GIS in PLANNING

Re-writing the City of Vernon's Zoning Bylaw with GIS

EKISTICS
TOWN PLANNING INC

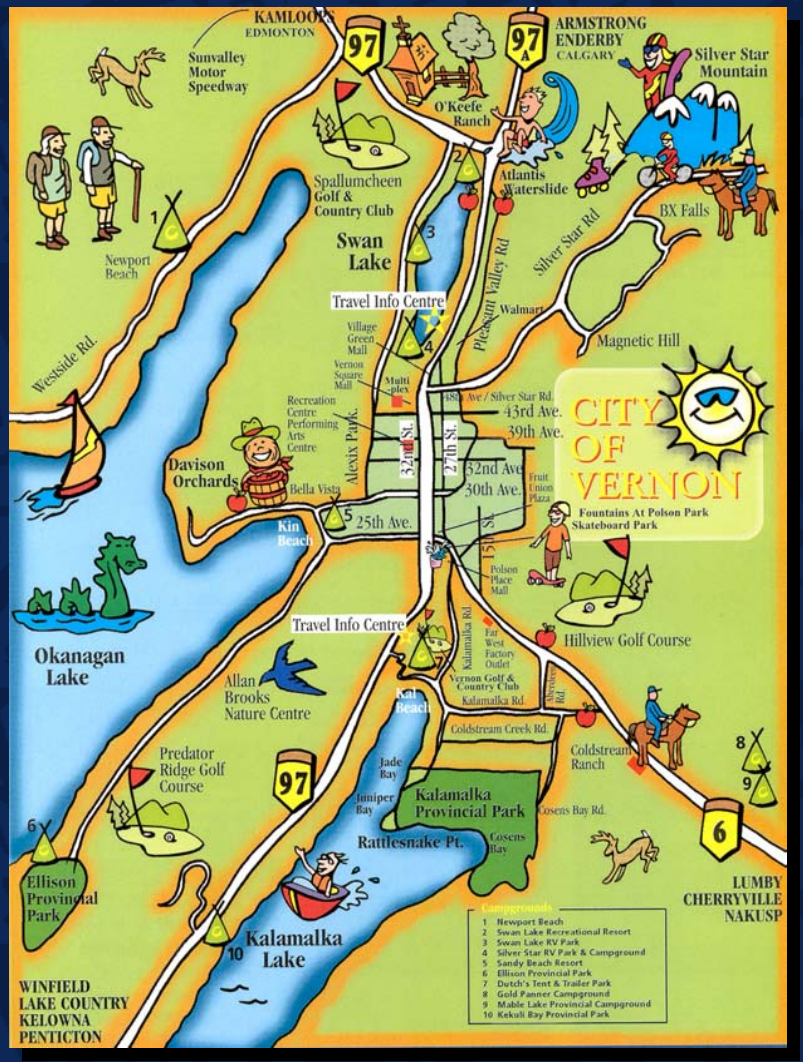
LandInfo
Technologies

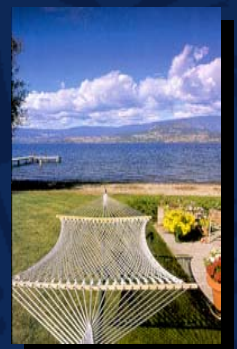
Presentation Overview

- The City of Vernon GIS Initiative
- Re-writing the Bylaw with GIS
- Assessing the GIS Contribution

City of Vernon

- Location
- Population
- Economic Base
- 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

Re-writing the Zoning Bylaw

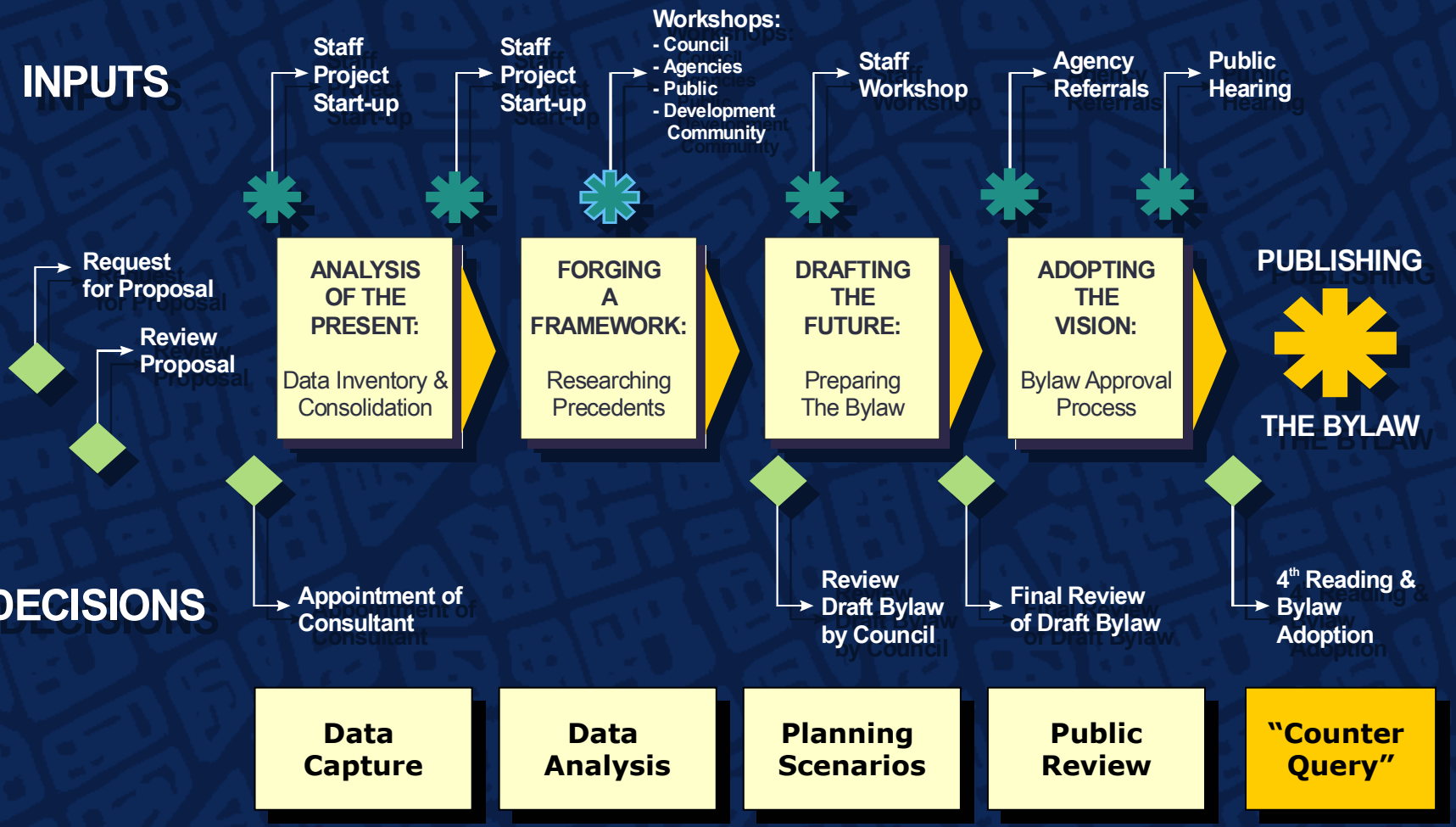
The revision of Vernon's Zoning Bylaw No. 2458 sought to:

- 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 Zoning Bylaw & GIS

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

Zoning Bylaw Project



GIS Support

Data Capture

- GIS web-based software used to:

1. Capture land parcel information – the basic "building blocks" of the database - using BC Assessment & City information

2. Verify existing land use

3. Assign OCP designations

4. Overlay existing zoning and additional land use layers such as ALR and floodplain

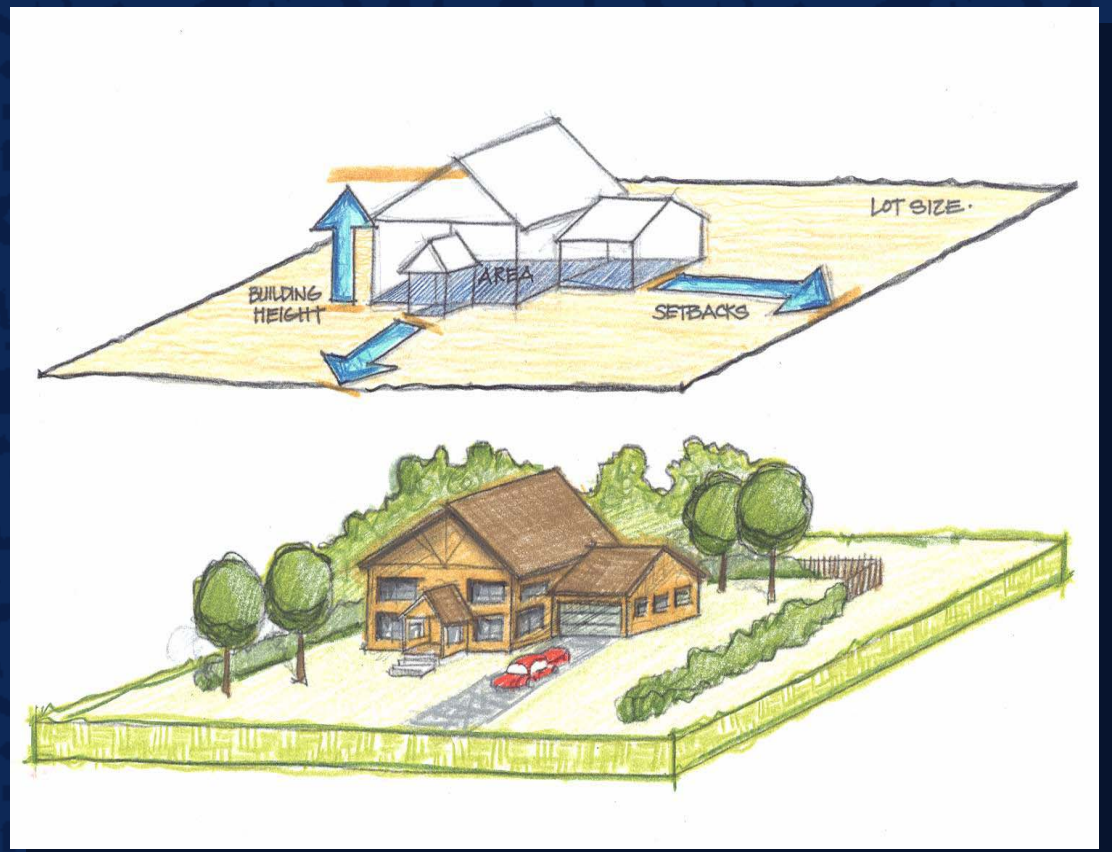
5. Integrate new information within the City parcel database

Data Capture Method

- GIS web-based software *(MapGuide)* allowed:
  - Remote locations in Vernon, Vancouver, Seattle & South Africa
  - Minimal duplication of data & staff time – cost effective
  - Multiple users with "real-time" access and information
  - Instant simultaneous on-line viewing & editing of data

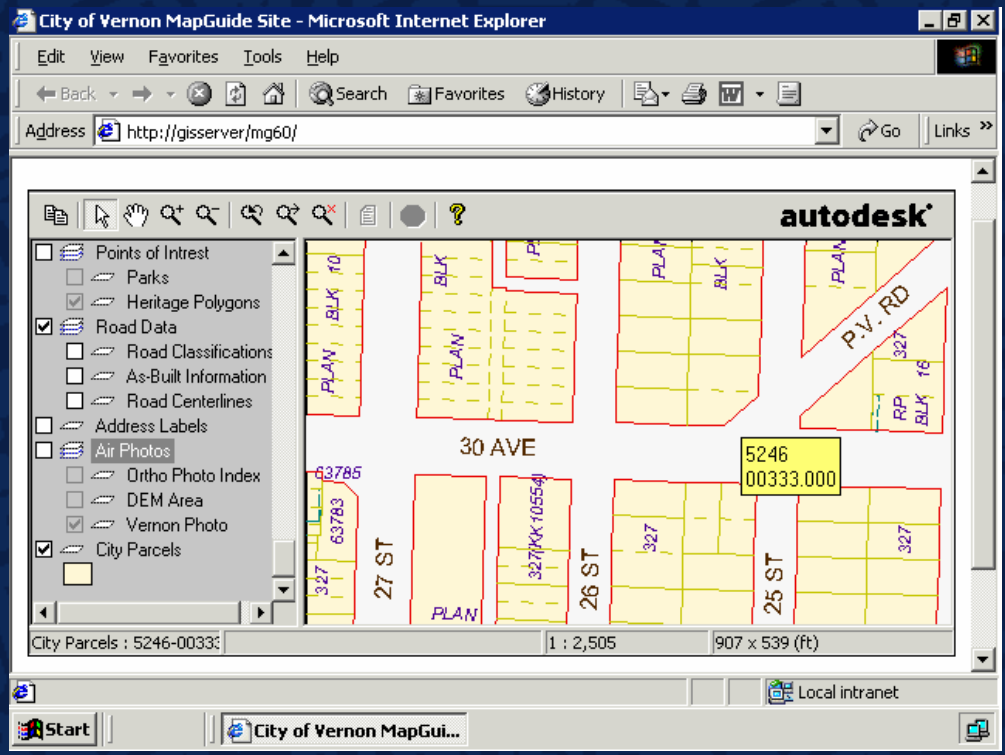
Parcel Information

- Zoning regulates at a "parcel" scale between the OCP policy and City's physical form
- To ensure 100% accuracy, property parcels were used as the "building blocks" of the database



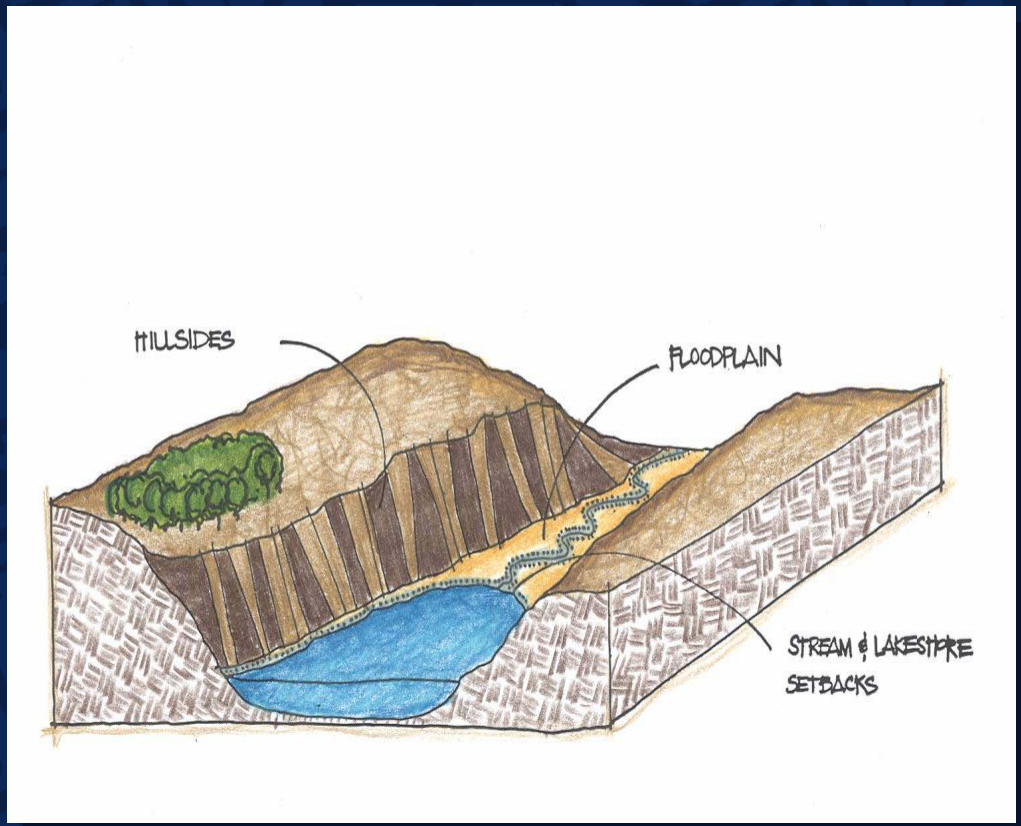
Parcel Information

- Using the City's mature GIS system, parcel data specific to the project was captured and compiled
- Property attributes were "tagged" and integrated into the City's existing map and database



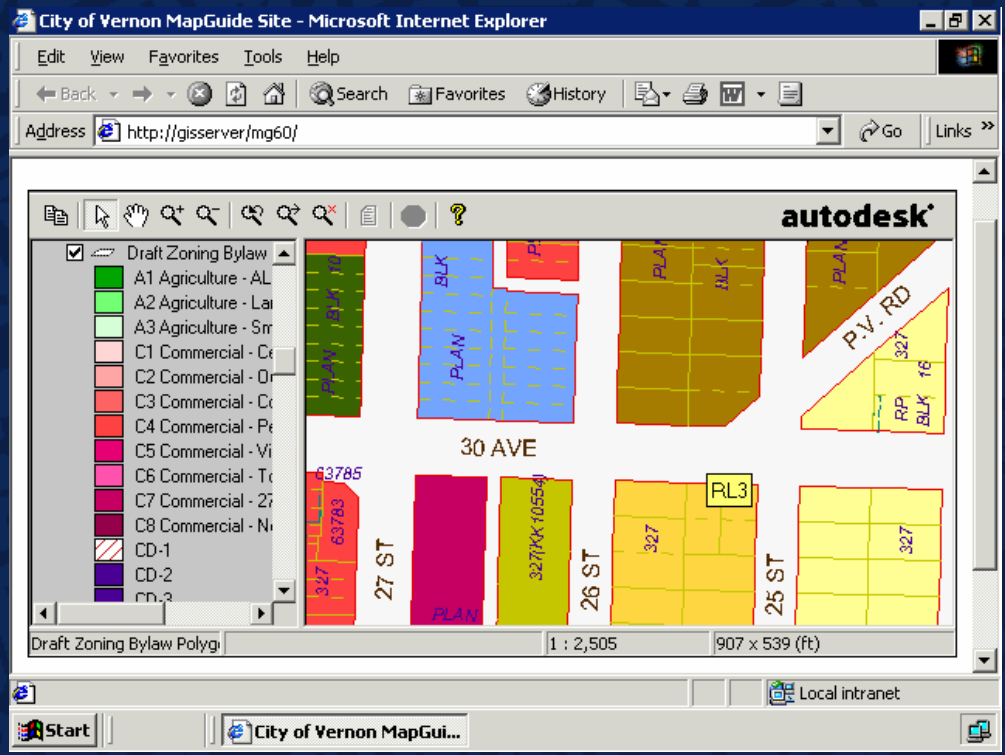
Non-Parcel Information

- The following non-parcel land use layers were also mapped and added to the database:
  - ALR
  - Aquatic Ecosystems
  - Terrestrial Ecosystems
  - Floodplains
  - Hillside Slopes
  - Highway Corridors



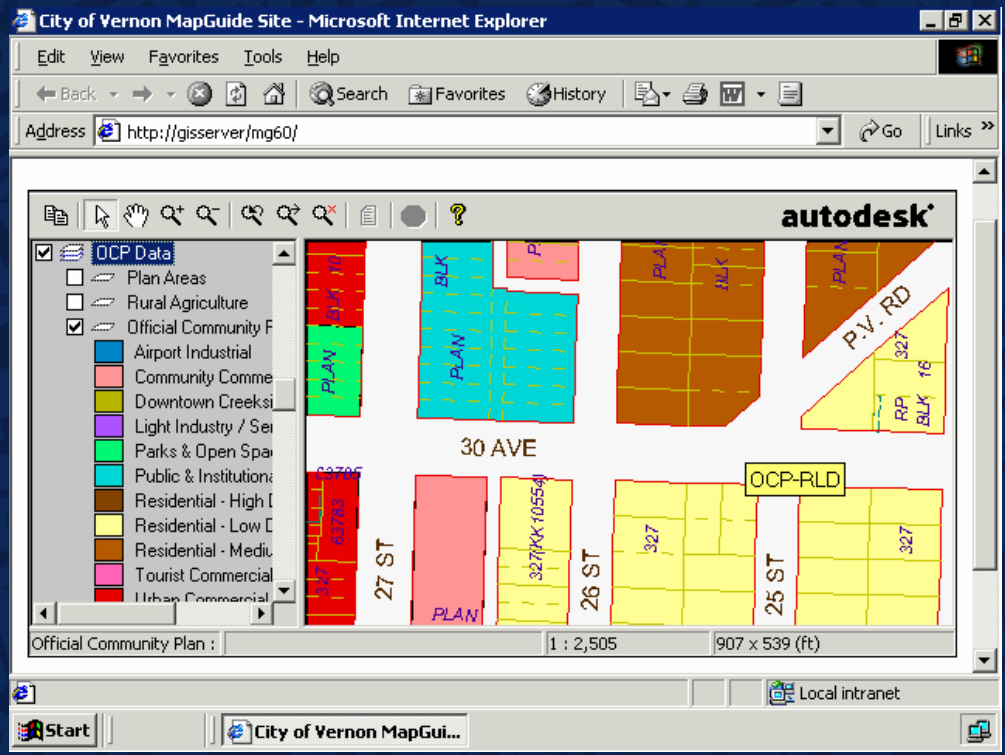
Assign OCP Designations

- Non-parcel area data, such as the Official Community Plan designations, were linked to the individual parcel data so as to ensure 100% accuracy – no margin for error



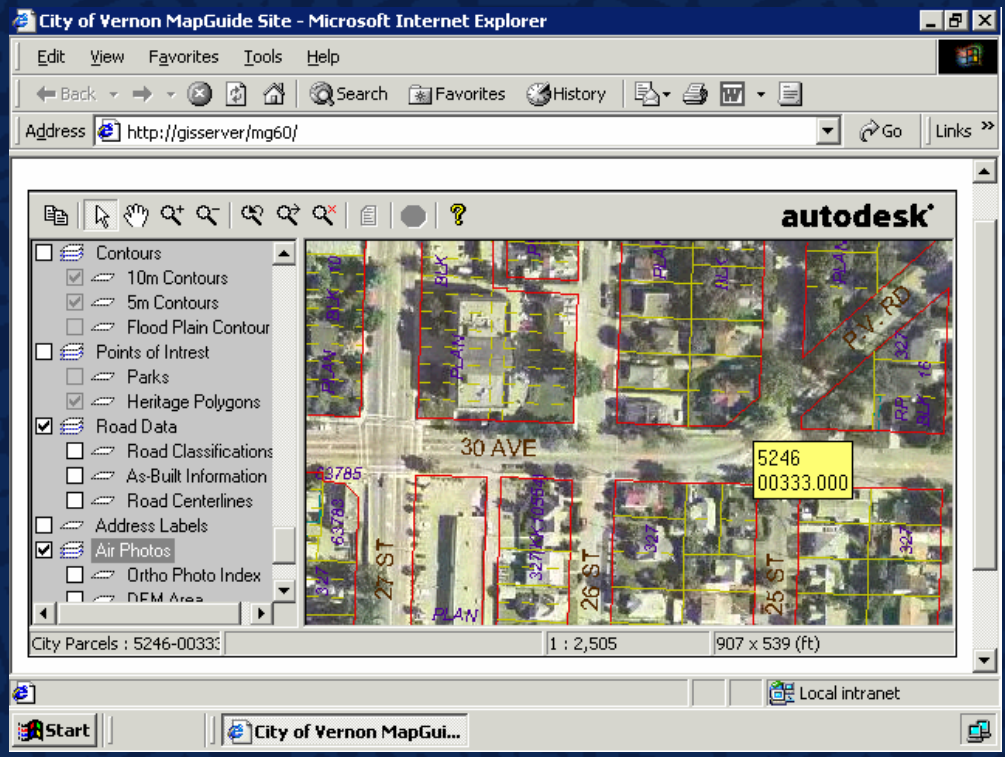
Overlay Existing Zoning

- Recaptured existing zoning in order to verify parcel information and complete City's database
- Provided review mechanism to ensure there were no "holes" in the mapping



Verify Actual Land Use

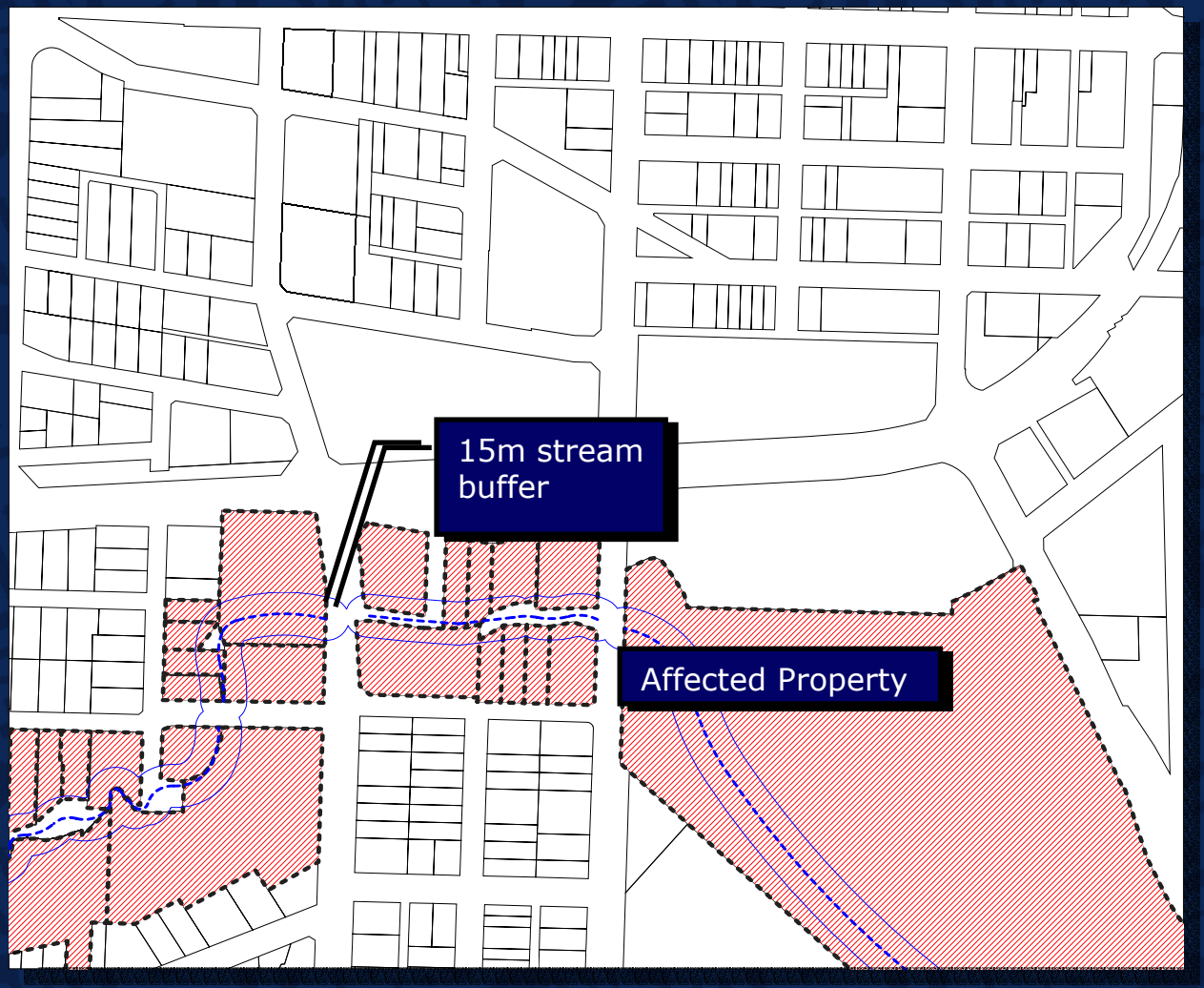
- Multiple data sets from the City & BC Assessment were used to verify information relevant to the project
- Aerial photos were used in place of extensive field work – saving money for analysis



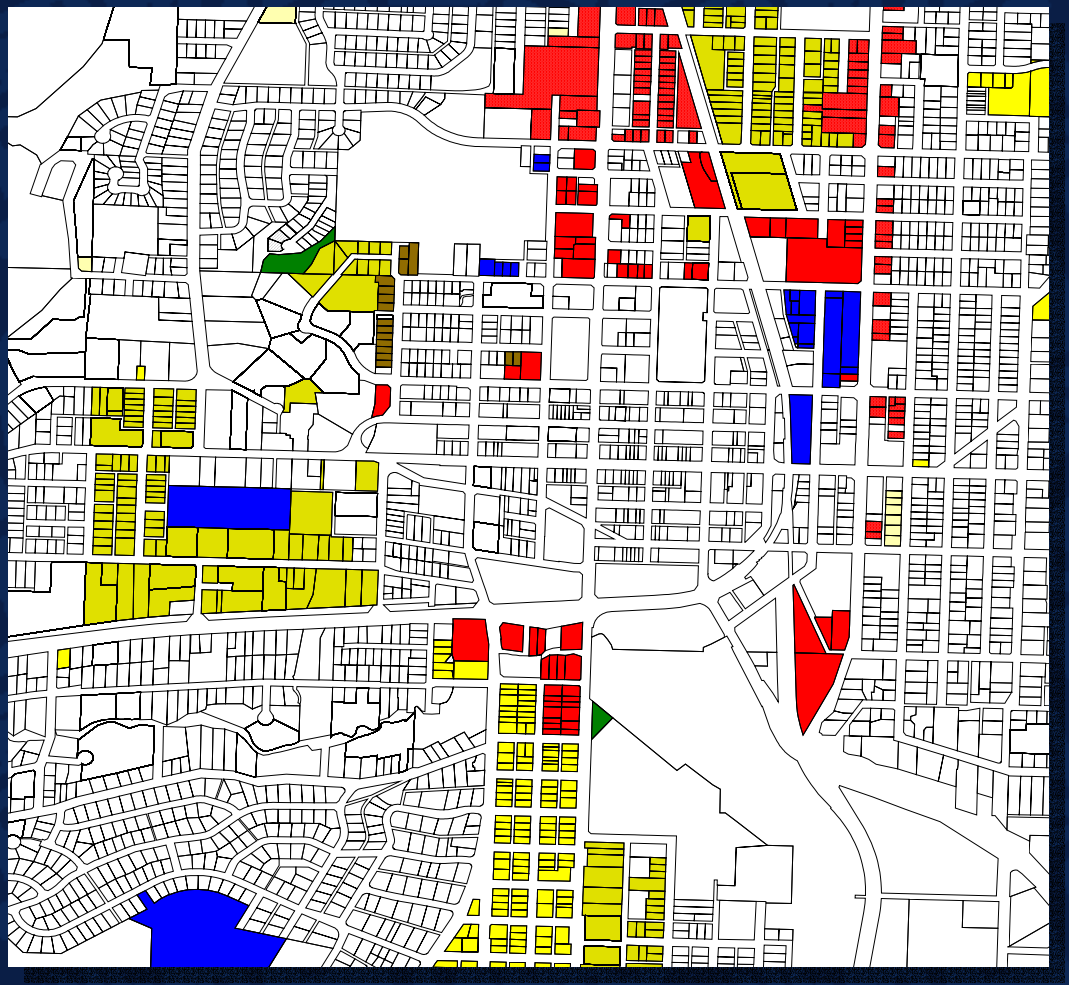
Data Analysis

- 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



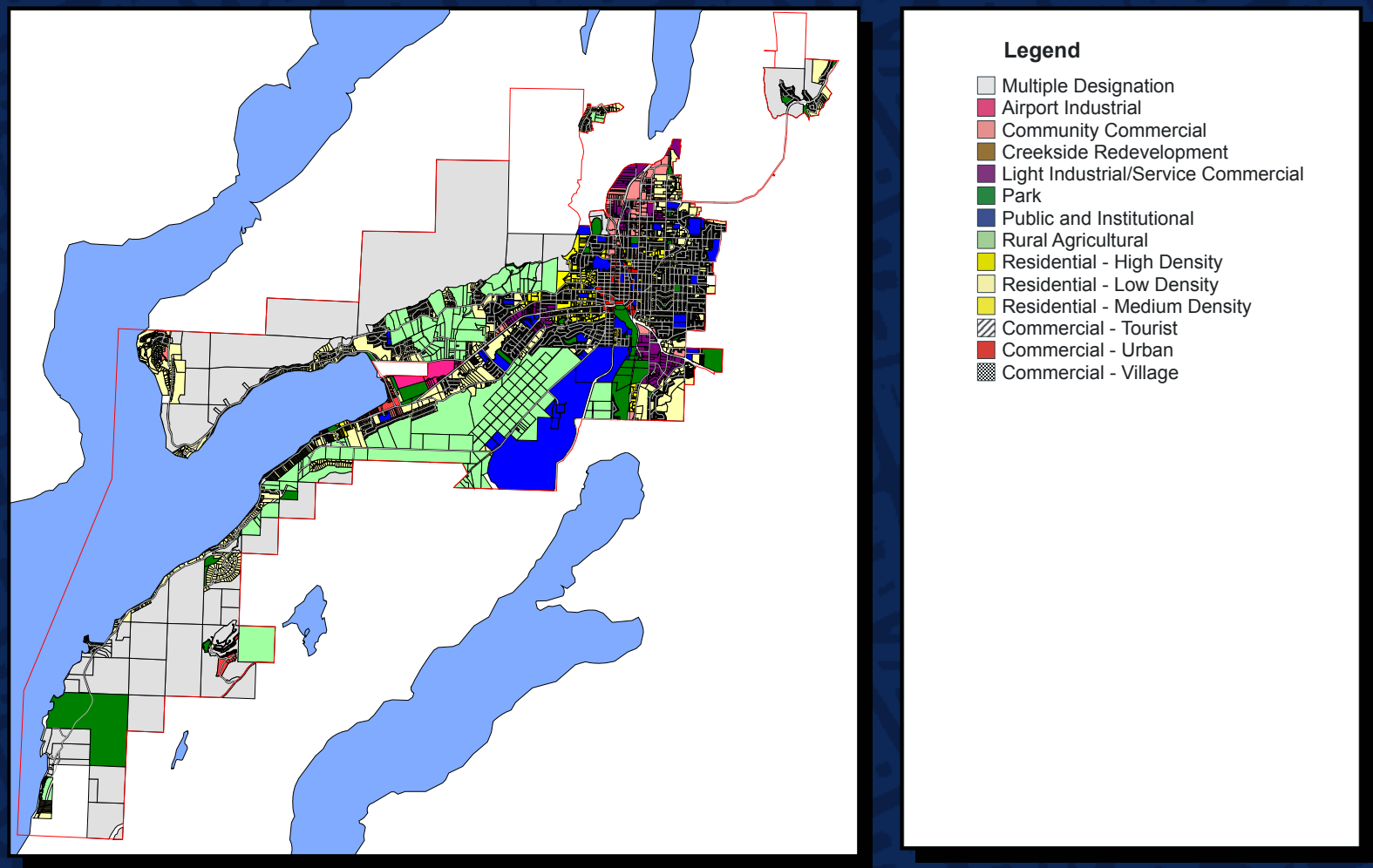
- Commercial – Community
- Downtown Creekside Redevelopment
- Parks and Open Space
- Public and Institutional
- Residential – High Density
- Residential – Medium Density
- Commercial – Tourist
- Commercial – Urban
- Commercial - Village

Planning Scenarios

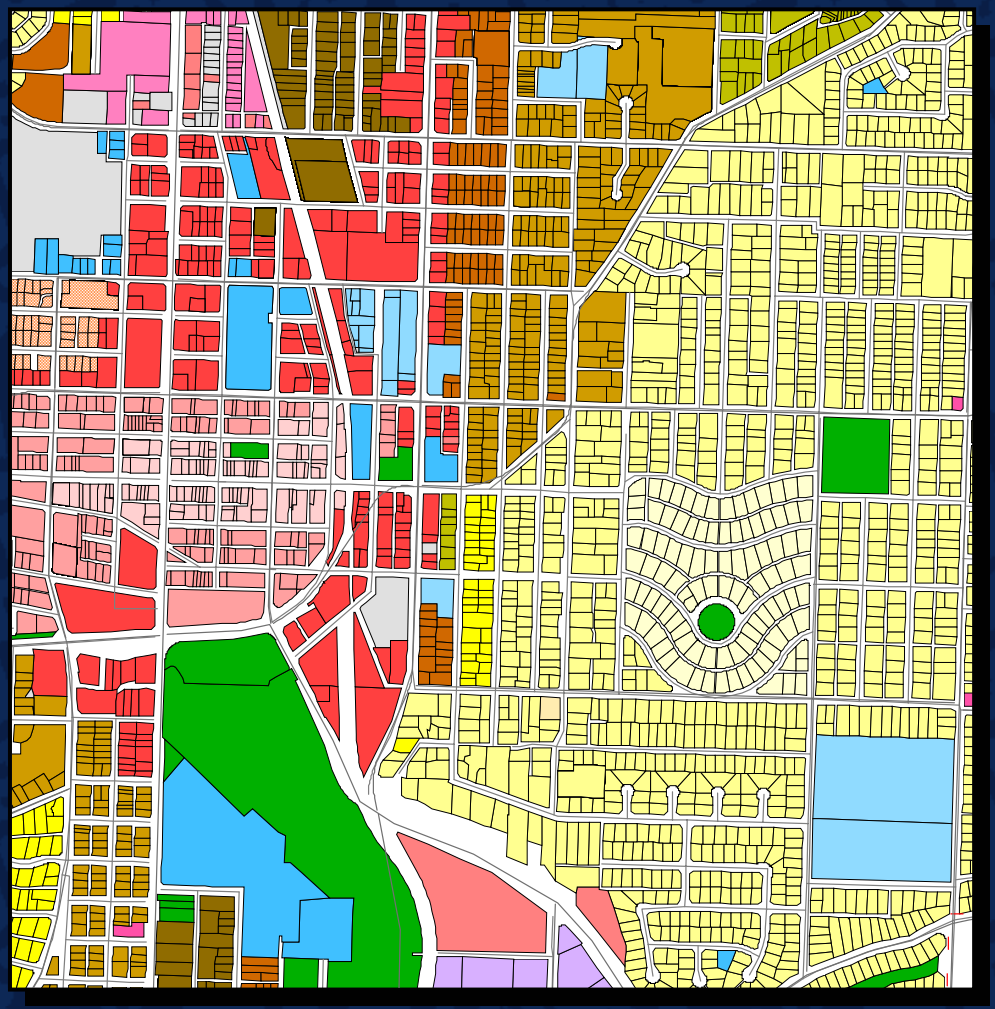
GIS technology (MapInfo) was also used to:

- 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



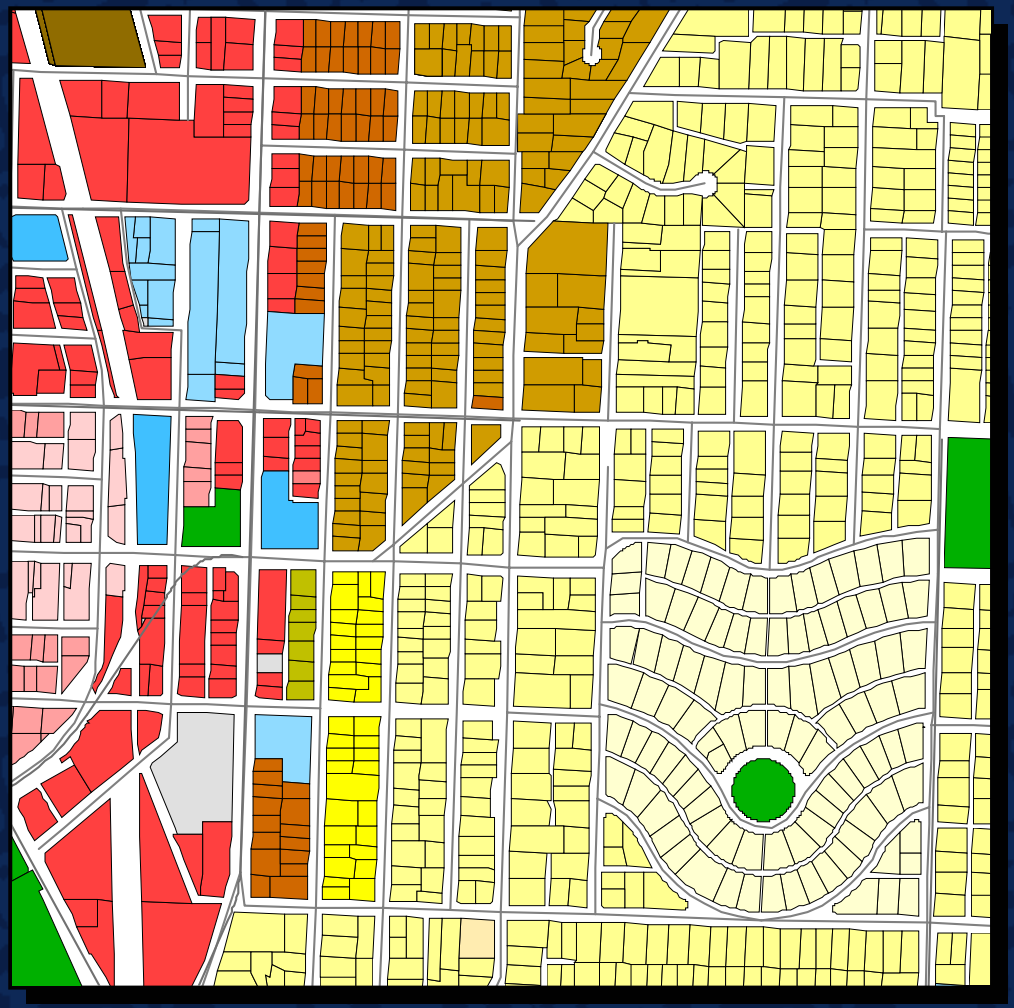
Refined Complex SQL



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



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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

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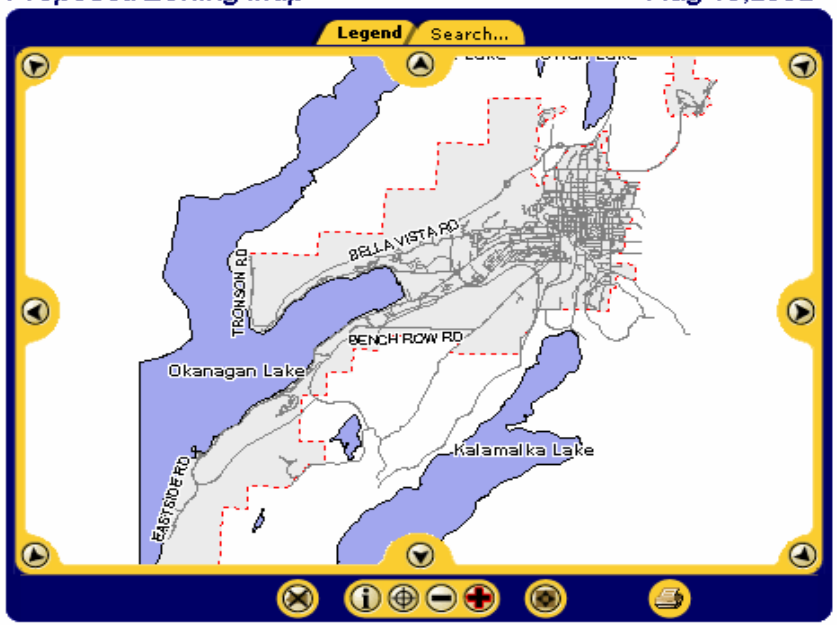
Vernon Draft Zoning Bylaw

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.
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Internet

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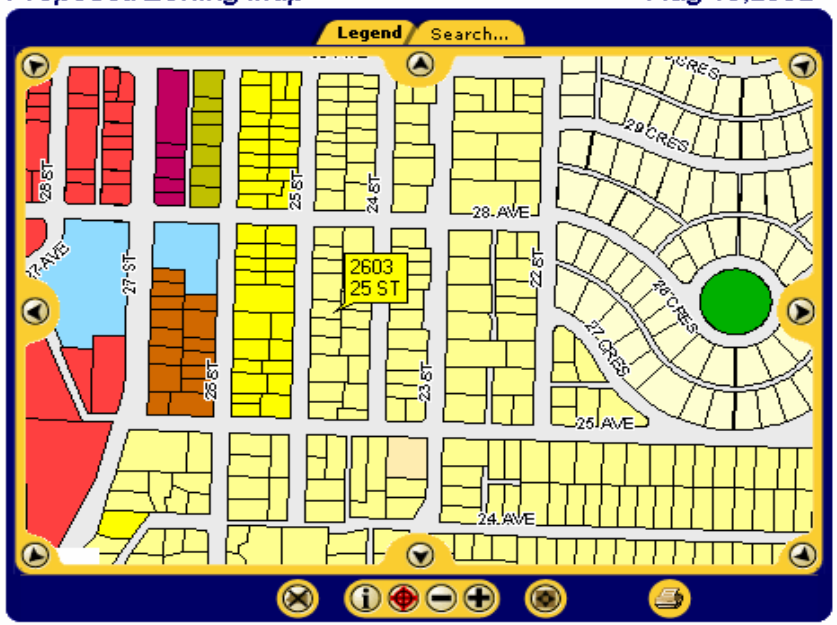

Feedback form for the selected property:

(2603 - 25 ST)

Official Community Plan (OCP) Designation:
Residential Low Density

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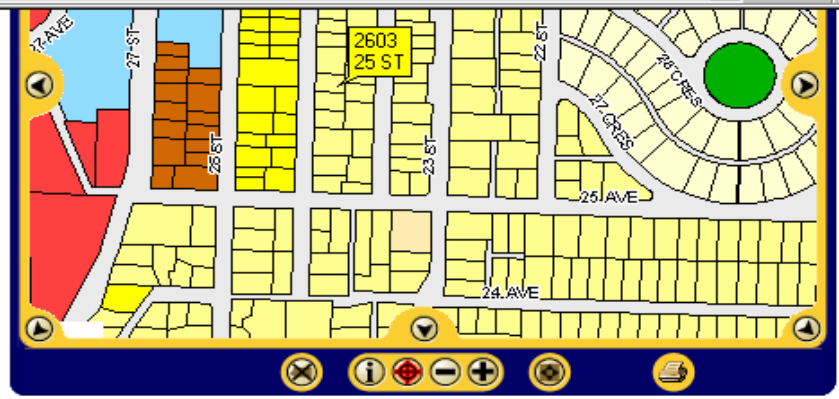

Feedback form for the selected property:

(2603 - 25 ST)

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

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

First Name: **Last Name:**

Email:

Comments:

Submit

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use "st" for street, "ave" for avenue
use 27, not 27th for street numbers
do not use punctuation
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delc
e.g. "COMMON" for "COMMONAGE CRES"
Your partial street number:
e.g. "37" for "3705" or just ignore.
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Vernon Draft Zoning Bylaw

Proposed Zoning Map

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Feedback form for the selected property:

(9720 - DELCLIFFE RD)

Official Community Plan (OCP) Designation:
Residential Low Density

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Assessing Data Capture

- Advantages
  - Web interface worked well - providing simultaneous "real time" data access, edit & viewing from different locations with different users
  - GIS saved time through capturing data using Assessment role data & integrating it with existing 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 to view large images (web based)

Assessing Analysis

- Advantages
  - Relatively easy to use: any standard commercial desktop GIS ideally suited *(e.g. MapInfo or ArcView)*
  - Scenarios were generated through SQL queries – easy to save & re-run
  - Aerial images were used extensively to verify land use and to get a "feel" for surrounding uses without on-site inspection
  - Select and buffer tools worked well to establish new overlay zones that the City had not yet mapped - adding attribute information to the database

Assessing Public Web Site

- Advantages
  - Cost savings – immediate & longterm
  - Info access & dissemination "24 – 7"
  - Ease & convenience
  - Quality & accuracy of information

- Disadvantages
  - New technology: Public learning curve - GIS literacy and familiarity with maps on the Internet
  - Cost of advertising in newspapers to inform public
  - Front Counter time for land owner education

The Future

- In 2003, the City's GIS system will be able to:
  - maintain & 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 GIS technology in the field