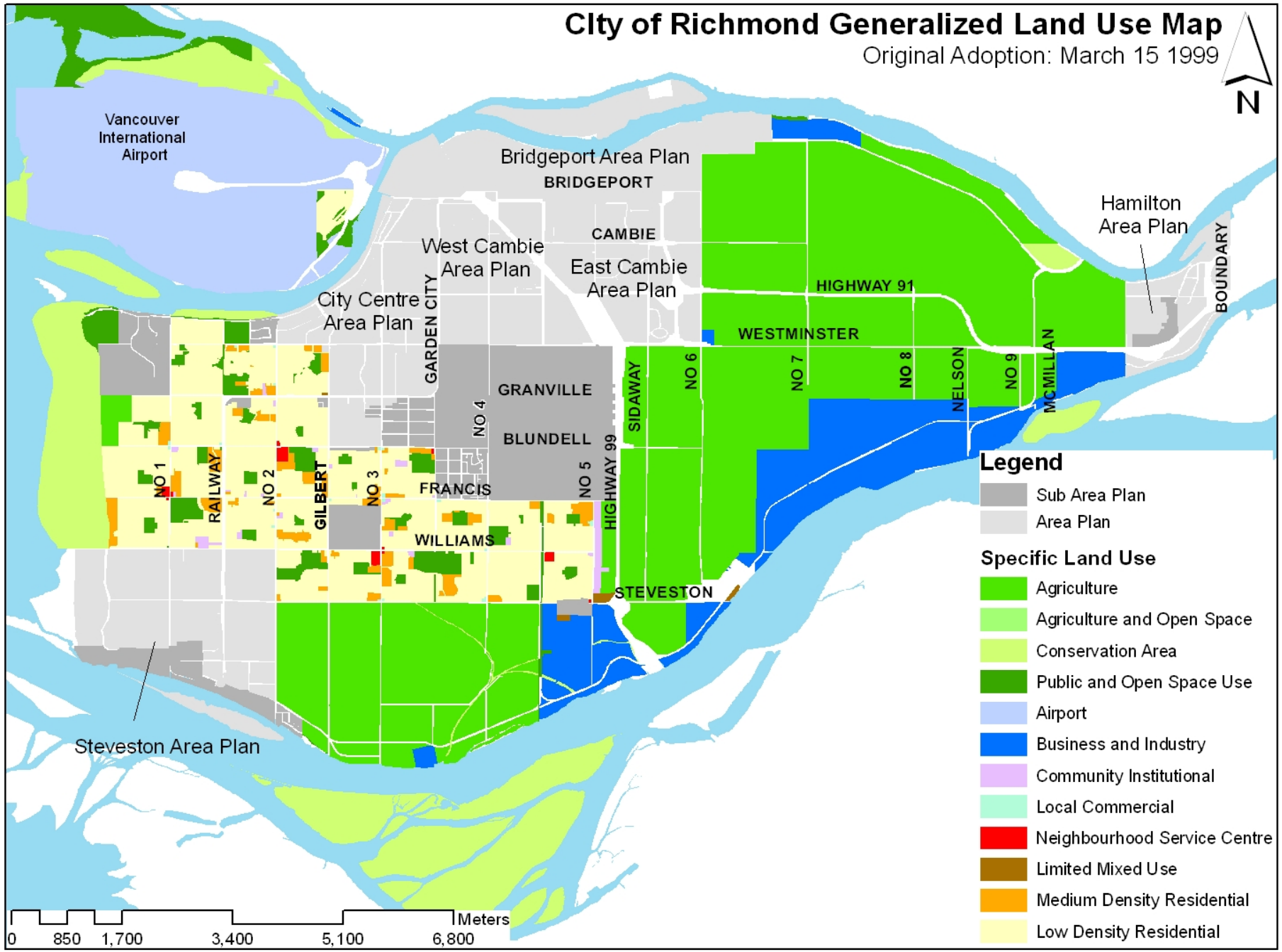
A Land Use Based Population Projection Model For Richmond

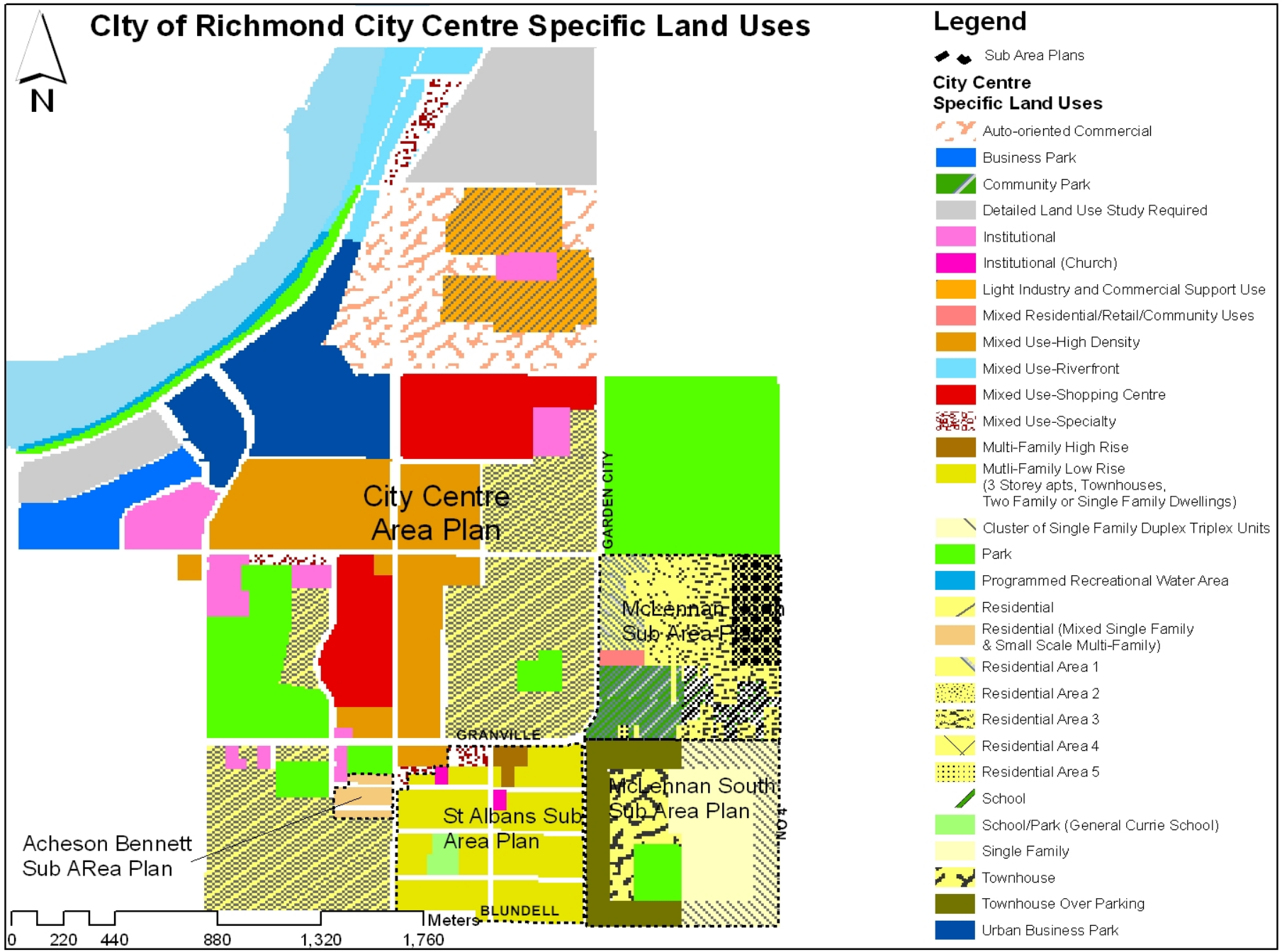
Outline

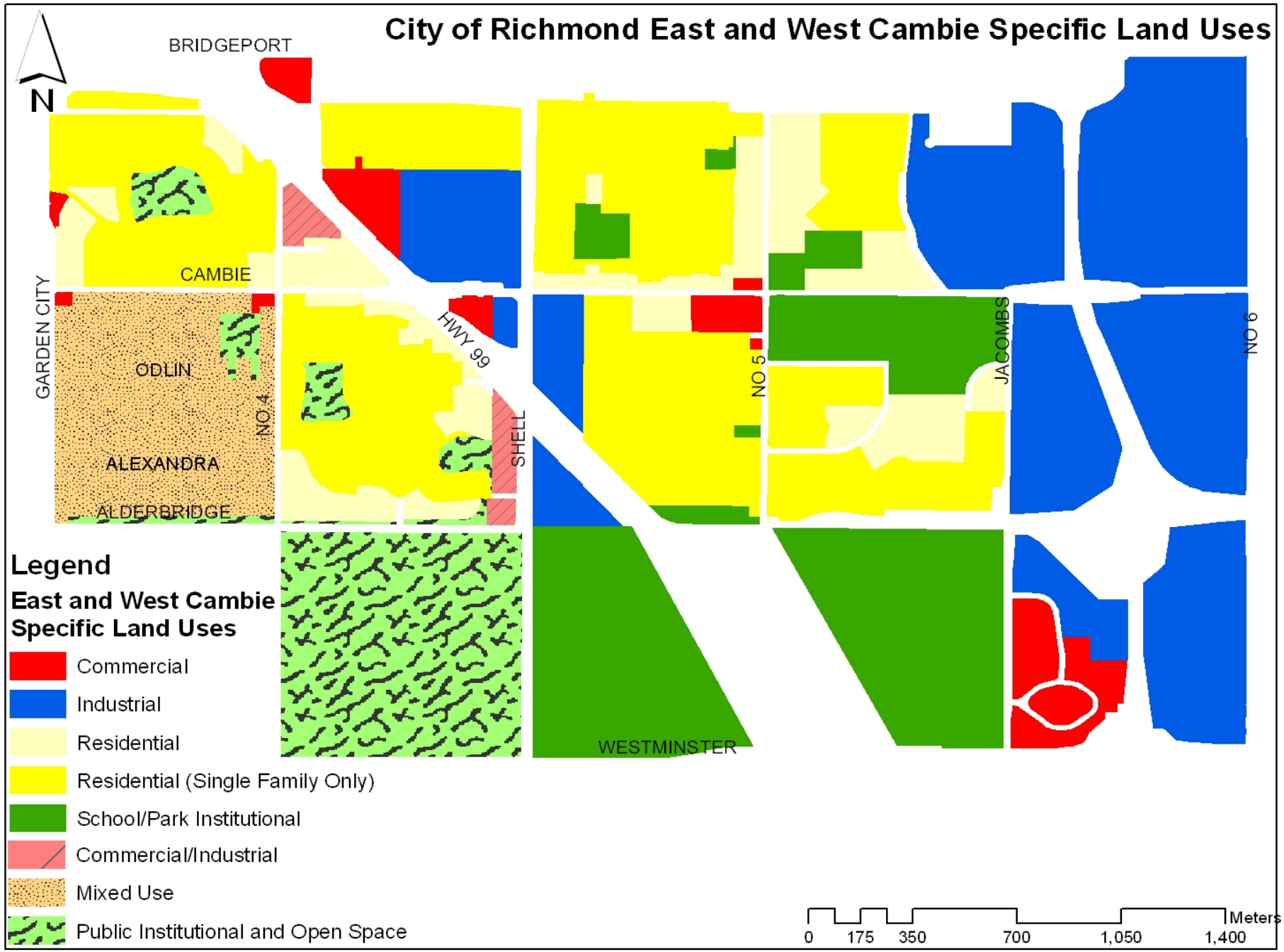
- Current Land Uses in Richmond
- Current Residential Development In Richmond
- The Population Projection Model
- The Population Projection Model and Transportation in Richmond
- Model Output

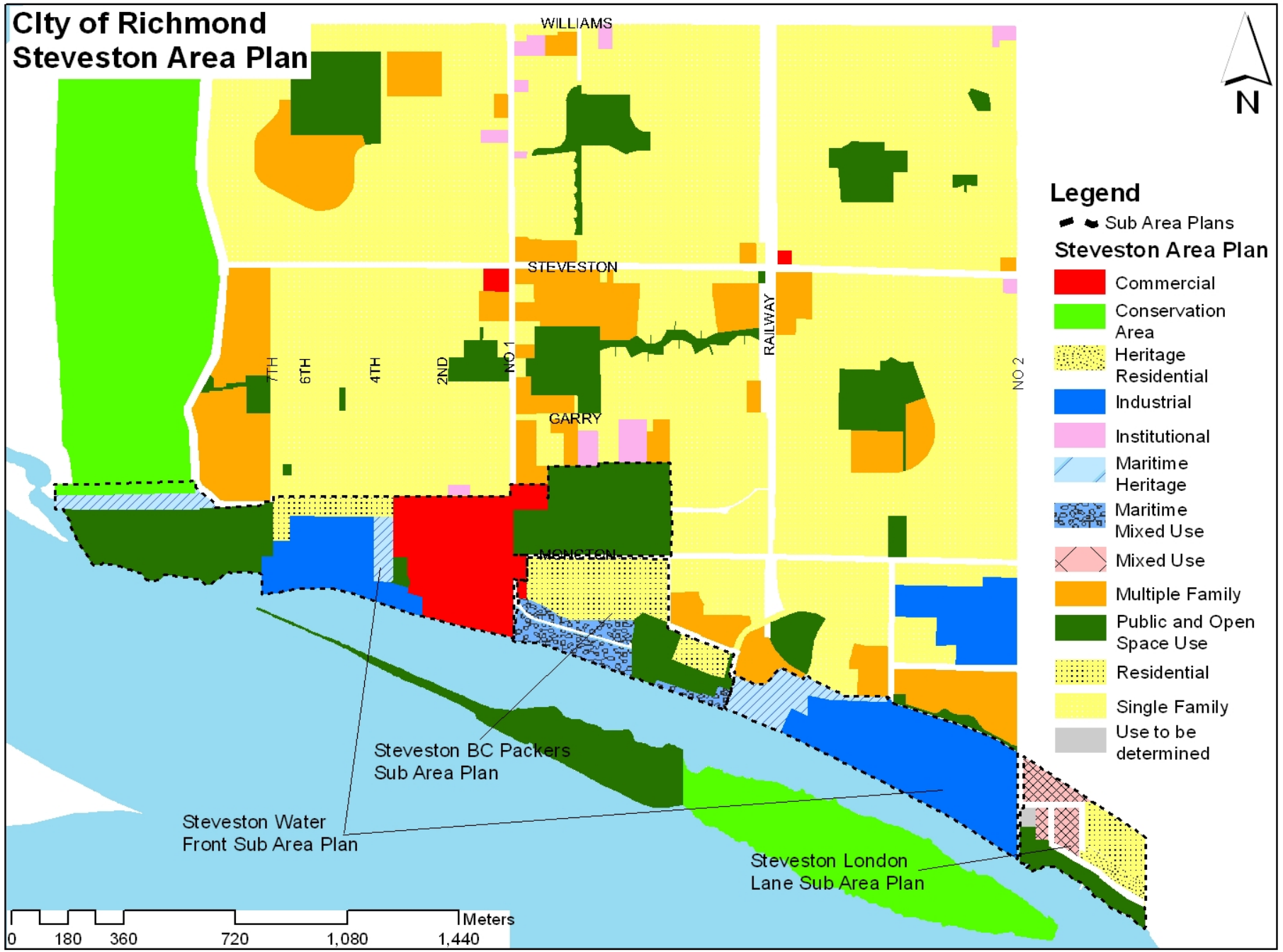
Current Land Uses in Richmond

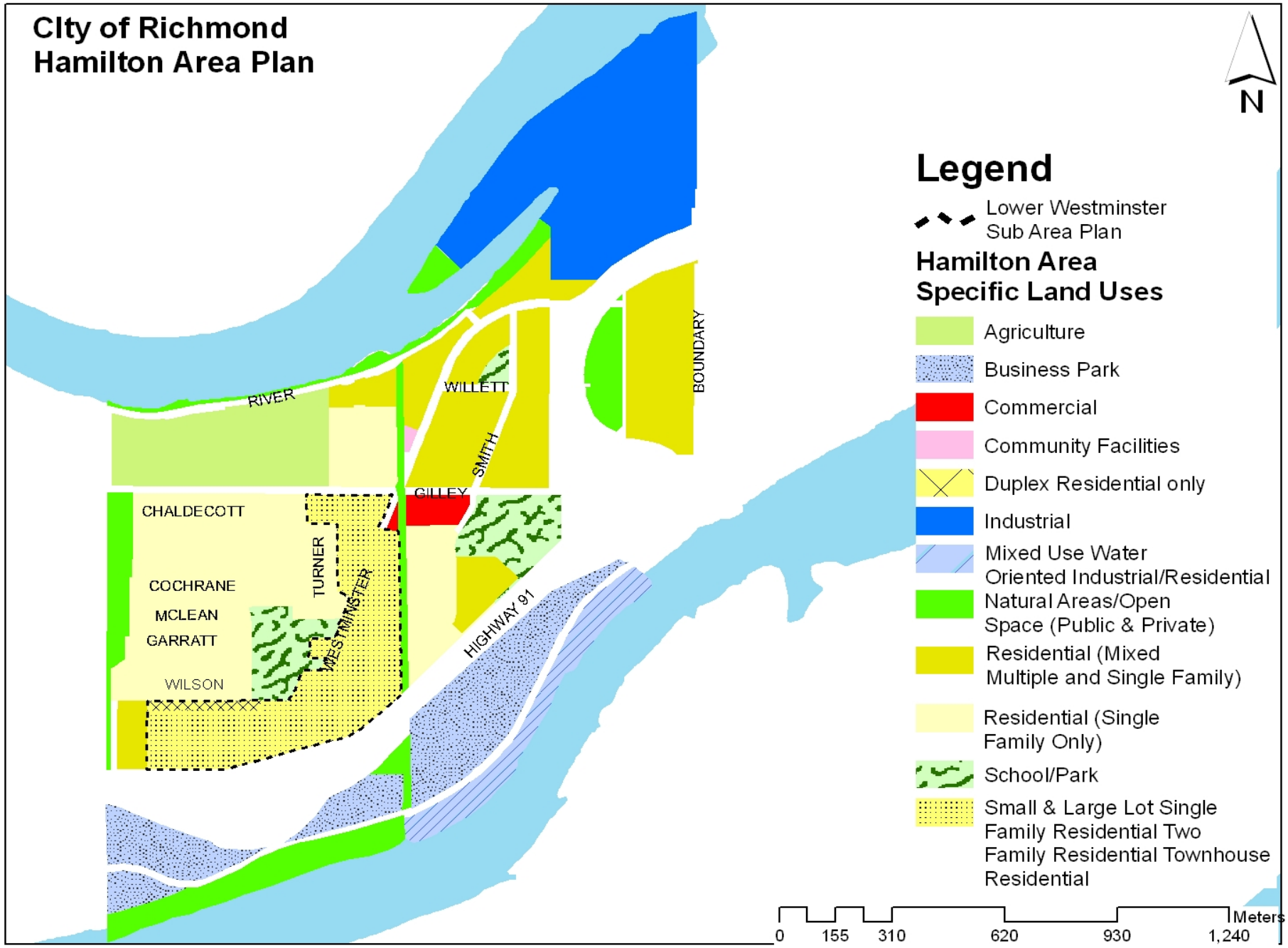
- Generalized Land Uses (Richmond's OCP 1999)
- Specific Land Uses (Richmond's OCP)
  - Area Plans
  - Sub Area Plans
- Vancouver International Airport 2015 Land Use (YVR)
- Arterial Redevelopment
  - Neighbourhoods Service Centres
    - Areas of Potential Multi-Family Developments
- Agricultural Land Reserve
- Zoning

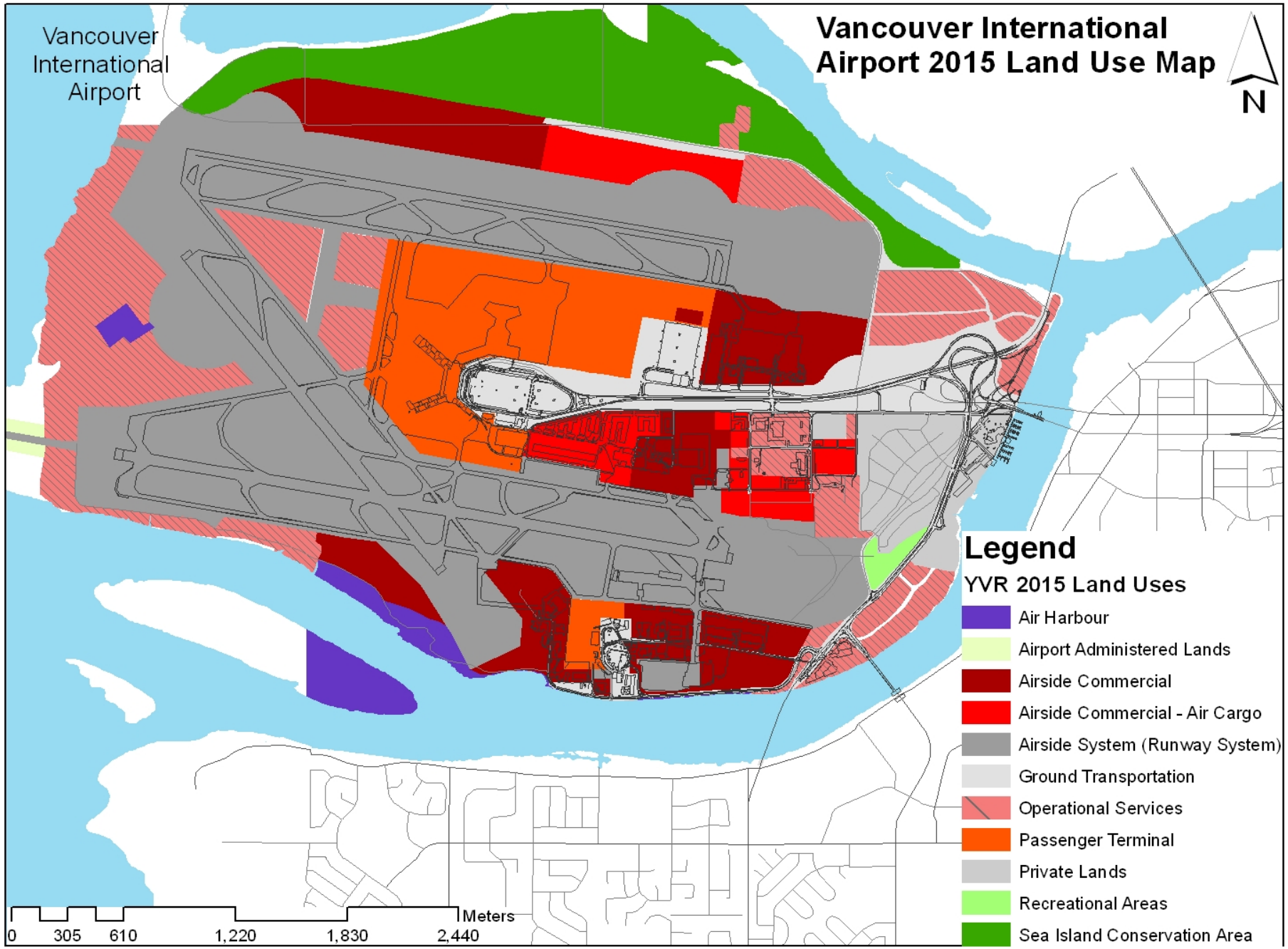

City of Richmond Generalized Land Use Map
Original Adoption: March 15 1999
N
Vancouver International Airport
Bridgeport Area Plan
BRIDGEPORT
CAMBIE
West Cambie Area Plan
East Cambie Area Plan
City Centre Area Plan
Hamilton Area Plan
BOUNDARY
HIGHWAY 91
WESTMINSTER
GARDEN CITY
GRANVILLE
BLUNDELL
FRANCIS
WILLIAMS
STEVESTON
NO 1
NO 2
NO 3
NO 4
NO 5
NO 6
NO 7
NO 8
NO 9
RAILWAY
GILBERT
HIGHWAY 99
SIDAWAY
NELSON
McMILLAN
Steveston Area Plan
Legend
Sub Area Plan
Area Plan
Specific Land Use
Agriculture
Agriculture and Open Space
Conservation Area
Public and Open Space Use
Airport
Business and Industry
Community Institutional
Local Commercial
Neighbourhood Service Centre
Limited Mixed Use
Medium Density Residential
Low Density Residential
Meters
0
850
1,700
3,400
5,100
6,800

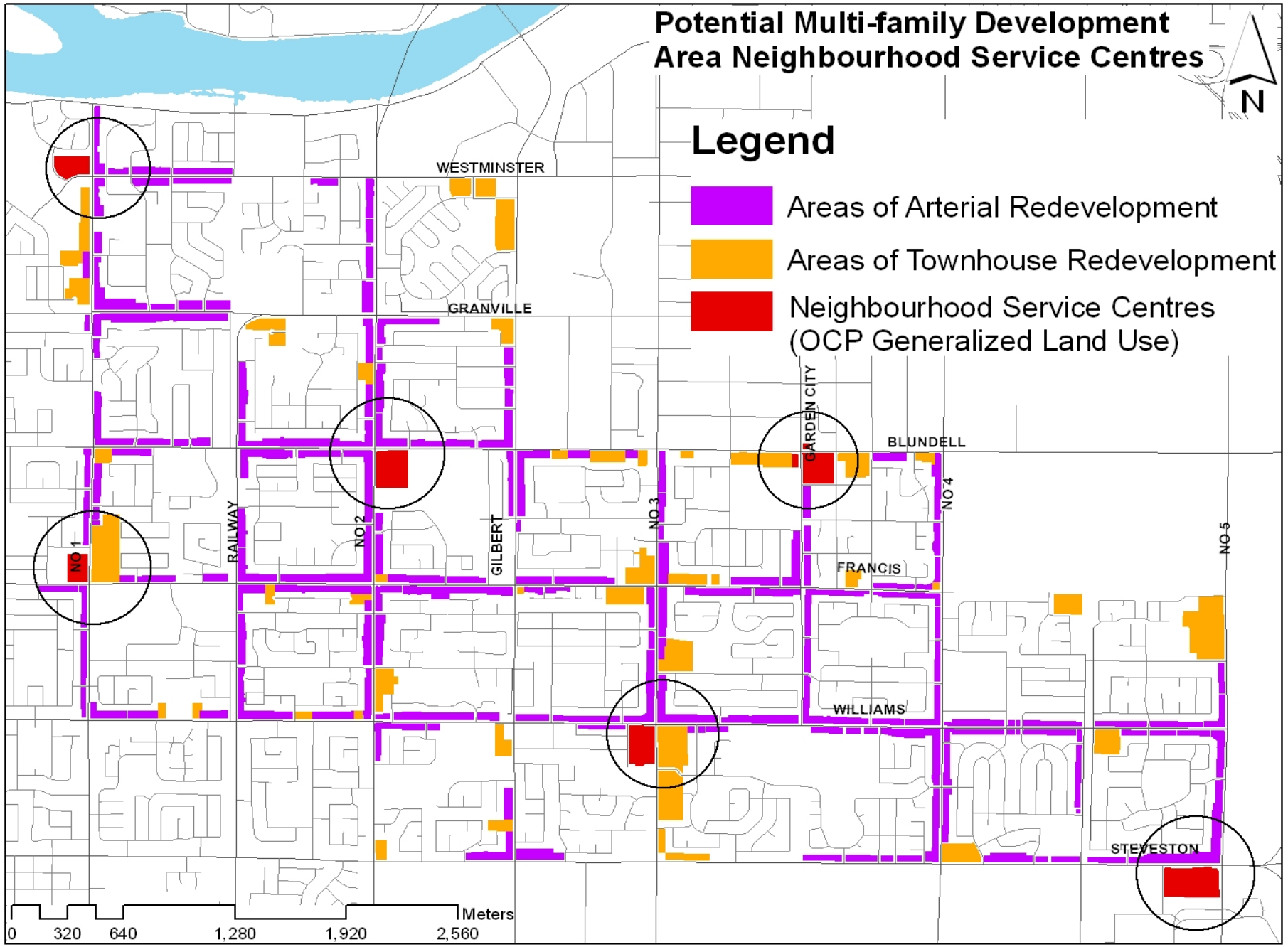

CIty of Richmond City Centre Specific Land Uses
N
City Centre
Area Plan
GARDEN CITY
McLennan North
Sub Area Plan
GRANVILLE
McLennan South
Sub Area Plan
St Albans Sub
Area Plan
Acheson Bennett
Sub ARea Plan
BLUNDELL
NO. 4 RD
Meters
0
220
440
880
1,320
1,760
Legend
Sub Area Plans
City Centre
Specific Land Uses
Auto-oriented Commercial
Business Park
Community Park
Detailed Land Use Study Required
Institutional
Institutional (Church)
Light Industry and Commercial Support Use
Mixed Residential/Retail/Community Uses
Mixed Use-High Density
Mixed Use-Riverfront
Mixed Use-Shopping Centre
Mixed Use-Specialty
Multi-Family High Rise
Mutli-Family Low Rise
(3 Storey apts, Townhouses,
Two Family or Single Family Dwellings)
Cluster of Single Family Duplex Triplex Units
Park
Programmed Recreational Water Area
Residential
Residential (Mixed Single Family
& Small Scale Multi-Family)
Residential Area 1
Residential Area 2
Residential Area 3
Residential Area 4
Residential Area 5
School
School/Park (General Currie School)
Single Family
Townhouse
Townhouse Over Parking
Urban Business Park

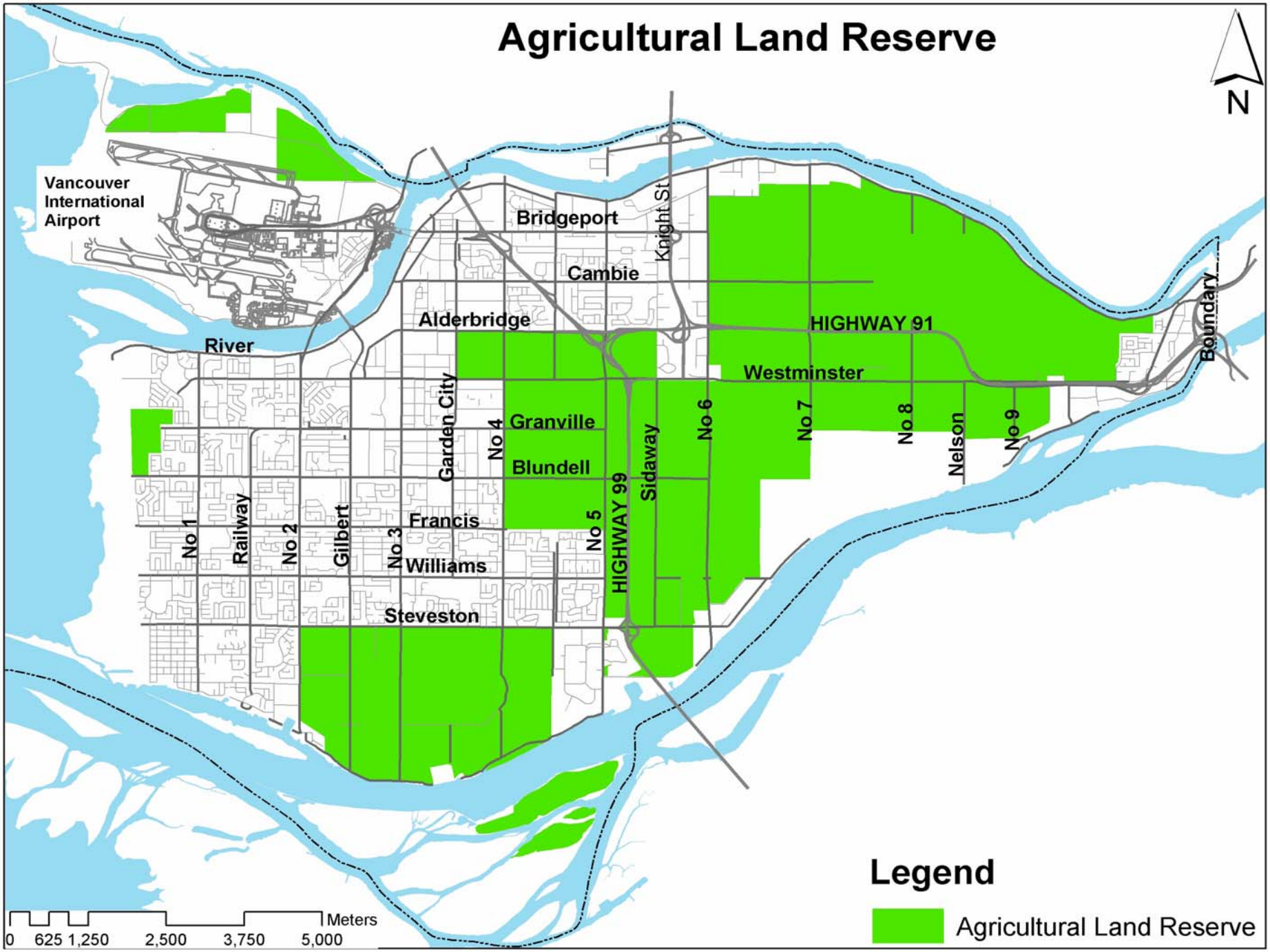

City of Richmond East and West Cambie Specific Land Uses
N
BRIDGEPORT
CAMBIE
GARDEN CITY
ODLIN
NO 4
ALEXANDRA
ALDERBRIDGE
HWY 99
SHELL
NO 5
JACOMBS
NO 6
WESTMINSTER
Legend
East and West Cambie Specific Land Uses
Commercial
Industrial
Residential
Residential (Single Family Only)
School/Park Institutional
Commercial/Industrial
Mixed Use
Public Institutional and Open Space
0
175
350
700
1,050
1,400
Meters

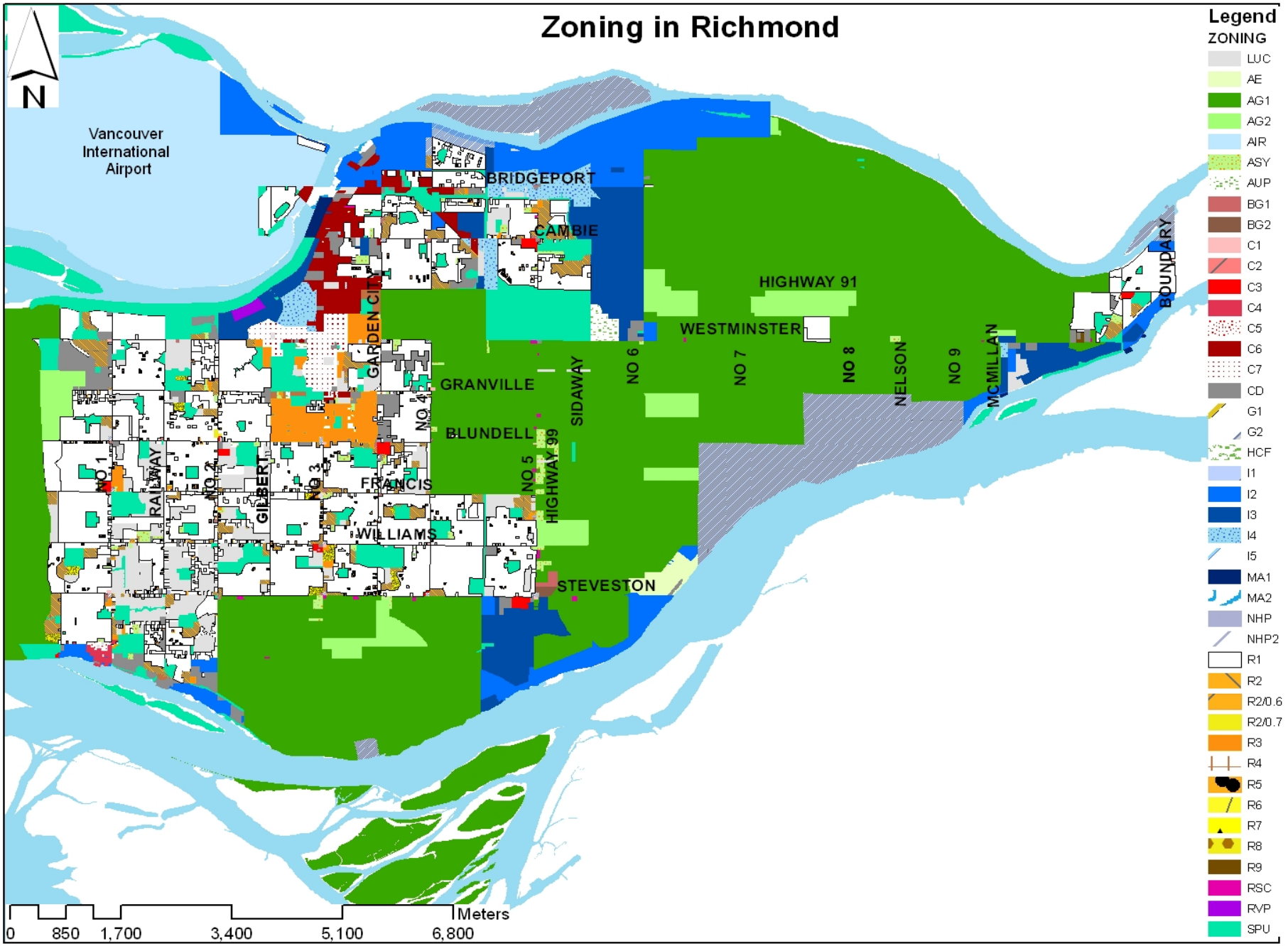

CIty of Richmond
Steveston Area Plan
WILLIAMS
STEVESTON
GARRY
MONCTON
7TH
6TH
4TH
2ND
NO 1
RAILWAY
NO 2
N
Legend
Sub Area Plans
Steveston Area Plan
Commercial
Conservation Area
Heritage Residential
Industrial
Institutional
Maritime Heritage
Maritime Mixed Use
Mixed Use
Multiple Family
Public and Open Space Use
Residential
Single Family
Use to be determined
Steveston BC Packers Sub Area Plan
Steveston Water Front Sub Area Plan
Steveston London Lane Sub Area Plan
Meters
0
180
360
720
1,080
1,440


CIty of Richmond
Hamilton Area Plan
N
Legend
Lower Westminster Sub Area Plan
Hamilton Area Specific Land Uses
Agriculture
Business Park
Commercial
Community Facilities
Duplex Residential only
Industrial
Mixed Use Water Oriented Industrial/Residential
Natural Areas/Open Space (Public & Private)
Residential (Mixed Multiple and Single Family)
Residential (Single Family Only)
School/Park
Small & Large Lot Single Family Residential Two Family Residential Townhouse Residential
RIVER
WILLETT
SMITH
BOUNDARY
GILLEY
CHALDECOTT
TURNER
WESTMINSTER
COCHRANE
MCLEAN
GARRATT
WILSON
HIGHWAY 91
0
155
310
620
930
1,240
Meters


Vancouver International Airport
Vancouver International Airport 2015 Land Use Map
N
Legend
YVR 2015 Land Uses
Air Harbour
Airport Administered Lands
Airside Commercial
Airside Commercial - Air Cargo
Airside System (Runway System)
Ground Transportation
Operational Services
Passenger Terminal
Private Lands
Recreational Areas
Sea Island Conservation Area
0 305 610 1,220 1,830 2,440
Meters

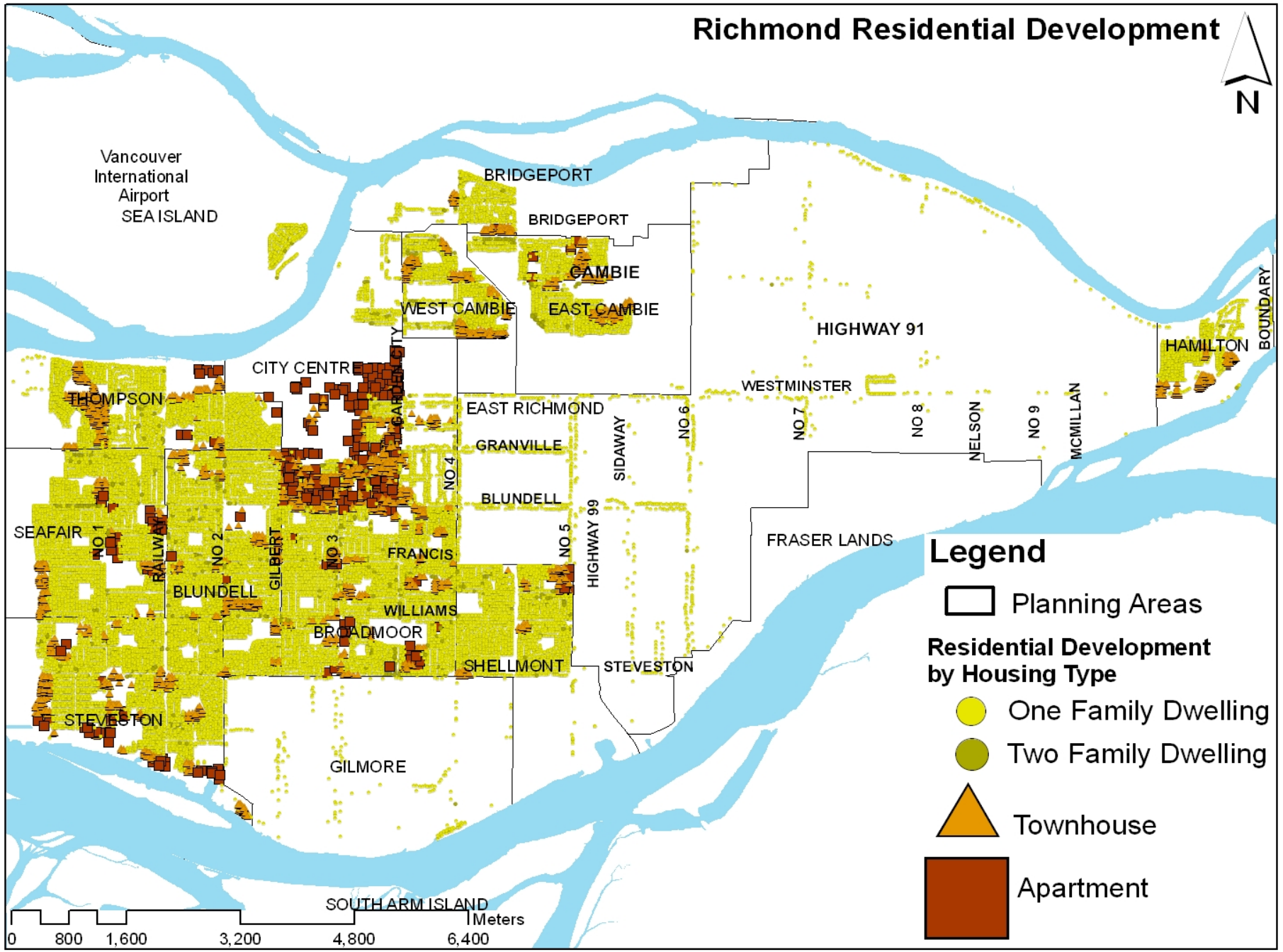

Potential Multi-family Development
Area Neighbourhood Service Centres
N
Legend
Areas of Arterial Redevelopment
Areas of Townhouse Redevelopment
Neighbourhood Service Centres
(OCP Generalized Land Use)
WESTMINSTER
GRANVILLE
GARDEN CITY
BLUNDELL
NO 1
RAILWAY
NO 2
GILBERT
NO 3
NO 4
NO 5
FRANCIS
WILLIAMS
STEVESTON
0
320
640
1,280
1,920
2,560
Meters

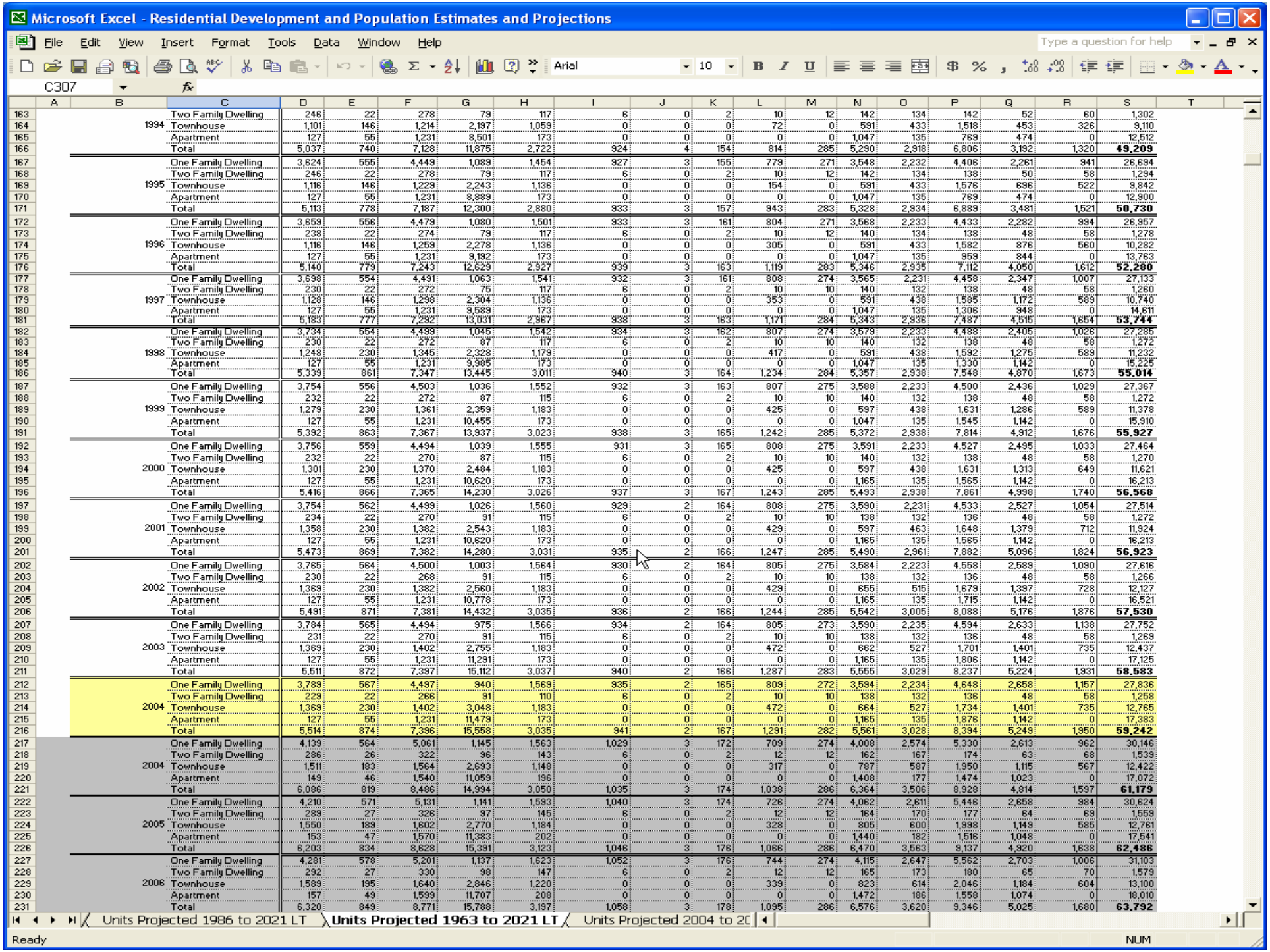

Agricultural Land Reserve
N
Vancouver International Airport
River
Bridgeport
Cambie
Knight St
Alderbridge
HIGHWAY 91
Boundary
Westminster
Garden City
No 4
Granville
Blundell
Sidaway
No 6
No 7
No 8
Nelson
No 9
No 1
Railway
No 2
Gilbert
No 3
Francis
Williams
Steveston
No 5
HIGHWAY 99
Legend
Agricultural Land Reserve
Meters
0 625 1,250 2,500 3,750 5,000


Zoning in Richmond
N
Vancouver International Airport
BRIDGEPORT
CAMBIE
GARDEN CITY
HIGHWAY 91
WESTMINSTER
BOUNDARY
GRANVILLE
BLUNDELL
FRANCIS
WILLIAMS
STEVESTON
SIDAWAY
NO 6
NO 7
NO 8
NELSON
NO 9
MCMILLAN
NO 4
NO 5
HIGHWAY 99
NO 1
RAILWAY
NO 2
GILBERT
NO 3
Meters
0 850 1,700 3,400 5,100 6,800
Legend
ZONING
LUC
AE
AG1
AG2
AIR
ASY
AUP
BG1
BG2
C1
C2
C3
C4
C5
C6
C7
CD
G1
G2
HCF
I1
I2
I3
I4
I5
MA1
MA2
NHP
NHP2
R1
R2
R2/0.6
R2/0.7
R3
R4
R5
R6
R7
R8
R9
RSC
RVP
SPU

Current Residential Development and Population

- Residential Development
  - Example of the Terra Nova Plan
- Residential Demolitions
- Data
  - Population by Housing Type and Planning Area
  - Average Household Size by Housing Type and Planning Area
  - Average Household Size by Housing Type (1986 – 2001)
- Population (1921 – 2004)
- Annual Growth Rate of Population


Richmond Residential Development
N
Vancouver International Airport
SEA ISLAND
BRIDGEPORT
BRIDGEPORT
CAMBIE
WEST CAMBIE
EAST CAMBIE
HIGHWAY 91
HAMILTON
BOUNDARY
CITY CENTRE
CITY
THOMPSON
WESTMINSTER
EAST RICHMOND
GRANVILLE
BLUNDELL
SEAFAIR
NO 1
RAILWAY
NO 2
GILBERT
NO 3
NO 4
NO 5
NO 6
NO 7
NO 8
NELSON
NO 9
MCMILLAN
SIDAWAY
HIGHWAY 99
FRANCIS
BLUNDELL
WILLIAMS
BROADMOOR
SHELLMONT
STEVESTON
FRASER LANDS
STEVESTON
GILMORE
SOUTH ARM ISLAND
Meters
0
800
1,600
3,200
4,800
6,400
Legend
Planning Areas
Residential Development by Housing Type
One Family Dwelling
Two Family Dwelling
Townhouse
Apartment



			D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
1994	Two Family Dwelling		246	22	278	79	117	6	0	2	10	12	142	134	142	52	60	1,302
	Townhouse		1,101	146	1,214	2,197	1,059	0	0	0	72	0	591	433	1,518	453	326	9,110
	Apartment		127	55	1,231	8,501	173	0	0	0	0	0	1,047	135	769	474	0	12,512
	Total		5,037	740	7,128	11,875	2,722	924	4	154	814	285	5,290	2,918	6,806	3,192	1,320	**49,209**
1995	One Family Dwelling		3,624	555	4,449	1,089	1,454	927	3	155	779	271	3,548	2,232	4,406	2,261	941	26,694
	Two Family Dwelling		246	22	278	79	117	6	0	2	10	12	142	134	138	50	58	1,294
	Townhouse		1,116	146	1,229	2,243	1,136	0	0	0	154	0	591	433	1,576	696	522	9,842
	Apartment		127	55	1,231	8,889	173	0	0	0	0	0	1,047	135	769	474	0	12,900
	Total		5,113	778	7,187	12,300	2,880	933	3	157	943	283	5,328	2,934	6,889	3,481	1,521	**50,730**
1996	One Family Dwelling		3,659	556	4,479	1,080	1,501	933	3	161	804	271	3,568	2,233	4,433	2,282	994	26,957
	Two Family Dwelling		238	22	274	79	117	6	0	2	10	12	140	134	138	48	58	1,278
	Townhouse		1,116	146	1,259	2,278	1,136	0	0	0	305	0	591	433	1,582	876	560	10,282
	Apartment		127	55	1,231	9,192	173	0	0	0	0	0	1,047	135	959	844	0	13,763
	Total		5,140	779	7,243	12,629	2,927	939	3	163	1,119	283	5,346	2,935	7,112	4,050	1,612	**52,280**
1997	One Family Dwelling		3,698	554	4,491	1,063	1,541	932	3	161	808	274	3,565	2,231	4,458	2,347	1,007	27,133
	Two Family Dwelling		230	22	272	75	117	6	0	2	10	10	140	132	138	48	58	1,260
	Townhouse		1,128	146	1,298	2,304	1,136	0	0	0	353	0	591	438	1,585	1,172	589	10,740
	Apartment		127	55	1,231	9,589	173	0	0	0	0	0	1,047	135	1,306	948	0	14,611
	Total		5,183	777	7,292	13,031	2,967	938	3	163	1,171	284	5,343	2,936	7,487	4,515	1,654	**53,744**
1998	One Family Dwelling		3,734	554	4,499	1,045	1,542	934	3	162	807	274	3,579	2,233	4,488	2,405	1,026	27,285
	Two Family Dwelling		230	22	272	87	117	6	0	2	10	10	140	132	138	48	58	1,272
	Townhouse		1,248	230	1,345	2,328	1,179	0	0	0	417	0	591	438	1,592	1,276	589	11,232
	Apartment		127	55	1,231	9,985	173	0	0	0	0	0	1,047	135	1,330	1,142	0	15,225
	Total		5,339	861	7,347	13,445	3,011	940	3	164	1,234	284	5,357	2,938	7,548	4,870	1,673	**55,014**
1999	One Family Dwelling		3,754	556	4,503	1,036	1,552	932	3	163	807	275	3,588	2,233	4,500	2,436	1,029	27,367
	Two Family Dwelling		232	22	272	87	115	6	0	2	10	10	140	132	138	48	58	1,272
	Townhouse		1,279	230	1,361	2,359	1,183	0	0	0	425	0	597	438	1,631	1,286	589	11,378
	Apartment		127	55	1,231	10,455	173	0	0	0	0	0	1,047	135	1,545	1,142	0	15,910
	Total		5,392	863	7,367	13,937	3,023	938	3	165	1,242	285	5,372	2,938	7,814	4,912	1,676	**55,927**
2000	One Family Dwelling		3,756	559	4,494	1,039	1,555	931	3	165	808	275	3,591	2,233	4,527	2,495	1,033	27,464
	Two Family Dwelling		232	22	270	87	115	6	0	2	10	10	140	132	138	48	58	1,270
	Townhouse		1,301	230	1,370	2,484	1,183	0	0	0	425	0	597	438	1,631	1,313	649	11,621
	Apartment		127	55	1,231	10,620	173	0	0	0	0	0	1,165	135	1,565	1,142	0	16,213
	Total		5,416	866	7,365	14,230	3,026	937	3	167	1,243	285	5,493	2,938	7,861	4,998	1,740	**56,568**
2001	One Family Dwelling		3,754	562	4,499	1,026	1,560	929	2	164	808	275	3,590	2,231	4,533	2,527	1,054	27,514
	Two Family Dwelling		234	22	270	91	115	6	0	2	10	10	138	132	136	48	58	1,272
	Townhouse		1,358	230	1,382	2,543	1,183	0	0	0	429	0	597	463	1,648	1,379	712	11,924
	Apartment		127	55	1,231	10,620	173	0	0	0	0	0	1,165	135	1,565	1,142	0	16,213
	Total		5,473	869	7,382	14,280	3,031	935	2	166	1,247	285	5,490	2,961	7,882	5,096	1,824	**56,923**
2002	One Family Dwelling		3,765	564	4,500	1,003	1,564	930	2	164	805	275	3,584	2,223	4,558	2,589	1,090	27,616
	Two Family Dwelling		230	22	268	91	115	6	0	2	10	10	138	132	136	48	58	1,266
	Townhouse		1,369	230	1,382	2,560	1,183	0	0	0	429	0	655	515	1,679	1,397	728	12,127
	Apartment		127	55	1,231	10,778	173	0	0	0	0	0	1,165	135	1,715	1,142	0	16,521
	Total		5,491	871	7,381	14,432	3,035	936	2	166	1,244	285	5,542	3,005	8,088	5,176	1,876	**57,530**
2003	One Family Dwelling		3,784	565	4,494	975	1,566	934	2	164	805	273	3,590	2,235	4,594	2,633	1,138	27,752
	Two Family Dwelling		231	22	270	91	115	6	0	2	10	10	138	132	136	48	58	1,269
	Townhouse		1,369	230	1,402	2,755	1,183	0	0	0	472	0	662	527	1,701	1,401	735	12,437
	Apartment		127	55	1,231	11,291	173	0	0	0	0	0	1,165	135	1,806	1,142	0	17,125
	Total		5,511	872	7,397	15,112	3,037	940	2	166	1,287	283	5,555	3,029	8,237	5,224	1,931	**58,583**
2004	One Family Dwelling		3,789	567	4,497	940	1,569	935	2	165	809	272	3,594	2,234	4,648	2,658	1,157	27,836
	Two Family Dwelling		229	22	266	91	110	6	0	2	10	10	138	132	136	48	58	1,258
	Townhouse		1,369	230	1,402	3,048	1,183	0	0	0	472	0	664	527	1,734	1,401	735	12,765
	Apartment		127	55	1,231	11,479	173	0	0	0	0	0	1,165	135	1,876	1,142	0	17,383
	Total		5,514	874	7,396	15,558	3,035	941	2	167	1,291	282	5,561	3,028	8,394	5,249	1,950	**59,242**
2004	One Family Dwelling		4,139	564	5,061	1,145	1,563	1,029	3	172	709	274	4,008	2,574	5,330	2,613	962	30,146
	Two Family Dwelling		286	26	322	96	143	6	0	2	12	12	162	167	174	63	68	1,539
	Townhouse		1,511	183	1,564	2,693	1,148	0	0	0	317	0	787	587	1,950	1,115	567	12,422
	Apartment		149	46	1,540	11,059	196	0	0	0	0	0	1,408	177	1,474	1,023	0	17,072
	Total		6,086	819	8,486	14,994	3,050	1,035	3	174	1,038	286	6,364	3,506	8,928	4,814	1,597	**61,179**
2005	One Family Dwelling		4,210	571	5,131	1,141	1,593	1,040	3	174	726	274	4,062	2,611	5,446	2,658	984	30,624
	Two Family Dwelling		289	27	326	97	145	6	0	2	12	12	164	170	177	64	69	1,559
	Townhouse		1,550	189	1,602	2,770	1,184	0	0	0	328	0	805	600	1,998	1,149	585	12,761
	Apartment		153	47	1,570	11,383	202	0	0	0	0	0	1,440	182	1,516	1,048	0	17,541
	Total		6,203	834	8,628	15,391	3,123	1,046	3	176	1,066	286	6,470	3,563	9,137	4,920	1,638	**62,486**
2006	One Family Dwelling		4,281	578	5,201	1,137	1,623	1,052	3	176	744	274	4,115	2,647	5,562	2,703	1,006	31,103
	Two Family Dwelling		292	27	330	98	147	6	0	2	12	12	165	173	180	65	70	1,579
	Townhouse		1,589	195	1,640	2,846	1,220	0	0	0	339	0	823	614	2,046	1,184	604	13,100
	Apartment		157	43	1,599	11,707	208	0	0	0	0	0	1,472	186	1,558	1,074	0	18,010
	Total		6,320	843	8,771	15,788	3,197	1,058	3	178	1,095	286	6,576	3,620	9,346	5,025	1,680	**63,792**

Microsoft Excel - Residential Development and Population Estimates and Projections

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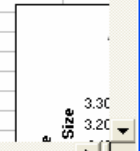
Average Household Size by Housing Type 1986, 1991, 1996, 2001 and 2006

		Housing Type	Blundell	Bridgeport	Broadmoo	City Centre	East Camb	East Richm	Fraser Lan	Gilmore	Hamilton	Sea Island	Seafair	Shellmont	Steveston	Thompson	West Camb	Total
		Planning Area																
ACTUAL	1986	One Family Dwelling	3.27	2.89	3.24	2.97	3.40	3.21	0.00	2.70	3.08	2.44	3.30	3.40	3.28	3.32	2.87	**3.24**
		Two Family Dwelling	2.94	2.22	2.59	2.60	3.90	2.93	0.00	2.33	2.00	0.00	2.87	3.50	2.69	3.15	2.76	**3.05**
		Townhouse	2.38	0.00	2.39	2.39	3.22	0.00	0.00	0.00	0.00	0.00	2.52	2.90	2.67	2.84	0.00	**2.60**
		Apartment	1.97	1.62	1.91	1.72	2.02	2.25	0.00	0.00	3.50	2.00	2.07	2.11	1.93	1.78	3.10	**1.84**
		Total	3.00	2.82	2.87	2.05	3.32	3.14	0.00	2.66	3.09	2.42	2.94	3.20	3.00	2.98	2.88	2.82
	1991	One Family Dwelling	3.41	3.05	3.33	3.06	3.66	3.33	0.00	2.81	3.30	2.59	3.30	3.47	3.39	3.40	3.27	**3.35**
		Two Family Dwelling	3.25	3.30	2.85	2.37	2.74	3.21	0.00	0.00	3.69	0.00	2.99	2.96	2.55	2.35	3.58	**2.94**
		Townhouse	2.33	3.06	2.35	2.74	3.29	0.00	0.00	0.00	0.00	0.00	2.42	2.43	2.48	2.92	3.41	**2.60**
		Apartment	1.96	0.00	1.85	1.71	2.28	3.13	0.00	0.00	0.00	0.00	1.99	1.79	1.75	1.96	0.00	**1.80**
		Total	3.08	3.10	2.93	2.06	3.33	3.21	0.00	2.67	2.98	2.55	2.93	3.21	2.98	3.05	3.27	2.82
	1996	One Family Dwelling	3.58	3.40	3.55	3.12	3.69	3.40	0.00	2.75	3.38	2.41	3.40	3.55	3.45	3.56	3.74	**3.48**
		Two Family Dwelling	3.03	3.13	3.07	3.46	3.35	3.33	0.00	0.00	3.37	0.00	3.56	3.49	2.79	2.65	3.52	**3.26**
		Townhouse	2.47	3.32	2.36	3.04	3.22	0.00	0.00	0.00	1.87	0.00	2.46	2.70	2.58	2.86	3.29	**2.79**
		Apartment	1.96	2.39	2.00	1.89	2.03	6.00	0.00	0.00	0.00	0.00	2.10	1.84	1.69	1.93	0.00	**1.91**
		Total	3.21	3.31	3.05	2.19	3.31	3.35	0.00	2.75	3.13	2.40	3.03	3.31	3.00	3.06	3.60	2.91
	2001	One Family Dwelling	3.46	3.04	3.42	3.07	4.02	3.14	0.00	2.86	3.39	2.57	3.32	3.48	3.31	3.45	3.64	**3.39**
		Two Family Dwelling	2.92	2.75	2.86	3.13	3.83	3.92	0.00	2.89	2.61	1.60	2.86	3.09	2.62	2.85	3.12	**3.00**
		Townhouse	2.51	2.18	2.62	3.16	3.57	2.89	0.00	3.25	2.89	0.00	2.51	2.68	2.65	2.96	3.03	**2.89**
		Apartment	2.11	0.80	2.09	2.04	2.39	1.71	0.00	1.68	4.00	0.00	2.19	1.74	1.74	2.05	6.57	**2.02**
		Total	3.16	2.70	3.03	2.31	3.70	3.15	0.00	2.27	3.19	2.49	2.97	3.17	2.87	2.98	3.42	2.88
	2006	One Family Dwelling																
		Two Family Dwelling																
		Townhouse																
		Apartment																
		Total																
PROJECTED	2006	One Family Dwelling	3.62	3.30	3.57	3.15	4.17	3.24	0.00	2.88	3.54	2.56	3.36	3.56	3.39	3.57	4.07	**3.51**
		Two Family Dwelling	2.97	3.20	3.10	3.56	3.55	4.12	0.00	1.72	3.29	1.60	3.20	3.08	2.67	2.60	3.50	**3.11**
		Townhouse	2.56	3.84	2.60	3.49	3.57	2.89	0.00	3.25	3.82	0.00	2.48	2.58	2.60	2.97	4.68	**2.98**
		Apartment	2.11	1.19	2.13	2.12	2.40	3.58	0.00	1.68	2.25	-1.00	2.20	1.61	1.62	2.13	5.02	**2.06**
		Total	3.26	2.95	3.11	2.38	3.69	3.26	0.00	2.32	3.21	2.48	3.01	3.23	2.87	3.02	3.78	**2.92**
	2011	One Family Dwelling	3.69	3.38	3.65	3.19	4.36	3.23	0.00	2.92	3.64	2.58	3.38	3.59	3.40	3.63	4.35	**3.57**
		Two Family Dwelling	2.94	3.35	3.21	3.83	3.59	4.43	0.00	1.89	3.44	2.08	3.26	3.01	2.68	2.53	3.60	**3.13**
		Townhouse	2.62	4.52	2.67	3.75	3.67	3.75	0.00	4.23	4.87	0.00	2.48	2.54	2.60	3.00	5.57	**3.09**
		Apartment	2.15	1.19	2.20	2.24	2.48	3.70	0.00	2.18	2.40	-1.60	2.25	1.50	1.56	2.21	6.06	**2.13**
		Total	3.32	2.93	3.17	2.48	3.80	3.28	0.00	2.21	3.26	2.49	3.03	3.23	2.84	3.02	3.97	**2.95**
	2016	One Family Dwelling	3.77	3.46	3.72	3.23	4.54	3.22	0.00	2.96	3.74	2.60	3.39	3.62	3.42	3.69	4.63	**3.63**
		Two Family Dwelling	2.91	3.49	3.31	4.10	3.63	4.74	0.00	2.06	3.59	2.56	3.31	2.94	2.68	2.47	3.71	**3.14**
		Townhouse	2.68	5.19	2.74	4.01	3.77	4.62	0.00	5.20	5.93	0.00	2.48	2.50	2.61	3.03	6.47	**3.20**
		Apartment	2.20	1.18	2.26	2.35	2.57	3.83	0.00	2.69	2.55	-2.20	2.29	1.40	1.50	2.29	7.10	**2.19**
		Total	3.39	2.92	3.23	2.57	3.91	3.29	0.00	2.10	3.30	2.49	3.04	3.23	2.80	3.02	4.17	**2.97**
	2021	One Family Dwelling	3.85	3.54	3.79	3.27	4.73	3.21	0.00	3.00	3.84	2.62	3.41	3.65	3.43	3.74	4.90	**3.68**
		Two Family Dwelling	2.89	3.63	3.42	4.37	3.67	5.05	0.00	2.22	3.74	3.04	3.36	2.87	2.68	2.41	3.81	**3.16**
		Townhouse	2.73	5.87	2.81	4.27	3.86	5.48	0.00	6.18	6.98	0.00	2.48	2.46	2.61	3.06	7.37	**3.30**
		Apartment	2.24	1.18	2.33	2.47	2.66	3.95	0.00	3.19	2.70	-2.80	2.34	1.29	1.43	2.37	8.14	**2.26**
		Total	3.45	2.90	3.29	2.66	4.02	3.31	0.00	2.00	3.35	2.50	3.06	3.23	2.77	3.02	4.36	**3.00**
	2026	One Family Dwelling																
		Two Family Dwelling																
		Townhouse																
		Apartment																
		Total																

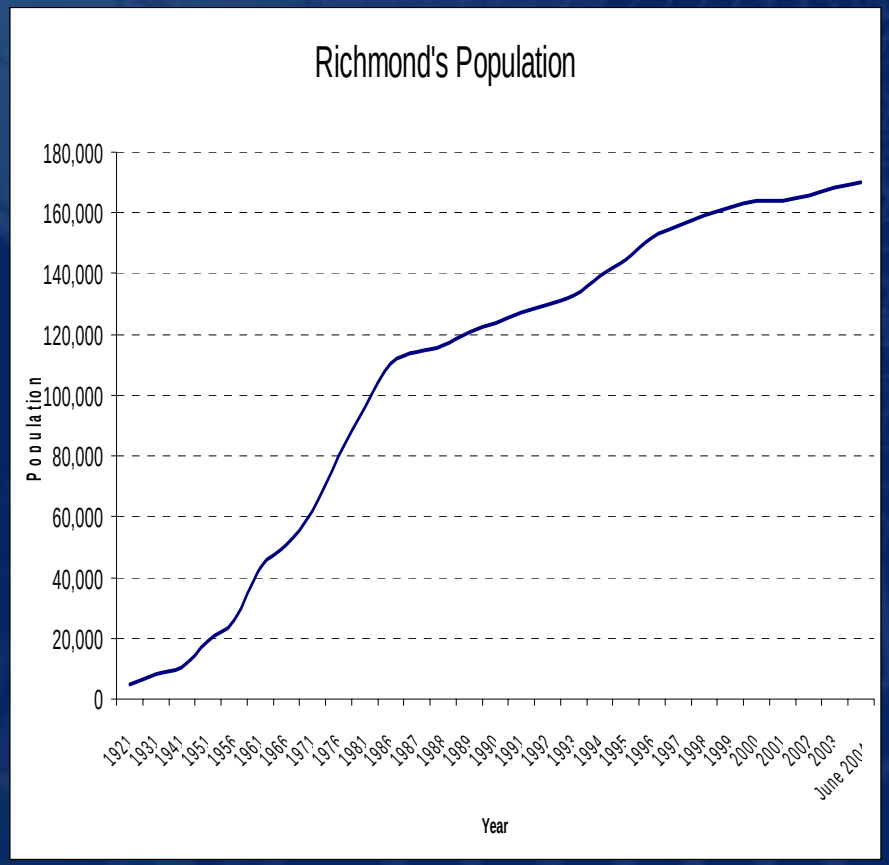


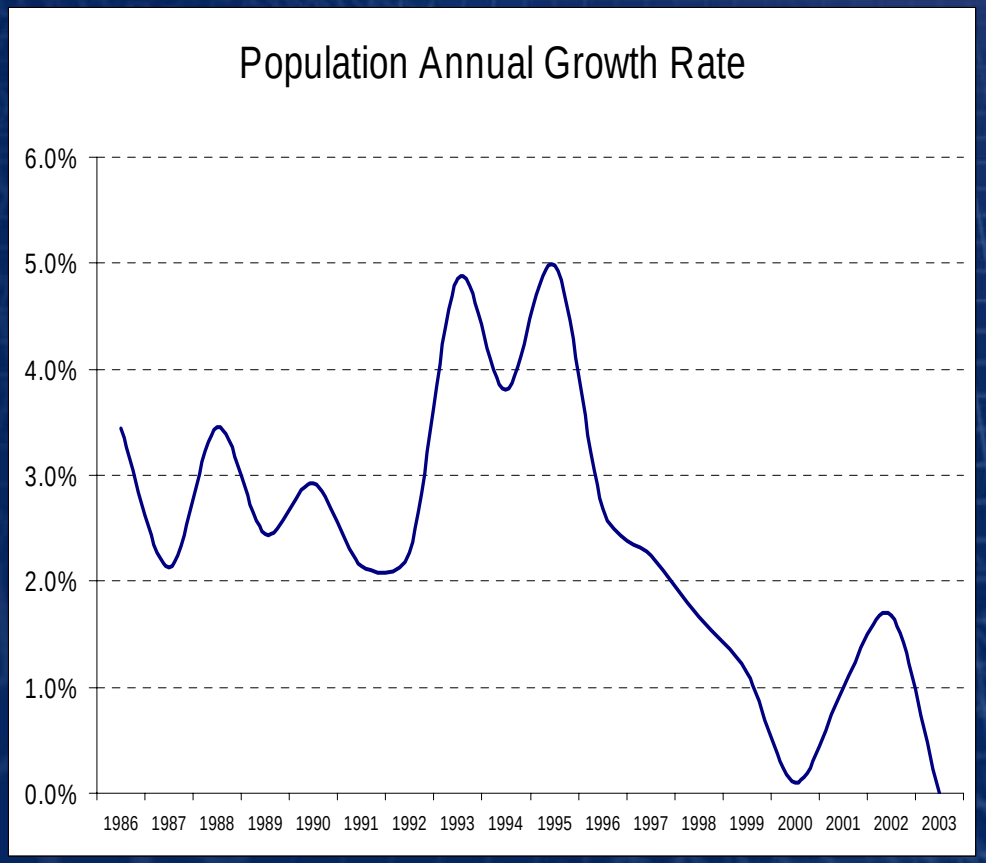
# of Units Added Between Census | Pop Added Between Census | Household Size by Housing Type

Ready

NUM

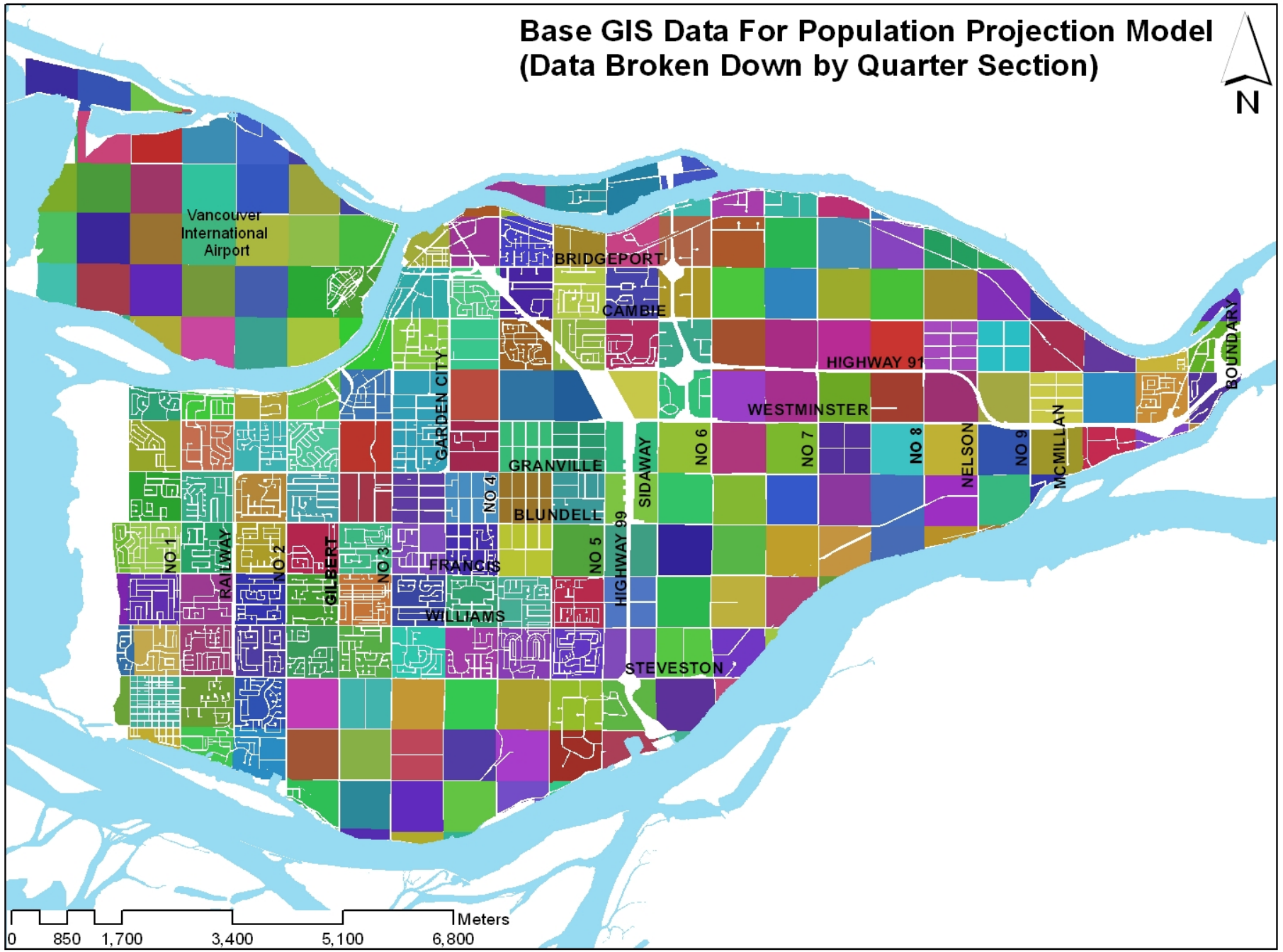
Population


Richmond's Population
180,000
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
Population
1921
1931
1941
1951
1956
1961
1966
1971
1976
1981
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
June 200
Year


Population Annual Growth Rate
6.0%
5.0%
4.0%
3.0%
2.0%
1.0%
0.0%
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003

Population Projection Model

- Base GIS Data
  - Attribute Information
- Objective and Process
- Current Densities
- Projected Densities
  - Projected Single Family Development
  - Projected Townhouse Development
  - Projected Apartment Development
- Range of Population Growth
- RAV
  - Current and projected units and population

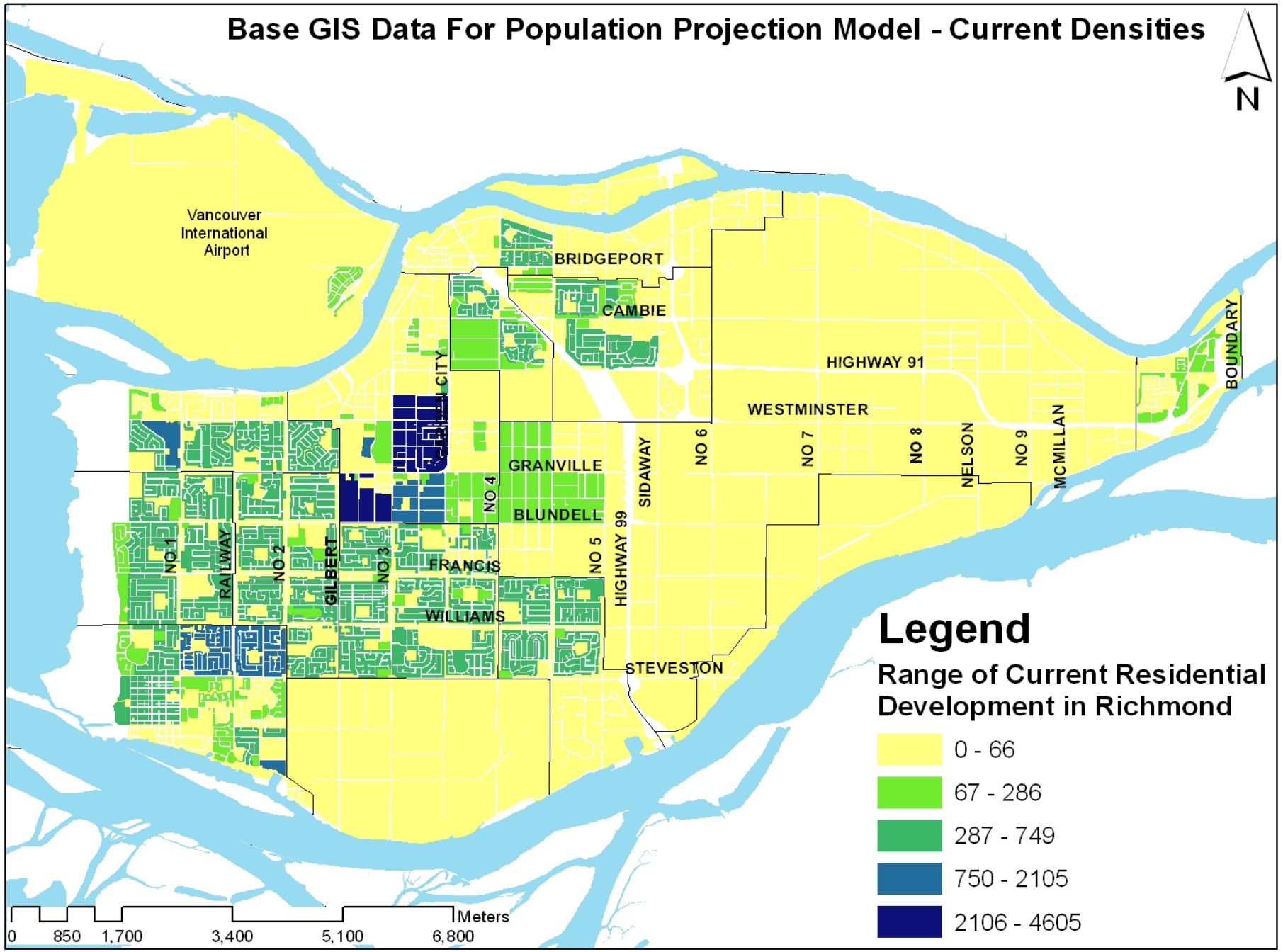

Base GIS Data For Population Projection Model
(Data Broken Down by Quarter Section)
N
Vancouver International Airport
BRIDGEPORT
CAMBIE
HIGHWAY 91
WESTMINSTER
BOUNDARY
GARDEN CITY
GRANVILLE
SIDAWAY
NO 6
NO 7
NO 8
NELSON
NO 9
MCMILLAN
NO 4
BLUNDELL
NO 5
HIGHWAY 99
NO 1
RAILWAY
NO 2
GILBERT
NO 3
FRANCIS
WILLIAMS
STEVESTON
Meters
0
850
1,700
3,400
5,100
6,800

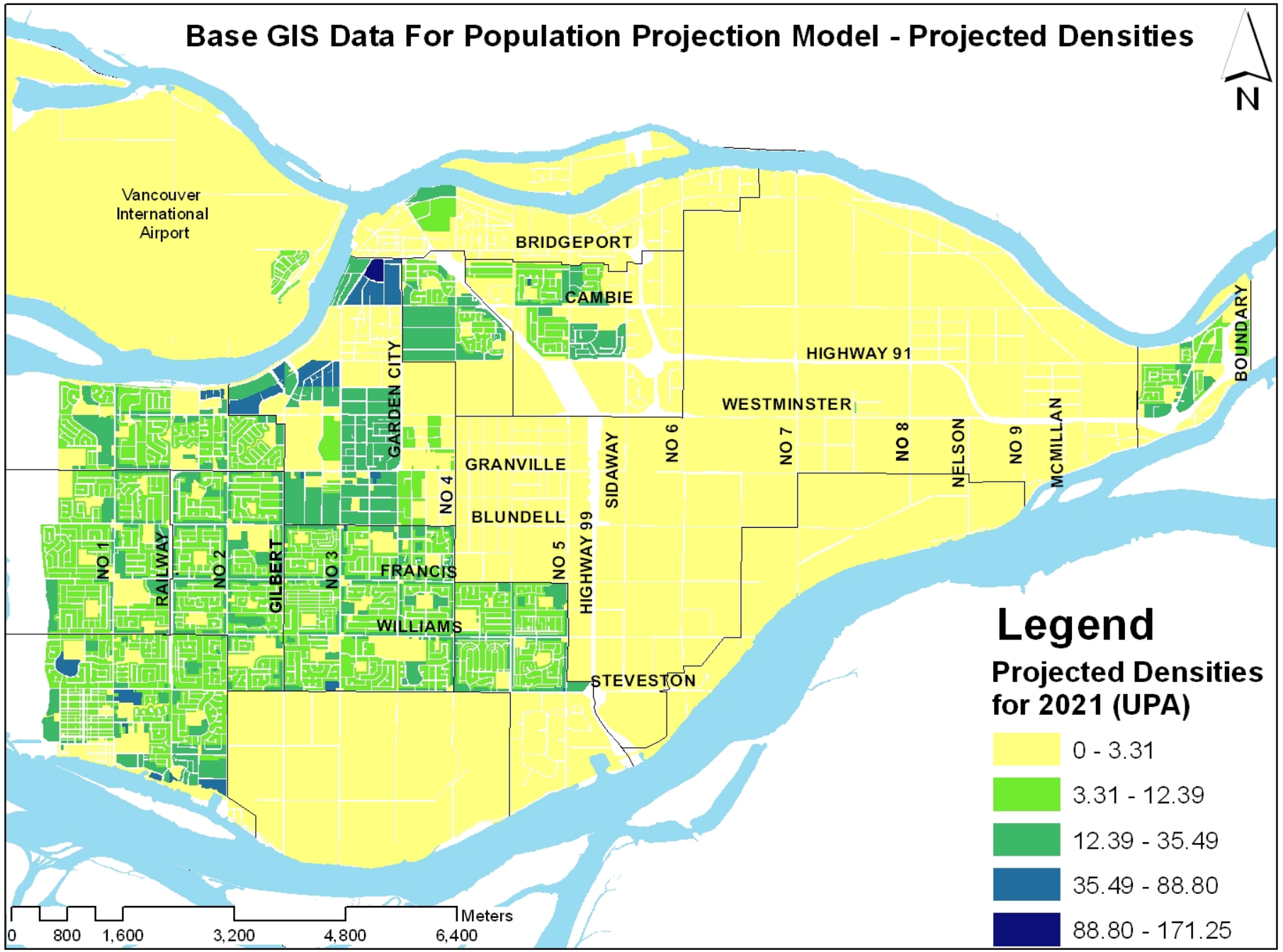
Estimates of UPA and PPU Figures

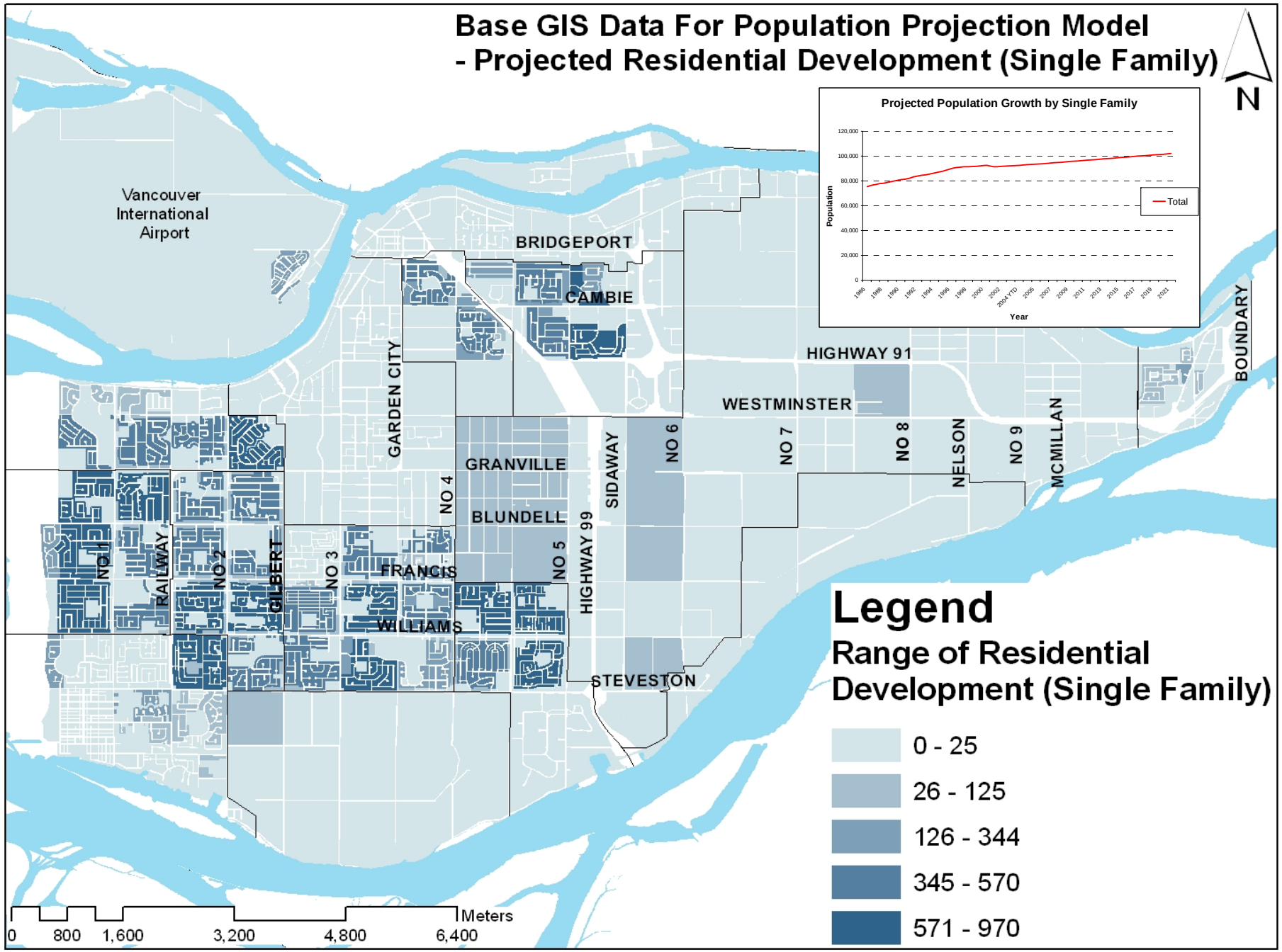
Attribute Name	Type of Housing	Area Applied	UPA	PPU
Low Density Single Family	Large lot single family (R1/E), duplexes	Most of the single family neighbourhoods (including arterial properties) (includes an estimate of secondary suites)	3-8	3.0
Medium Density Single Family	Small and medium lot single family (R1/A,K & B)	Some single family neighbourhoods where there are some small lots (Ash Street, Marrington, Steveston)	9-15	3.1
Medium Density Arterial Redevelopment	Small lot single family, medium density townhouses, duplexes, coach houses	Areas along arterial roads where we have seen some redevelopment	9-18	2.7
Medium Density Townhouse	Townhouse	Areas in the City Centre and some parts of West Richmond where there are townhouse developments	15-25	2.5
High Density Apartment	apartment	Areas in the City Centre where there are apartments	25-50	1.5

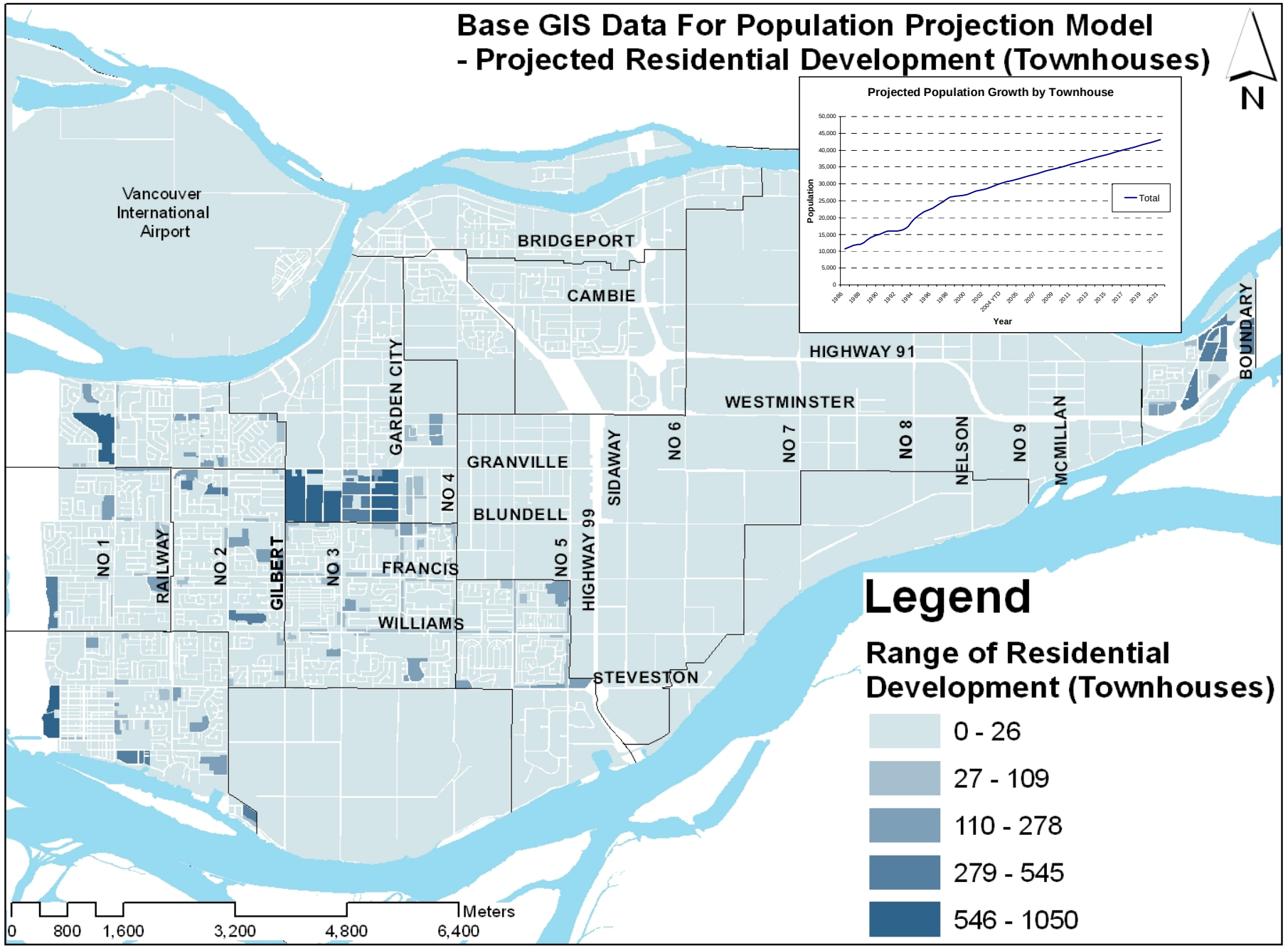
Objectives and Process

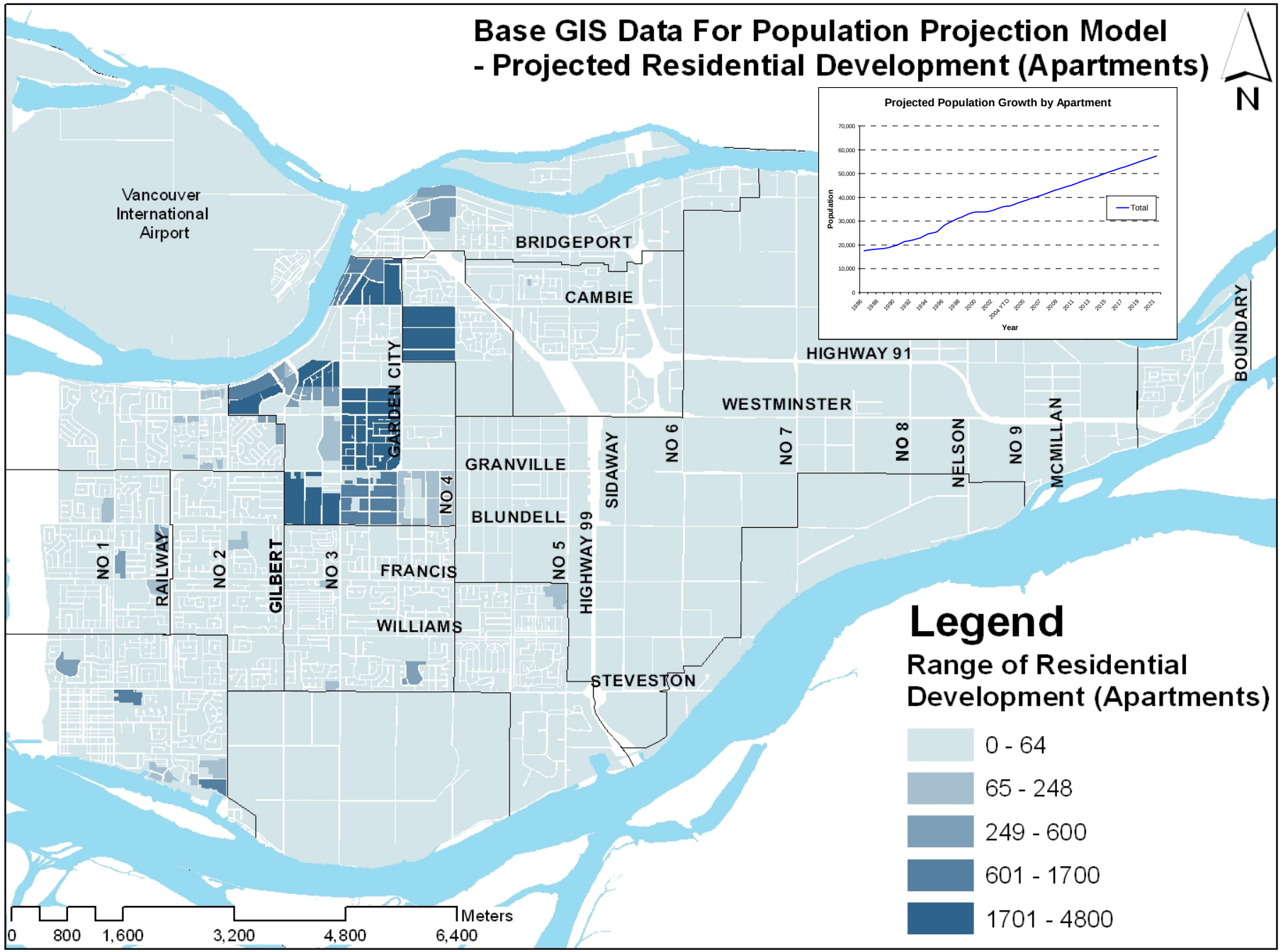
- Objective
  - To estimate Low and high population projections for 2021 (16 years from now correlating to the LRSP) using a map based GIS model.
- Process
  - A GIS shape file is created to represent geographic areas that have housing types that are consistent in terms of type and density.
  - Population figures are calculated by multiplying the area of the shape file (acres) by the density (upa) of the area and the people per unit (ppu) figures by housing type.

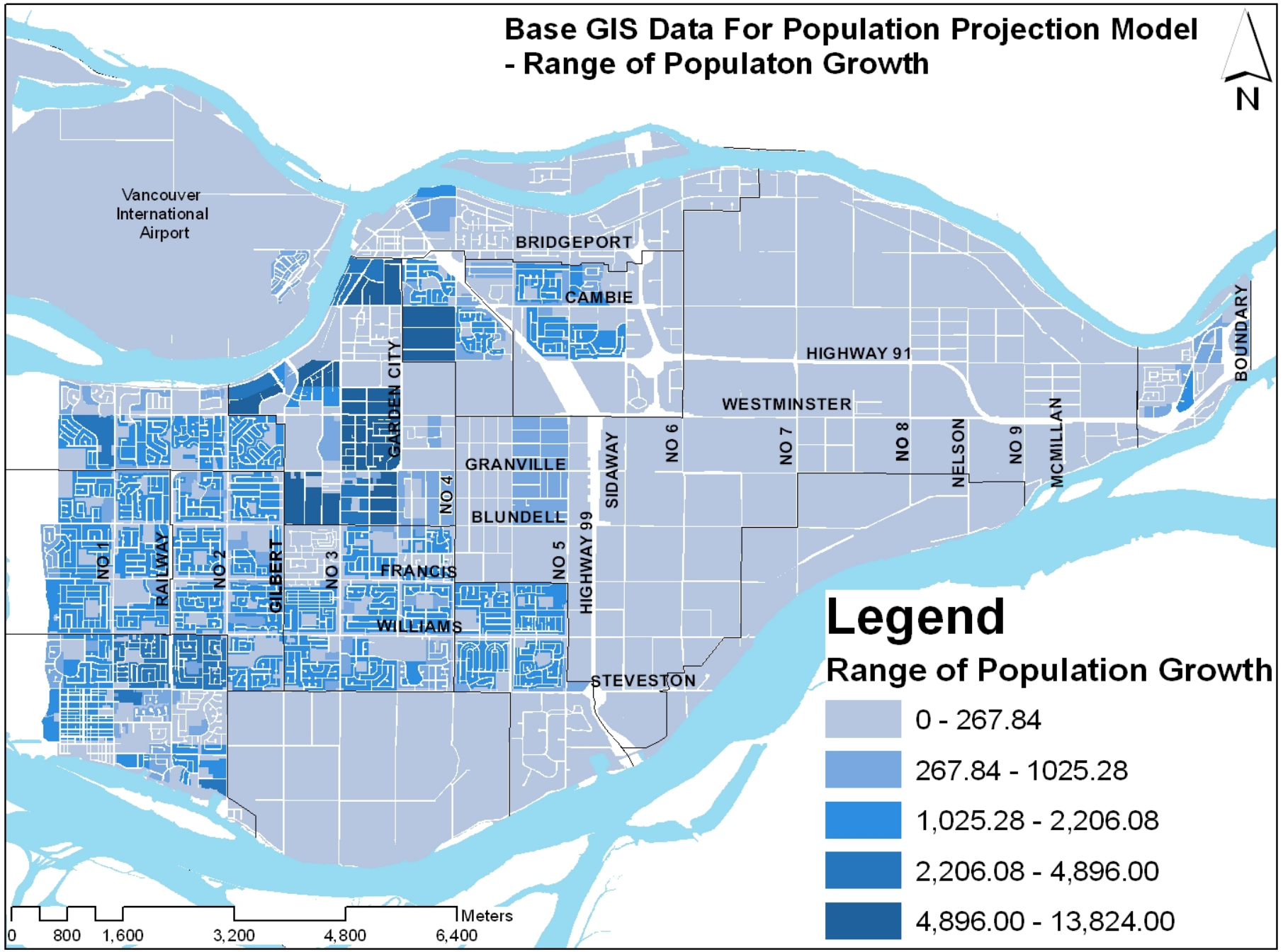

Base GIS Data For Population Projection Model - Current Densities
N
Vancouver International Airport
BRIDGEPORT
CAMBIE
HIGHWAY 91
BOUNDARY
WESTMINSTER
GRANVILLE
BLUNDELL
FRANCIS
WILLIAMS
STEVESTON
SIDAWAY
HIGHWAY 99
NO 1
NO 2
NO 3
NO 4
NO 5
NO 6
NO 7
NO 8
NO 9
RAILWAY
GILBERT
NELSON
MCMILLAN
Meters
0
850
1,700
3,400
5,100
6,800
Legend
Range of Current Residential Development in Richmond
0 - 66
67 - 286
287 - 749
750 - 2105
2106 - 4605

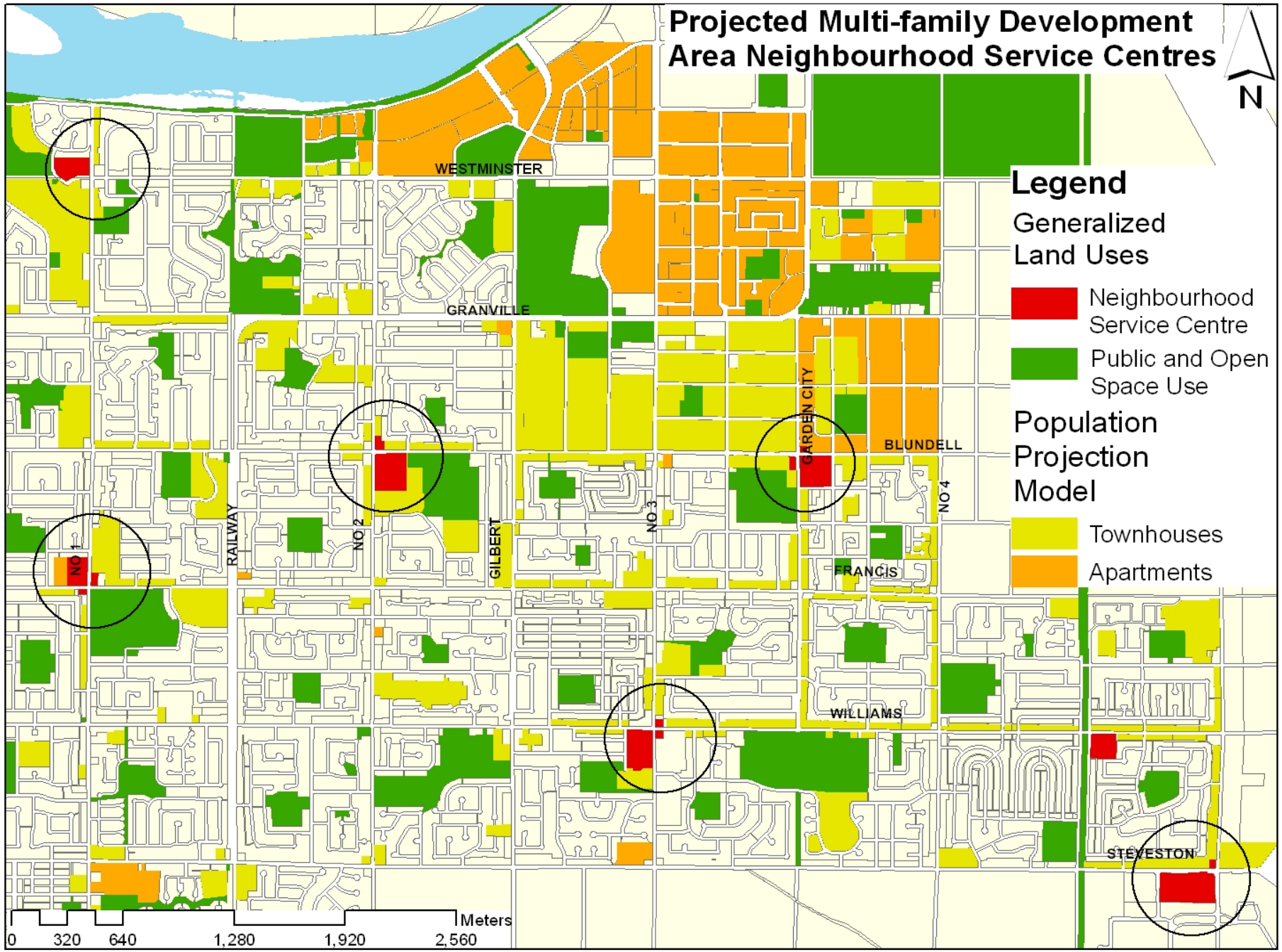

Base GIS Data For Population Projection Model - Projected Densities
N
Vancouver International Airport
BRIDGEPORT
CAMBIE
HIGHWAY 91
BOUNDARY
GARDEN CITY
WESTMINSTER
GRANVILLE
NO 4
SIDAWAY
NO 6
NO 7
NO 8
NELSON
NO 9
MCMILLAN
BLUNDELL
NO 1
RAILWAY
NO 2
GILBERT
NO 3
FRANCIS
NO 5
HIGHWAY 99
WILLIAMS
STEVESTON
Legend
Projected Densities for 2021 (UPA)
0 - 3.31
3.31 - 12.39
12.39 - 35.49
35.49 - 88.80
88.80 - 171.25
Meters
0
800
1,600
3,200
4,800
6,400

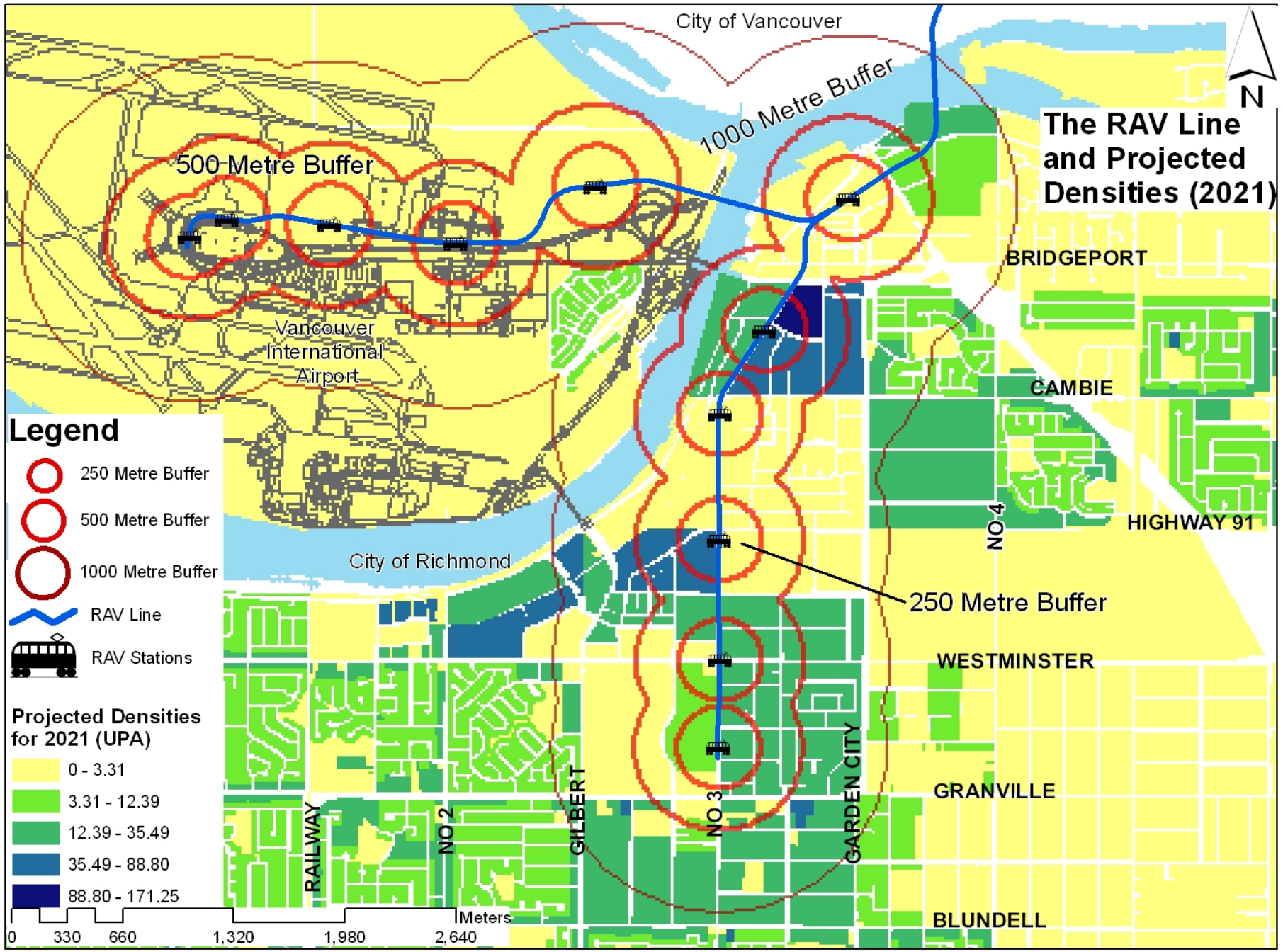

Base GIS Data For Population Projection Model
- Projected Residential Development (Single Family)
N
Projected Population Growth by Single Family
Population
Year
Total
Vancouver International Airport
BRIDGEPORT
CAMBIE
GARDEN CITY
HIGHWAY 91
WESTMINSTER
BOUNDARY
GRANVILLE
BLUNDELL
FRANCIS
WILLIAMS
STEVESTON
SIDAWAY
HIGHWAY 99
NO 4
NO 5
NO 6
NO 7
NO 8
NO 9
NELSON
MCMILLAN
NO 1
NO 2
NO 3
RAILWAY
GILBERT
Legend
Range of Residential Development (Single Family)
0 - 25
26 - 125
126 - 344
345 - 570
571 - 970
Meters
0
800
1,600
3,200
4,800
6,400


Base GIS Data For Population Projection Model
- Projected Residential Development (Townhouses)
N
Projected Population Growth by Townhouse
Population
Year
Total
Vancouver International Airport
BRIDGEPORT
CAMBIE
HIGHWAY 91
WESTMINSTER
BOUNDARY
GARDEN CITY
GRANVILLE
BLUNDELL
FRANCIS
WILLIAMS
STEVESTON
NO 1
RAILWAY
NO 2
GILBERT
NO 3
NO 4
NO 5
HIGHWAY 99
SIDAWAY
NO 6
NO 7
NO 8
NELSON
NO 9
MCMILLAN
Legend
Range of Residential Development (Townhouses)
0 - 26
27 - 109
110 - 278
279 - 545
546 - 1050
Meters
0
800
1,600
3,200
4,800
6,400


Base GIS Data For Population Projection Model
- Projected Residential Development (Apartments)
N
Projected Population Growth by Apartment
Population
Year
Total
Vancouver International Airport
BRIDGEPORT
CAMBIE
HIGHWAY 91
BOUNDARY
WESTMINSTER
GARDEN CITY
GRANVILLE
BLUNDELL
FRANCIS
WILLIAMS
STEVESTON
SIDAWAY
HIGHWAY 99
NO 1
NO 2
NO 3
NO 4
NO 5
NO 6
NO 7
NO 8
NO 9
RAILWAY
GILBERT
NELSON
MCMILLAN
Legend
Range of Residential Development (Apartments)
0 - 64
65 - 248
249 - 600
601 - 1700
1701 - 4800
Meters
0
800
1,600
3,200
4,800
6,400


Base GIS Data For Population Projection Model
- Range of Populaton Growth
N
Vancouver International Airport
BRIDGEPORT
CAMBIE
HIGHWAY 91
BOUNDARY
WESTMINSTER
GARDEN CITY
GRANVILLE
BLUNDELL
FRANCIS
WILLIAMS
STEVESTON
NO 1
RAILWAY
NO 2
GILBERT
NO 3
NO 4
NO 5
HIGHWAY 99
SIDAWAY
NO 6
NO 7
NO 8
NELSON
NO 9
MCMILLAN
Legend
Range of Population Growth
0 - 267.84
267.84 - 1025.28
1,025.28 - 2,206.08
2,206.08 - 4,896.00
4,896.00 - 13,824.00
Meters
0
800
1,600
3,200
4,800
6,400


Projected Multi-family Development
Area Neighbourhood Service Centres
N
Legend
Generalized
Land Uses
Neighbourhood
Service Centre
Public and Open
Space Use
Population
Projection
Model
Townhouses
Apartments
WESTMINSTER
GRANVILLE
GARDEN CITY
BLUNDELL
NO 4
NO 3
NO 2
NO 1
RAILWAY
GILBERT
FRANCIS
WILLIAMS
STEVESTON
Meters
0
320
640
1,280
1,920
2,560


The RAV Line and Projected Densities (2021)
N
City of Vancouver
1000 Metre Buffer
500 Metre Buffer
Vancouver International Airport
BRIDGEPORT
CAMBIE
HIGHWAY 91
NO 4
City of Richmond
250 Metre Buffer
WESTMINSTER
GRANVILLE
BLUNDELL
GARDEN CITY
NO 3
GILBERT
NO 2
RAILWAY
Legend
250 Metre Buffer
500 Metre Buffer
1000 Metre Buffer
RAV Line
RAV Stations
Projected Densities for 2021 (UPA)
0 - 3.31
3.31 - 12.39
12.39 - 35.49
35.49 - 88.80
88.80 - 171.25
Meters
0
330
660
1,320
1,980
2,640

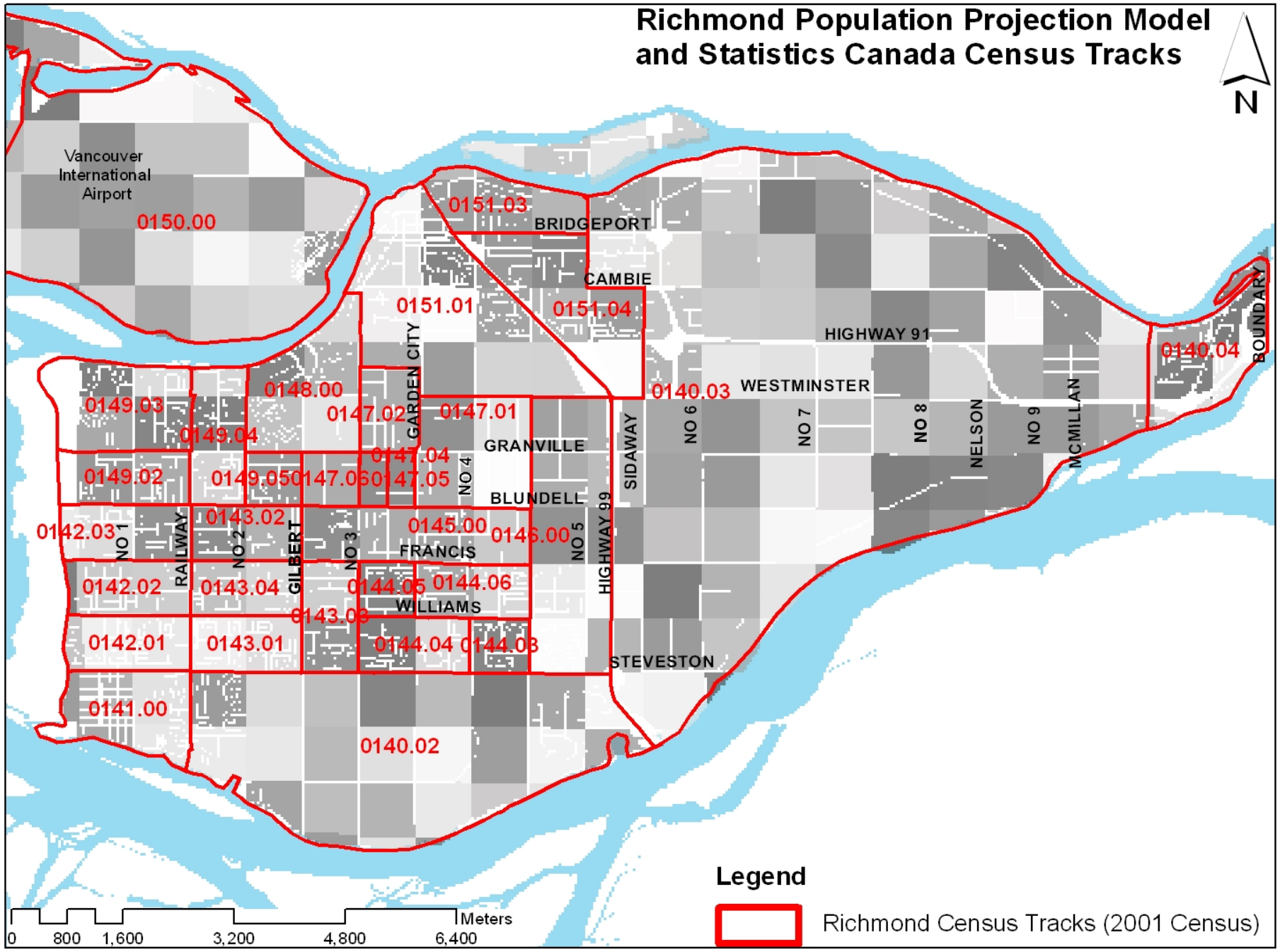
Current and Projected Units and Population Within RAV Buffer Zones

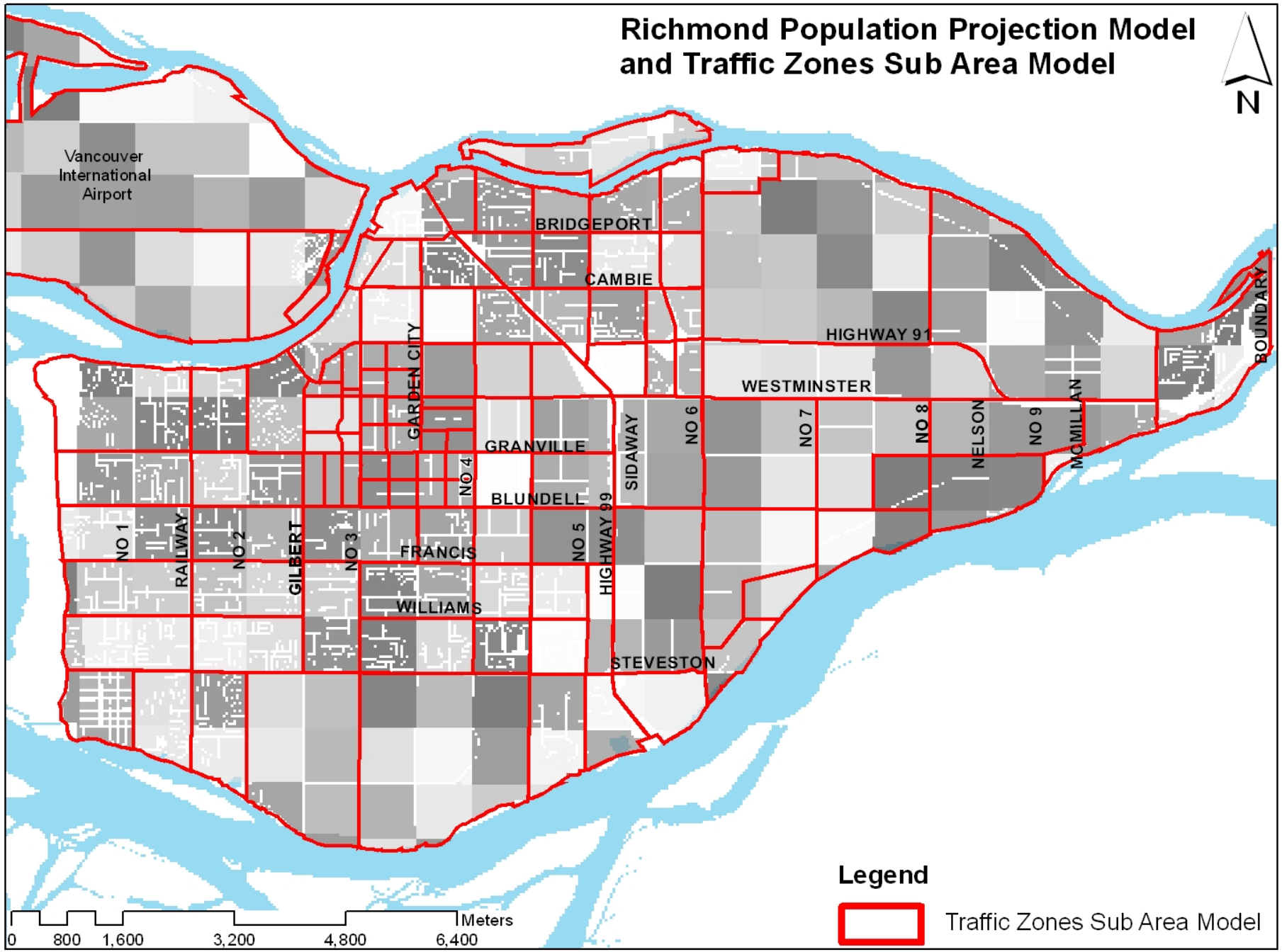
	Current		Projected	
Buffer Zones	Units	Population	Units	Population
250 Metre Buffer	834	1,968	1,048	3,018
500 Metre Buffer	6,190	17,827	13,710	39,484
1000 Metre Buffer	14,528	41,840	23,267	67,008

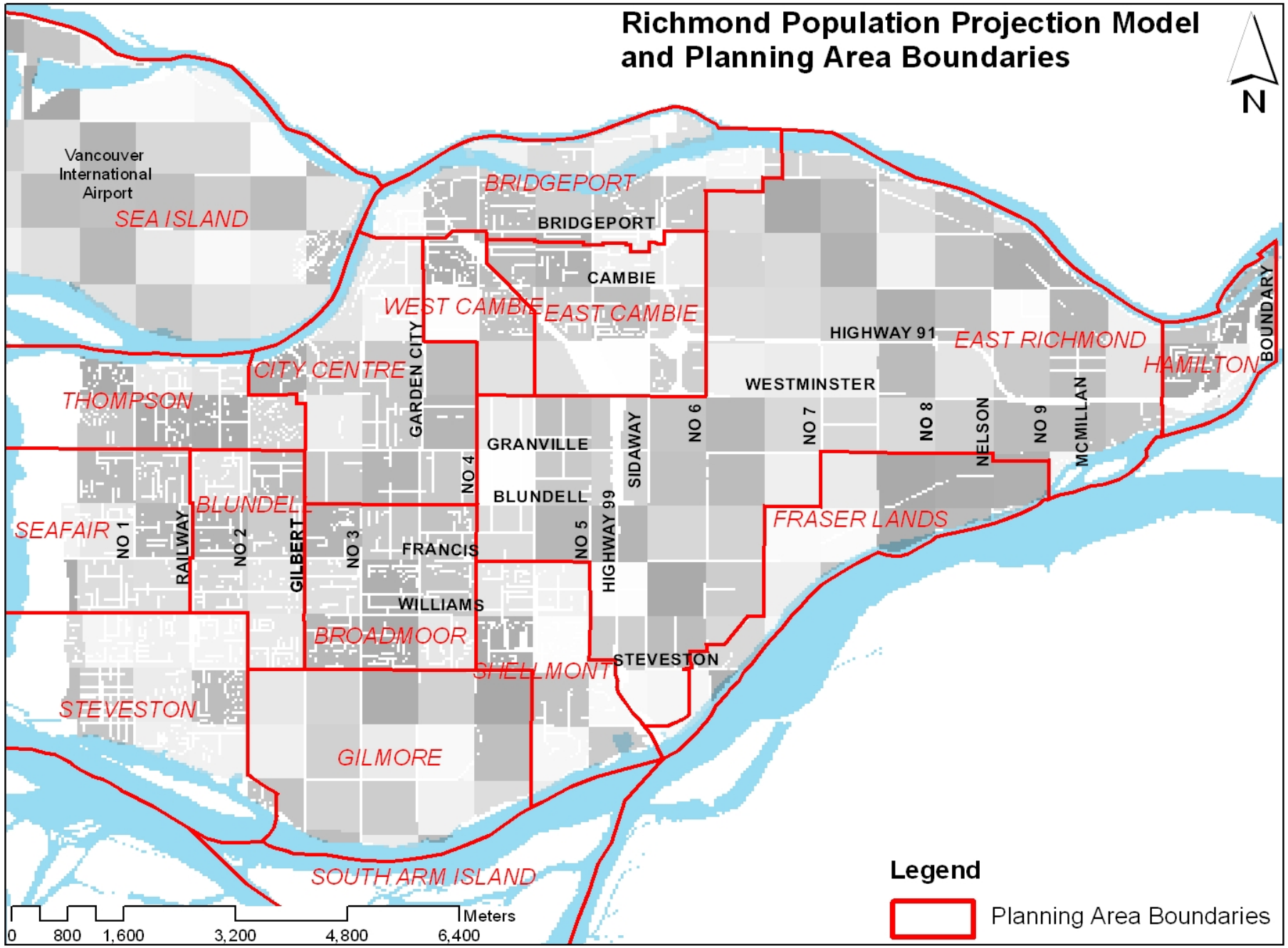
- 250 metre buffer equals a 5 minute walk
- 500 metre buffer equals a 10 minute walk
- 1000 metre buffer equals a 20 minute walk
- RAV transit stations will receive very little rider-ship outside the 1000 metre buffer zone.

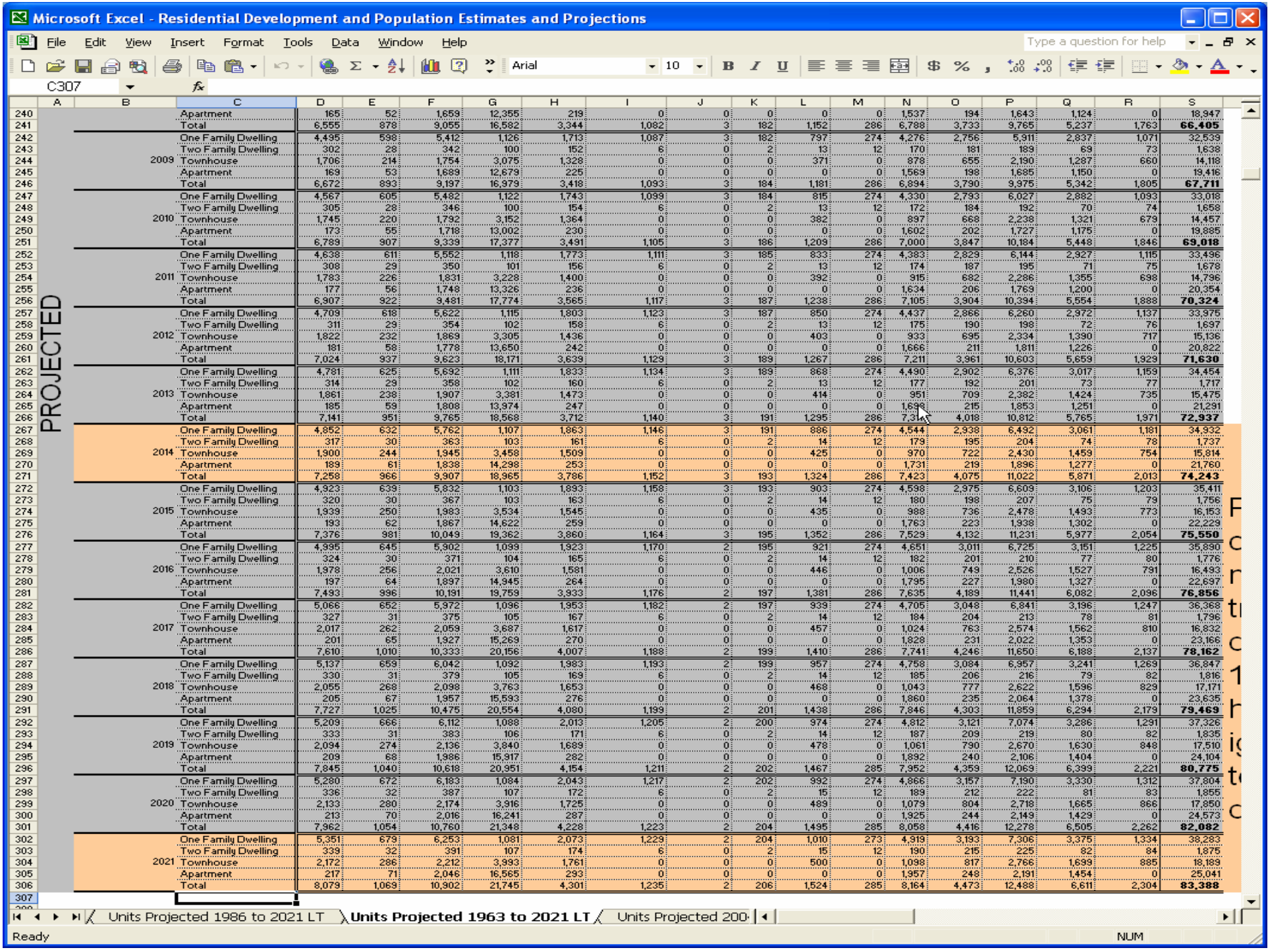
Model Output

- Statistics Canada Census Tracks
- Traffic Zones Sub Area Model
- Data Output
- Future Development Trends


Richmond Population Projection Model
and Statistics Canada Census Tracks
N
Vancouver
International
Airport
0150.00
0151.03
BRIDGEPORT
CAMBIE
0151.01
0151.04
HIGHWAY 91
0140.04
BOUNDARY
0140.03
WESTMINSTER
0148.00
0149.03
0147.02
GARDEN CITY
0147.01
0149.04
GRANVILLE
0147.04
0149.02
0149.05
0147.06
0147.05
NO 4
BLUNDELL
SIDAWAY
NO 6
NO 7
NO 8
NELSON
NO 9
MCMILLAN
0142.03
NO 1
RAILWAY
0143.02
NO 2
GILBERT
NO 3
0145.00
0146.00
NO 5
FRANCIS
HIGHWAY 99
0142.02
0143.04
0144.05
0144.06
WILLIAMS
0143.03
0142.01
0143.01
0144.04
0144.03
STEVESTON
0141.00
0140.02
Legend
Richmond Census Tracks (2001 Census)
Meters
0
800
1,600
3,200
4,800
6,400


Richmond Population Projection Model
and Traffic Zones Sub Area Model
N
Vancouver
International
Airport
BRIDGEPORT
CAMBIE
HIGHWAY 91
WESTMINSTER
BOUNDARY
GARDEN CITY
GRANVILLE
SIDAWAY
NO 6
NO 7
NO 8
NELSON
NO 9
MCMILLAN
NO 4
BLUNDELL
NO 1
RAILWAY
NO 2
GILBERT
NO 3
FRANCIS
NO 5
HIGHWAY 99
WILLIAMS
STEVESTON
Legend
Traffic Zones Sub Area Model
Meters
0
800
1,600
3,200
4,800
6,400


Richmond Population Projection Model
and Planning Area Boundaries
N
Vancouver
International
Airport
SEA ISLAND
BRIDGEPORT
BRIDGEPORT
CAMBIE
WEST CAMBIE
EAST CAMBIE
HIGHWAY 91
EAST RICHMOND
HAMILTON
BOUNDARY
CITY CENTRE
GARDEN CITY
WESTMINSTER
THOMPSON
GRANVILLE
SIDAWAY
NO 6
NO 7
NO 8
NELSON
NO 9
MCMILLAN
NO 4
BLUNDELL
BLUNDELL
FRASER LANDS
SEAFAIR
NO 1
RAILWAY
NO 2
GILBERT
NO 3
FRANCIS
NO 5
HIGHWAY 99
WILLIAMS
BROADMOOR
STEVESTON
SHELLMONT
STEVESTON
GILMORE
SOUTH ARM ISLAND
0
800
1,600
3,200
4,800
6,400
Meters
Legend
Planning Area Boundaries



		Apartment	165	52	1,659	12,355	219	0	0	0	0	0	1,537	194	1,643	1,124	0	18,947
		Total	6,555	878	9,055	16,582	3,344	1,082	3	182	1,152	286	6,788	3,733	9,765	5,237	1,763	**66,405**
		One Family Dwelling	4,495	598	5,412	1,126	1,713	1,087	3	182	797	274	4,276	2,756	5,911	2,837	1,071	32,539
		Two Family Dwelling	302	28	342	100	152	6	0	2	13	12	170	181	189	69	73	1,638
	2009	Townhouse	1,706	214	1,754	3,075	1,328	0	0	0	371	0	878	655	2,190	1,287	660	14,118
		Apartment	169	53	1,689	12,679	225	0	0	0	0	0	1,569	198	1,685	1,150	0	19,416
		Total	6,672	893	9,197	16,979	3,418	1,093	3	184	1,181	286	6,894	3,790	9,975	5,342	1,805	**67,711**
		One Family Dwelling	4,567	605	5,482	1,122	1,743	1,099	3	184	815	274	4,330	2,793	6,027	2,882	1,093	33,018
		Two Family Dwelling	305	28	346	100	154	6	0	2	13	12	172	184	192	70	74	1,658
	2010	Townhouse	1,745	220	1,792	3,152	1,364	0	0	0	382	0	897	668	2,238	1,321	679	14,457
		Apartment	173	55	1,718	13,002	230	0	0	0	0	0	1,602	202	1,727	1,175	0	19,885
		Total	6,789	907	9,339	17,377	3,491	1,105	3	186	1,209	286	7,000	3,847	10,184	5,448	1,846	**69,018**
		One Family Dwelling	4,638	611	5,552	1,118	1,773	1,111	3	185	833	274	4,383	2,829	6,144	2,927	1,115	33,496
		Two Family Dwelling	308	29	350	101	156	6	0	2	13	12	174	187	195	71	75	1,678
	2011	Townhouse	1,783	226	1,831	3,228	1,400	0	0	0	392	0	915	682	2,286	1,355	698	14,796
		Apartment	177	56	1,748	13,326	236	0	0	0	0	0	1,634	206	1,769	1,200	0	20,354
		Total	6,907	922	9,481	17,774	3,565	1,117	3	187	1,238	286	7,105	3,904	10,394	5,554	1,888	**70,324**
		One Family Dwelling	4,709	618	5,622	1,115	1,803	1,123	3	187	850	274	4,437	2,866	6,260	2,972	1,137	33,975
		Two Family Dwelling	311	29	354	102	158	6	0	2	13	12	175	190	198	72	76	1,697
	2012	Townhouse	1,822	232	1,869	3,305	1,436	0	0	0	403	0	933	695	2,334	1,390	717	15,136
		Apartment	181	58	1,778	13,650	242	0	0	0	0	0	1,666	211	1,811	1,226	0	20,822
		Total	7,024	937	9,623	18,171	3,639	1,129	3	189	1,267	286	7,211	3,961	10,603	5,659	1,929	**71,630**
		One Family Dwelling	4,781	625	5,692	1,111	1,833	1,134	3	189	868	274	4,490	2,902	6,376	3,017	1,159	34,454
		Two Family Dwelling	314	29	358	102	160	6	0	2	13	12	177	192	201	73	77	1,717
	2013	Townhouse	1,861	238	1,907	3,381	1,473	0	0	0	414	0	951	709	2,382	1,424	735	15,475
		Apartment	185	59	1,808	13,974	247	0	0	0	0	0	1,698	215	1,853	1,251	0	21,291
		Total	7,141	951	9,765	18,568	3,712	1,140	3	191	1,295	286	7,314	4,018	10,812	5,765	1,971	**72,937**
		One Family Dwelling	4,852	632	5,762	1,107	1,863	1,146	3	191	886	274	4,544	2,938	6,492	3,061	1,181	34,932
		Two Family Dwelling	317	30	363	103	161	6	0	2	14	12	179	195	204	74	78	1,737
	2014	Townhouse	1,900	244	1,945	3,458	1,509	0	0	0	425	0	970	722	2,430	1,459	754	15,814
		Apartment	189	61	1,838	14,298	253	0	0	0	0	0	1,731	219	1,896	1,277	0	21,760
		Total	7,258	966	9,907	18,965	3,786	1,152	3	193	1,324	286	7,423	4,075	11,022	5,871	2,013	**74,243**
		One Family Dwelling	4,923	639	5,832	1,103	1,893	1,158	3	193	903	274	4,598	2,975	6,609	3,106	1,203	35,411
		Two Family Dwelling	320	30	367	103	163	6	0	2	14	12	180	198	207	75	79	1,756
	2015	Townhouse	1,939	250	1,983	3,534	1,545	0	0	0	435	0	988	736	2,478	1,493	773	16,153
		Apartment	193	62	1,867	14,622	259	0	0	0	0	0	1,763	223	1,938	1,302	0	22,229
		Total	7,376	981	10,049	19,362	3,860	1,164	3	195	1,352	286	7,529	4,132	11,231	5,977	2,054	**75,550**
		One Family Dwelling	4,995	645	5,902	1,099	1,923	1,170	2	195	921	274	4,651	3,011	6,725	3,151	1,225	35,890
		Two Family Dwelling	324	30	371	104	165	6	0	2	14	12	182	201	210	77	80	1,776
	2016	Townhouse	1,978	256	2,021	3,610	1,581	0	0	0	446	0	1,006	749	2,526	1,527	791	16,493
		Apartment	197	64	1,897	14,945	264	0	0	0	0	0	1,795	227	1,980	1,327	0	22,697
		Total	7,493	996	10,191	19,759	3,933	1,176	2	197	1,381	286	7,635	4,189	11,441	6,082	2,096	**76,856**
		One Family Dwelling	5,066	652	5,972	1,096	1,953	1,182	2	197	939	274	4,705	3,048	6,841	3,196	1,247	36,368
		Two Family Dwelling	327	31	375	105	167	6	0	2	14	12	184	204	213	78	81	1,796
	2017	Townhouse	2,017	262	2,059	3,687	1,617	0	0	0	457	0	1,024	763	2,574	1,562	810	16,832
		Apartment	201	65	1,927	15,269	270	0	0	0	0	0	1,828	231	2,022	1,353	0	23,166
		Total	7,610	1,010	10,333	20,156	4,007	1,188	2	199	1,410	286	7,741	4,246	11,650	6,188	2,137	**78,162**
		One Family Dwelling	5,137	659	6,042	1,092	1,983	1,193	2	199	957	274	4,758	3,084	6,957	3,241	1,269	36,847
		Two Family Dwelling	330	31	379	105	169	6	0	2	14	12	186	206	216	79	82	1,816
	2018	Townhouse	2,055	268	2,098	3,763	1,653	0	0	0	468	0	1,043	777	2,622	1,596	829	17,171
		Apartment	205	67	1,957	15,593	276	0	0	0	0	0	1,860	235	2,064	1,378	0	23,635
		Total	7,727	1,025	10,475	20,554	4,080	1,199	2	201	1,438	286	7,846	4,303	11,859	6,294	2,179	**79,469**
		One Family Dwelling	5,209	666	6,112	1,088	2,013	1,205	2	200	974	274	4,812	3,121	7,074	3,286	1,291	37,326
		Two Family Dwelling	333	31	383	106	171	6	0	2	14	12	187	209	219	80	82	1,835
	2019	Townhouse	2,094	274	2,136	3,840	1,689	0	0	0	478	0	1,061	790	2,670	1,630	848	17,510
		Apartment	209	68	1,986	15,917	282	0	0	0	0	0	1,892	240	2,106	1,404	0	24,104
		Total	7,845	1,040	10,618	20,951	4,154	1,211	2	202	1,467	285	7,952	4,359	12,069	6,399	2,221	**80,775**
		One Family Dwelling	5,280	672	6,183	1,084	2,043	1,217	2	202	992	274	4,866	3,157	7,190	3,330	1,312	37,804
		Two Family Dwelling	336	32	387	107	172	6	0	2	15	12	189	212	222	81	83	1,855
	2020	Townhouse	2,133	280	2,174	3,916	1,725	0	0	0	489	0	1,079	804	2,718	1,665	866	17,850
		Apartment	213	70	2,016	16,241	287	0	0	0	0	0	1,925	244	2,149	1,429	0	24,573
		Total	7,962	1,054	10,760	21,348	4,228	1,223	2	204	1,495	285	8,058	4,416	12,278	6,505	2,262	**82,082**
		One Family Dwelling	5,351	679	6,253	1,081	2,073	1,229	2	204	1,010	273	4,919	3,193	7,306	3,375	1,334	38,283
		Two Family Dwelling	339	32	391	107	174	6	0	2	15	12	190	215	225	82	84	1,875
	2021	Townhouse	2,172	286	2,212	3,993	1,761	0	0	0	500	0	1,098	817	2,766	1,699	885	18,189
		Apartment	217	71	2,046	16,565	293	0	0	0	0	0	1,957	248	2,191	1,454	0	25,041
		Total	8,079	1,069	10,902	21,745	4,301	1,235	2	206	1,524	285	8,164	4,473	12,488	6,611	2,304	**83,388**

Future Development

- Moving to future projection years, housing type and their upa range will change in terms of their geographic areas.
  - For example, Low Density Single Family upa will increase in future years to represent the legalization of secondary suites.
  - Additionally, the people per unit figures will also likely decrease.
  - Development along major arterial roads will increase as densification takes place.
    - Single family housing will be replaced by higher density townhouse development.
  - The City Centre will see a significant increase in multi-family development.
    - The bulk of this development will be apartment high-rise development.

END