

**Long  
Range**

*Surrey*

**Planning:**

**Land Development  
& Transportation**

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URISA Seminar  
December 13, 2004**



# Overview

- **In a rapidly growing city, planners must anticipate development scenarios and prepare appropriate development strategies.**
- **This presentation looks at the City of Surrey experience in preparing land use and development plans, growth scenarios, and transportation models, and how IS tools assist this process.**

# Outline

- **Surrey's Land Use and Development Context**
- **City Plans and the Future Growth / Development Concept**
- **Applications for Transportation Modeling**



# Surrey's Development Context

- Geographic area 125 sq miles
- Land Use Diversity
- Currently 400,000 population (10th in Canada), and 140,000 jobs
- Grow by 8,000 to 15,000 residents per year
- Growth Capacity – add over 200,000 residents and 100,000 jobs over next 25 years
- By 2031, 620,000 residents and 250,000 jobs

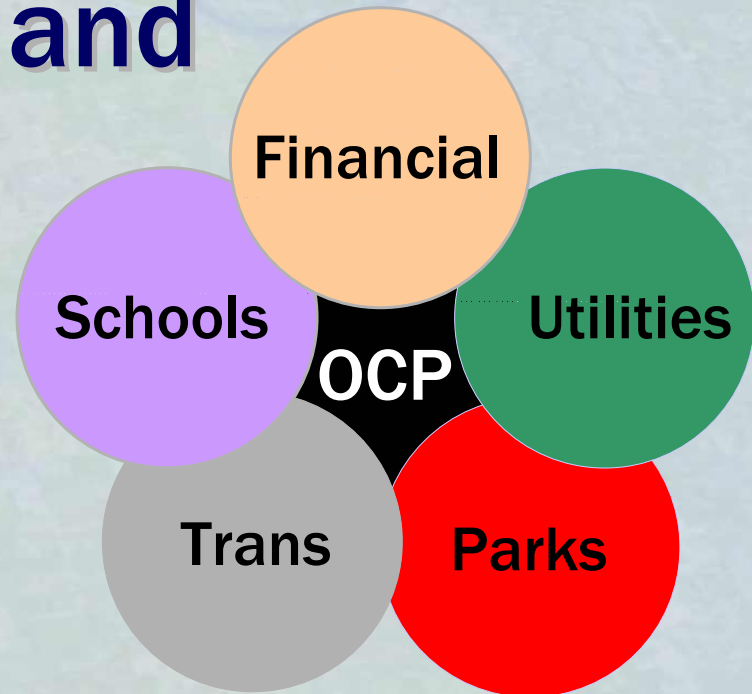


# Surrey's Development Context

- **30% of future GVRD population/job growth**
- **Low job to resident ratio**
- **90,000 commute to jobs outside Surrey**
- **50,000 commute to jobs in Surrey**
- **Project 300,000 (+100,000) city's labour force**
- **Project 260,000 (+100,000) city's jobs**
- **Increasing prominence as both an origin and destination for Lower Mainland transportation**

# Structure of Plans and Strategies

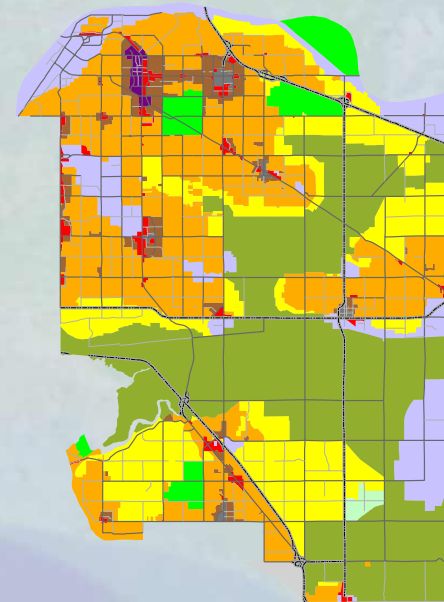
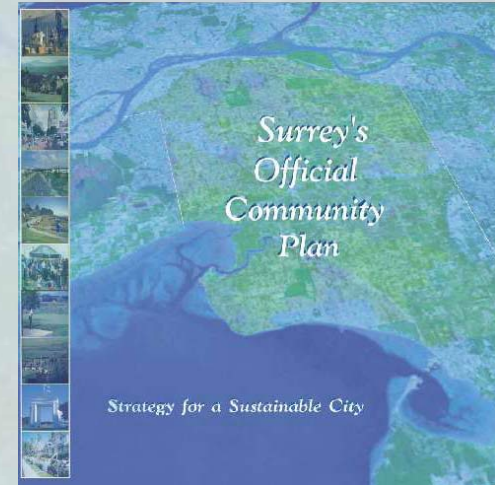
Structure of inter-related plans provide city objectives and policies



- Official Community Plan
- Transportation Plan, Infrastructure Servicing Plan, Parks Plan, Financial Plan
- School Capital Plans
  
- Livable Region Strategic Plan – Regional Context Statement - how city and region plans relate

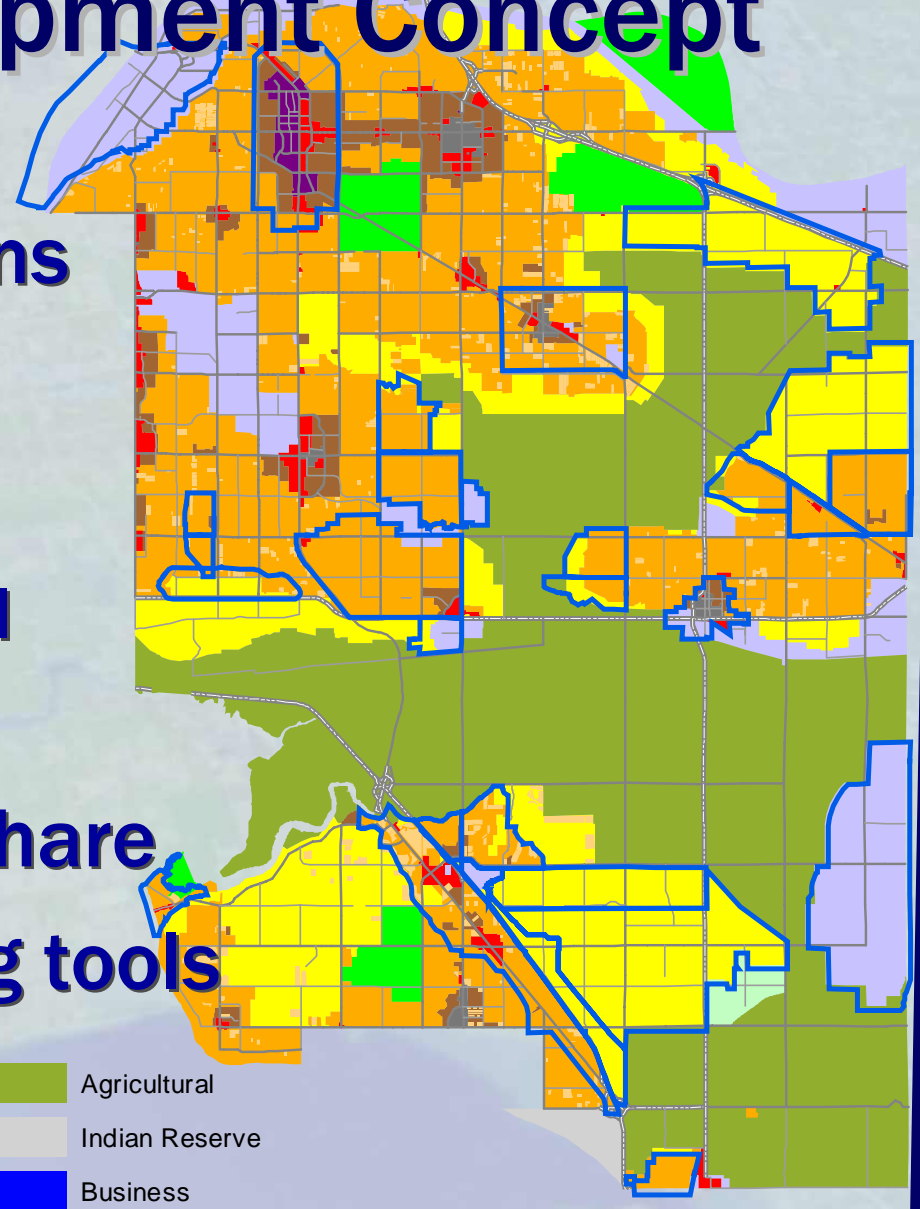
# OCP Foundation

- **Comprehensive objectives and policies for land use, growth management and community development.**
- **Basis of scenarios for housing, population, business and employment, used for transportation and other development related models.**



# Growth / Development Concept

- Land Use Designations
- Infill Capacity
- Series of Area Plans
  - Housing / Residential
  - Business / Jobs
- Regional Context / Share
- GIS & other modeling tools

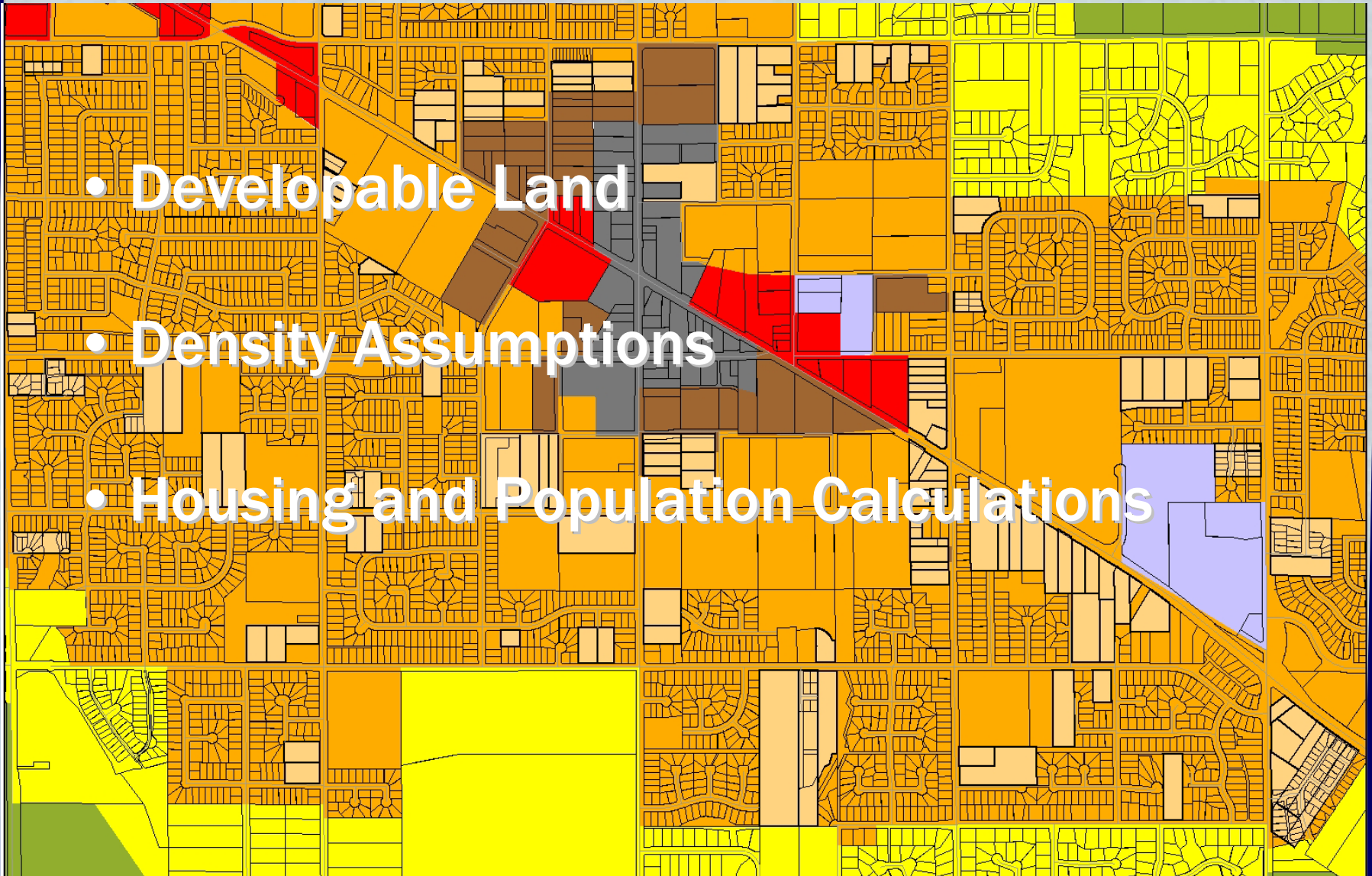


 City Centre	 Urban	 Commercial	 Agricultural
 Town Centre	 Suburban	 Industrial	 Indian Reserve
 Multiple Residential	 Rural	 Conservation	 Business



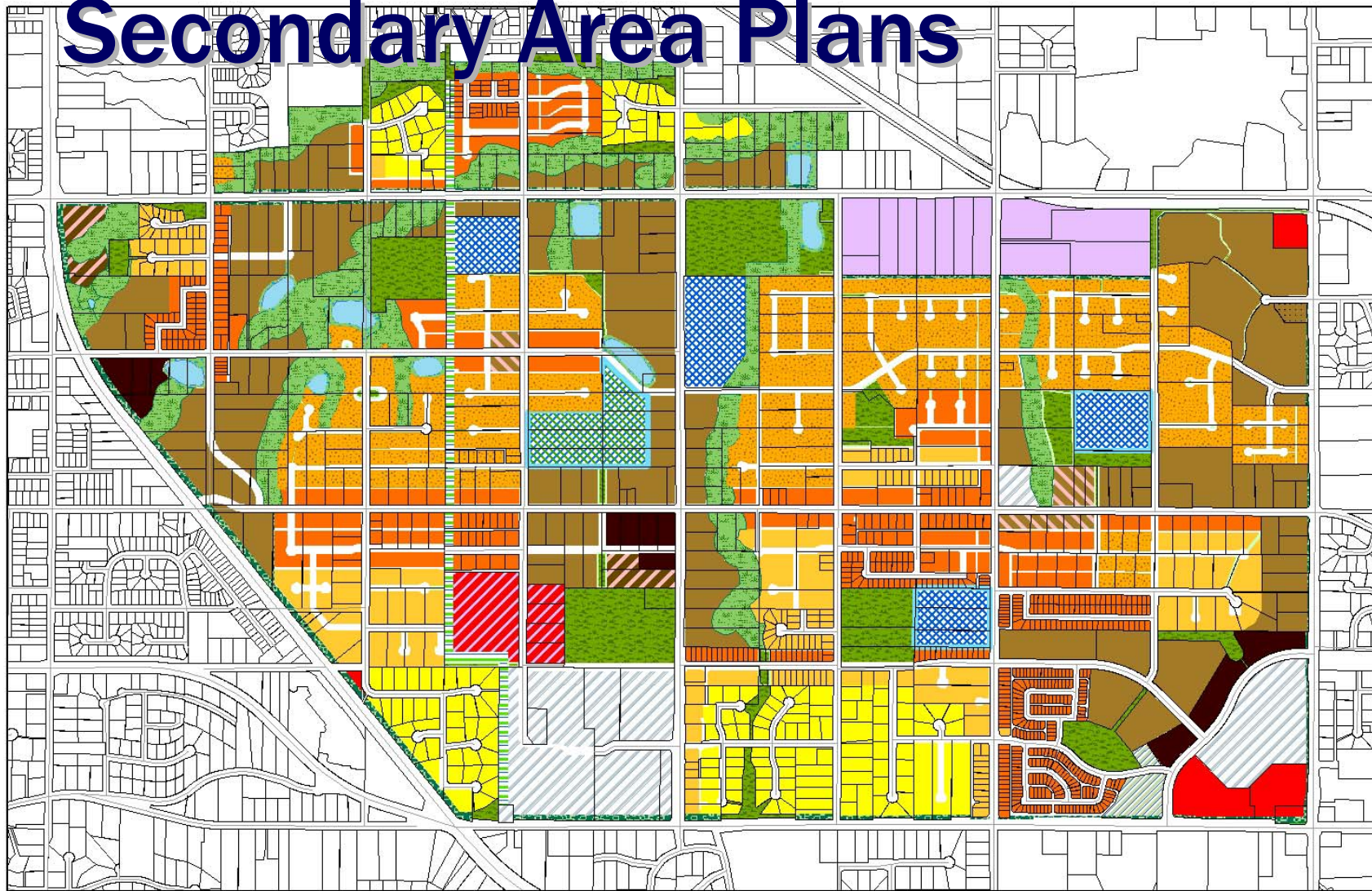
# Infill Capacity

- Developable Land
- Density Assumptions
- Housing and Population Calculations





# Secondary Area Plans



- |                                     |                           |                 |                               |                |
|-------------------------------------|---------------------------|-----------------|-------------------------------|----------------|
| Apartments                          | Single Family Residential | Institutional   | Proposed School and Park      | Buffers        |
| Townhouses 25                       | Existing Suburban         | Office Park     | Parks                         | Pond Buffers   |
| Townhouses 15                       | Com/Res Apartments        | Industrial      | Proposed Parks and Walkways   | Proposed Ponds |
| Single Family Small Lots            | Com/Res Townhouse         | Schools         | Recreational                  | Utility R/W    |
| Single Family Residential 6 to 14.5 | Commercial                | Proposed School | Creeks and Riparian Set Backs |                |

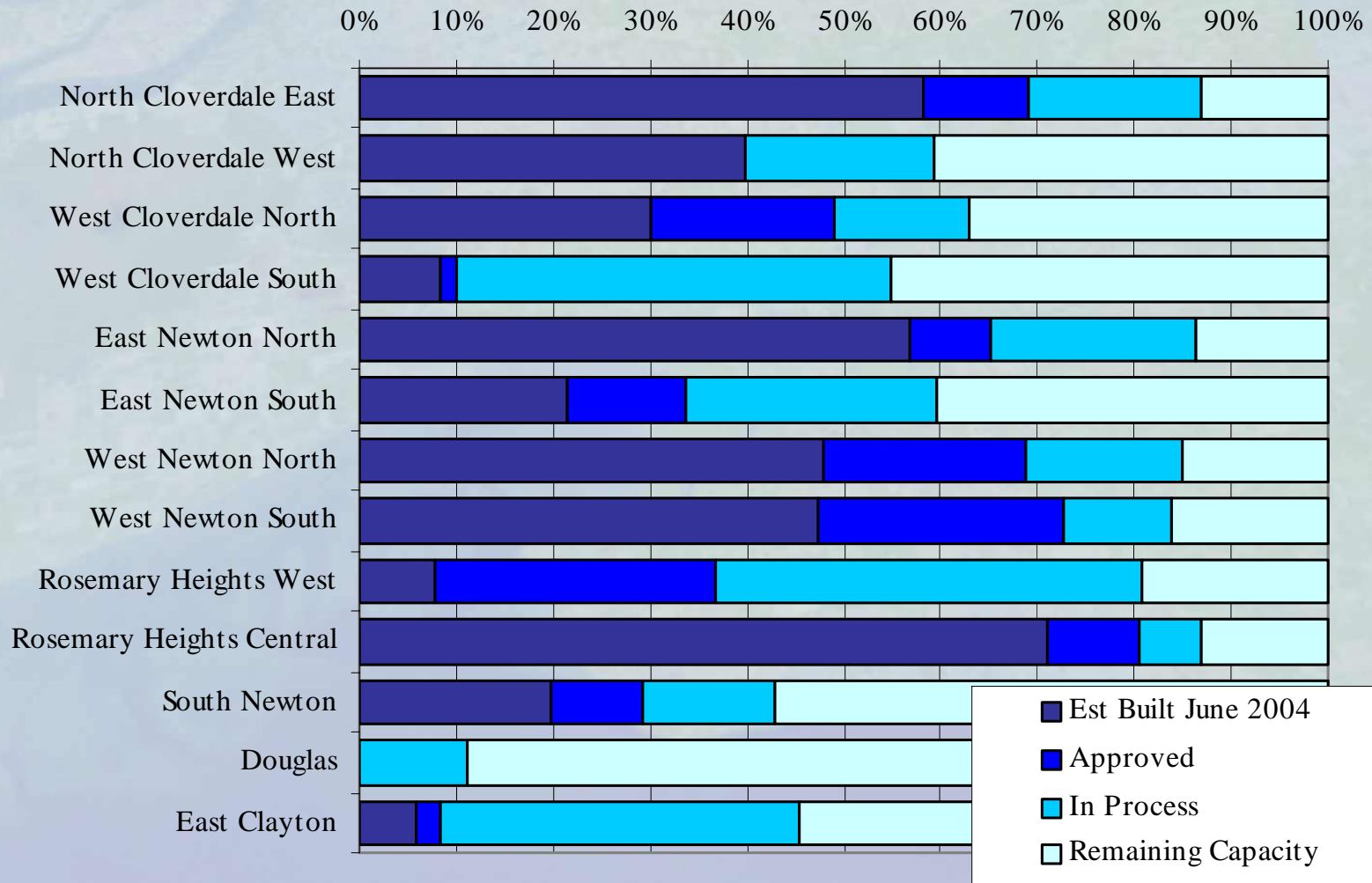


# Plan Capacity Calculations

- Land use capacities and propensities
- Calculate housing, population, school demand, business development, jobs, etc.

Land Use Summary	Hectares	Density	Res Units	Household	Population	School Rat	Elementary	Secondary	Business m2	Job Ratio	Jobs
Existing Suburban	31.1	3.7	115	3.3	380	0.7	55	26			
Single Family Residential	29.0	14.5	421	3.3	1,389	0.7	200	94			
Single Family Residential 6 to 14.5	53.4	24	1,281	3.3	4,227	0.7	610	287			
Single Family Small Lots	48.2	24	1,157	3.3	3,818	0.7	551	259			
Townhouses 15	79.1	37	2,926	2.8	8,193	0.4	796	375			
Townhouses 25	0.4	60	22	2.4	53	0.3	5	2			
Apartments	6.5	111	725	2	1,450	0.1	49	23			
Commercial	4.8	0.75							36,237	45	805
Office Park	5.4	0.5							27,153	45	603
Recreational	1.5										
Com/Res Apartments	2.6	37	95	1.5	142	0.1	6	3			
Com/Res Townhouse	2.6	20	53	2	105	0.1	4	2			
Industrial	14.6	0.3							43,674	75	582
<b>Totals</b>	<b>279.2</b>	<b>332.8</b>	<b>6,794</b>	<b>24</b>	<b>19,756</b>	<b>4</b>	<b>2,275</b>	<b>1,071</b>	<b>107,065</b>		<b>1,991</b>

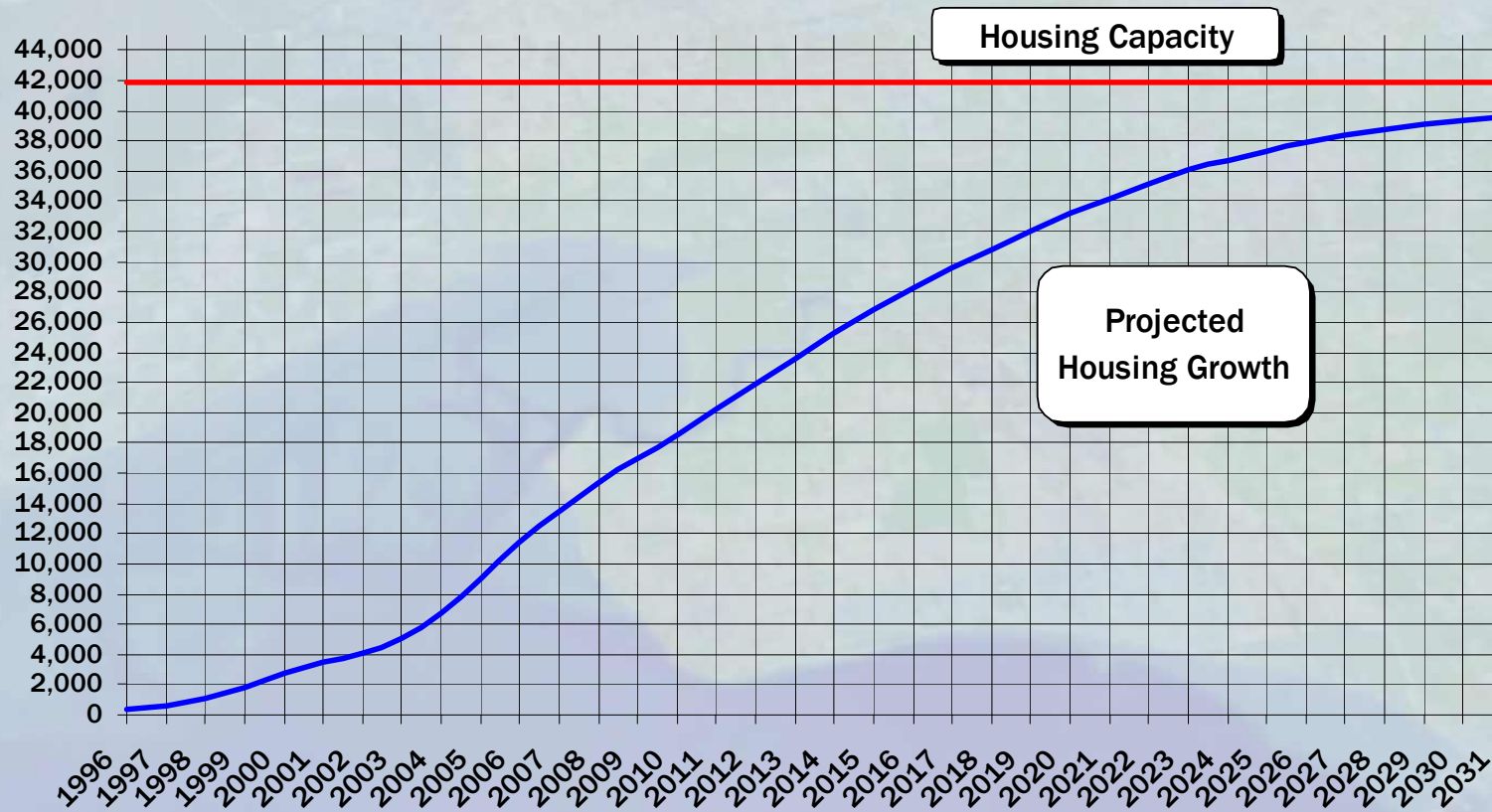
# Monitoring Community Growth



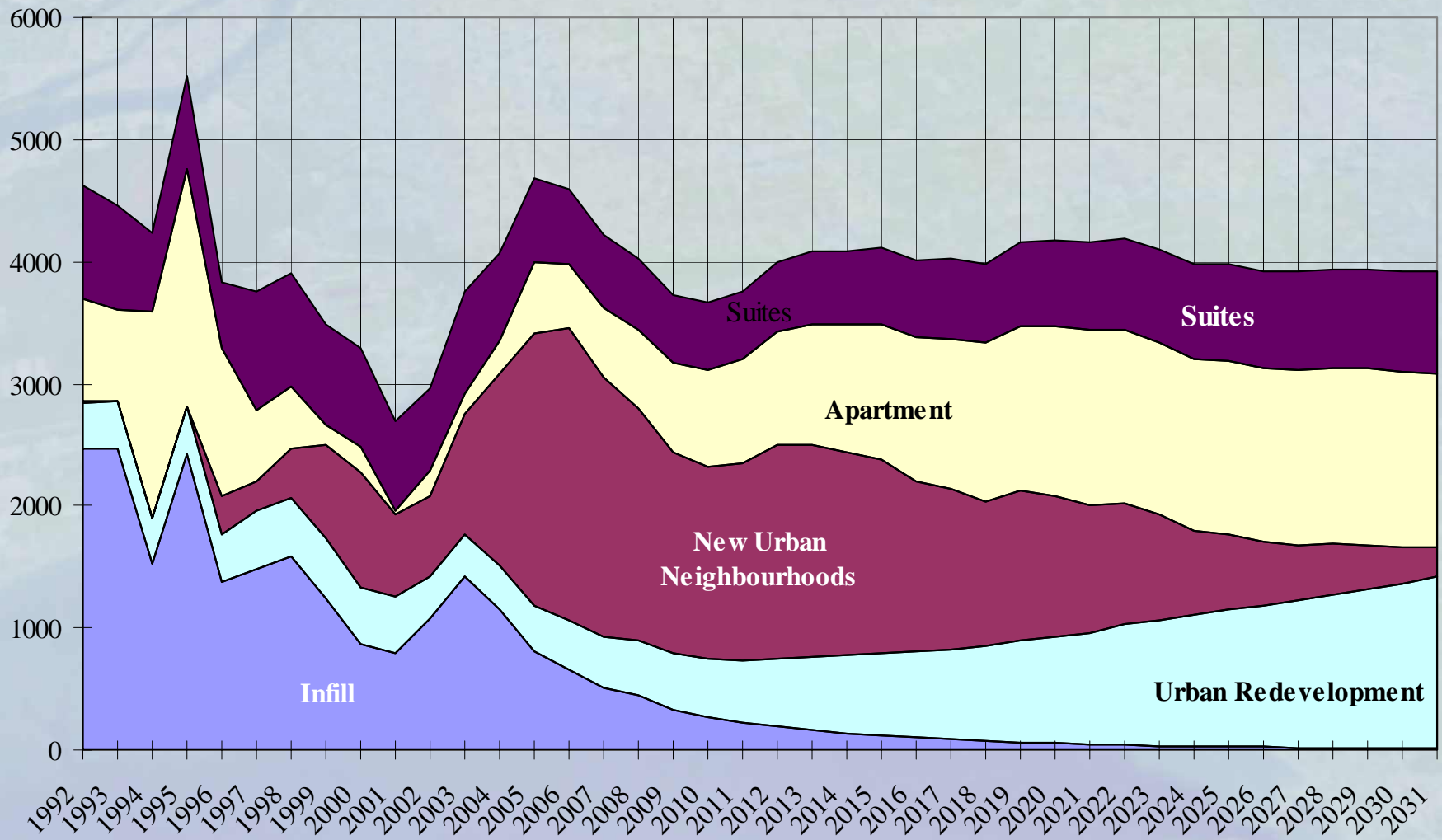


# Projecting Community Growth

## Planned Housing Capacity and Projected



# OCP Development Scenario





# Long Range Planning Applications

**OCP provides a base scenario for other city planning applications and models.**

- **Transportation, Parks, Fire, Police, Libraries etc**
- **Infrastructure servicing plans – roads, water, sewer and drainage, parks – DCC's**
- **School District Capital Plans**
- **Electoral Districting – city, provincial, federal**
  
- **Regional plans – LRSP Regional Growth Management Scenario and Regional Transportation Modeling**

# Diversity of Model Applications

- **Each application has a unique set of information input and output requirements, and unique spatial considerations and boundary references.**
- **All data has specific and unique geographic constraints/considerations.**
- **Requires many combinations and methods of data and spatial allocations.**



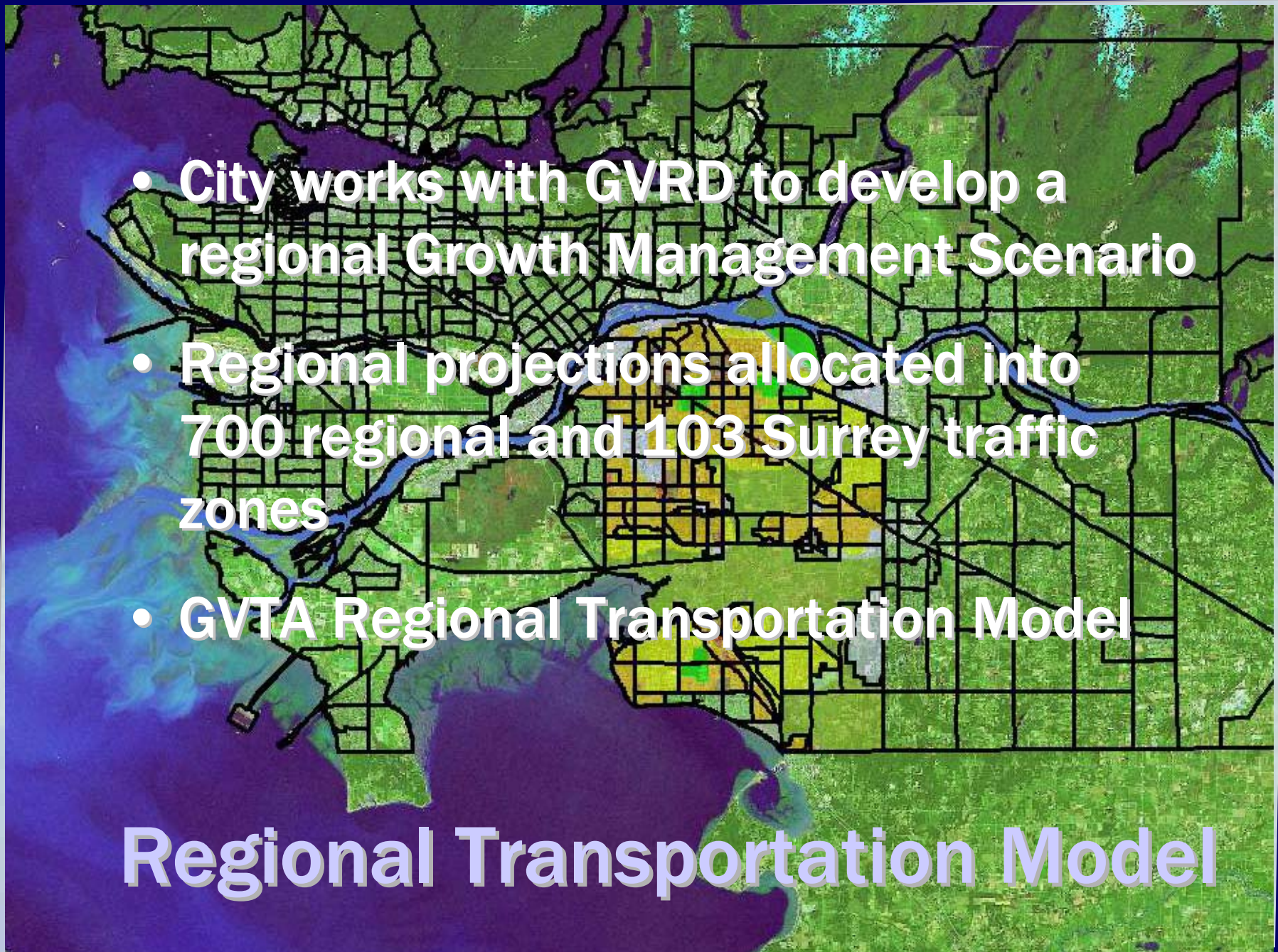
# Transportation Applications

- **Regional, City and Neighbourhood Models.**
- **Information requirements and sources.**
- **Information allocation / calculation issues and methods.**

# **Regional, City and Neighbourhood Models**

- **GVRD Growth Management /GVTA  
Regional Transportation Model**
- **Surrey Sub-Area Transportation Model**
- **Neighbourhood Specific Traffic Models**
- **Inter-related**



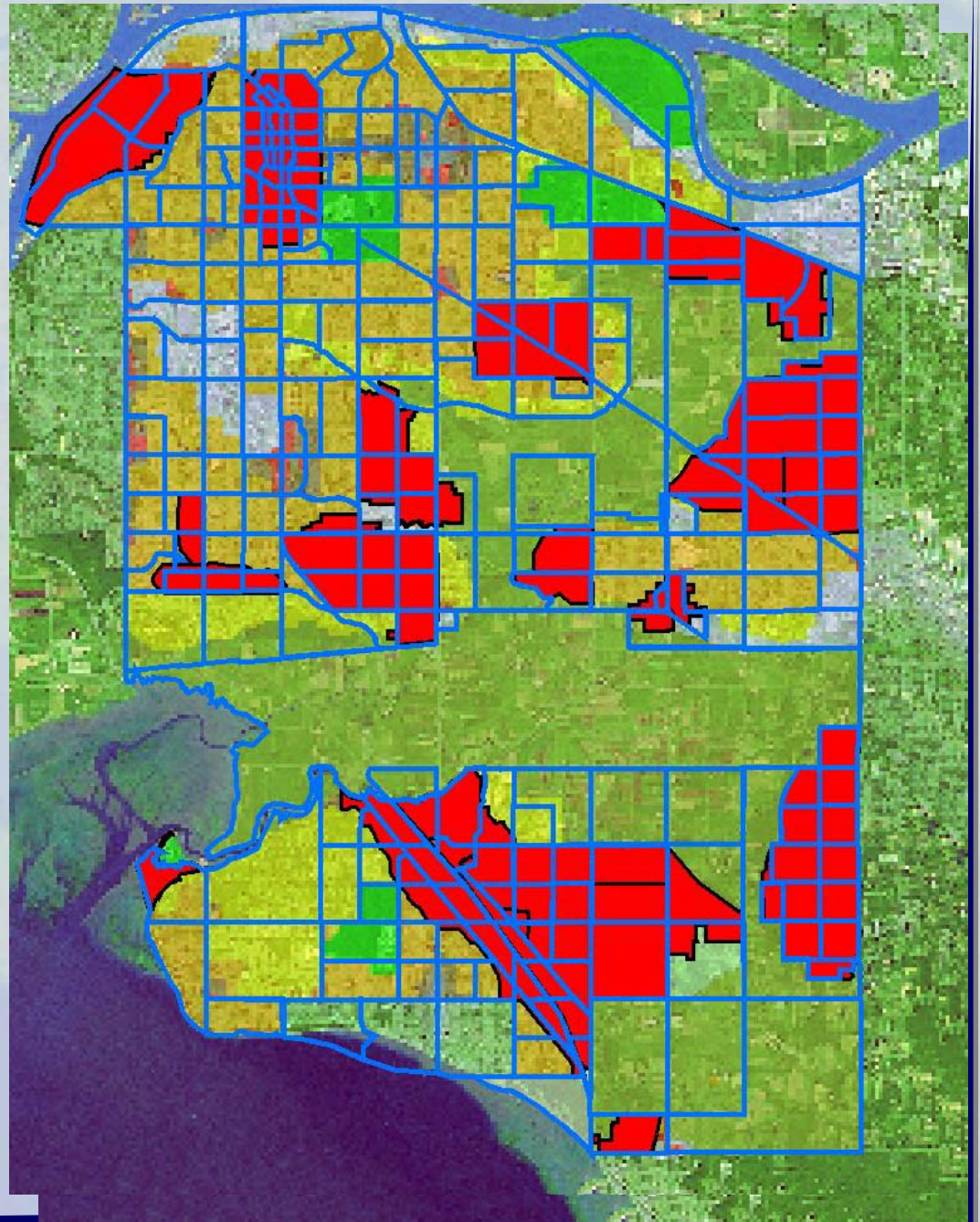
- 
- City works with GVRD to develop a regional Growth Management Scenario
  - Regional projections allocated into 700 regional and 103 Surrey traffic zones
  - GVTA Regional Transportation Model

# Regional Transportation Model



# Surrey Sub-area Model

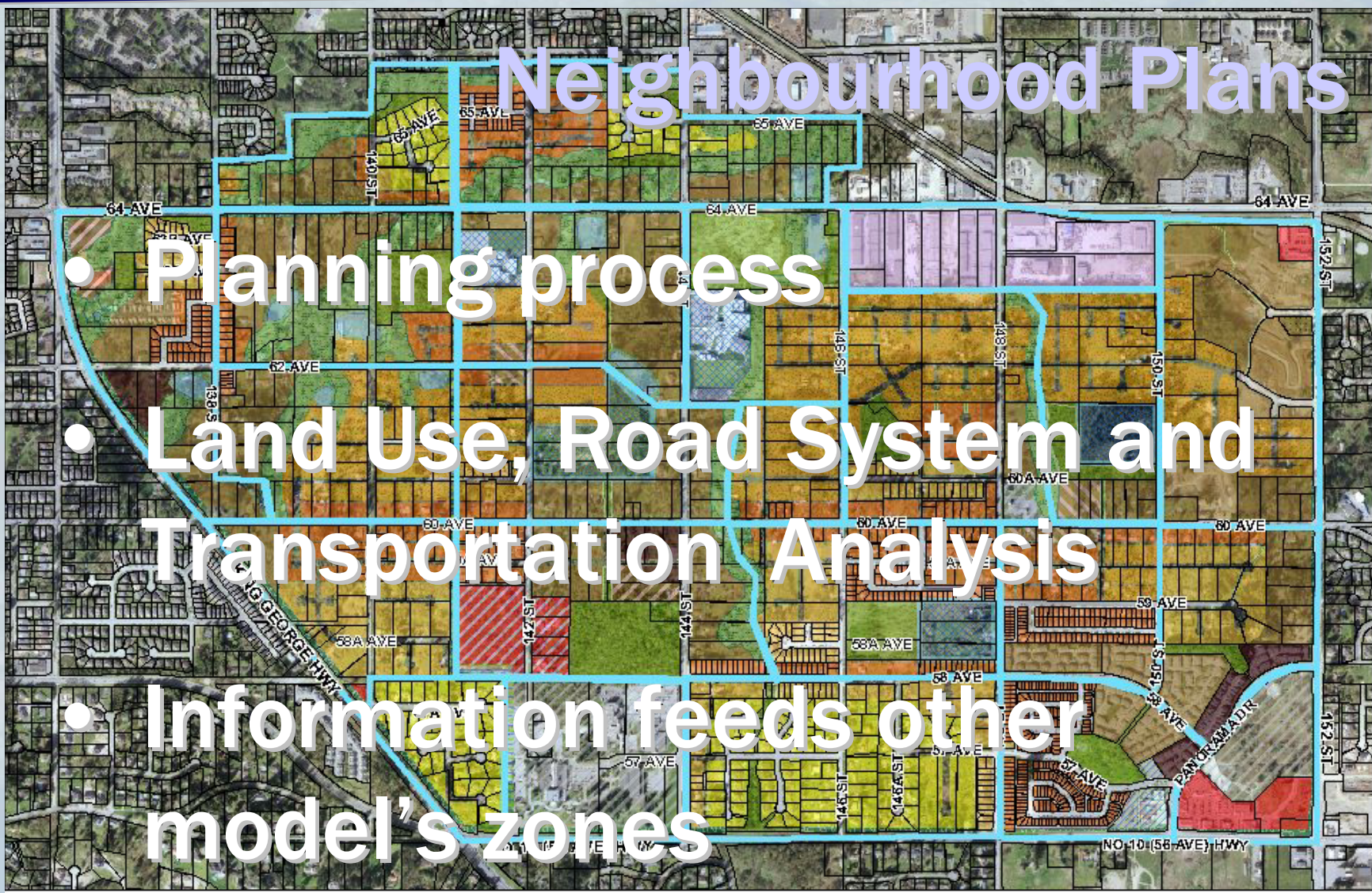
- 290 zones
- Sub-zones of regional model
- More detailed networks





# Neighbourhood Plans

- Planning process
- Land Use, Road System and Transportation Analysis
- Information feeds other model's zones



South Newton  
Neighbourhood Concept Plan

Apartments	Single Family Residential	Institutional	Proposed School and Park	Buffers
Townhouses 25	Existing Suburban	Office Park	Parks	Pond Buffers
Townhouses 15	Com/Res Apartments	Industrial	Proposed Parks and Walkways	Proposed Pond
Single Family Small Lots	Com/Res Townhouse	Schools	Recreational	Utility R/W
Single Family Residential 6 to 145	Commercial	Proposed School	Creeks and Riparian Set Backs	



# Information Requirements

**Information and allocations to transportation zones for base year, horizon year and interval years.**

- Population total and population age groups**
- Resident labour force - employed**
- Jobs total - retail and non-retail**
- Average Family Income**



# Information Sources

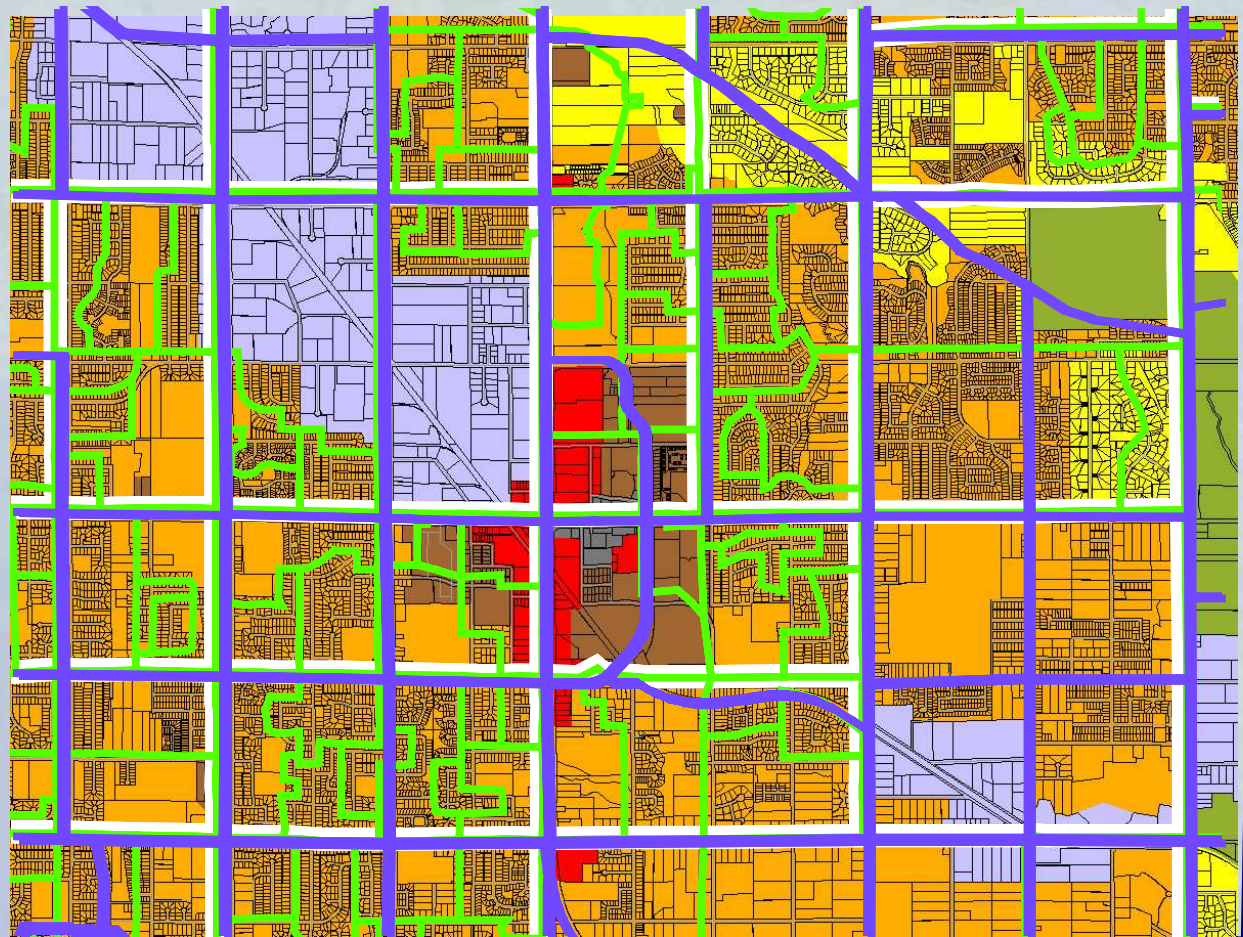
- **Census Data for Base Year Model**
- **Property and Zoning**
- **Building Permit Data**
- **BCAA Data – Commercial / Industrial**
- **Land Use Plans –Use, Density**
  - **Population & Job Propensities**
- **Servicing Plans – Phasing**
- **Site Specific Information**
- **Assumptions**

# Base Year Model

## Census Demographics / Jobs

Aggregate or disaggregate Census Areas

- CT to TZ
- DA to TZ



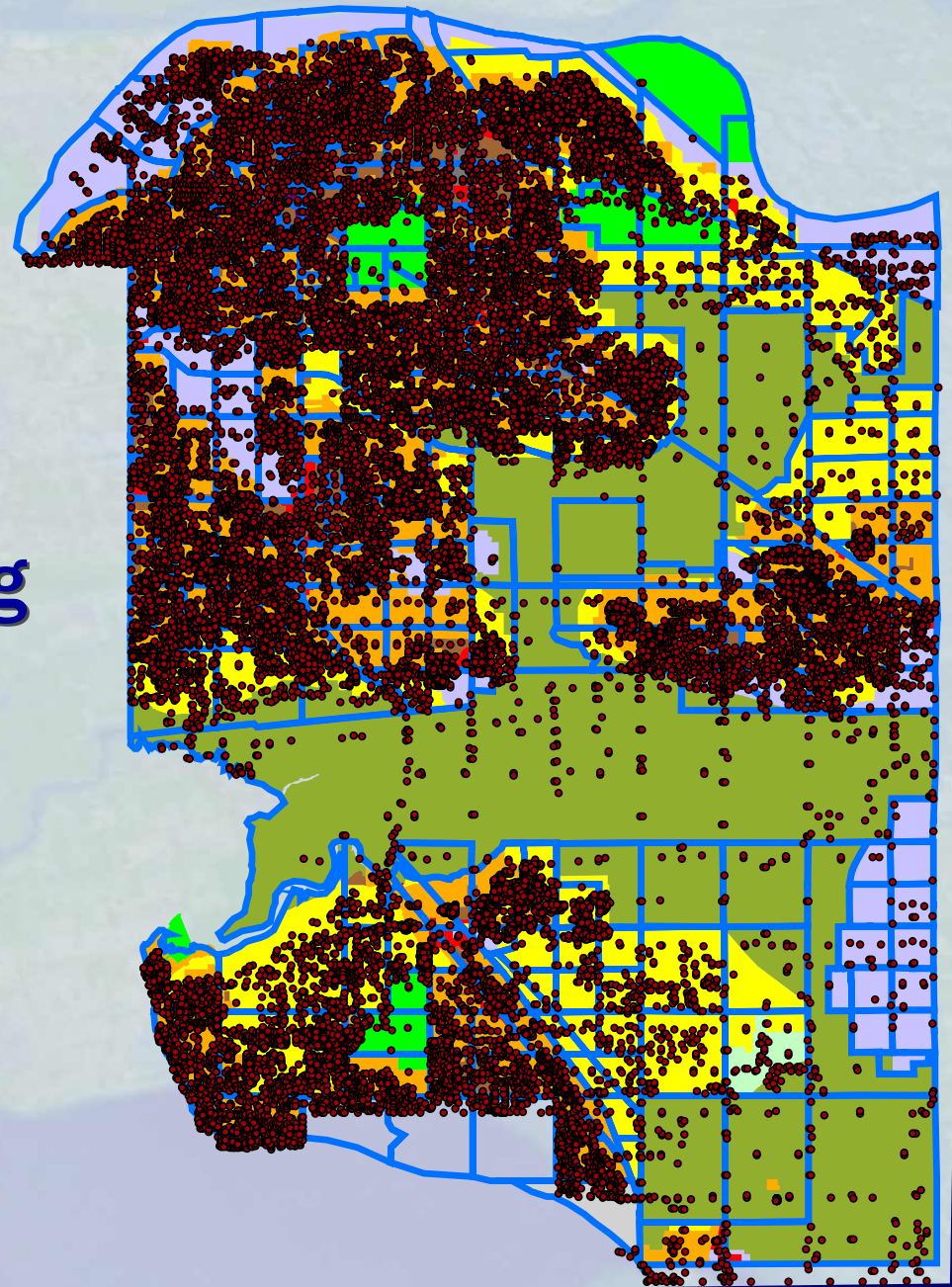


# Zone Allocations

- **Proximate Census Area Controls**
- **Land Use / Zoning / Properties**
- **Census /Residential Building Permits**
- **Census /BCAA Base /Commercial Building Permits**
- **Units by type - propensities**
  - household size, job ratios

# Population Allocation

- Census Base and Geocoded Building Permit Data
- Spatial Join and summary total of points to TZones



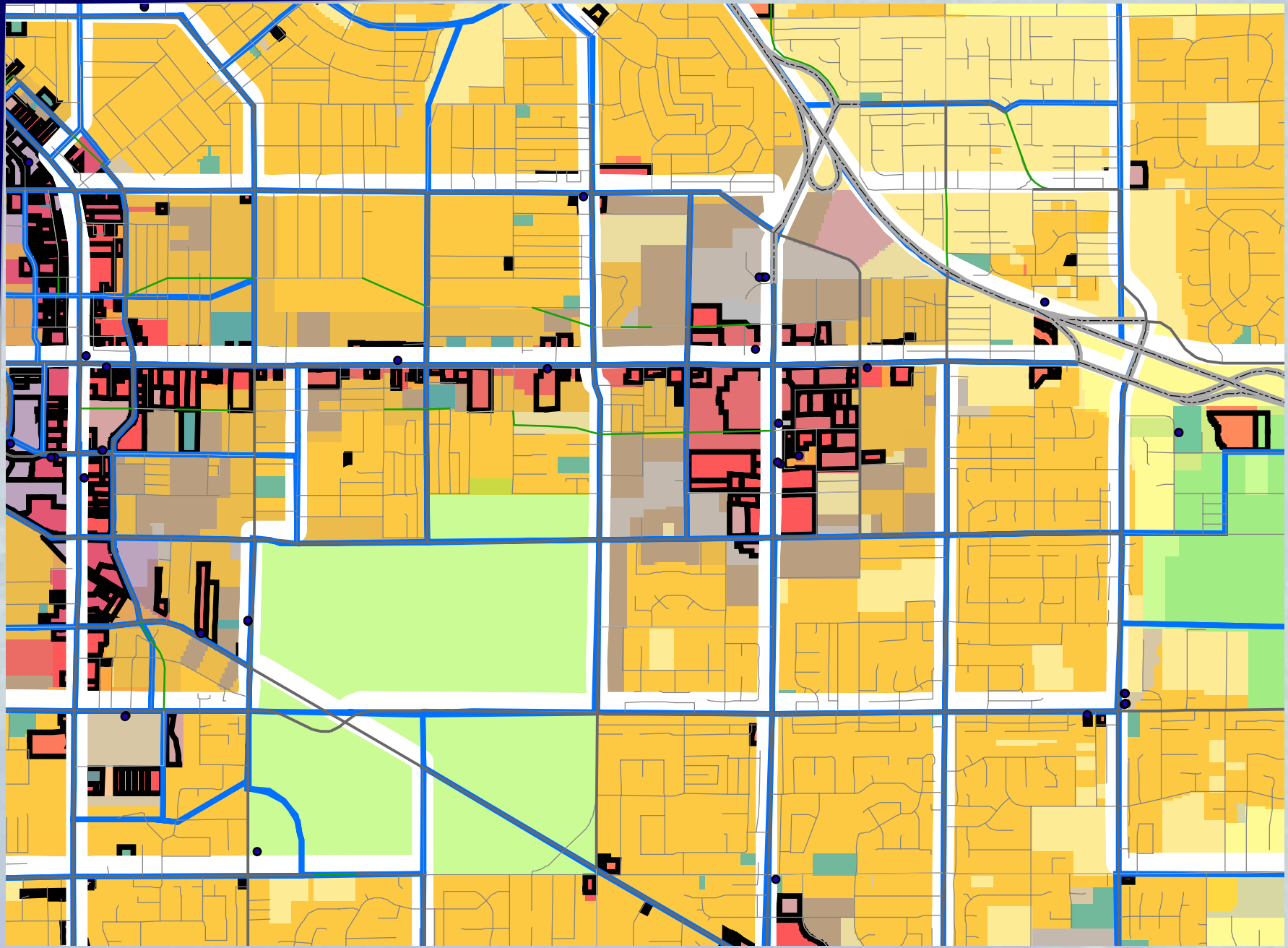


# Employment Allocation

## Census Tract Control Totals

Allocate proportionally by:

- **BCAA data – built floor area and average employment ratios by type of use – retail and non-retail**
- **Land Use Property Zoning**
- **Specific Known Land Uses**



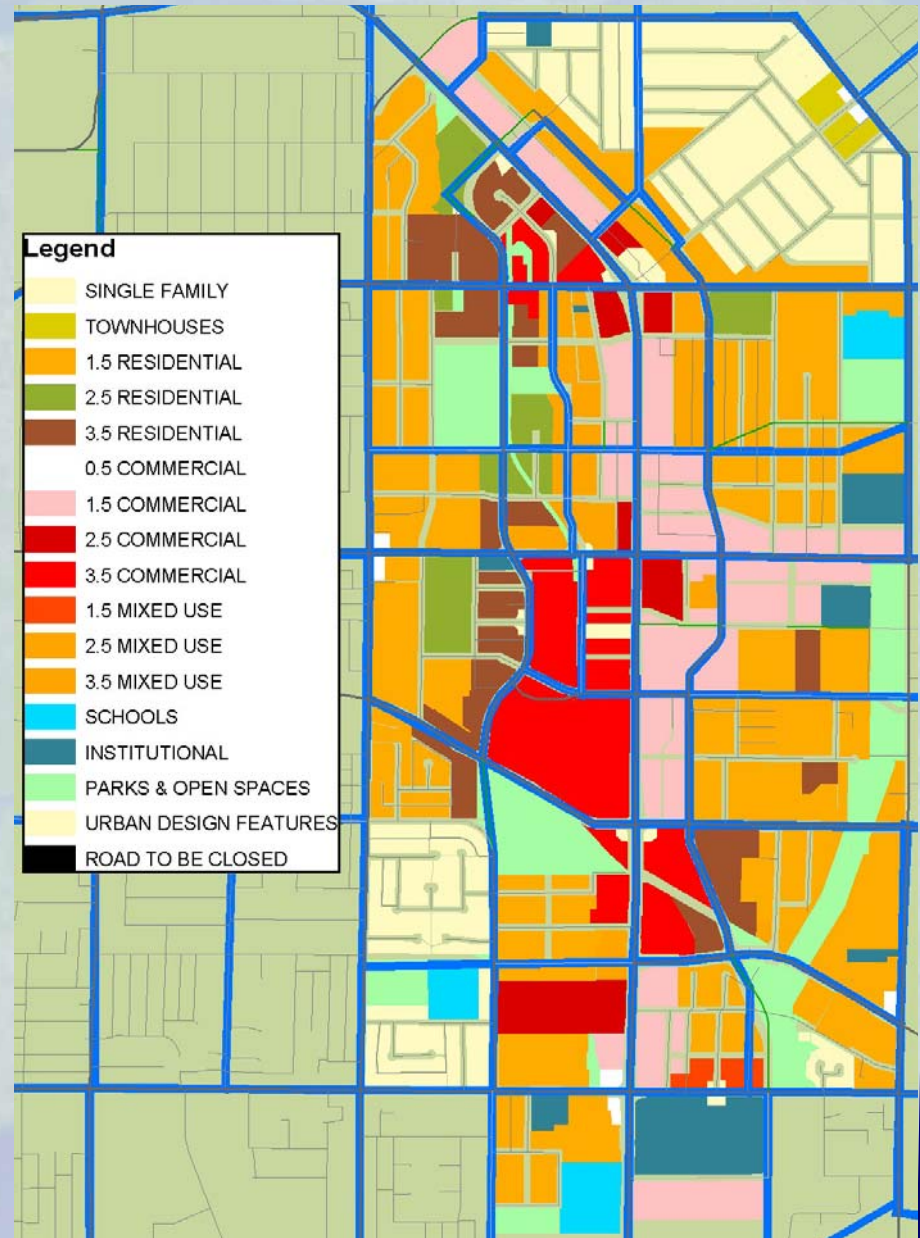


# Estimating Future Years

- **Population / Employment Projection Control Totals**
- **OCP & Secondary Plan Land Uses and Development Capacities**
  - Land area / Planned density / Unit ratios
- **Growth Rate Assumptions**
  - Timing / Constraints

# Land Use Plan Capacities

Development Type	Capacity
Row Housing	283
Apartment Low Rise	21,703
Apartment High Rise	16,337
Total Residential Units	39,263
Total Population	67,838
Retail Floor Area	658,069
Retail Employment	14,001
Office Floor Area	1,191,622
Office Employment	51,376





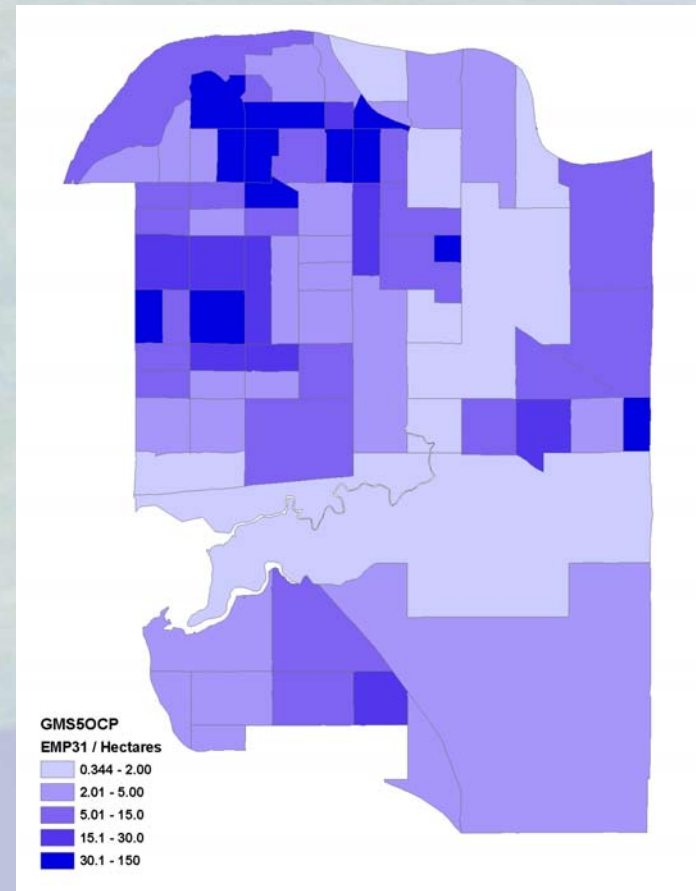
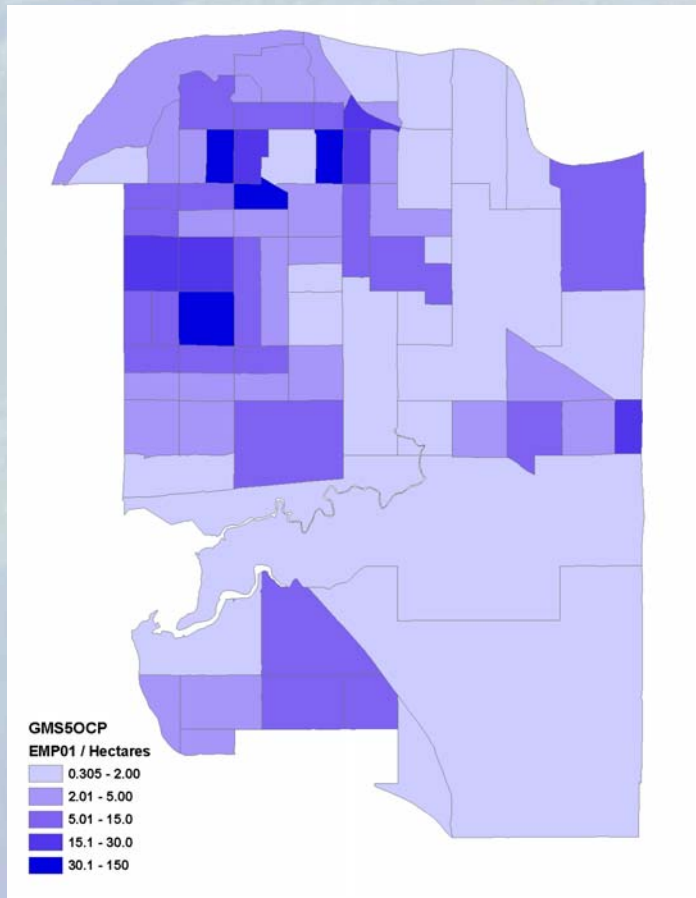
# Allocating Growth to Zones

- Parsing polygons
- Assigning TZones
- Calculating Capacities
- Estimating Growth Rates



# Displaying Results

- Thematic Maps for Base and Horizon Years





# Conclusion

**IS tools have become essential:**

- **Increase scope, flexibility, level of detail, and manageability of information and analysis.**
- **Expand options the presentation of information and products.**
- **Promote task/time efficiency in a multi-tasking, rapid paced work environment.**