	94000	137000	138.10	43.35	94.76	EXTRA	2.2	0.0022
198	1611	1229	51000	131000	182000	148.09	41.50	106.59	EXTRA	2.6	0.0021
199	2073	248	13000	62000	75000	302.42	52.42	250.00	EXTRA	4.8	0.0192
200	2621	496	22000	56500	78500	158.27	44.35	113.91	EXTRA	2.6	0.0052
202	2613	248	9500	46000	55500	223.79	38.31	185.48	EXTRA	4.8	0.0195
203	2614	248	9500	51000	60500	243.95	38.31	205.65	EXTRA	5.4	0.0216
204	2589	496	16500	85000	101500	204.64	33.27	171.37	EXTRA	5.2	0.0104
205	2568	496	22000	48000	70000	141.13	44.35	96.77	EXTRA	2.2	0.0044
206	2586	248	13000	40500	53500	215.73	52.42	163.31	EXTRA	3.1	0.0126
207	2628	248	13000	60500	73500	296.37	52.42	243.95	EXTRA	4.7	0.0188
208	2598	496	22000	58000	80000	161.29	44.35	116.94	EXTRA	2.6	0.0053
210	2620	248	9500	54000	63500	256.05	38.31	217.74	EXTRA	5.7	0.0229
211	2518	248	13000	57500	70500	284.27	52.42	231.85	EXTRA	4.4	0.0178
212	2521	248	13000	60000	73000	294.35	52.42	241.94	EXTRA	4.6	0.0186
213	2556	496	22000	48500	70500	142.14	44.35	97.78	EXTRA	2.2	0.0044
214	2174	248	13000	5150	64500	260.08	52.42	207.66	EXTRA	4.0	0.0160

215	2175	248	13000	61000	74000	298.39	52.42	245.97	EXTRA	4.7	0.0189
216	2171	248	13000	54000	67000	270.16	52.42	217.74	EXTRA	4.2	0.0167
217	2172	248	13000	48500	61500	247.98	52.42	195.56	EXTRA	3.7	0.0150
218	2173	248	13000	55500	68500	276.21	52.42	223.79	EXTRA	4.3	0.0172
219	2244	248	9500	37500	47000	189.52	38.31	151.21	EXTRA	3.9	0.0159
220	2245	248	9500	45000	54500	219.76	38.31	181.45	EXTRA	4.7	0.0191
221	2362	496	16500	48500	65000	131.05	33.27	97.78	EXTRA	2.9	0.0059
222	2367	248	13000	54000	67000	270.16	52.42	217.74	EXTRA	4.2	0.0167
223	2364	248	13000	51000	64000	258.06	52.42	205.65	EXTRA	3.9	0.0158
224	2408	248	13000	55000	68000	274.19	52.42	221.77	EXTRA	4.2	0.0171
225	2409	248	13000	52000	65000	262.10	52.42	209.68	EXTRA	4.0	0.0161
226	2449	248	9500	50000	59500	239.92	38.31	201.61	EXTRA	5.3	0.0212
227	2448	248	9500	44500	54000	217.74	38.31	179.44	EXTRA	4.7	0.0189
228	2515	248	13000	50000	63000	254.03	52.42	201.61	EXTRA	3.8	0.0155
229	2514	248	13000	58500	71500	288.31	52.42	235.89	EXTRA	4.5	0.0181
230	2516	248	13000	41500	54500	219.76	52.42	167.34	EXTRA	3.2	0.0129
231	2517	248	13000	52500	65500	264.11	52.42	211.69	EXTRA	4.0	0.0163
232	2581	496	26000	53000	79000	159.27	52.42	106.85	EXTRA	2.0	0.0041
233	2615	248	9500	54000	63500	256.05	38.31	217.74	EXTRA	5.7	0.0229
234	2616	248	9500	54500	64000	258.06	38.31	219.76	EXTRA	5.7	0.0231
235	2638	496	27000	56500	83500	168.35	54.44	113.91	EXTRA	2.1	0.0042
236	2617	248	9500	57500	67000	270.16	38.31	231.85	EXTRA	6.1	0.0244
237	2618	248	9500	53000	62500	252.02	38.31	213.71	EXTRA	5.6	0.0225
238	2619	248	9500	49500	59000	237.90	38.31	199.60	EXTRA	5.2	0.0210
239	2622	496	22000	49500	71500	144.15	44.35	99.80	EXTRA	2.3	0.0045
240	2624	496	22000	41000	63000	127.02	44.35	82.66	EXTRA	1.9	0.0038
241	2623	496	22000	48000	70000	141.13	44.35	96.77	EXTRA	2.2	0.0044
242	2625	248	13000	53000	66000	266.13	52.42	213.71	EXTRA	4.1	0.0164
243	2626	248	13000	48500	61500	247.98	52.42	195.56	EXTRA	3.7	0.0150
244	2627	248	13000	55000	68000	274.19	52.42	221.77	EXTRA	4.2	0.0171
245	2552	496	26000	73000	99000	199.60	52.42	147.18	EXTRA	2.8	0.0057
246	2554	248	13000	52000	65000	262.10	52.42	209.68	EXTRA	4.0	0.0161
247	2555	248	13000	72000	85000	342.74	52.42	290.32	EXTRA	5.5	0.0223
248	2557	496	22000	51500	73500	148.19	44.35	103.83	EXTRA	2.3	0.0047

249	2558	592	24500	37000	61500	103.89	41.39	62.50	EXTRA	1.5	0.0026
250	2585	248	13000	45500	58500	235.89	52.42	183.47	EXTRA	3.5	0.0141
251	2587	248	13000	48500	61500	247.98	52.42	195.56	EXTRA	3.7	0.0150
252	2590	496	22000	77000	99000	199.60	44.35	155.24	EXTRA	3.5	0.0071
253	2592	496	22000	31500	53500	107.86	44.35	63.51	EXTRA	1.4	0.0029
254	2050	996	43000	109500	152500	153.11	43.17	109.94	EXTRA	2.5	0.0026
255	2048	996	43000	139000	182000	182.73	43.17	139.56	EXTRA	3.2	0.0032
256	2054	996	43000	74000	117000	117.47	43.17	74.30	EXTRA	1.7	0.0017
257	2128	996	43000	108000	151000	151.61	43.17	108.43	EXTRA	2.5	0.0025
258	2135	996	43000	60000	103000	103.41	43.17	60.24	EXTRA	1.4	0.0014
259	2204	996	43000	75000	118000	118.47	43.17	75.30	EXTRA	1.7	0.0018
260	2209	996	43000	25000	68000	68.27	43.17	25.10	EXTRA	0.6	0.0006
261	2208	996	43000	105000	148000	148.59	43.17	105.42	EXTRA	2.4	0.0025
262	2272	996	43000	105000	148000	148.59	43.17	105.42	EXTRA	2.4	0.0025
263	2324	996	43000	78000	121000	121.49	43.17	78.31	EXTRA	1.8	0.0018
264	2328	996	100000	105000	205000	205.82	100.40	105.42	EXTRA	1.1	0.0011
265	2329	996	43000	13500	56500	56.73	43.17	13.55	EXTRA	0.3	0.0003
266	2062	996	43000	83500	126500	127.01	43.17	83.84	EXTRA	1.9	0.0019
267	2060	996	43000	70500	113500	113.96	43.17	70.78	EXTRA	1.6	0.0016
268	2066	996	43000	75000	118000	118.47	43.17	75.30	EXTRA	1.7	0.0018
269	2067	996	43000	70500	113500	113.96	43.17	70.78	EXTRA	1.6	0.0016
270	2140	996	43000	102000	145000	145.58	43.17	102.41	EXTRA	2.4	0.0024
271	2146	996	43000	110000	153000	153.61	43.17	110.44	EXTRA	2.6	0.0026
272	2150	996	43000	81500	124500	125.00	43.17	81.83	EXTRA	1.9	0.0019
273	2221	996	43000	41500	84500	84.84	43.17	41.67	EXTRA	1.0	0.0010
274	2220	996	43000	42500	85500	85.84	43.17	42.67	EXTRA	1.0	0.0010
275	1986	996	43000	62500	105500	105.92	43.17	62.75	EXTRA	1.5	0.0015
276	1985	996	43000	54500	97500	97.89	43.17	54.72	EXTRA	1.3	0.0013
277	1897	996	43000	95000	138000	138.55	43.17	95.38	EXTRA	2.2	0.0022
278	1899	996	43000	75500	118500	118.98	43.17	75.80	EXTRA	1.8	0.0018
279	1815	996	43000	73000	116000	116.47	43.17	73.29	EXTRA	1.7	0.0017
280	1729	996	43000	86000	129000	129.52	43.17	86.35	EXTRA	2.0	0.0020
281	1636	996	43000	93000	136000	136.55	43.17	93.37	EXTRA	2.2	0.0022
282	1912	248	13000	51000	64000	258.06	52.42	205.65	EXTRA	3.9	0.0158

283	1991	248	13000	59000	72000	290.32	52.42	237.90	EXTRA	4.5	0.0183
284	1992	248	13000	10000	23000	92.74	52.42	40.32	EXTRA	0.8	0.0031
285	1993	248	13000	41500	54500	219.76	52.42	167.34	EXTRA	3.2	0.0129
286	1994	248	13000	47500	60500	243.95	52.42	191.53	EXTRA	3.7	0.0147
287	1995	496	22000	29500	51500	103.83	44.35	59.48	EXTRA	1.3	0.0027
288	1996	496	22000	48000	70000	141.13	44.35	96.77	EXTRA	2.2	0.0044
289	2075	248	13000	47000	60000	241.94	52.42	189.52	EXTRA	3.6	0.0146
290	2074	248	13000	62000	75000	302.42	52.42	250.00	EXTRA	4.8	0.0192
291	2072	248	13000	44500	57500	231.85	52.42	179.44	EXTRA	3.4	0.0138
292	2152	248	13000	70000	83000	334.68	52.42	282.26	EXTRA	5.4	0.0217
293	2153	248	13000	68000	81000	326.61	52.42	274.19	EXTRA	5.2	0.0211
294	2229	248	13000	54000	67000	270.16	52.42	217.74	EXTRA	4.2	0.0167
295	2227	248	13000	59000	72000	290.32	52.42	237.90	EXTRA	4.5	0.0183
296	2230	496	22000	41000	63000	127.02	44.35	82.66	EXTRA	1.9	0.0038
297	2231	496	22000	38000	60000	120.97	44.35	76.61	EXTRA	1.7	0.0035
298	2290	248	13000	47000	60000	241.94	52.42	189.52	EXTRA	3.6	0.0146
299	2292	248	13000	47000	60000	241.94	52.42	189.52	EXTRA	3.6	0.0146
300	2293	248	13000	57000	70000	282.26	52.42	229.84	EXTRA	4.4	0.0177
301	2294	496	22000	39500	61500	123.99	44.35	79.64	EXTRA	1.8	0.0036
302	2296	496	22000	48000	70000	141.13	44.35	96.77	EXTRA	2.2	0.0044
303	2348	248	13000	60000	73000	294.35	52.42	241.94	EXTRA	4.6	0.0186
304	2351	496	22000	37000	59000	118.95	44.35	74.60	EXTRA	1.7	0.0034
305	2350	496	22000	58500	80500	162.30	44.35	117.94	EXTRA	2.7	0.0054
306	2347	248	13000	52500	65500	264.11	52.42	211.69	EXTRA	4.0	0.0163
307	2390	248	13000	68000	81000	326.61	52.42	274.19	EXTRA	5.2	0.0211
308	2392	248	13000	56500	69500	280.24	52.42	227.82	EXTRA	4.3	0.0175
309	2394	496	22000	53000	75000	151.21	44.35	106.85	EXTRA	2.4	0.0049
310	2396	496	22000	63500	85500	172.38	44.35	128.02	EXTRA	2.9	0.0058
311	2428	248	13000	59000	72000	290.32	52.42	237.90	EXTRA	4.5	0.0183
312	2429	248	13000	57000	70000	282.26	52.42	229.84	EXTRA	4.4	0.0177
313	2430	248	13000	47000	60000	241.94	52.42	189.52	EXTRA	3.6	0.0146
314	2431	248	13000	47000	60000	241.94	52.42	189.52	EXTRA	3.6	0.0146
315	2432	496	22000	52000	74000	149.19	44.35	104.84	EXTRA	2.4	0.0048
316	2434	496	22000	45000	67000	135.08	44.35	90.73	EXTRA	2.0	0.0041