



Accessing SCADA Data Through GIS





Objectives

- ④ Understand the value of integrating GIS with SCADA data
- ④ Political issues can be more challenging than technical issues

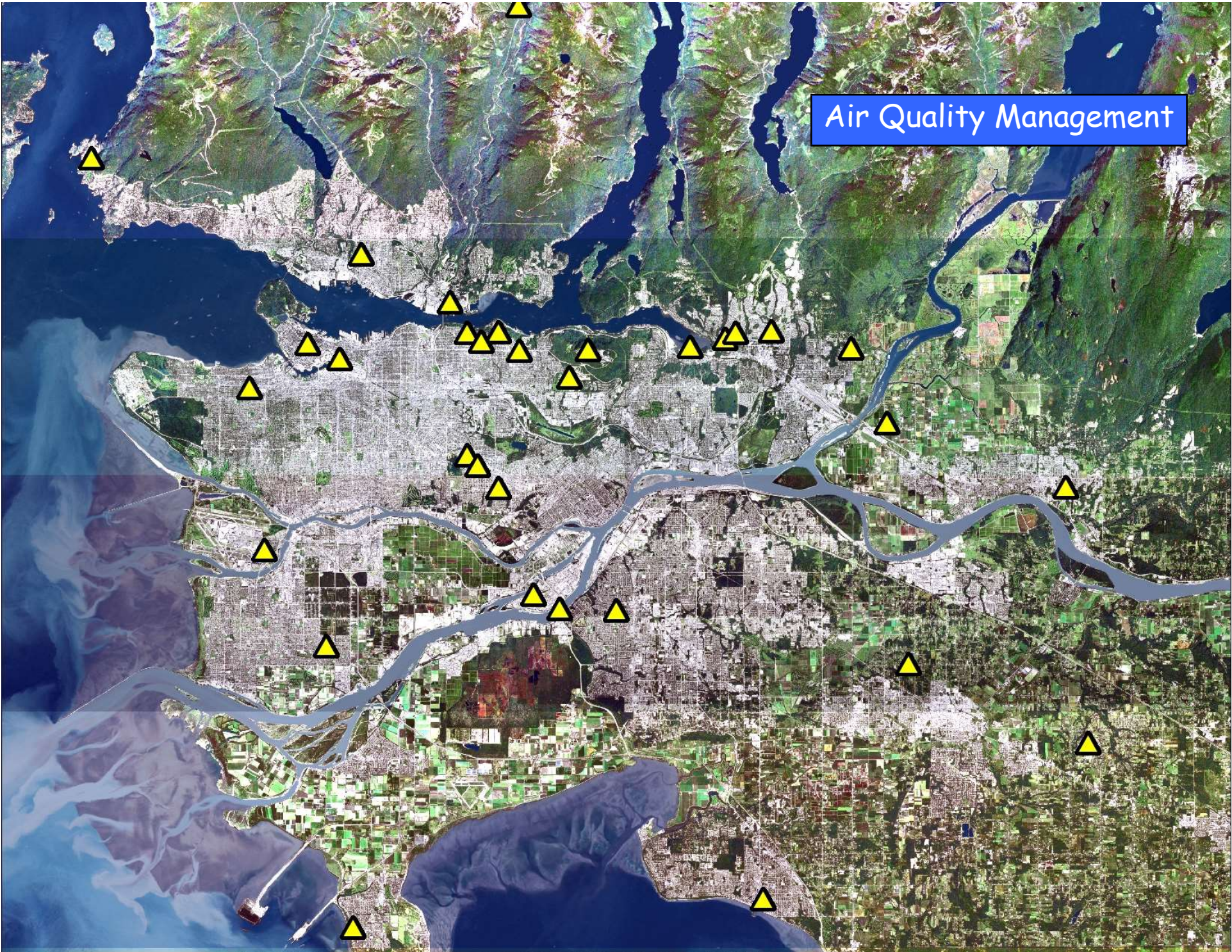


Agenda

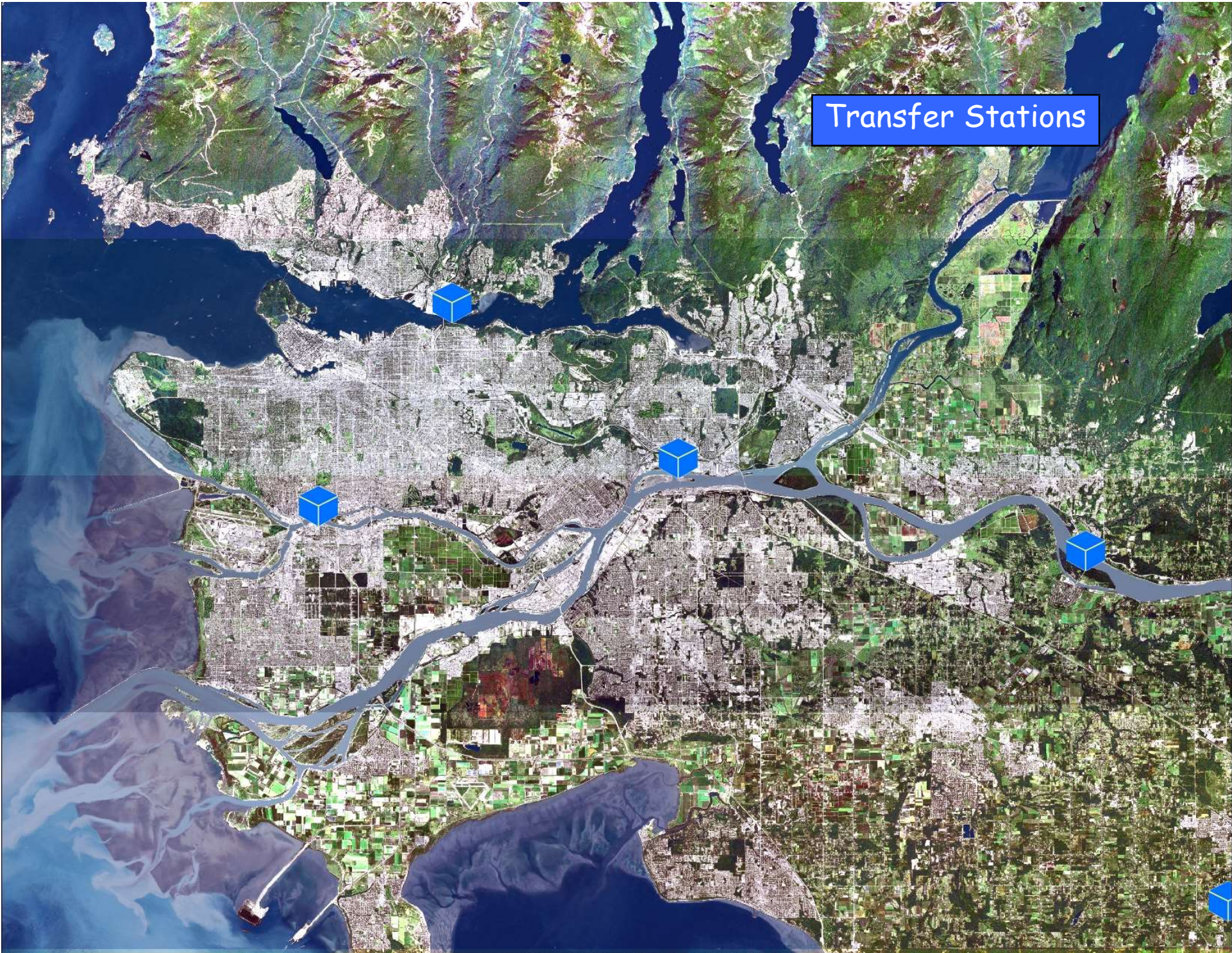
- ④ Background
- ④ Simplifying the User Experience
- ④ Data integration Issues
- ④ Key Challenges
- ④ Conclusion



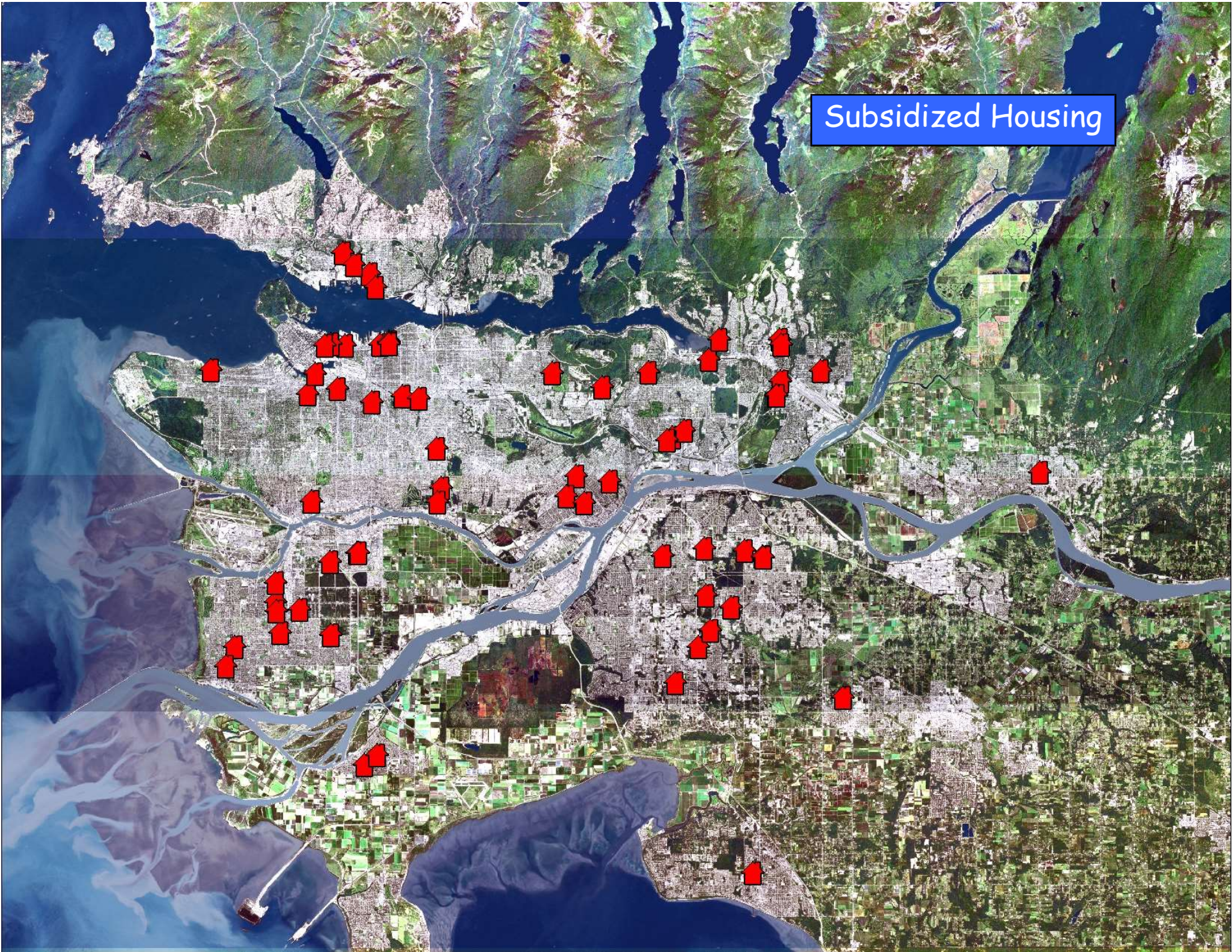
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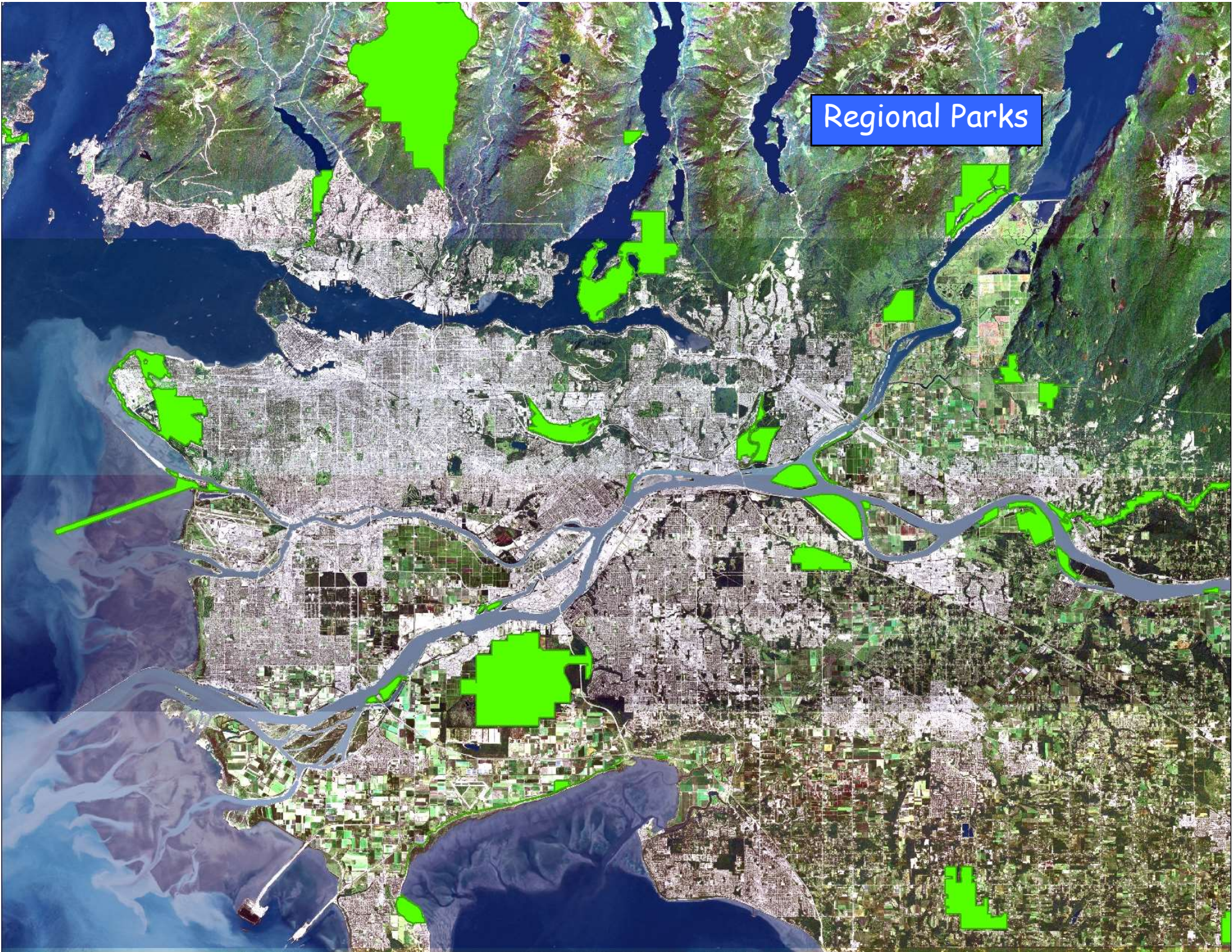


Transfer Stations



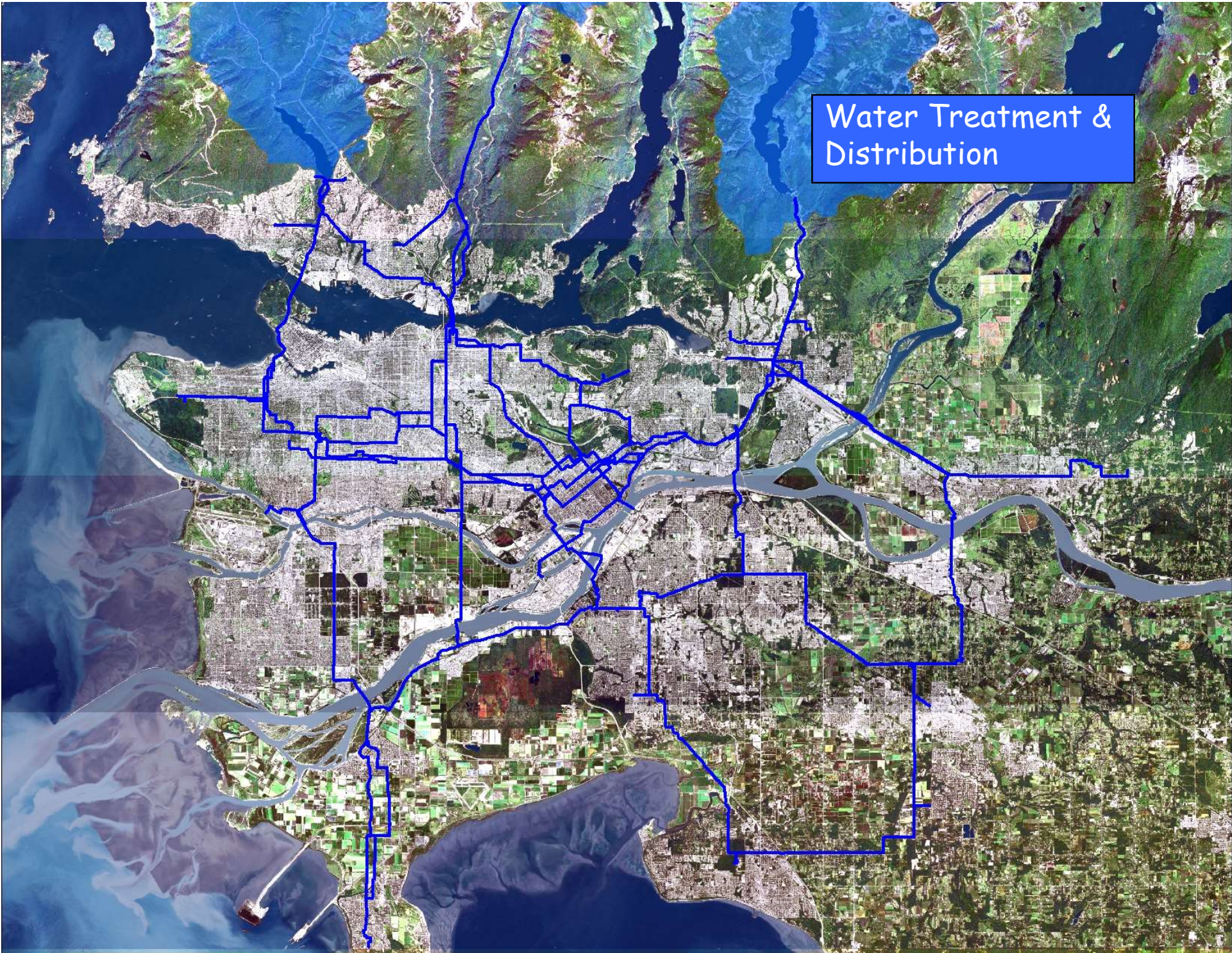
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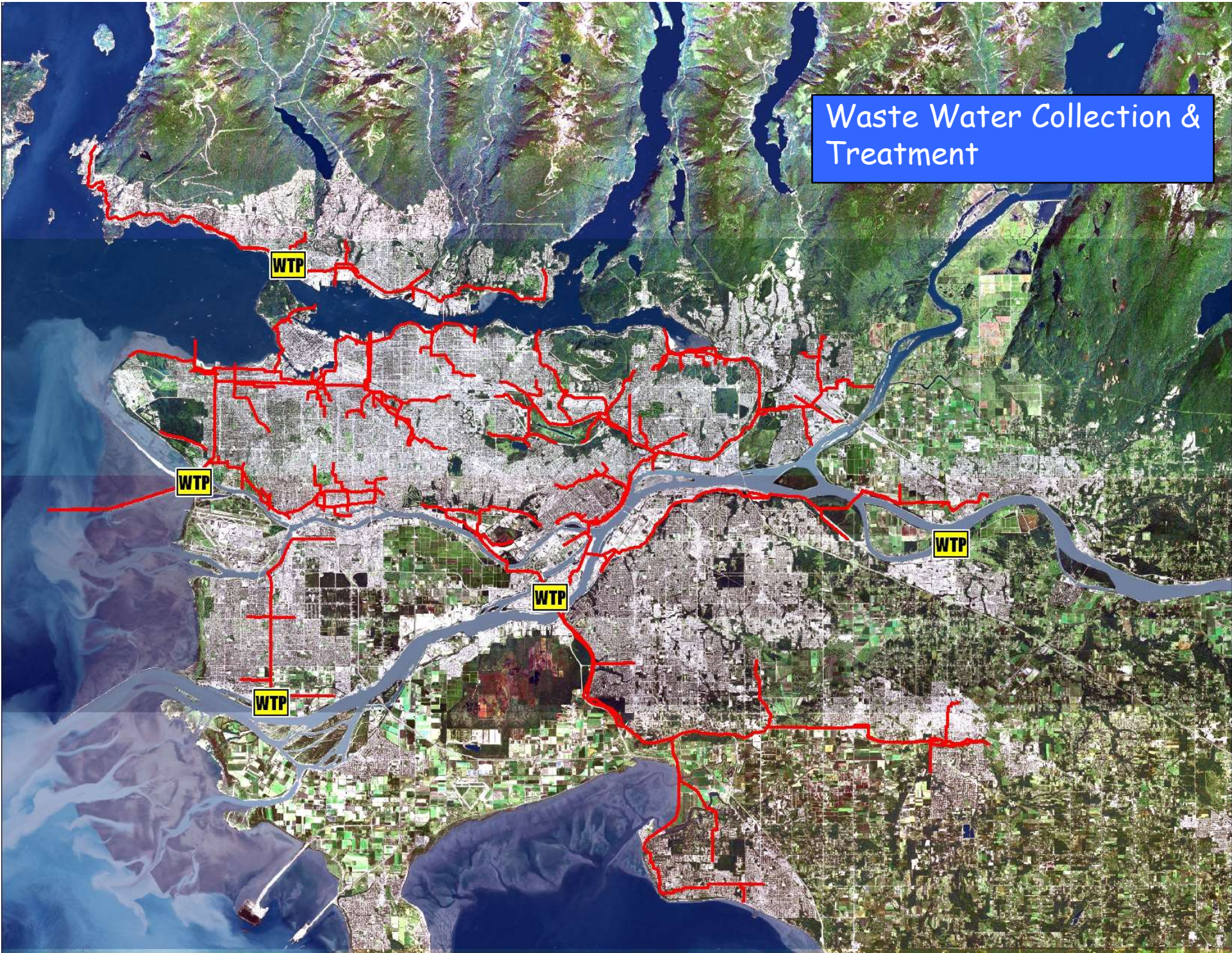


Regional Parks

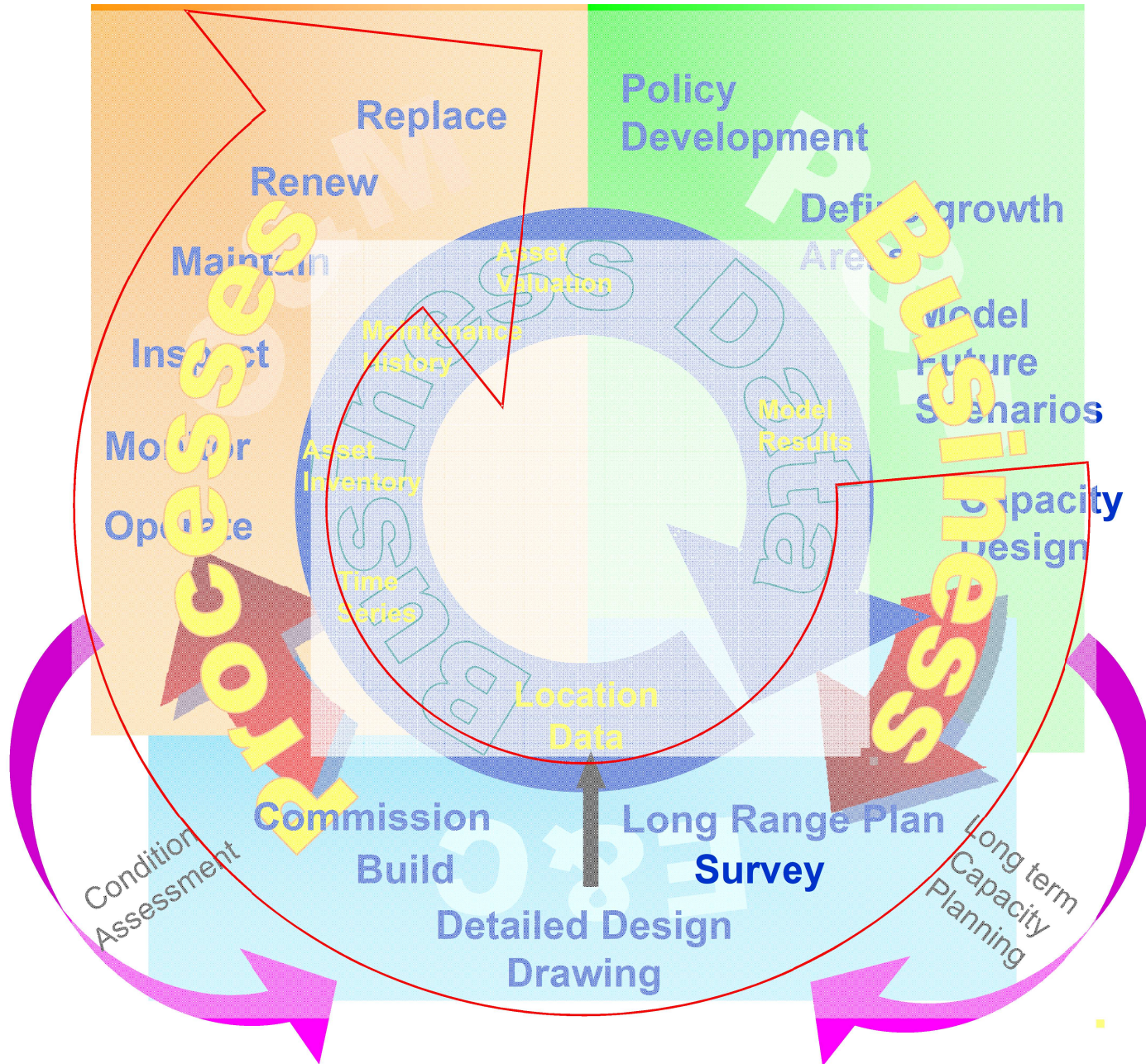
Water Treatment & Distribution

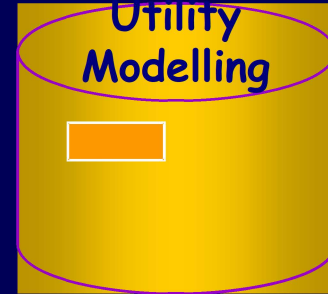
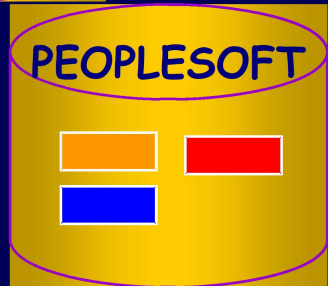
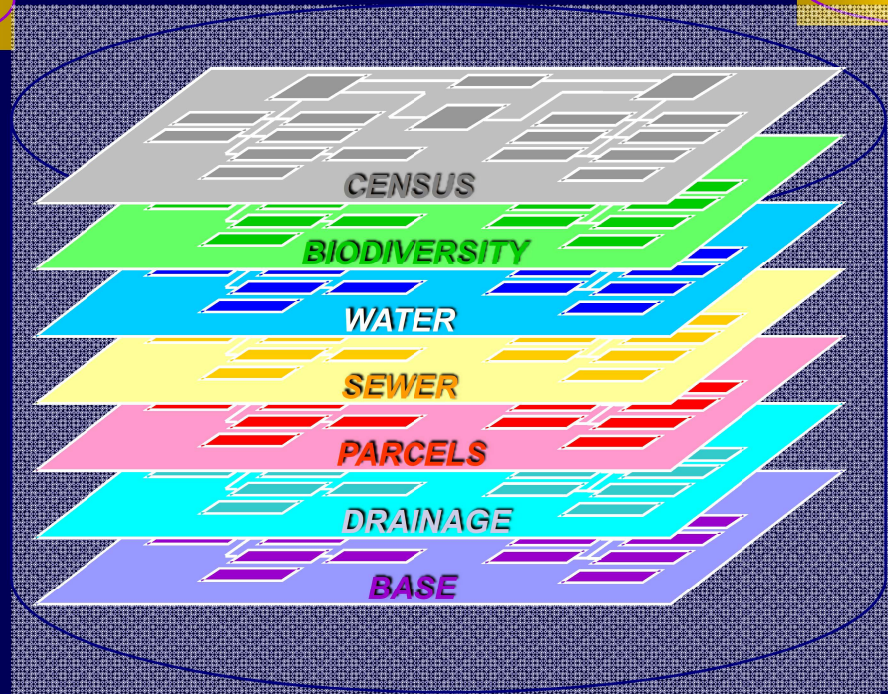
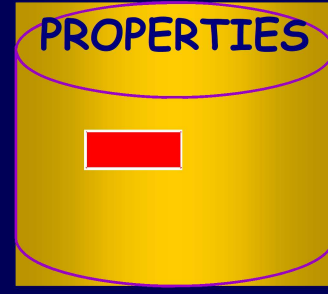
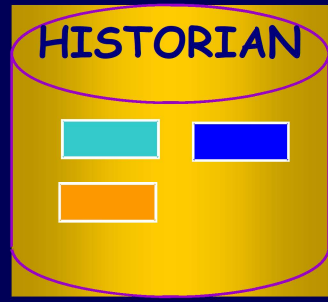
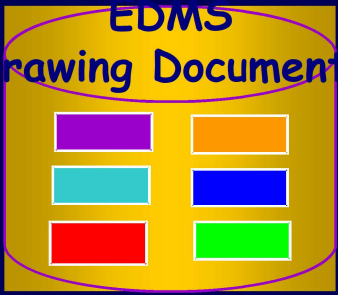
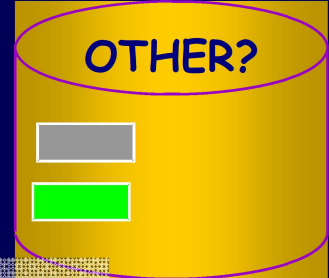
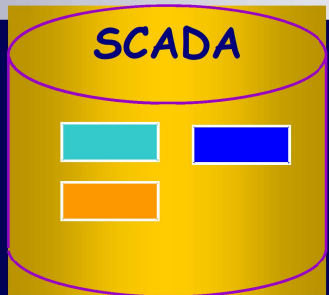
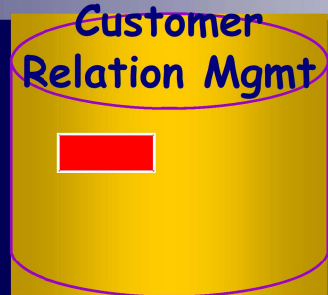
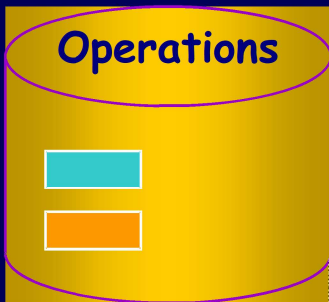


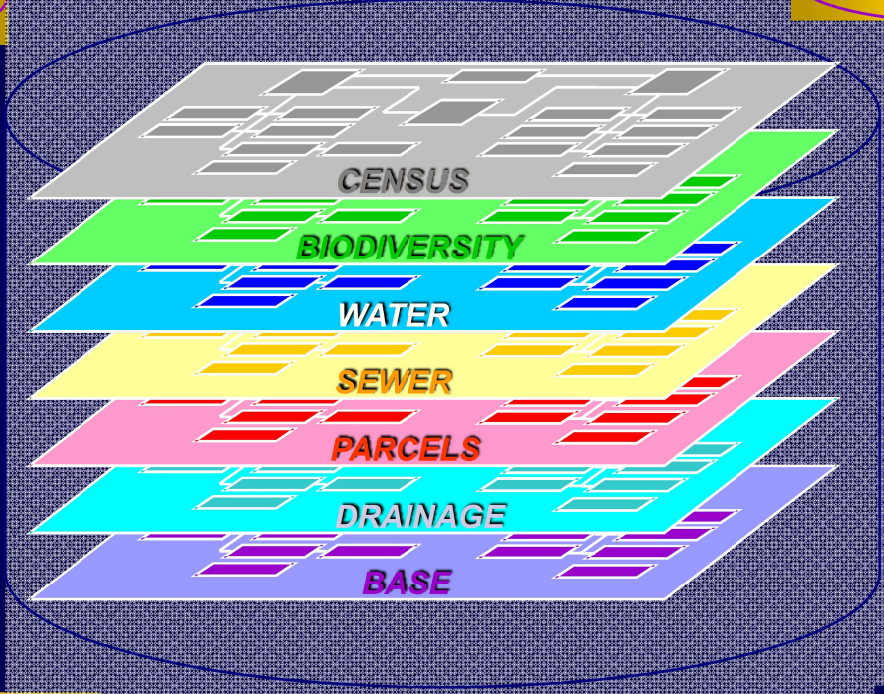
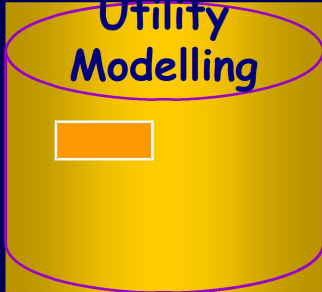
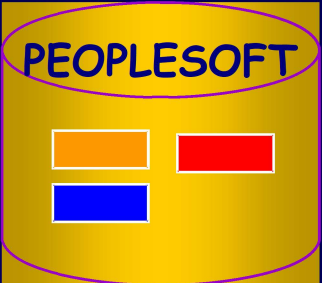
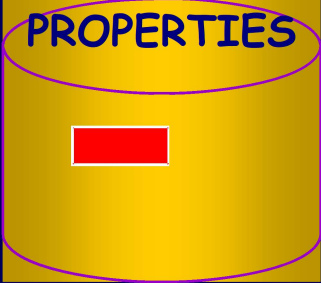
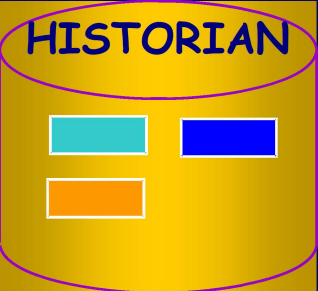
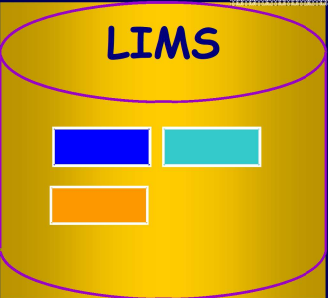
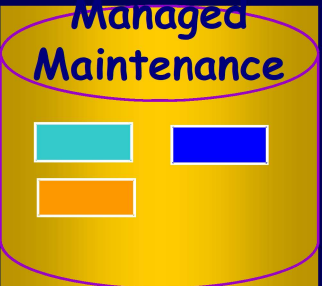
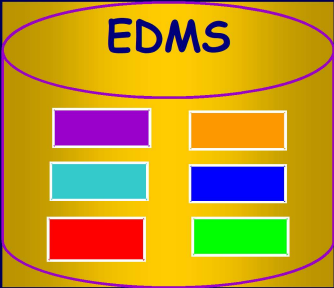
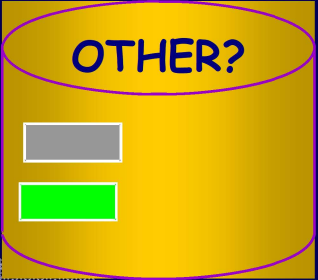
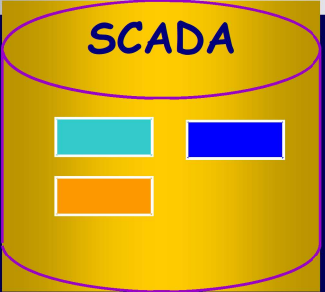
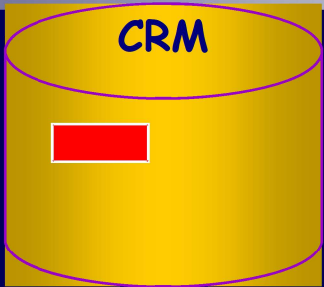
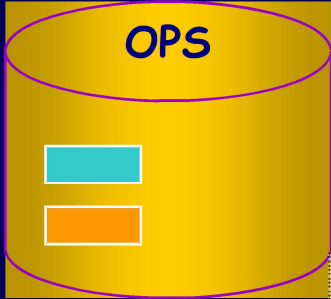
Waste Water Collection & Treatment



Lifecycle of Utility Assets







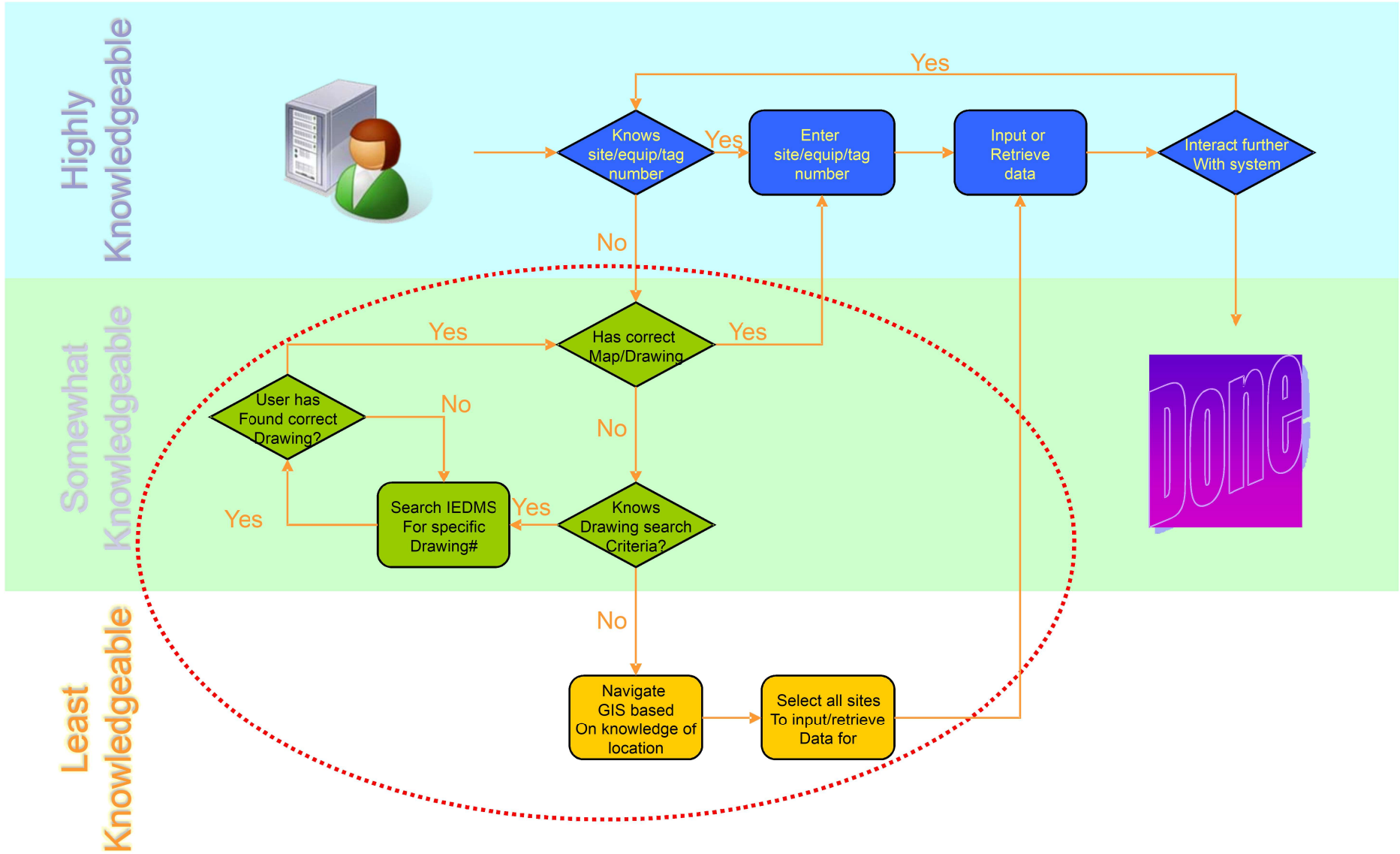


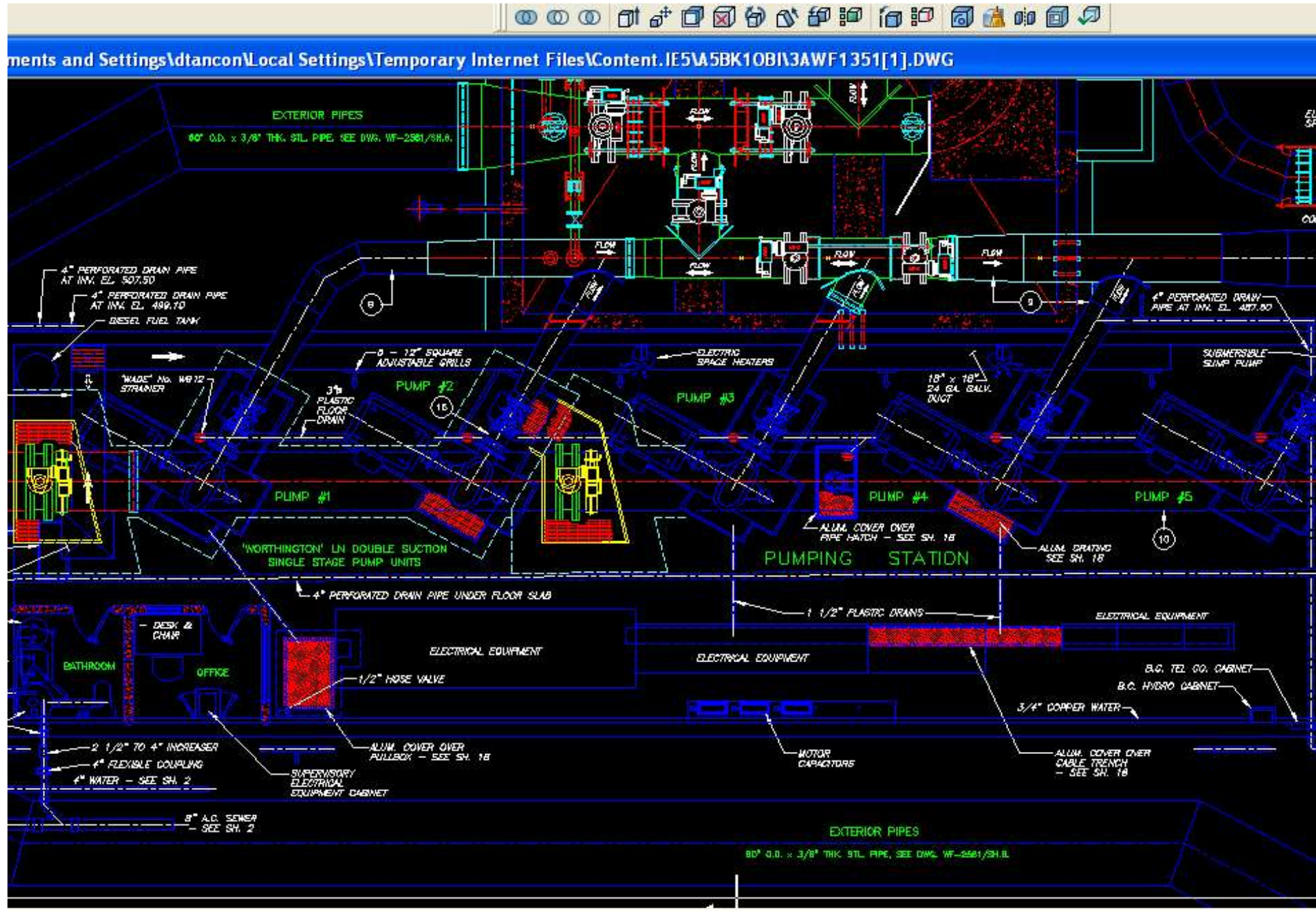
Simplifying the user Experience

- ④ Reduce the number of individual bits of software to simplify how a user accesses business data
- ④ Greater visualization with less clicking
- ④ Provide enough detail in GIS to minimize the reliance on searching for drawings when accessing business data from other systems. (eg. Pipe segment, valves, pumps)

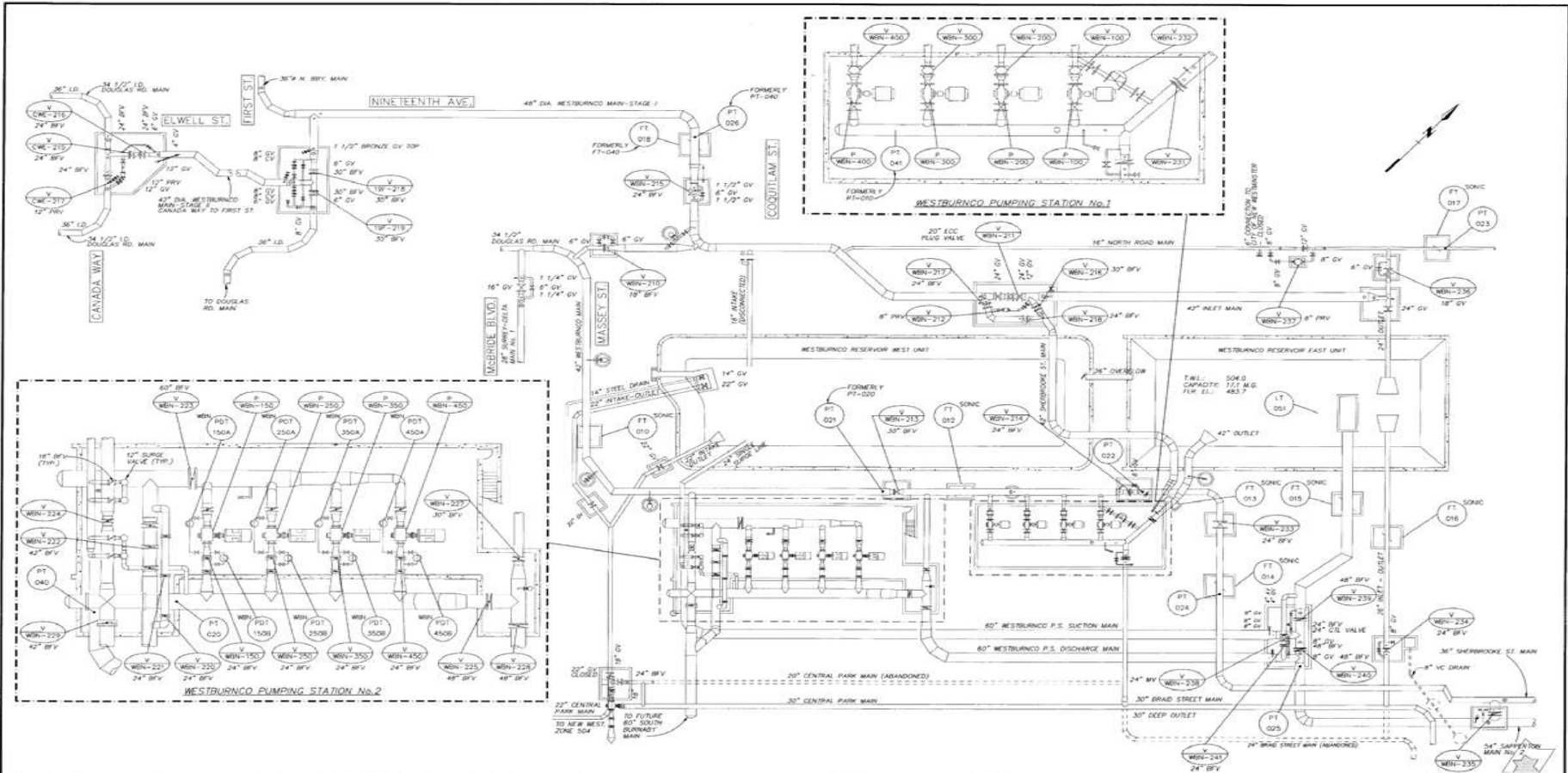
Drawing + Business Data = GIS

Search workflow with maps and drawings

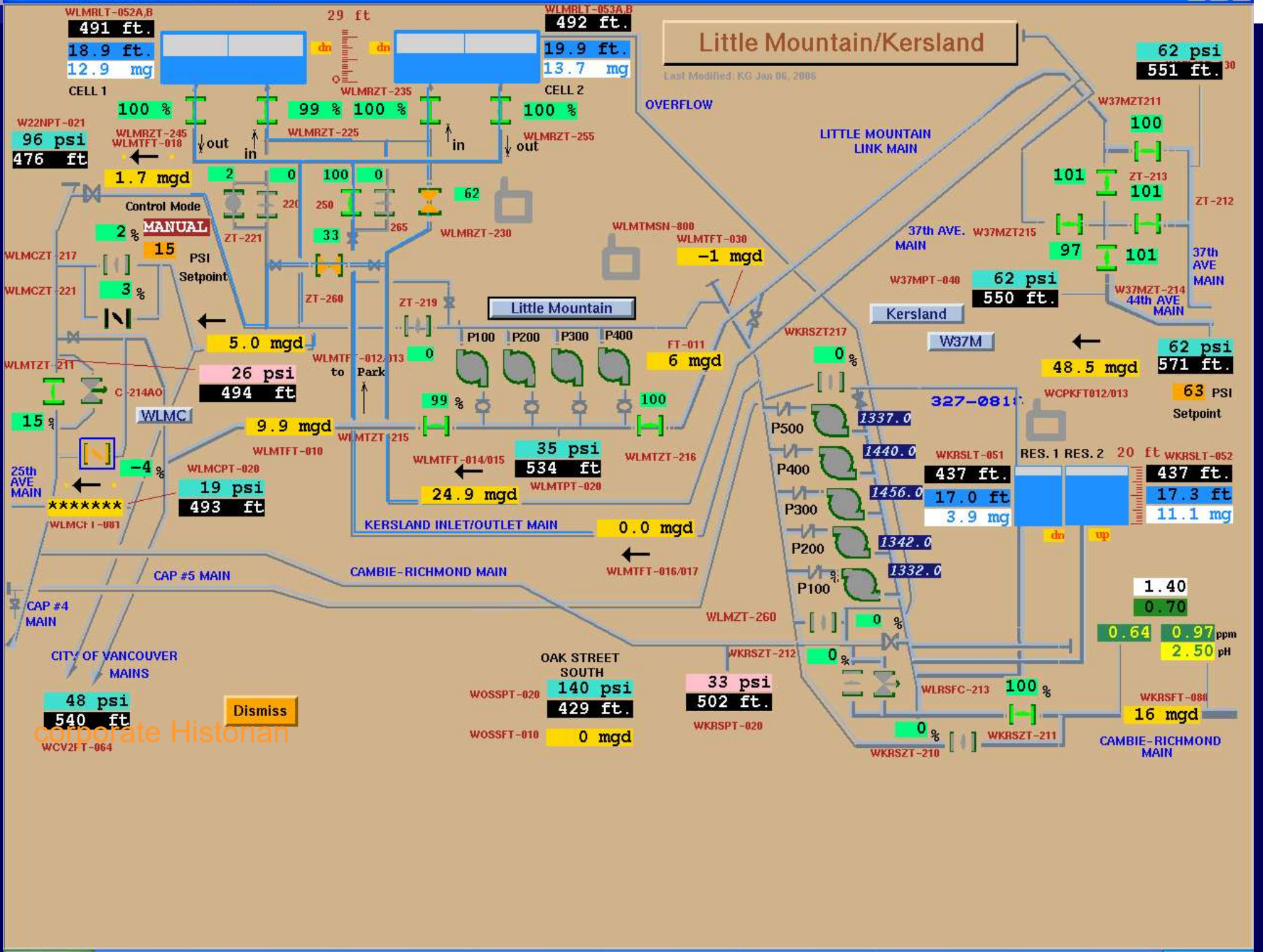




cached viewports.



DAYTON & KNIGHT LTD. Consulting Engineers				Design: J.S./A.A. Draw: D.C. Checked: [Signature] Submitted: [Signature] Engineer: [Signature]		GREATER VANCOUVER WATER DISTRICT WESTBURNCO PUMP STATION No. 2 CONTRACT No. 367		Scale: 1:1 Date: NOV 1992 Project File: WF-329 Sheet: 30 of 224 Drawing: E.S.	
Robert Freundlich & Associates Ltd. CONSULTING ENGINEERS 1000 - 10th Avenue S.E. Vancouver, B.C. V6A 1G6 TELEPHONE: (604) 681-7744 FAX: (604) 681-7746		TOOLS FOR CONSTRUCTION COUSE FOR EACH		SUPERSEDES PRINTS OF THIS NUMBER WITH LETTERS (SEE MOODS TO)					



Corporate Historian



Map Layers

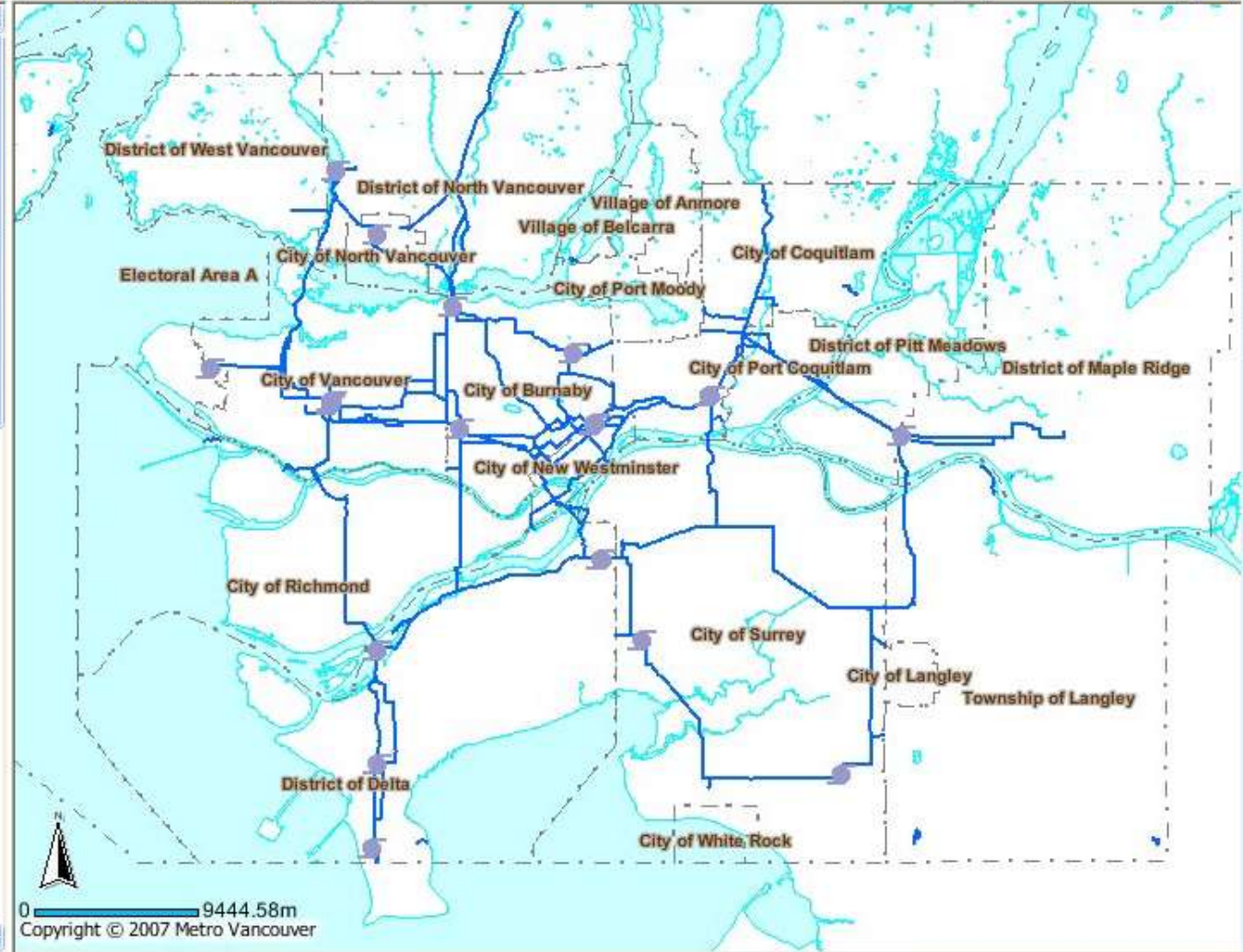
Auto Map Refresh On

Save/Reload Layer Settings

- Water Distribution Features
 - Water Manhole
 - Water Hatch
 - Water Alarms
 - Water Laterals
 - Water Fittings
 - Water Valves
 - Water Meters
 - Municipal Water Meters
 - Water RTU
 - Water Pump Stations
 - Water Chambers
 - Reservoirs
 - Water Mains
 - WQ GVRD Water Main Sites
 - WQ Municipal Sites
 - WQ GVRD Reservoir Sites
 - Water Stand Pipes
 - Water Fountains
 - Water Hydrants
 - Water Irrigation Boxes
 - Water Sprinklers
 - Water Wells

Sewer Collection Features

Other Water Features



- [-] Device Sites
 - [-] W29M
 - W29MPT-020
 - W29MPT-040

Real-time value: W29MPT-040: 29th/Moss U/S Pressure = **99.188 psia** at 2007-12-12 22:31:57Z

Search Historic Data

Start time Date: 12/12/2007 Time: 22 hr 24 min 00 sec

End time By Date By Number Max 5 readings per tag

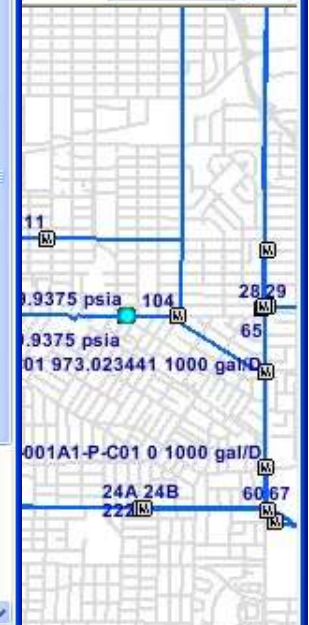
Search

Tag	Timestamp	Value	Unit
W29MPT-020	2007-12-12 22:24:12Z	65.109	psia
W29MPT-020	2007-12-12 22:24:57Z	65.109	psia
W29MPT-020	2007-12-12 22:25:12Z	64.359	psia
W29MPT-020	2007-12-12 22:25:27Z	65.109	psia
W29MPT-020	2007-12-12 22:28:27Z	65.109	psia
W29MPT-040	2007-12-12 22:24:57Z	98.438	psia
W29MPT-040	2007-12-12 22:25:12Z	99.188	psia
W29MPT-040	2007-12-12 22:26:27Z	99.188	psia
W29MPT-040	2007-12-12 22:26:42Z	99.938	psia
W29MPT-040	2007-12-12 22:29:42Z	99.938	psia

MetroMap(2)

Map Powered by ArcIMS

Scale 1: 62581 Go



Location:

Diameter:

Meter No.: 13B

Site Code:

Device Site ID: W29M

Tag (PI): W29MPT-040

Last Timestamp: Wed, 12 Dec 2007 22:26:42

Last Value: 99.9375

Measurement Unit: psia

Find All SCADA Values



Untitled Page - Microsoft Internet Explorer

Real-time value: WKRSMQN200HR: Accum Pump 2 Run H = **1,342 h** at 2007-12-12 15:05:11Z

Search History

Start time: Time: hr min sec

End time:

Unavailable Tags: WKRSMQN200MN

Tag	Timestamp	Value	Unit
WKRSMQN200HR	2007-12-11 01:04:10Z	1,342	h
WKRSMQN200HR	2007-12-11 01:04:25Z	1,342	h
WKRSMQN200HR	2007-12-11 09:04:11Z	1,342	h
WKRSMQN200HR	2007-12-11 09:04:26Z	1,342	h
WKRSMQN200HR	2007-12-11 10:39:42Z	1,342	h
WKRSMC-200CF	2007-12-11 01:04:10Z	0	Unknown
WKRSMC-200CF	2007-12-11 01:04:25Z	0	Unknown
WKRSMC-200CF	2007-12-11 09:04:11Z	0	Unknown
WKRSMC-200CF	2007-12-11 09:04:26Z	0	Unknown
WKRSMC-200CF	2007-12-11 17:04:13Z	0	Unknown
WKRSMQA200NS	2007-12-11 01:04:10Z	0	Unknown
WKRSMQA200NS	2007-12-11 01:04:25Z	0	Unknown
WKRSMQA200NS	2007-12-11 09:04:11Z	0	Unknown
WKRSMQA200NS	2007-12-11 09:04:26Z	0	Unknown
WKRSMQA200NS	2007-12-11 17:04:13Z	0	Unknown

1 2 3

- Layers**
- Device Sites
 - WKRSP2
 - WKRSMQN200HR
 - WKRSMQN200MN
 - WKRSMC-200CF
 - WKRSMQA200NS
 - WKRSMQ200
 - WKRSMO-200
 - WKRSMC-200SS
 - WKRSTSH200
 - WQ Municipal Sites
 - WQ GVRD Reservoir Sites
 - Water Stand Pipes
 - Water Fountains
 - Water Hydrants
 - Water Irrigation Boxes
 - Water Sprinklers
 - Water Wells
 - Sewer Collection Features
 - Storm Water Features



How it all works

Data model

Search Results - Microsoft Internet Explorer

MDB Code	Site Code	Pipe ID	Measurement Type	Active	Permanent	Classification
S8A23	8A23	80103		0	N	
SCC23	CC23	80103		0	N	
SCC2	CC2	103		0	N	

Spatial View

Search Results - Microsoft Internet Explorer

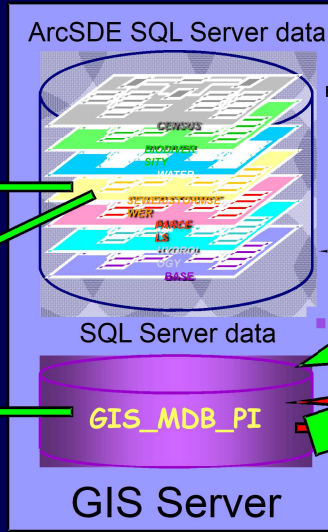
Search Results

Sewer Flow Meters PI (10 records selected)

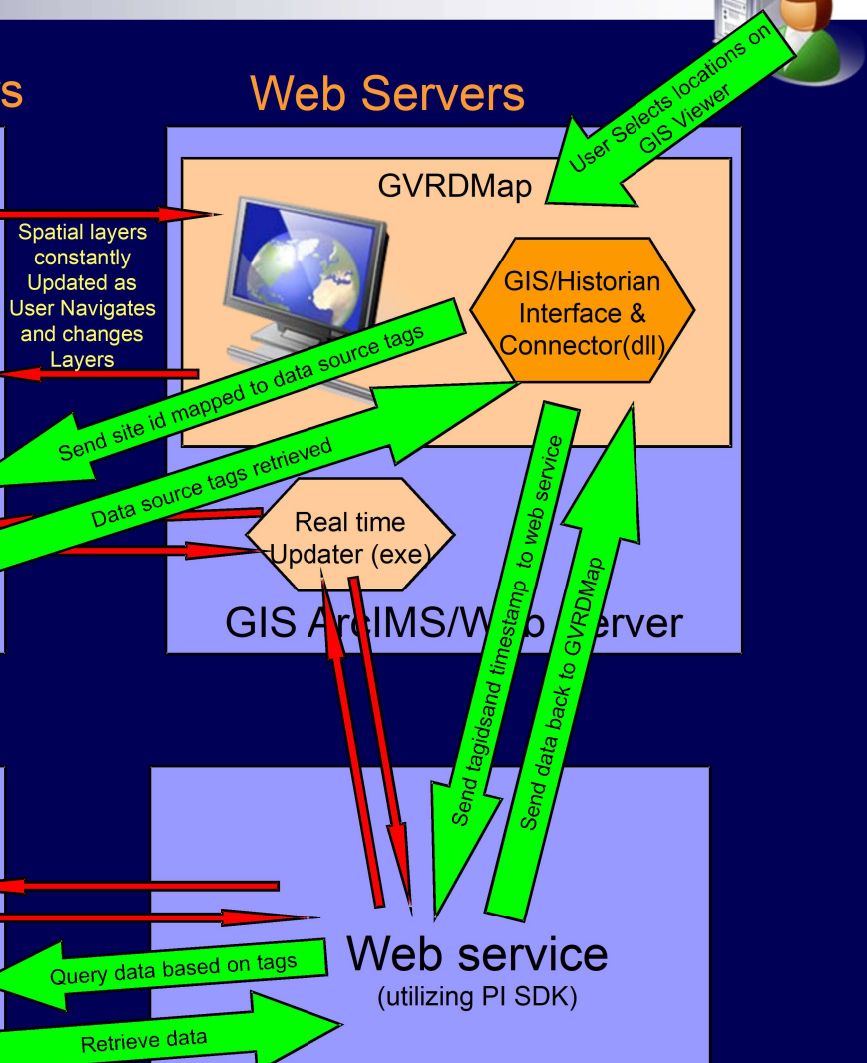
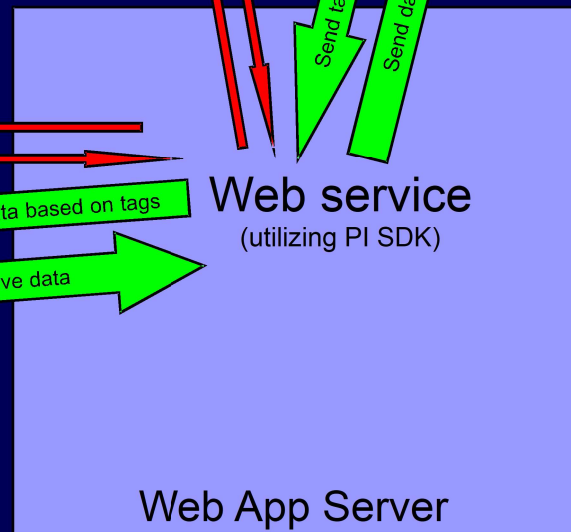
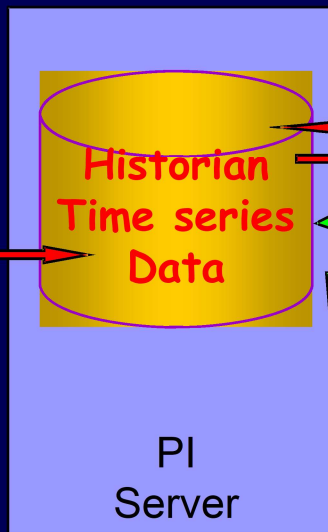
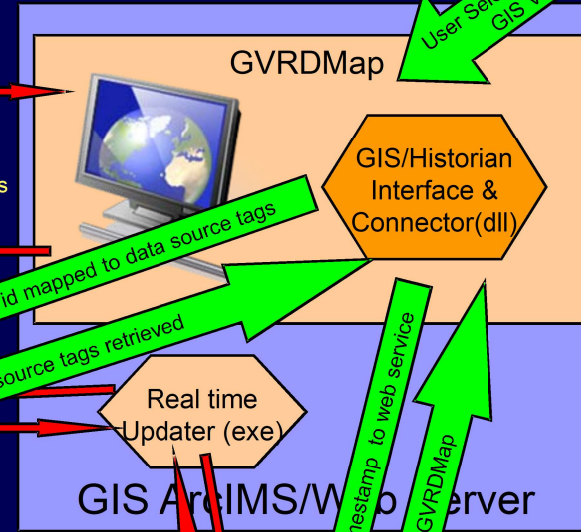
MDB Code	Tag PI	Last Timestamp	Last Value
SCC2	SCC-LT-051	Thu, 5 Apr 2007 08:35:40	1
SCC2	SCC-LT-051	Thu, 5 Apr 2007 08:35:40	1
SCC2	SCC-LXF051	Thu, 5 Apr 2007 03:49:55	0
SCC2	SCC-LXF051	Thu, 5 Apr 2007 03:49:55	0
S8A23		NaN	
SCC23		NaN	
SCC2	SCC-LT-001A1	Thu, 11 Jan 2007 17:11:03	0
SCC2	SCC-LT-001A1	Thu, 11 Jan 2007 17:11:03	0
SCC2		NaN	
SCC2		NaN	



Database Servers



Web Servers





Still to come...

- ④ Finish pump station details for a few more sites
- ④ Integrate with modelling tools
- ④ Visualize Patterns (eg. LIMS)



Legend Sites

- 0 - 0.099 mg/L
- 0.10 - 0.199 mg/L
- 0.20 - 0.349 mg/L
- 0.35 - 0.499 mg/L
- 0.50 - 0.749 mg/L
- 0.75 - 0.999 mg/L
- > 1 mg/L
- No Results

WQ GVRD Water Main Sites

- 0 - 0.099 mg/L
- 0.10 - 0.199 mg/L
- 0.20 - 0.349 mg/L
- 0.35 - 0.499 mg/L
- 0.50 - 0.749 mg/L
- 0.75 - 0.999 mg/L
- > 1 mg/L
- No Results

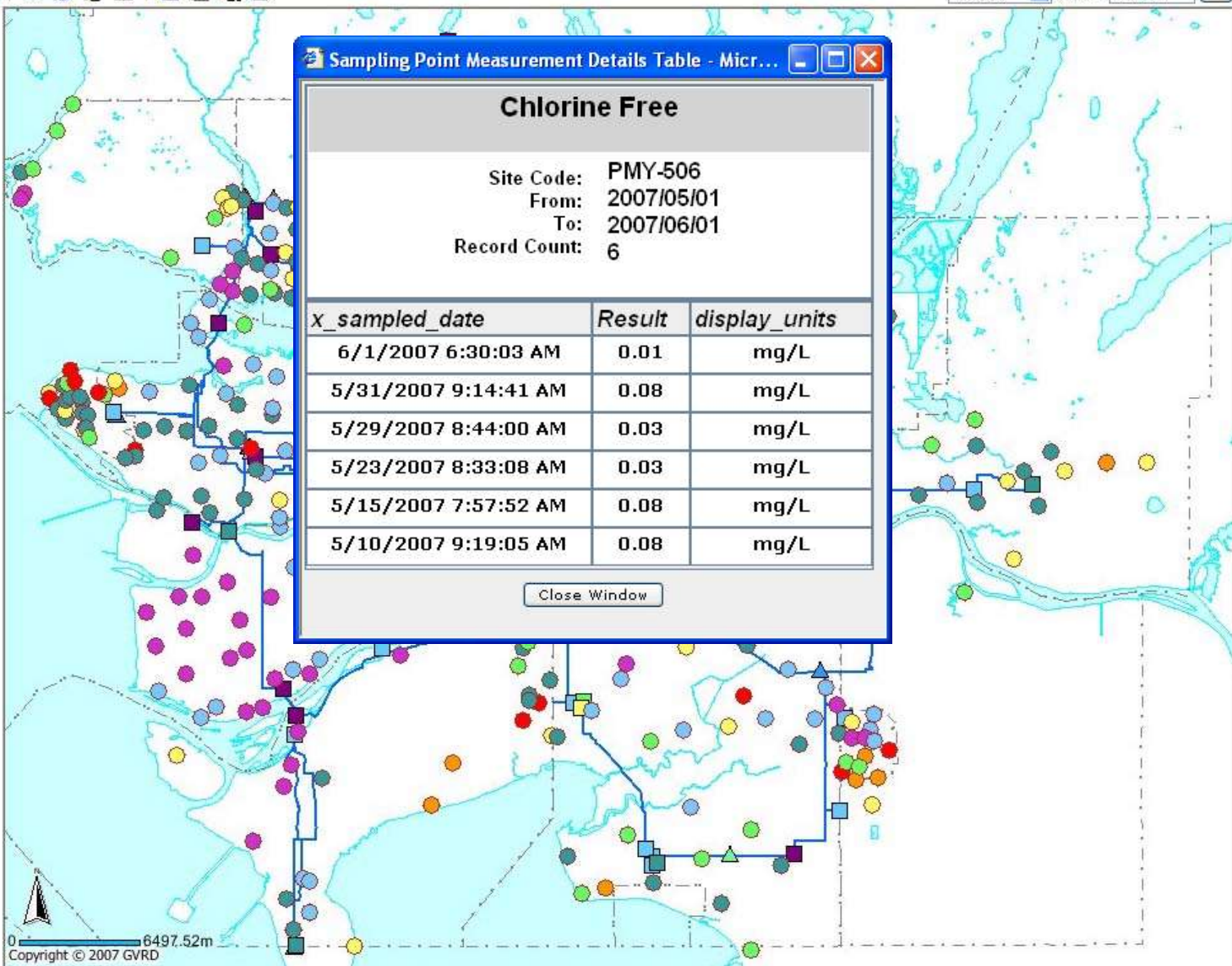
WQ GVRD Reservoir Sites

- 0 - 0.099 mg/L
- 0.10 - 0.199 mg/L
- 0.20 - 0.349 mg/L
- 0.35 - 0.499 mg/L
- 0.50 - 0.749 mg/L
- 0.75 - 0.999 mg/L
- > 1 mg/L
- No Results

Water Mains

Municipal Boundaries

Water Bodies



Sampling Point Measurement Details Table - Micr...

Chlorine Free

Site Code: PMY-506
 From: 2007/05/01
 To: 2007/06/01
 Record Count: 6

x_sampled_date	Result	display_units
6/1/2007 6:30:03 AM	0.01	mg/L
5/31/2007 9:14:41 AM	0.08	mg/L
5/29/2007 8:44:00 AM	0.03	mg/L
5/23/2007 8:33:08 AM	0.03	mg/L
5/15/2007 7:57:52 AM	0.08	mg/L
5/10/2007 9:19:05 AM	0.08	mg/L

Close Window

Map Legend

WQ Municipal Sites

- 0%
- 1 - 24%
- 25 - 50%
- 51 - 74%
- 75 - 100%

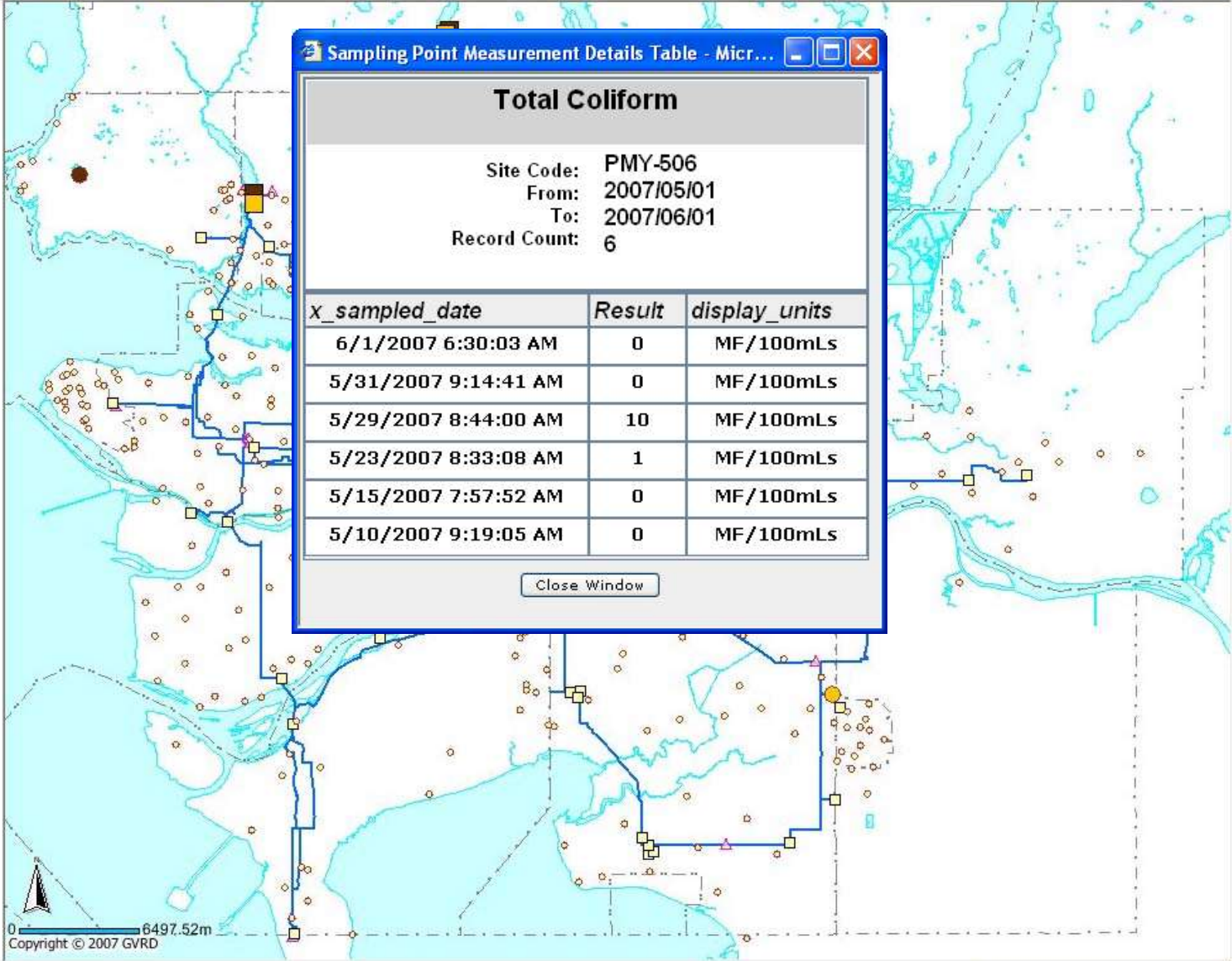
WQ GVRD Water Main Sites

- 0%
- 1 - 24%
- 25 - 50%
- 51 - 74%
- 75 - 100%

WQ GVRD Reservoir Sites

- 0%
- 1 - 24%
- 25 - 50%
- 51 - 74%
- 75 - 100%

Water Mains
 Municipal Boundaries
 Water Bodies



0 6497.52m
 Copyright © 2007 GVRD

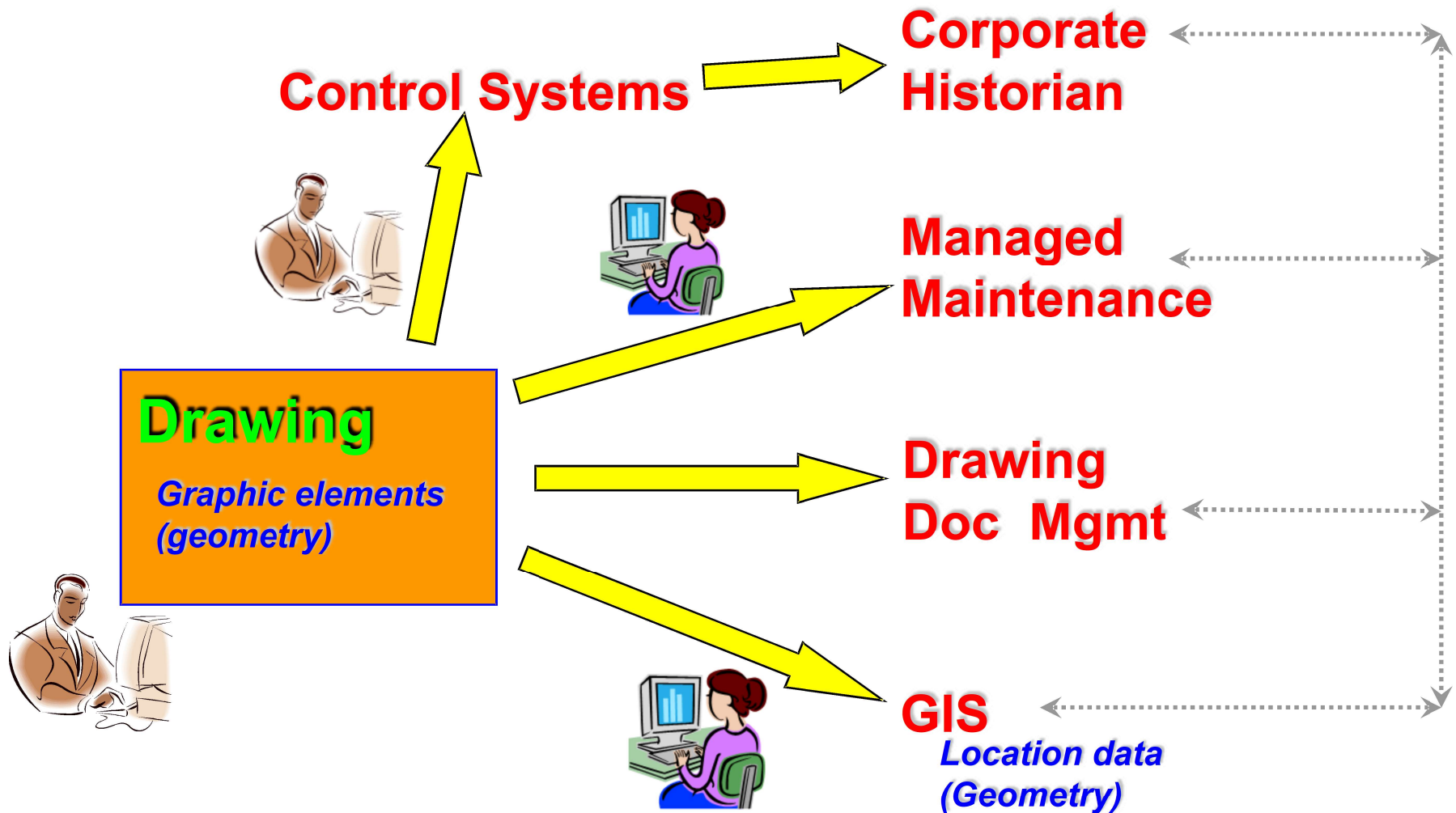


Data Integration Issues

- ④ Most of the larger systems were implemented prior to the centralization of IT funding
 - ⑤ Each system was brought in specific to business areas
 - ⑤ Lacked a corporate perspective resulting in some data duplication
 - ⑤ Different Id's for the same asset in different systems

- ④ The result is that systems are often out of synchronization which leads to inconsistent and unreliable information to the end user.

Data Integration Issues





Key Challenges

- ④ Should we work towards greater integration with Control Systems data and the Managed Maintenance System (10's of thousands)?

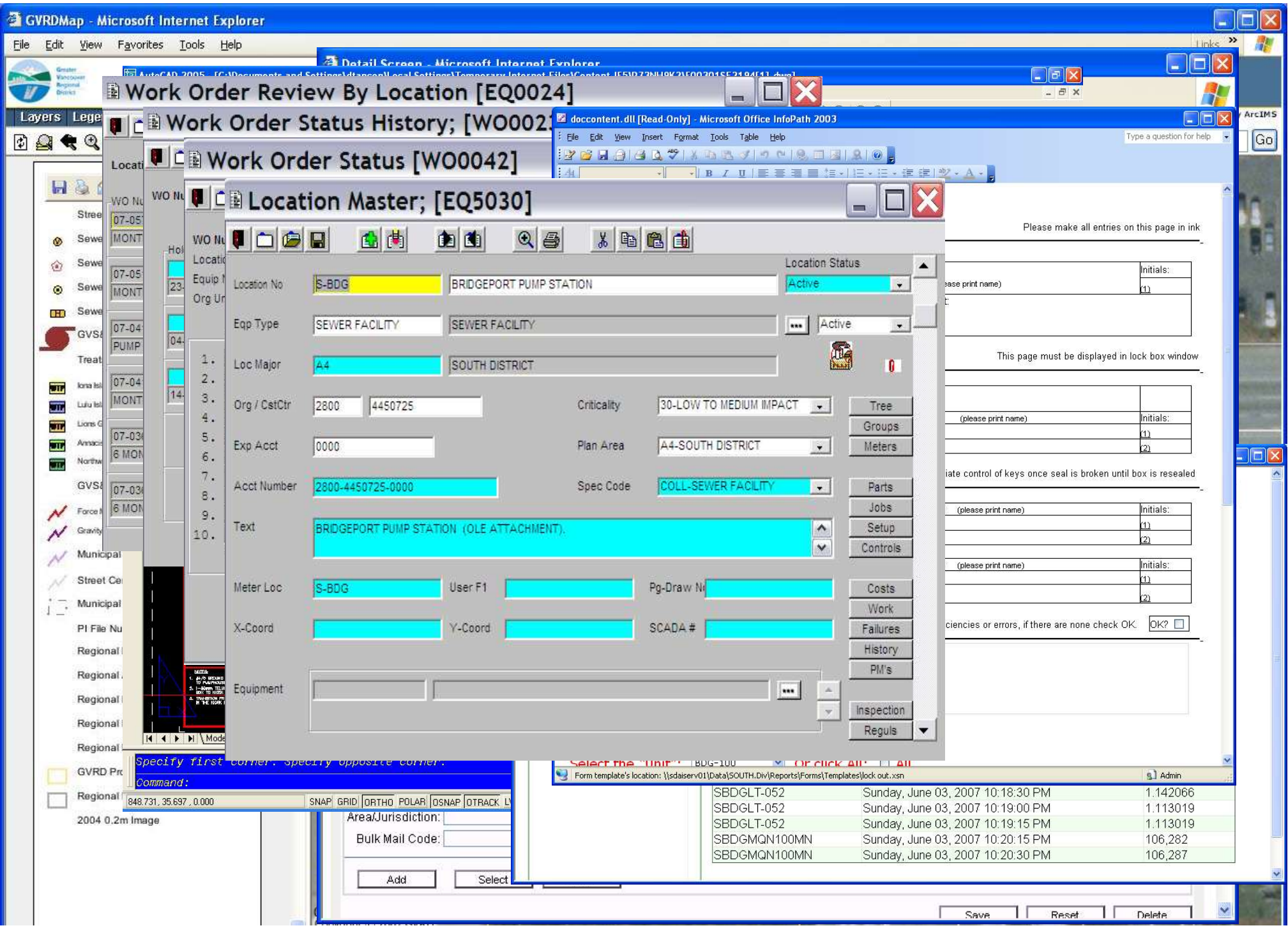
- ④ Change the way we do things across departments and work towards fewer asset repositories? What are the unknowns?
Or...

- ④ Request more staff to manually keep GIS (**close to**) in synch with all other systems?

Map Legend

- Street Address Labels
- Sewer Valves
- Sewer Flow Meters
- Sewer Manhole
- Sewer Hatch
- GVS&DD Pump Stations
- Treatment Plants
- Iona Island
- Lulu Island
- Lions Gate
- Anacis Island
- Northwest Langley
- GVS&DD Sewer Mains
- Force Main
- Gravity Main
- Municipal Sanitary Sewer Mains
- Street Centerlines
- Municipal Boundaries
- PI File Numbers
- Regional Lot Labels
- Regional Address Labels
- Regional Block Labels
- Regional Plan Labels
- Regional District Lot Labels
- GVRD Property
- Regional Parcels
- 2004 0.2m Image







Conclusion

- ④ Start small and pilot or prototype as you go (make sure it is scalable)
- ④ Provide the right information in the right amount to the decision makers
- ④ If it is of value to your organization, don't be afraid to question the status quo. The outcome may surprise you.



Questions?