

# GIS in Community & Regional Planning



The role of GIS in Re-writing the Zoning Bylaw  
for the  
City of Vernon

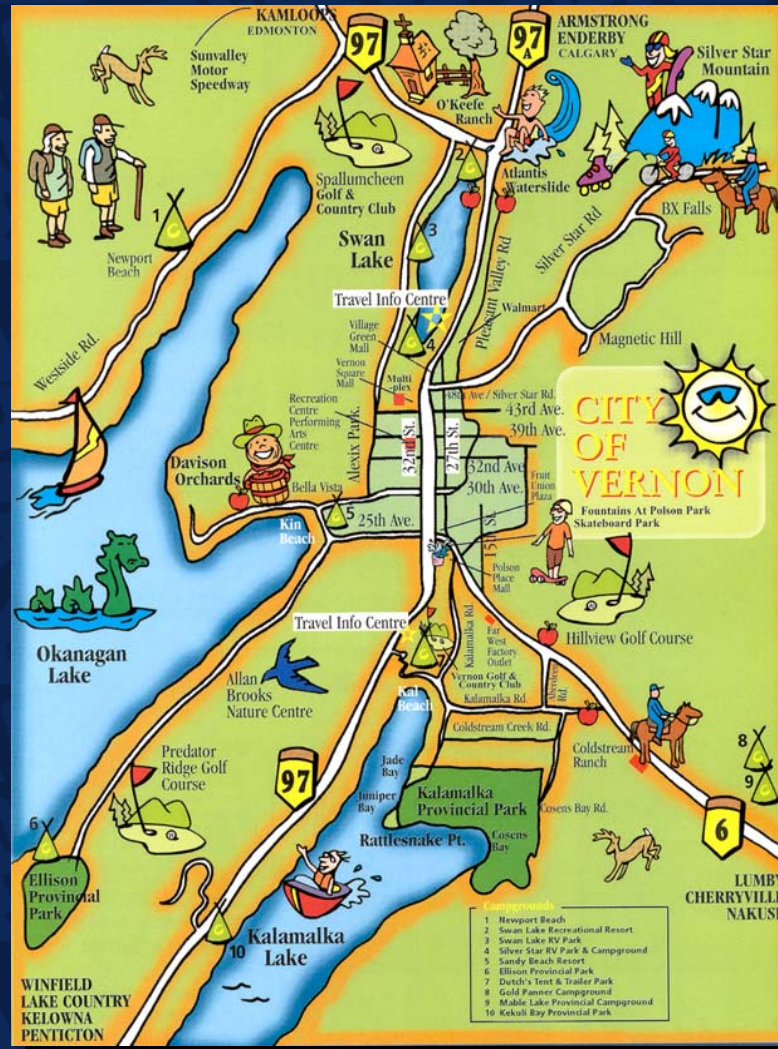
# Presentation Overview

- The GIS Initiative at the City of Vernon
- Re-writing the Zoning Bylaw with GIS
- Assessing the GIS Contribution to the Project



# City of Vernon

- Location
- Population
- Economic Base
- Attractions
- Growth
- Greater Vernon Initiatives



# Renewed GIS Focus

- The City has been using GIS for a number of years
- Initial focus was on data capture and inventory
- A renewed effort to use GIS technology to its full potential; provide cost savings while enhancing the City's efficiency and service provision
- New focus on data retrieval - view, query & reporting - with emphasis on web-based mapping technology





# Goals for GIS

- Municipal GIS System
  - "live" data inventory
  - linked databases
  - internet mapping
  - integrated information management
  - mobile wireless technology
- Municipal GIS Mapping Applications & Services for Staff & Clients
- Cost Savings
- Public Access "24-7"



# Multiple Access Levels

- City Intranet
  - linked internal municipal access to all data
- City Extranet
  - external access to password restricted specific city data
- Public Internet
  - free public access to limited city data



# The Zoning Bylaw & GIS

- The revision of the Zoning Bylaw was an ideal opportunity to use GIS
- GIS technology was used to
  - capture data using web-based GIS technology
  - analyze existing data sets
  - produce new zoning allocations through planning scenarios
  - distribute proposed zoning to the public through a web-based mapping interface
- EKISTICS Town Planning and LandInfo Technologies are currently developing the 2<sup>nd</sup> Draft of the Bylaw for public review



# Zoning's Strategic Role

Zoning Bylaws play a strategic role in determining how a community grows and develops.

Zoning establishes the legally binding framework for administering land uses and regulating development. It provides stability in land uses and certainty for land owners.

Zoning, however, can also act as a barrier to economic investment and as an impediment to implementing innovations in community and regional planning.





# Re-writing the Zoning Bylaw

The revision of Vernon's Zoning Bylaw N° 2458 sought to

- Consolidate two existing Zoning Bylaws
- Streamline the Zoning Bylaw categories
- Reflect OCP policy recommendations
- Implement "complete community" planning principles
- Apply GIS technology in the City



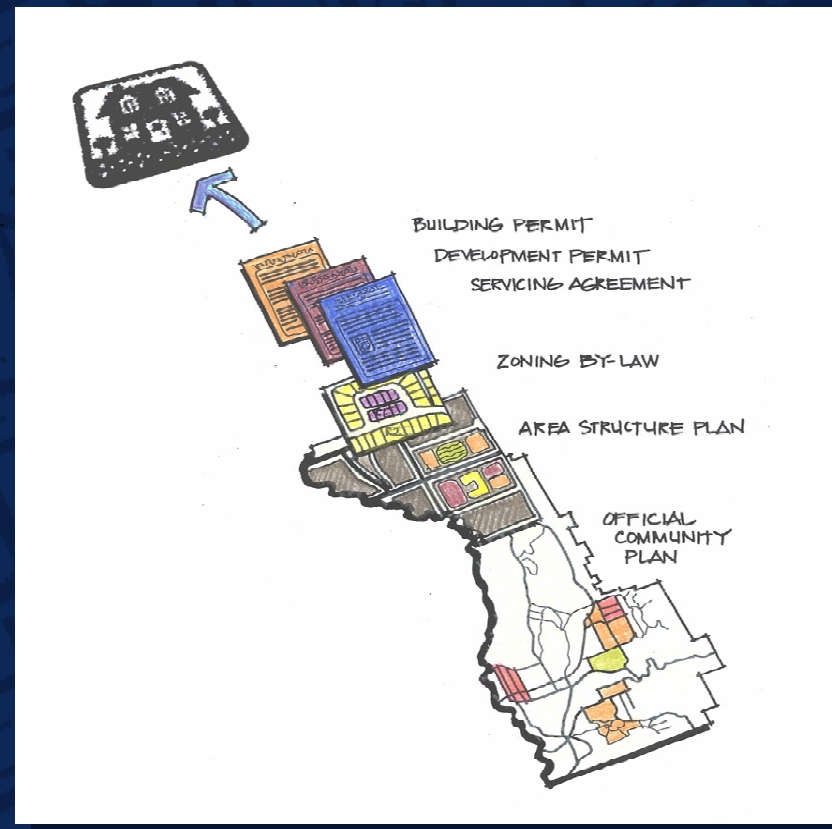
# The Function of Zoning

- Minimize adverse impacts on adjacent properties
- Encourage coherent development patterns
- Provide for appropriate use of land
- Protect public health and safety
- Promote easy movement from place to place
- Preserve the character of distinct areas



# The Scale of Zoning

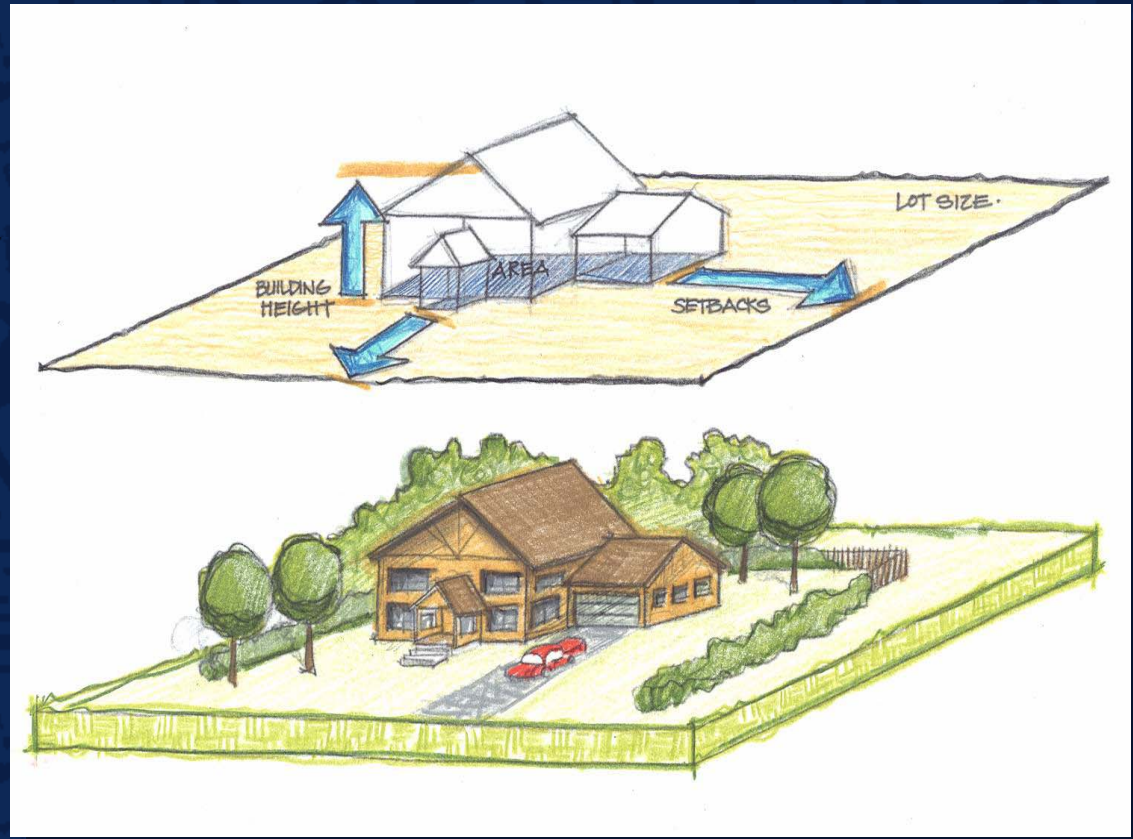
- Municipalities employ a variety of planning tools across a range of scales
- Zoning regulates at an intermediate “parcel” scale between OCP policy and physical form
- Complementary Bylaws
  - parking
  - landscape
  - signage
  - noise
  - runoff control





# Zoning Regulates

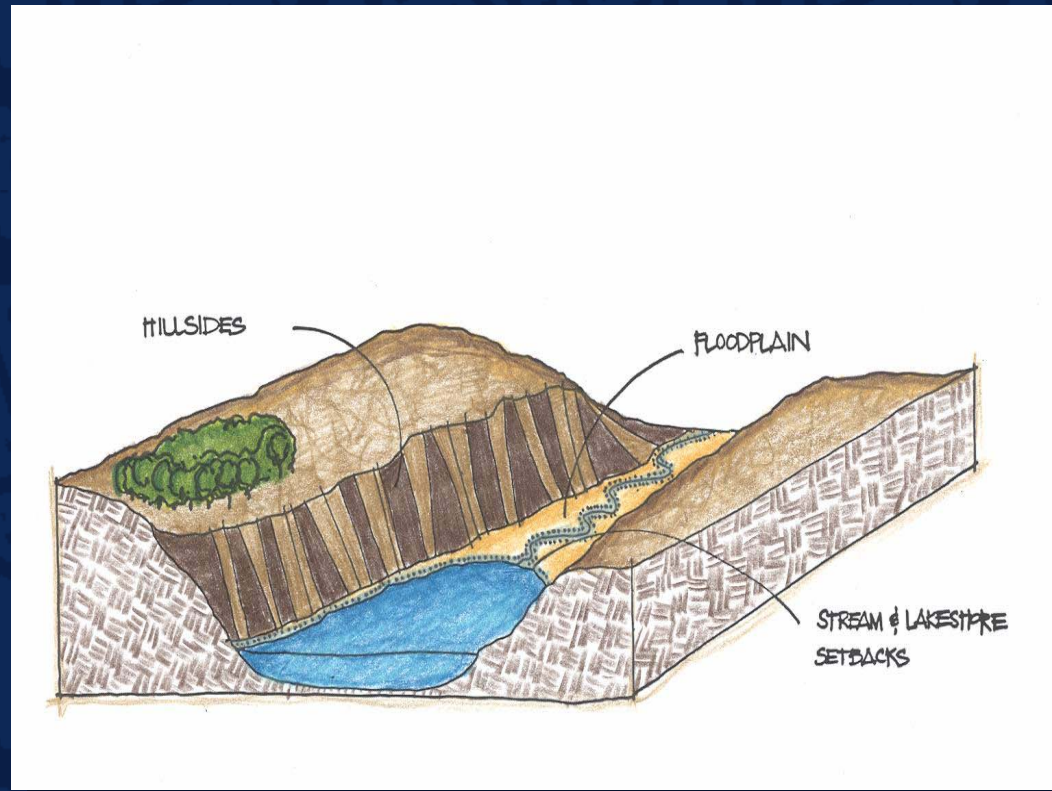
- Land Uses
- Parcel Size
- Building Area
- Building Setbacks
- Building Height
- Landscape
- Parking & Access



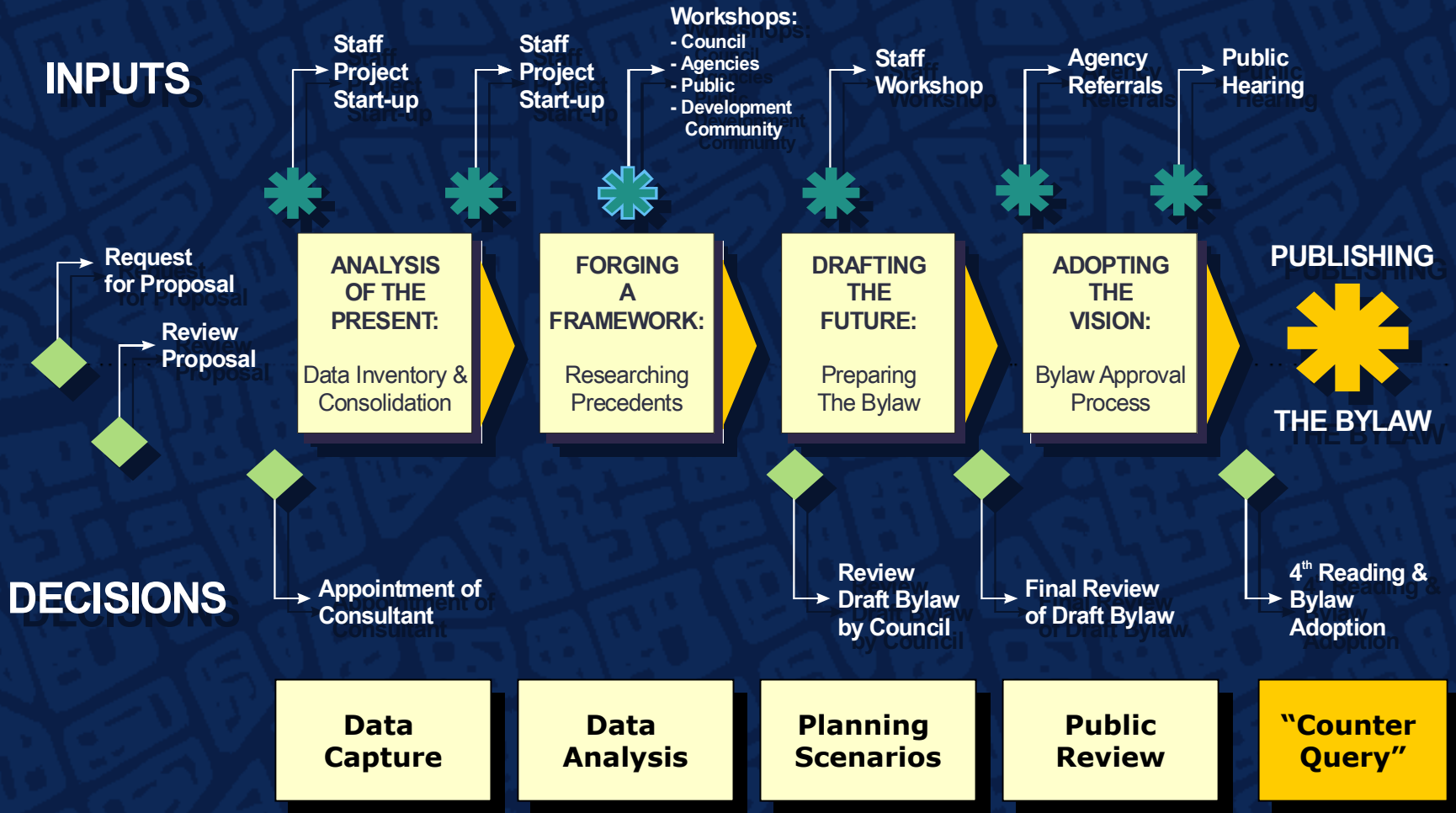


# Zoning Protects

- Riparian Habitat
- Aquatic Ecosystems
- Terrestrial Ecosystems
- Floodplains
- Hillside Slopes
- Highways Corridors



# Zoning Bylaw Project



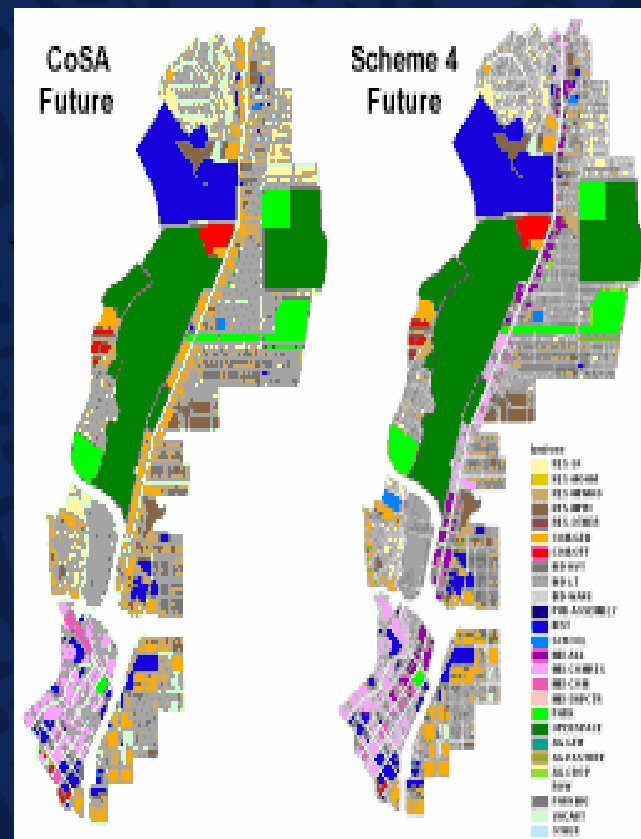
## GIS Support

# The Role of GIS

- The project used GIS to
  - capture parcel information
  - analyze data to produce new planning scenarios
  - distribute proposed zoning to the public through a web-based mapping interface

And...

- once adopted, the new Zoning Bylaw will be stored, up-dated and reproduced using GIS



# Data Capture

- GIS web-based technology was used to compile (MapGuide)
  - Land parcel information – the basic building blocks of the database – using BC Assessment & City information
  - Verify existing zoning & land use
  - Assign OCP designations
  - Overlay existing zoning and additional land use layers such as ALR and floodplain
  - Integrate new information within the existing City parcel datasets





# Capture Parcel Information



**Parcel Data**

**Landuse:**

Desc:	Original:	New:
Roll Number	03213.000	03213.000
Zoning	P1	P1
OCP	PUBINS	PUBINS
Landuse	640	640

**Assessment:**

Roll Number	03213.000
Prop_Class_Code	01
Land	2877000
Imprv	29232000
Exempt_Land	2877000
Exempt_Imprv	29232000

**Legal:**

Roll Number	03213.000
Lot	1
Block	no data
Legal_Desc	Sec3388-Twn34-Rge9
Dist_Lot	no data
Land_Dist	41
Hse_Num1	2101
Hse_Num2	no data
Str_Dir	no data
Str_Name	32 ST
Legal_Free	no data

**Ownership:**

Roll Number	03213.000
Name	INTERIOR HEALTH AUTHORITY

**Sales Data:**

Roll Number	03213.000
Cur_Title_Date	2002
Cur_Price	0
Cur_Type	5



# Verify Actual Land Use



## Parcel Data

### Landuse:

Desc:	Original:	New:
Roll Number	03213.000	03213.000
Zoning	P1	P1
OCP	PUBINS	PUBINS
Landuse	640	640

### Assessment:

Roll Number	03213.000
Prop_Class_Code	01
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Imprv	29232000
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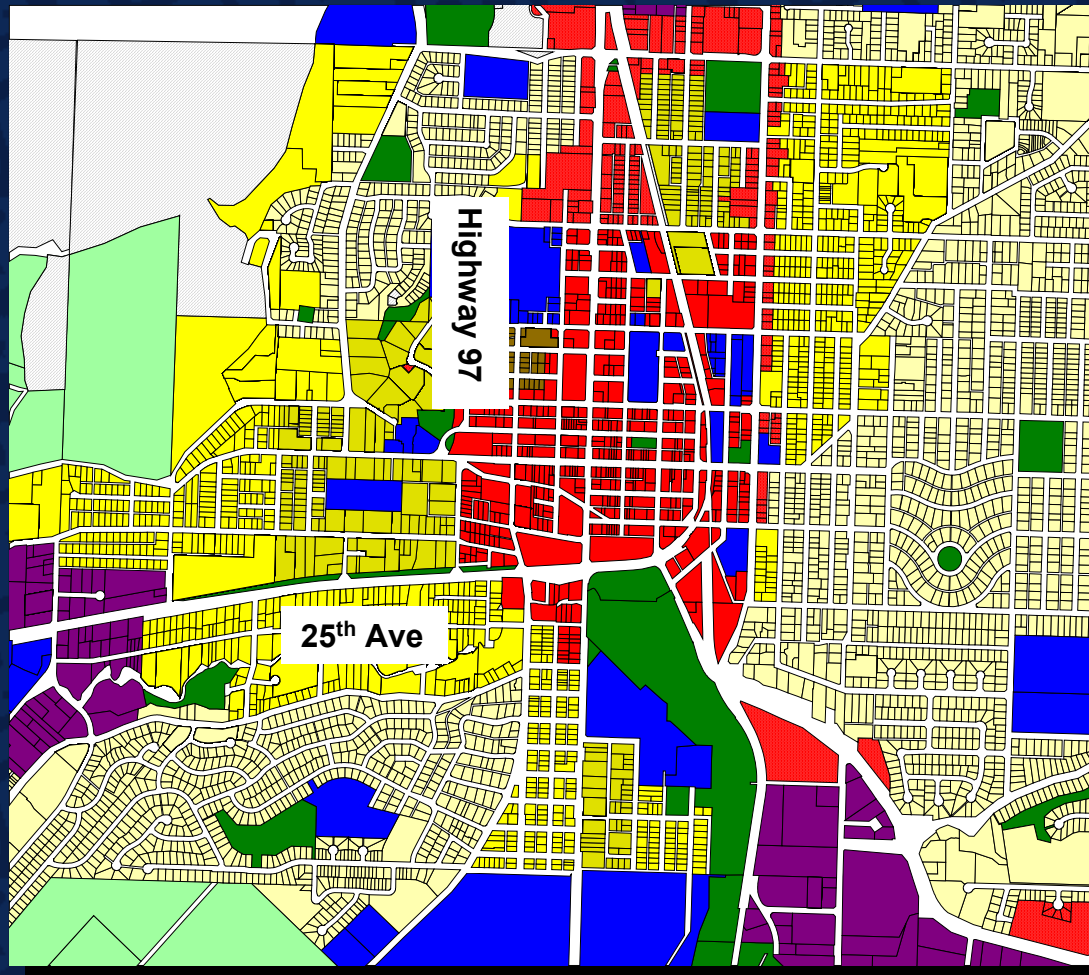
### Ownership:

Roll Number	03213.000
Name	INTERIOR HEALTH AUTHORITY

### Sales Data:

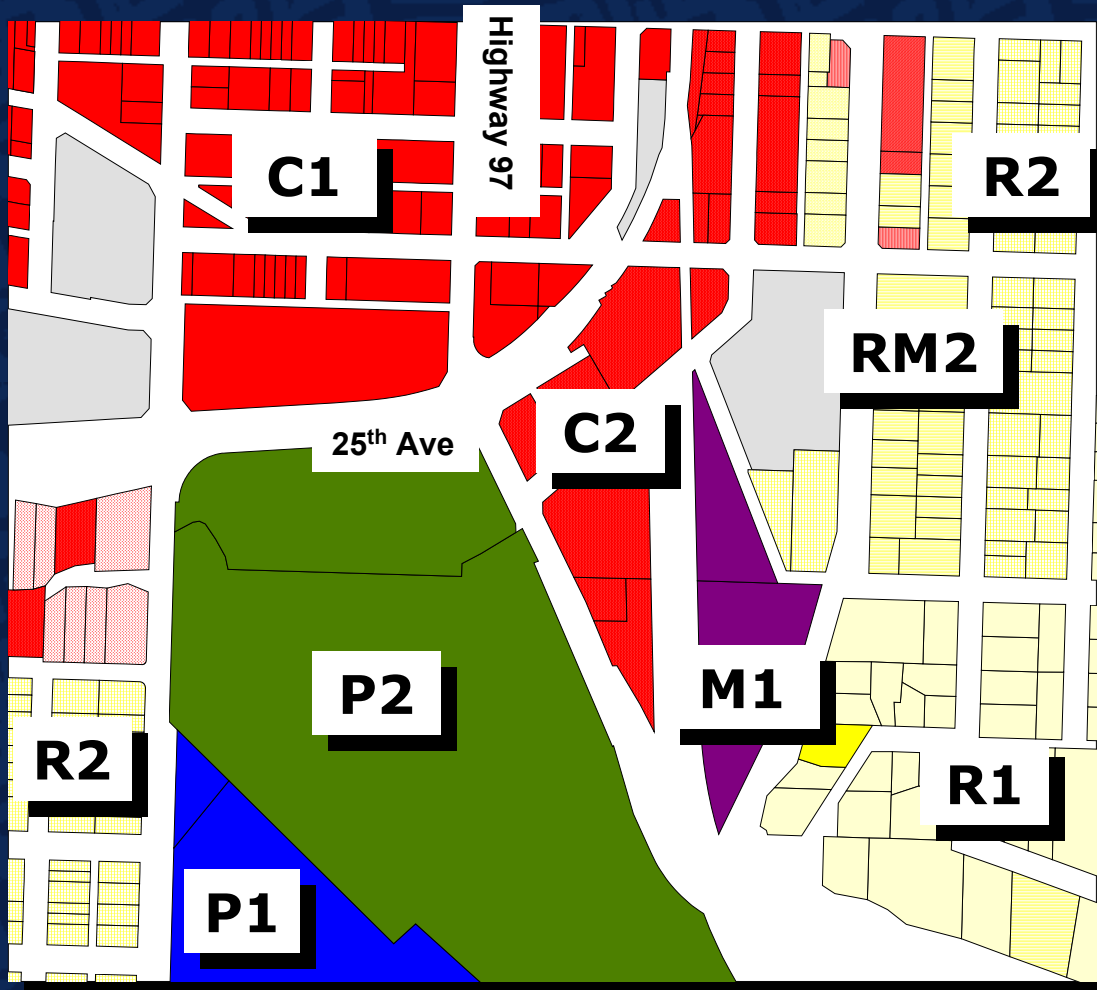
Roll Number	03213.000
Cur_Title_Date	2002
Cur_Price	0
Cur_Type	5

# Assign OCP Designations



-  To be confirmed
-  Airport Industrial
-  Commercial – Community
-  Downtown Creekside Redevelopment
-  Light Industrial
-  Parks and Open Space
-  Public and Institutional
-  Rural Agricultural
-  Residential – High Density
-  Residential – Low Density
-  Residential – Medium Density
-  Commercial – Tourist
-  Commercial – Urban
-  Commercial – Village

# Overlay Zoning



-  To be confirmed
-  Airport Industrial
-  Commercial – Community
-  Downtown Creekside Redevelopment
-  Light Industrial
-  Parks and Open Space
-  Public and Institutional
-  Rural Agricultural
-  Residential – High Density
-  Residential – Low Density
-  Residential – Medium Density
-  Commercial – Tourist
-  Commercial – Urban
-  Commercial – Village

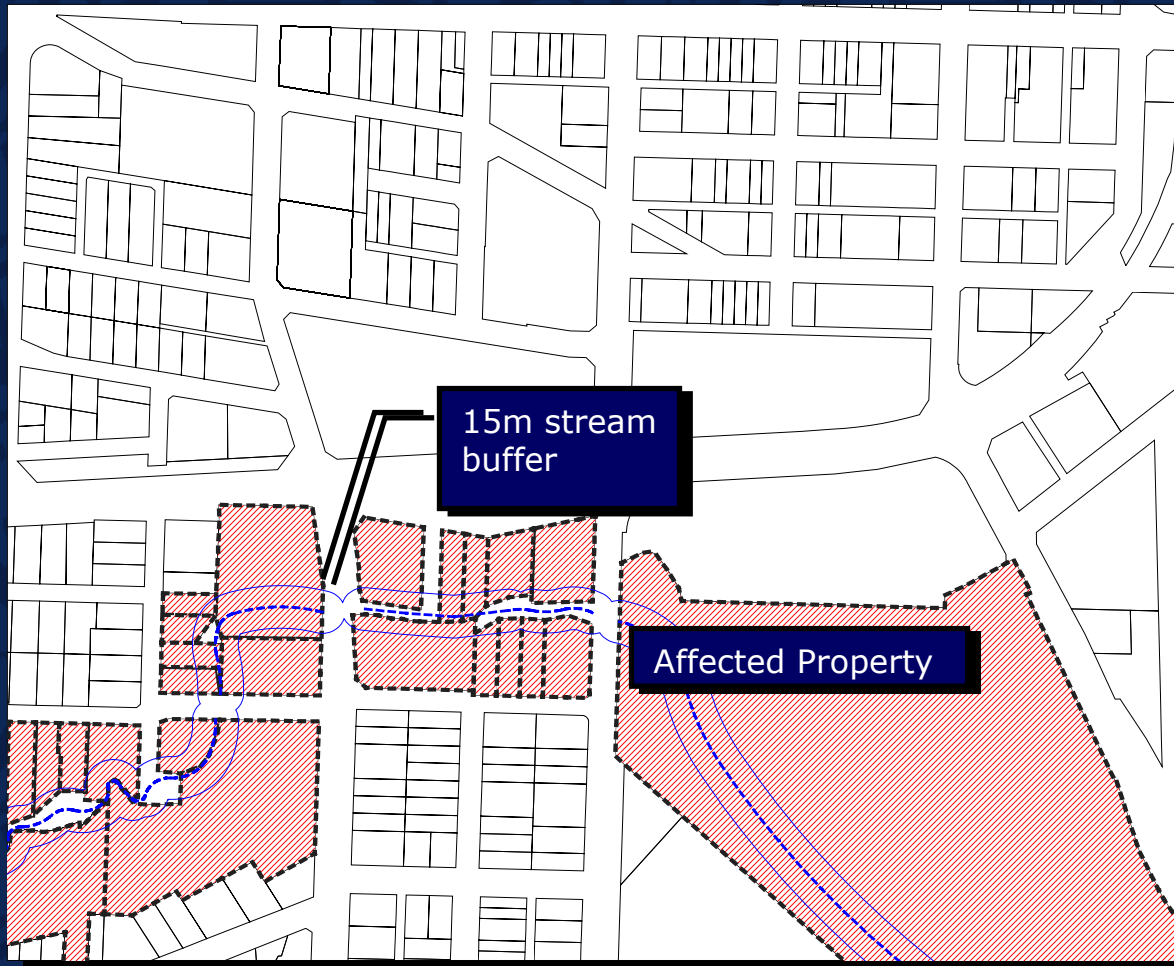


# Data Analysis

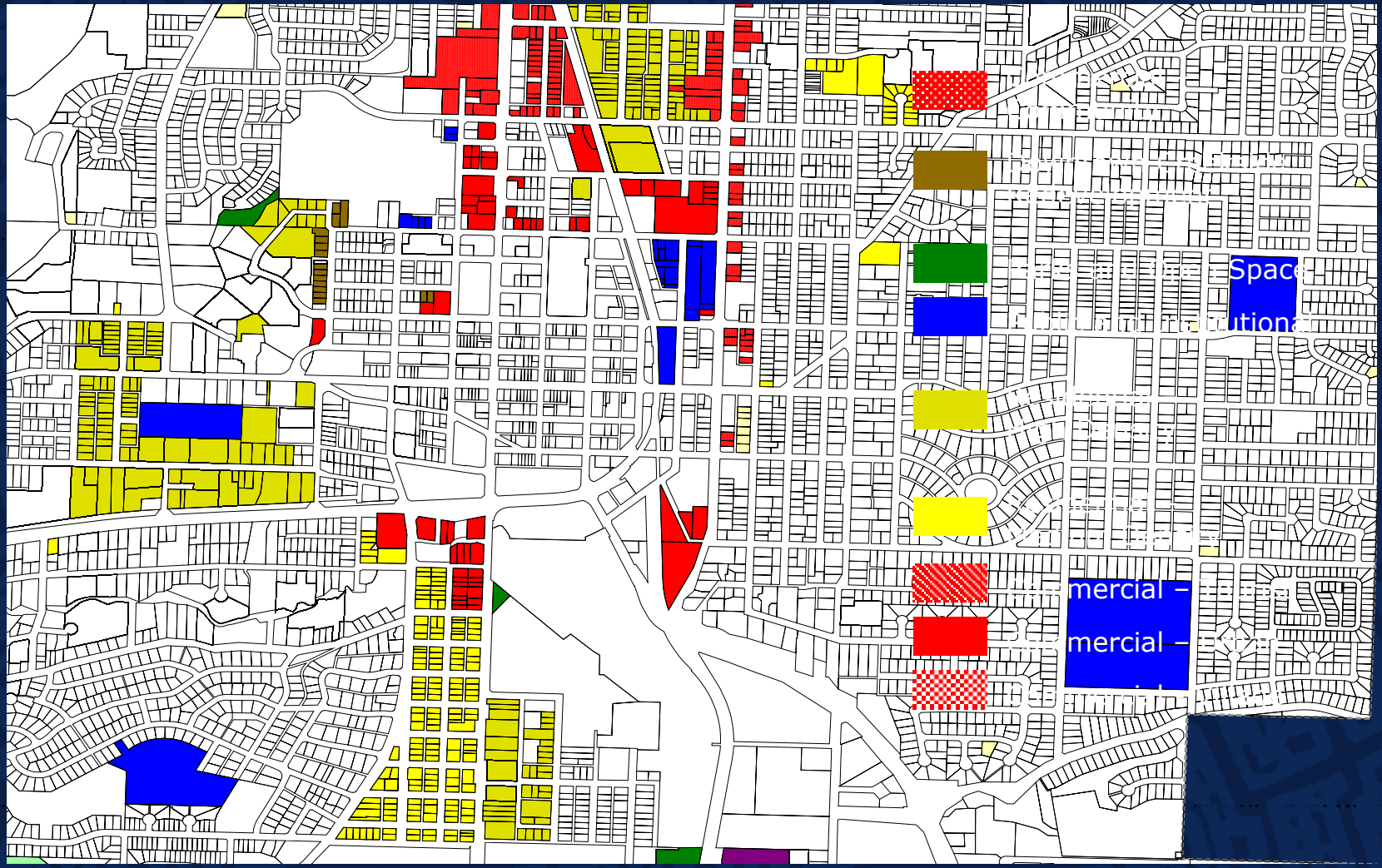
- GIS technology (MapInfo) was used to analyze data
  - landscape & contours
  - existing land use
  - flag parcels with floodplain, ALR and stream setbacks
  - zoning and OCP correspondence



# Analyze Landscape Features



# Analyze Zoning & OCP Correspondence



# Planning Scenarios

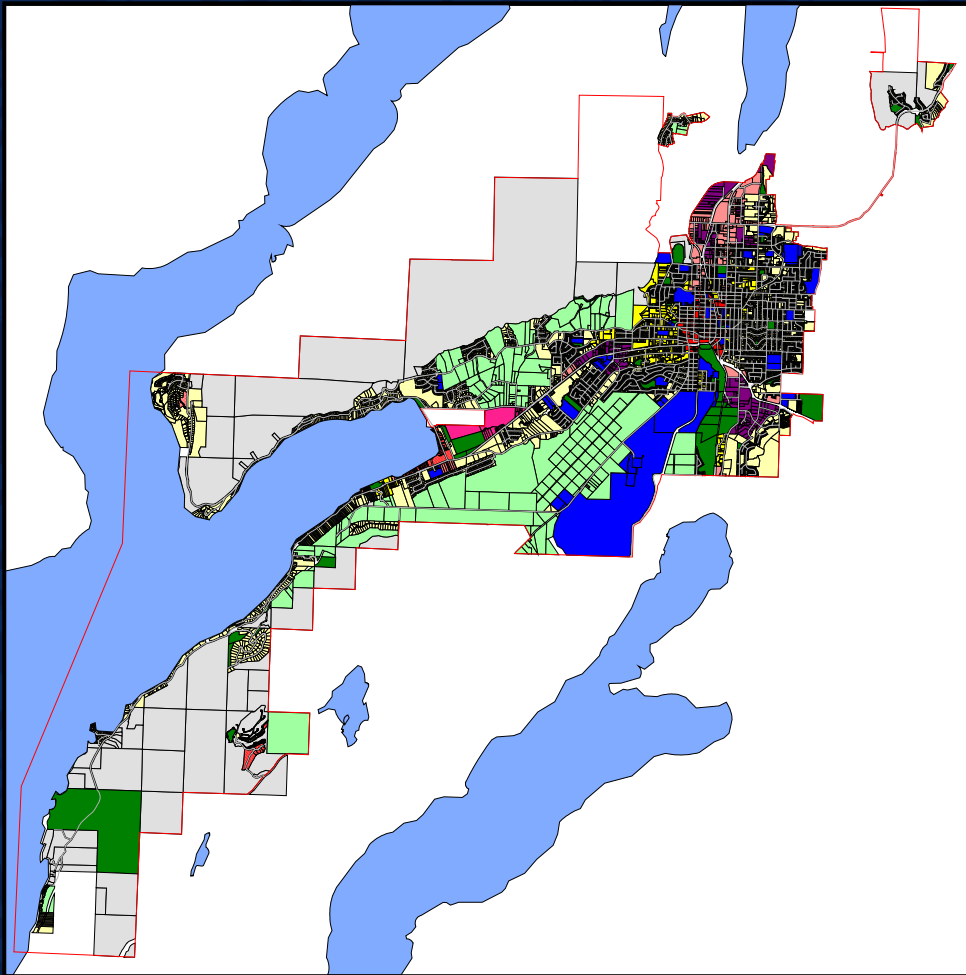
GIS technology (MapInfo) was also used to

- Identify areas in which the current zoning did not match the OCP designation
- Recommend new zoning to suit these areas
- Revise existing zones to reflect applicable OCP policies and planning innovations





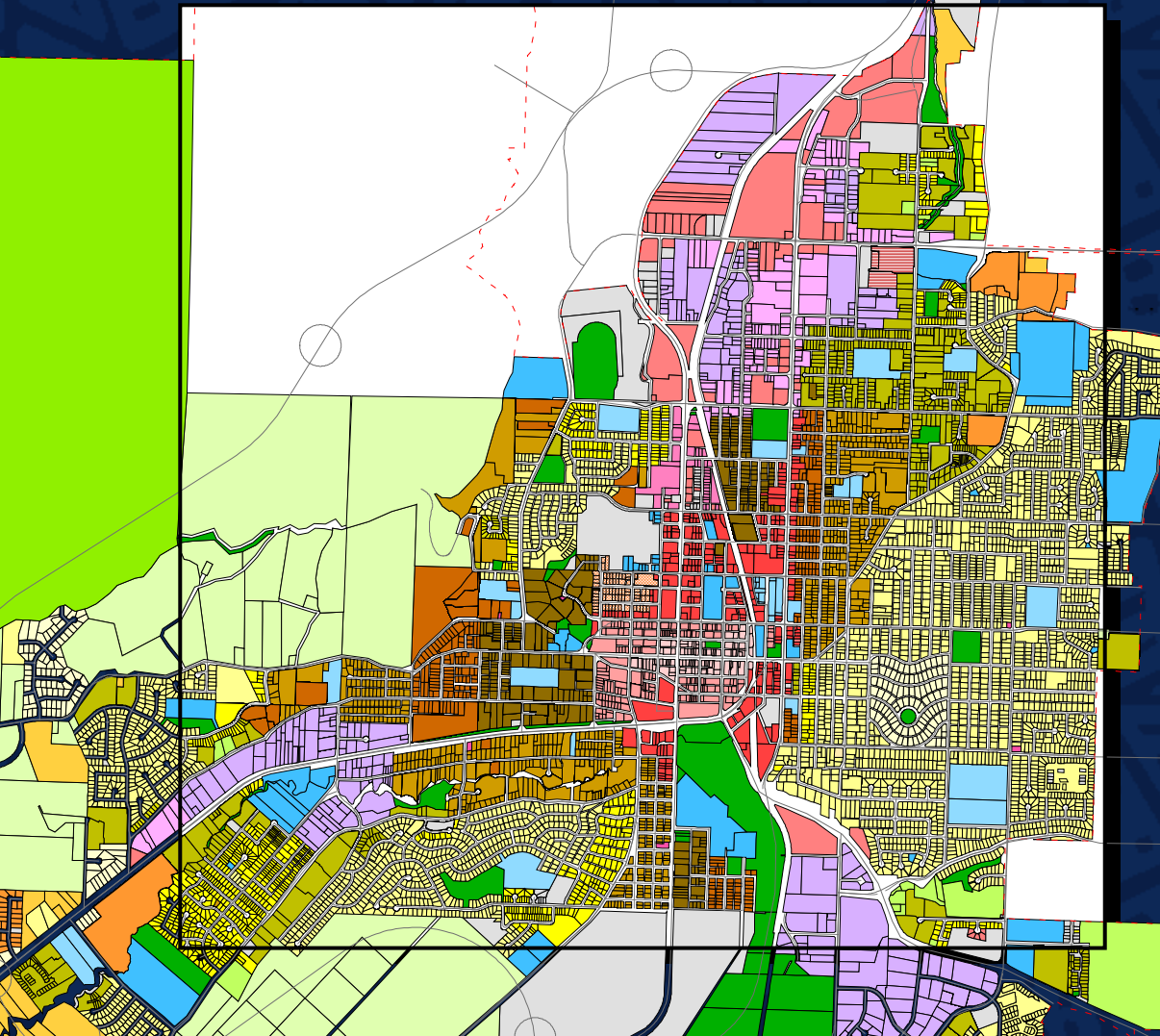
# Initial SQL Scenario



## Legend

- Multiple Designation
- Airport Industrial
- Community Commercial
- Creekside Redevelopment
- Light Industrial/Service Commercial
- Park
- Public and Institutional
- Rural Agricultural
- Residential - High Density
- Residential - Low Density
- Residential - Medium Density
- Commercial - Tourist
- Commercial - Urban
- Commercial - Village

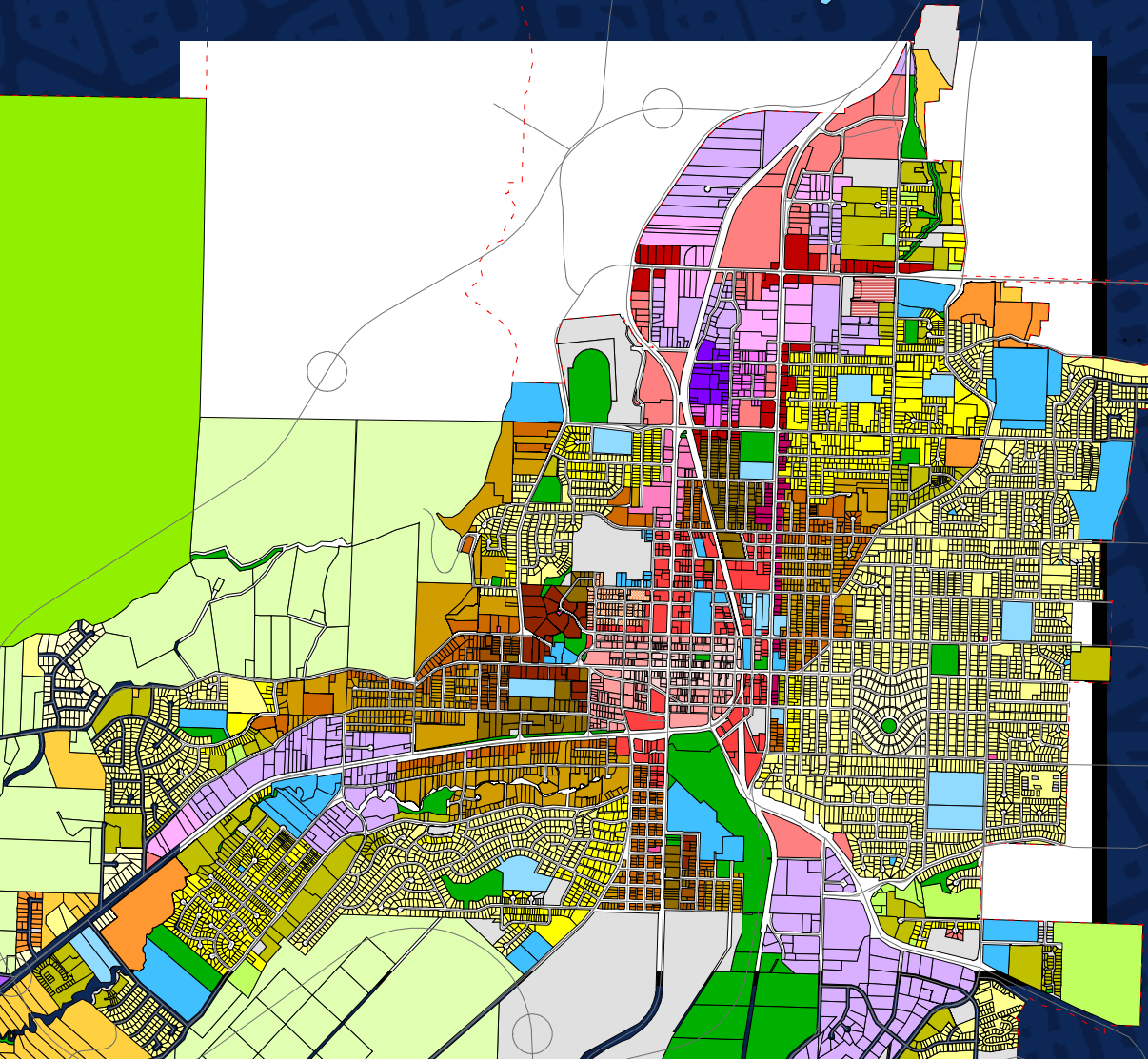
# Refined Complex SQL



## Legend: Zoning Scenarios, July 19, 2002

- Not Assigned
- A1 Agriculture - ALR
- A2 Agriculture - Large Lot
- A3 Agriculture - Small Lot
- C1 Commercial - Urban
- C2 Commercial - Urban
- C3 Commercial - Automobile Oriented
- C4 Commercial - Street Oriented
- C5 Commercial - Village
- C6 Commercial - Tourist
- C7 Commercial - 27th Street
- C8 Commercial - Neighbourhood
- CD1 CD1
- CD2 Predator Ridge - Commercial Zoning
- CD3 Predator Ridge - Residential Zoning
- CRD Creekside Redevelopment Area
- CS1 Commercial - Service
- CS2 Commercial - High-Tech Service
- I1 Industrial - Light
- I2 Industrial - Airport
- I3 Industrial - Industrial Park
- I4 Industrial - Heavy
- P1 Parks and Open Space
- P2 Institutional - Schools and Churches
- P3 Institutional - Other
- RH1 Residential - Low-Rise Apartment
- RH2 Residential - Stacked Rowhouse
- RH3 Residential - High Rise Apartment
- RL1 Residential - Duplex and Townhouse
- RL2 Residential - Detached 12 m wide lots
- RL3 Residential - Detached 15 m wide lots
- RL4 Residential - Detached 18 m wide lots
- RL5 Residential - Detached 24 m wide lots
- RL6 Residential - Mobile Home
- RL7 Residential - Lakeshore
- RL8 Residential - 1 acre lots
- RM1 Residential - Medium Density
- RM2 Residential - Rowhouse
- RS1 Residential - Detached with secondary suite

# Overlay Unique Allocations by Hand



## Legend: Zoning Scenarios, July 19, 2002

- Not Assigned
- A1 Agriculture - ALR
- A2 Agriculture - Large Lot
- A3 Agriculture - Small Lot
- C1 Commercial - Urban
- C2 Commercial - Urban
- C3 Commercial - Automobile Oriented
- C4 Commercial - Street Oriented
- C5 Commercial - Village
- C6 Commercial - Tourist
- C7 Commercial - 27th Street
- C8 Commercial - Neighbourhood
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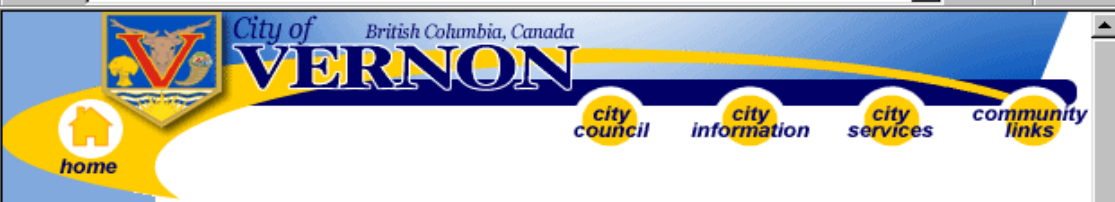


# Public Review

- GIS technology was then used to
  - produce the digital zoning maps and text for viewing on the internet
  - provide public access "24 -7" to the draft zoning bylaw through the internet on the city's web-page
  - provide public feedback form on the web for public and agency comment

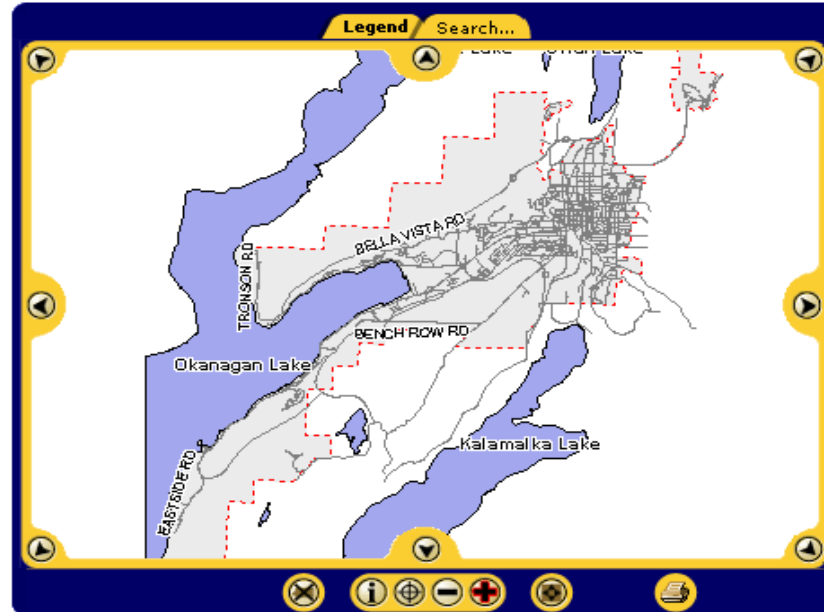









## Vernon Draft Zoning Bylaw Proposed Zoning Map

Aug 18, 2002

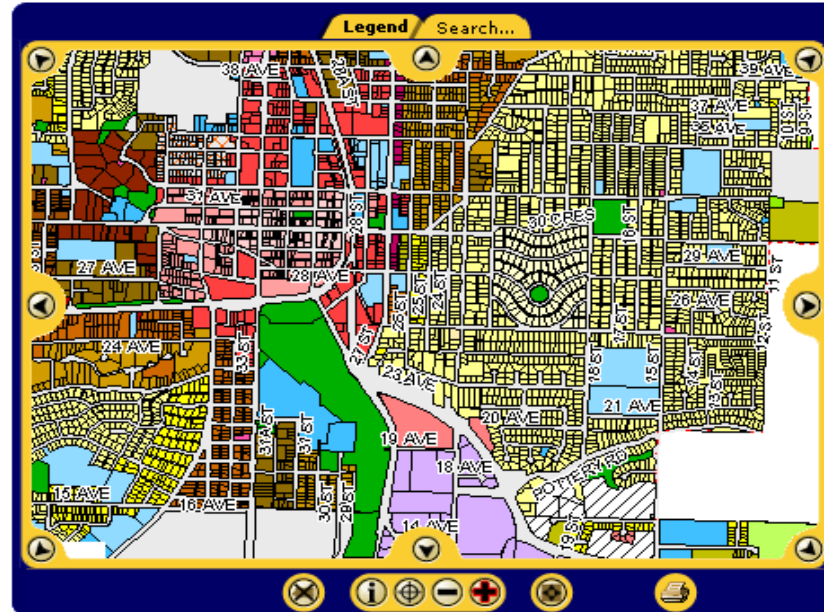


### Instructions:




- to search for a property, click the Search tab, fill in the form, and click Submit.
- to zoom in, click on the  button (selected by default when the window opens) and click on the area of the map you wish to look at.
- to zoom out, click on the  button, and click anywhere on the map.
- to get information about a property, first zoom in until you can see it. Then select the  button, and click on the property.

### Vernon Draft Zoning Bylaw Proposed Zoning Map

Aug 18, 2002




**Instructions:**

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File Edit View Favorites Tools Help

Back Forward Stop Refresh Home Search Favorites History Mail

Address <http://209.17.175.11/vernon/default.asp?MustZoom=No&VID=7814&ZoomLevel=2264.0625> Go Links

 **City of** British Columbia, Canada  
**VERNON**

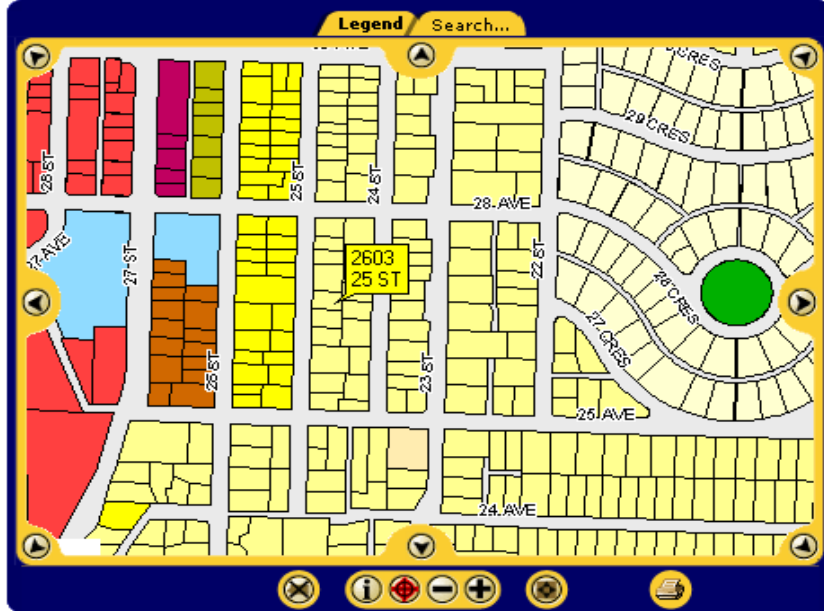
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### Vernon Draft Zoning Bylaw

#### Proposed Zoning Map

Aug 18, 2002

Legend Search...



2603  
25 ST

**Feedback form for the selected property:**  
**(2603 - 25 ST)**

**Official Community Plan (OCP) Designation:**  
Residential Low Density

Done Internet

er Express - Micro... Draft Zoning Bylaw - City I... City of Vernon - Vero...

File Edit View Favorites Tools Help

Back Forward Stop Refresh Home Search Favorites History Mail

Address <http://209.17.175.11/vernon/default.asp?MustZoom=No&VID=7814&ZoomLevel=2264.0625> Go Links

**Feedback form for the selected property:**  
*(2603 - 25 St)*

<b>Official Community Plan (OCP) Designation:</b> Residential Low Density
<b>Existing Zoning:</b> Residential District R1
<b>Proposed Zoning:</b> Residential - detached 18 m lots

*Please provide comments on the proposed zoning for the selected property:*

**First Name:**  **Last Name:**

**Email:**

**Comments:**

Submit

Done Internet

er Express - Micro... Draft Zoning Bylaw - City I... City of Vernon - Vero...



City of Vernon - Veron Draft Zoning Bylaw - Proposed Zoning Map - Aug 18,2002 - Microsoft Internet Explorer

File Edit View Favorites Tools Help



City of British Columbia, Canada  
**VERNON**

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### Enter your search parameters:

**Instructions:**

- use "st" for street, "ave" for avenue
- use 27, not 27th for street numbers
- do not use punctuation

**Your partial street name:**

e.g. "COMMON" for "COMMONAGE CRES"

**Your partial street number:**

e.g. "37" for "3705" or just ignore.



### Your Search Results:

[9705 - DELCLIFFE RD](#)

[9707 - DELCLIFFE RD](#)

[9708 - DELCLIFFE RD](#)

[9709 - DELCLIFFE RD](#)

[9713 - DELCLIFFE RD](#)

[9717 - DELCLIFFE RD](#)

[9720 - DELCLIFFE RD](#)

[9721 - DELCLIFFE RD](#)

[9724 - DELCLIFFE RD](#)

[9725 - DELCLIFFE RD](#)

[9729 - DELCLIFFE RD](#)

[9730 - DELCLIFFE RD](#)

[9734 - DELCLIFFE RD](#)

[9735 - DELCLIFFE RD](#)

[9738 - DELCLIFFE RD](#)

[9739 - DELCLIFFE RD](#)



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### Vernon Draft Zoning Bylaw Proposed Zoning Map

Aug 18,2002



#### Feedback form for the selected property:

(9720 - DELCLIFFE RD)

Official Community Plan (OCP) Designation:

Residential Low Density

# Assessing Data Capture

- Advantages
  - Web interface worked well - providing “real time” data access, edit & viewing from different locations with different users
  - GIS saved time through capturing data using existing BC Assessment role data & integrating it with City data
  - Aerial images with cadastral base were used extensively to verify land use and to get a “feel” for surrounding land uses without field investigation
  - GIS was fast – saving time, money while exceeding client expectations
- Disadvantages
  - BC Assessment data compatibility with accurate city data
  - Speed when viewing large images (web based)



# Assessing Analysis & Scenarios

- Advantages
  - Relatively easy to use: Any commercial desk top GIS ideally suited (e.g. MapInfo or ArcView) – standard software
  - Scenarios were generated through SQL queries – easy to save & rerun once created
  - Aerial images were used extensively – to verify land use and to get a “feel” for surrounding land uses without on-site inspection
  - Select and buffer tools worked well to establish overlay zones that the City had not yet mapped

# Assessing Mapping on Public Web Site

- Advantages
  - Cost savings – immediate & longterm
  - Info access & dissemination “24 – 7”
  - Convenience
  - Quality & accuracy of information
- Disadvantages
  - New technology: Public not GIS literate or familiar with maps on the Internet
  - Newsletters and local news newspapers to inform public
  - Front Counter land owner education

# The Future

- In 2003, the City's GIS system will be able to
  - maintain and reproduce the digital zoning maps and text for municipal & public use (Counter Query)
  - provide public access "24 -7" to a variety of parcel and municipal data from any internet connection
  - provide an integrated inventory and analysis tool for planning and municipal management
  - mobile technology – bringing GIS to the field



# GIS in Community & Regional Planning



The role of GIS in Re-writing the Zoning Bylaw  
for the  
City of Vernon