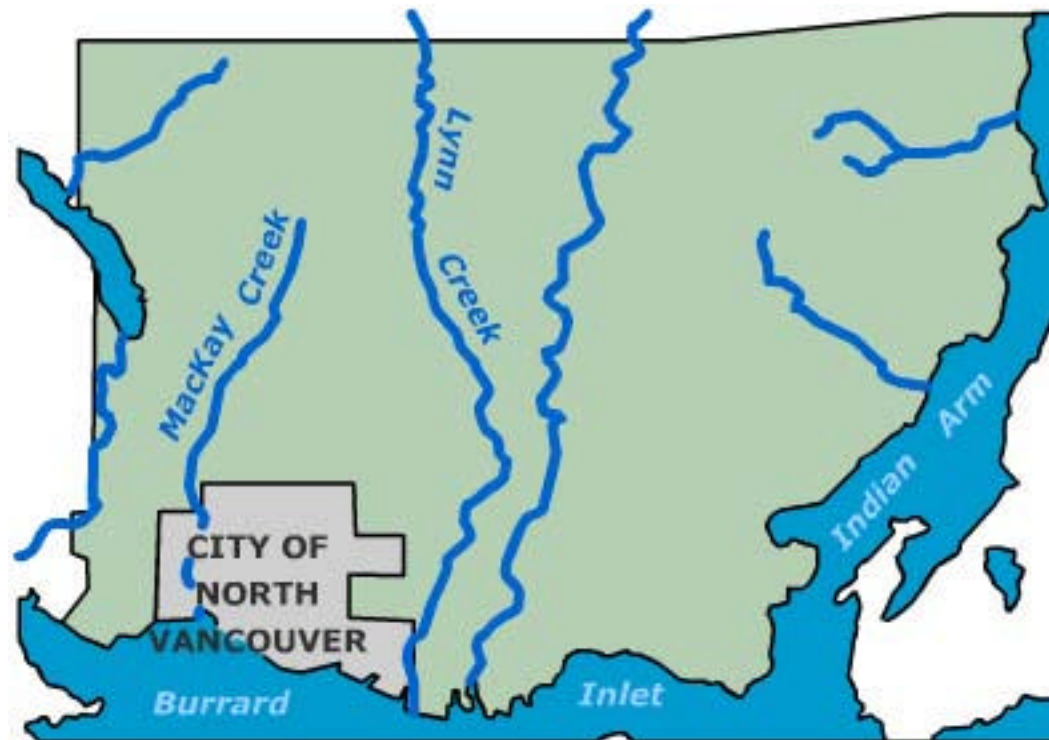


The District of North Vancouver's Forest Management System



Presented by
Mark Brown, Environment Dept
and Meaghan Taylor, GIS Dept

District Geography



- Population: 80,000+
- Properties: 26,300+
- Total Land Area: 17,819 ha
- % of Park Land: 62%

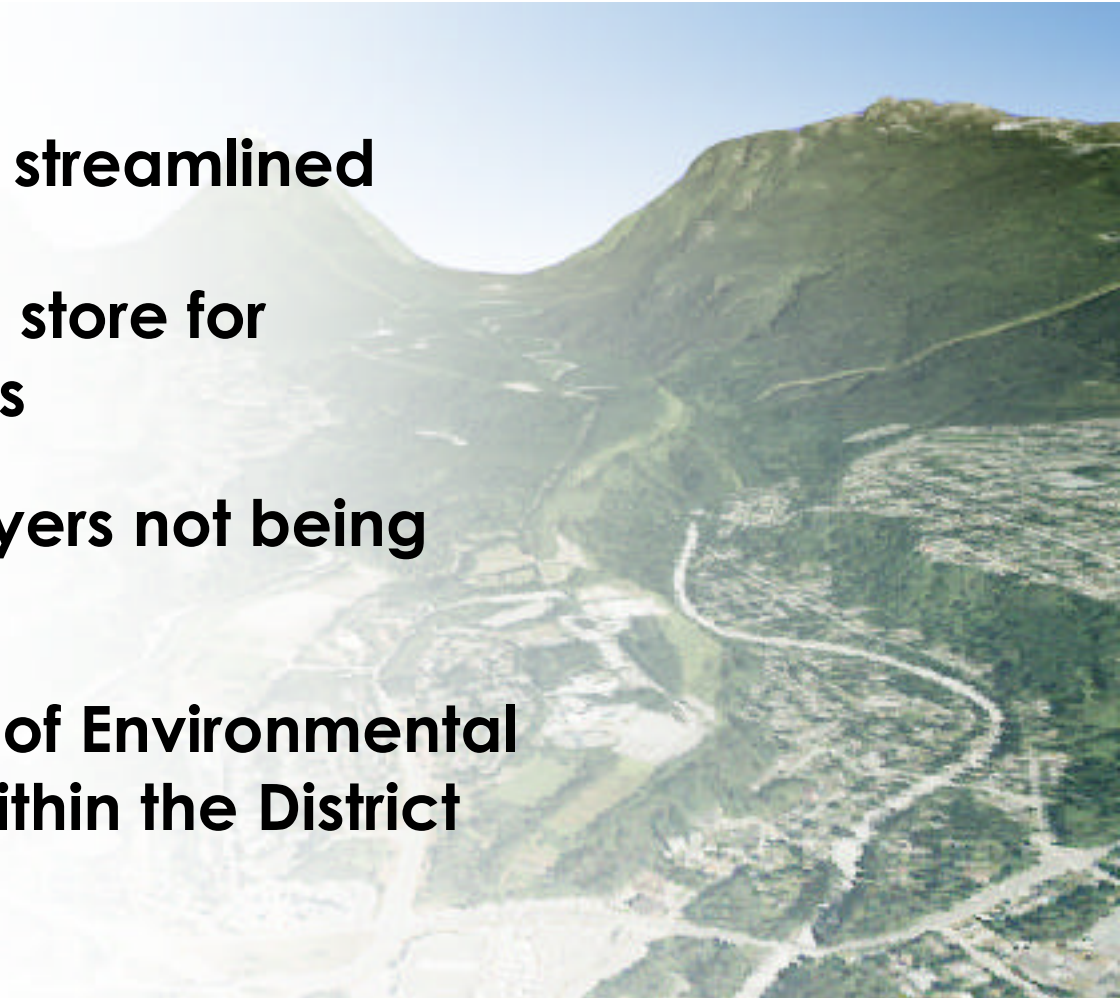
Our Responsibilities



- District of North Van is *responsible* for :
 - Over 3 million trees
 - 440 Hectares of urban forest
- Hazard tree management
- Public Safety

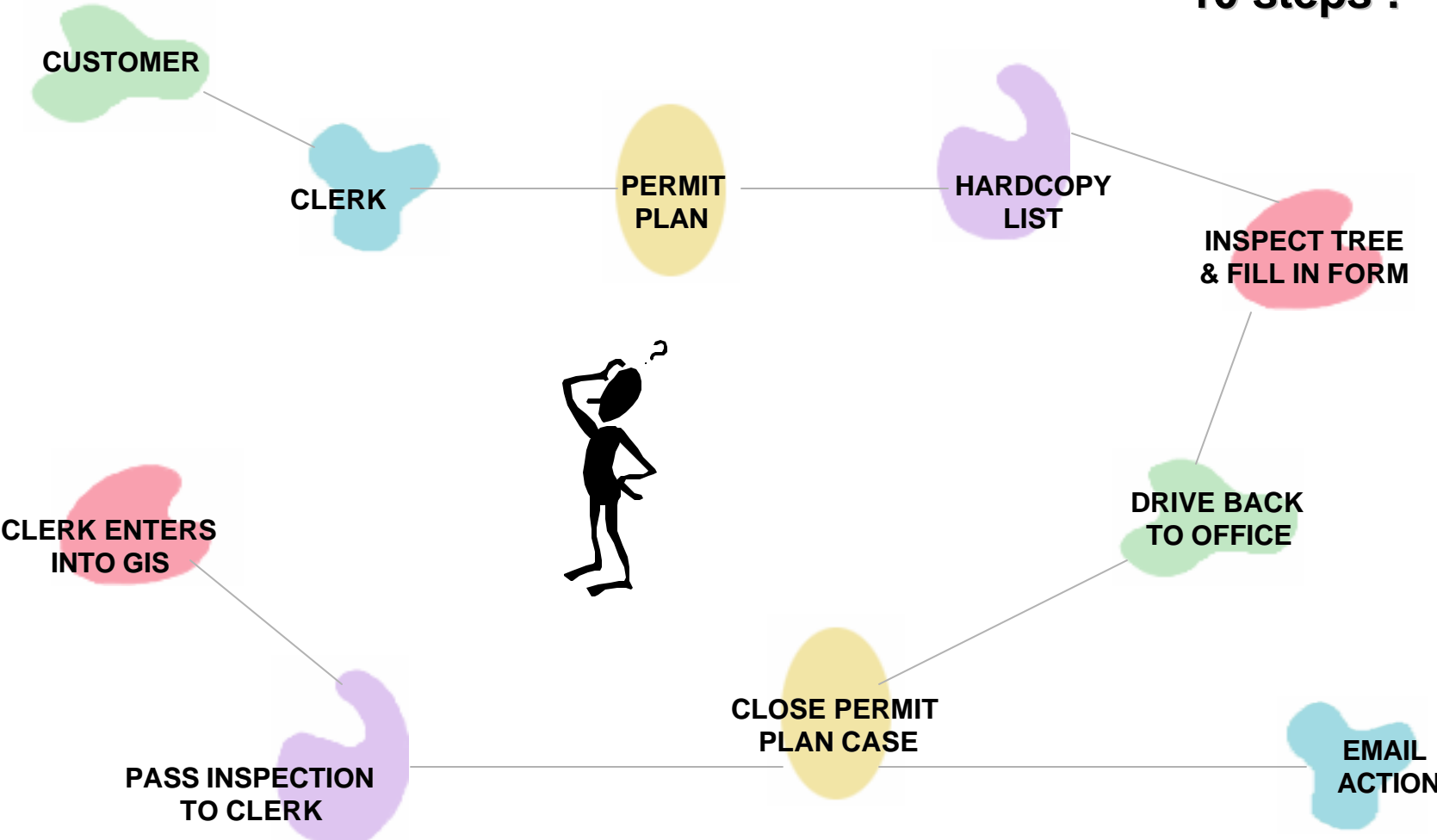
The Need for a New System

- **Work flows not streamlined**
- **No single data store for inspected trees**
- **Related GIS layers not being referenced**
- **High standard of Environmental Stewardship within the District**



Existing Workflow

10 steps !

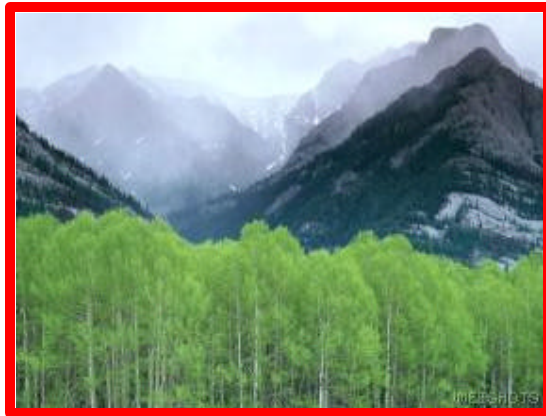


Our Vision

- **Build an integrated and wireless system**
- **Leverage GIS technology to maintain an inventory of environmental assets**
- **Provide a powerful analytical tool to aid in asset, risk, and liability management**



The Solution



Workflow Management Achieved by:

- **A Wireless Inspection Module**
- **An Automated Reporting Module**
- **Analytical Capabilities**

- **FMS is a digital *inventory* system of all DNV Trees inspected since 1997**

Workflow Overview

Wireless Inspection Module



Report Generation Module

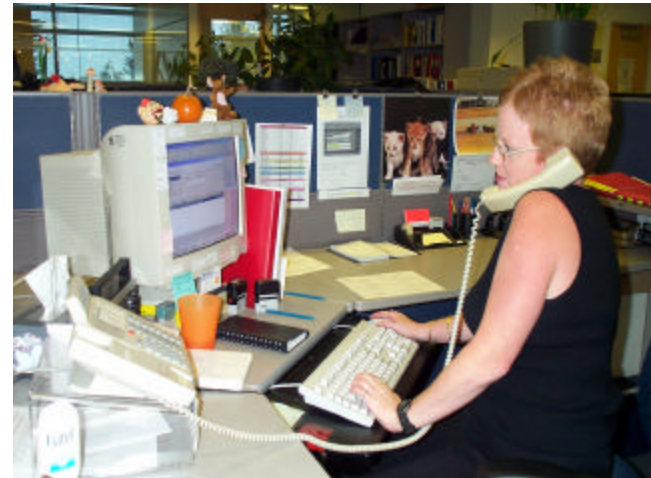


Assign Work Order

Wireless Inspection Module

Clerk records the service call

“Hazardous tree near children’s play area at Bridgman Park” .



Inspector looks at task list in the field

Wireless Inspection Module ...

**Drives to the
location**

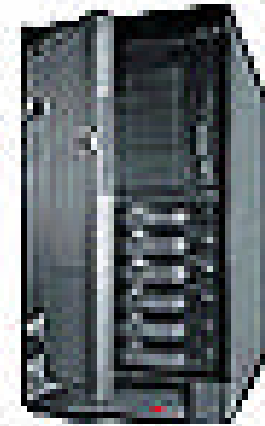
Arrives at Bridgman Park



**Identifies the tree to
inspect**

Wireless Inspection Module ...

**FMS sends data
back to the server
at the District Hall**




*Tree details are
now recorded in
the GIS*

Report Generation Module

Sunday evening reports are generated

Reports are prioritized and sorted for staff to deal with first thing Monday morning

	<u>The Corporation of the District of North Vancouver</u>
TREE INSPECTION REPORT	
<hr/>	
RFS Number:	RFS2002-04331
Inspected by:	MWB
Inspection Date:	Friday, April 25, 2003
<hr/>	
REQUEST FOR SERVICE DETAILS	
Address:	5383 NANCY GREENE WAY
Contact Name:	ROMAN KANAK
Contact Phone:	
Location Details:	Grouse mountain Flying club would like to remove taller trees and replace with shrubs along strip beside capilano road at cleveland Park
<hr/>	
TREE INSPECTION DETAILS	
Ownership:	
Tree Class:	-- N/A --
Terrain Class:	-- N/A --
<hr/>	
HAZARD INFORMATION	

Complete Work Order

Work is assigned

A hard copy or email report is given to the crew

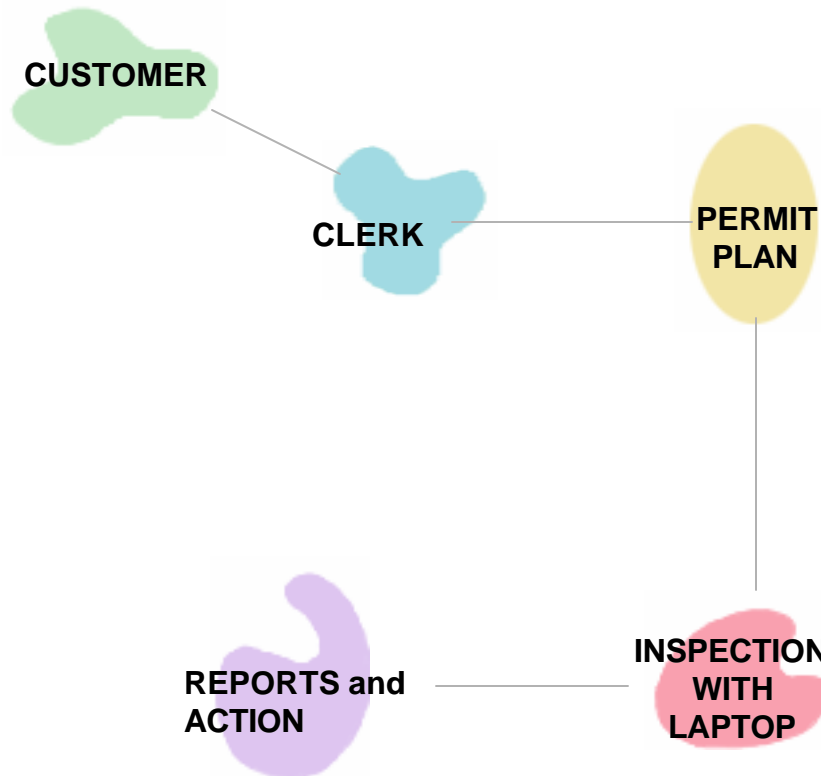


The work is performed

TIMBER !

New Workflow

5 steps!



System Architecture

ESRI ARCMAP Application

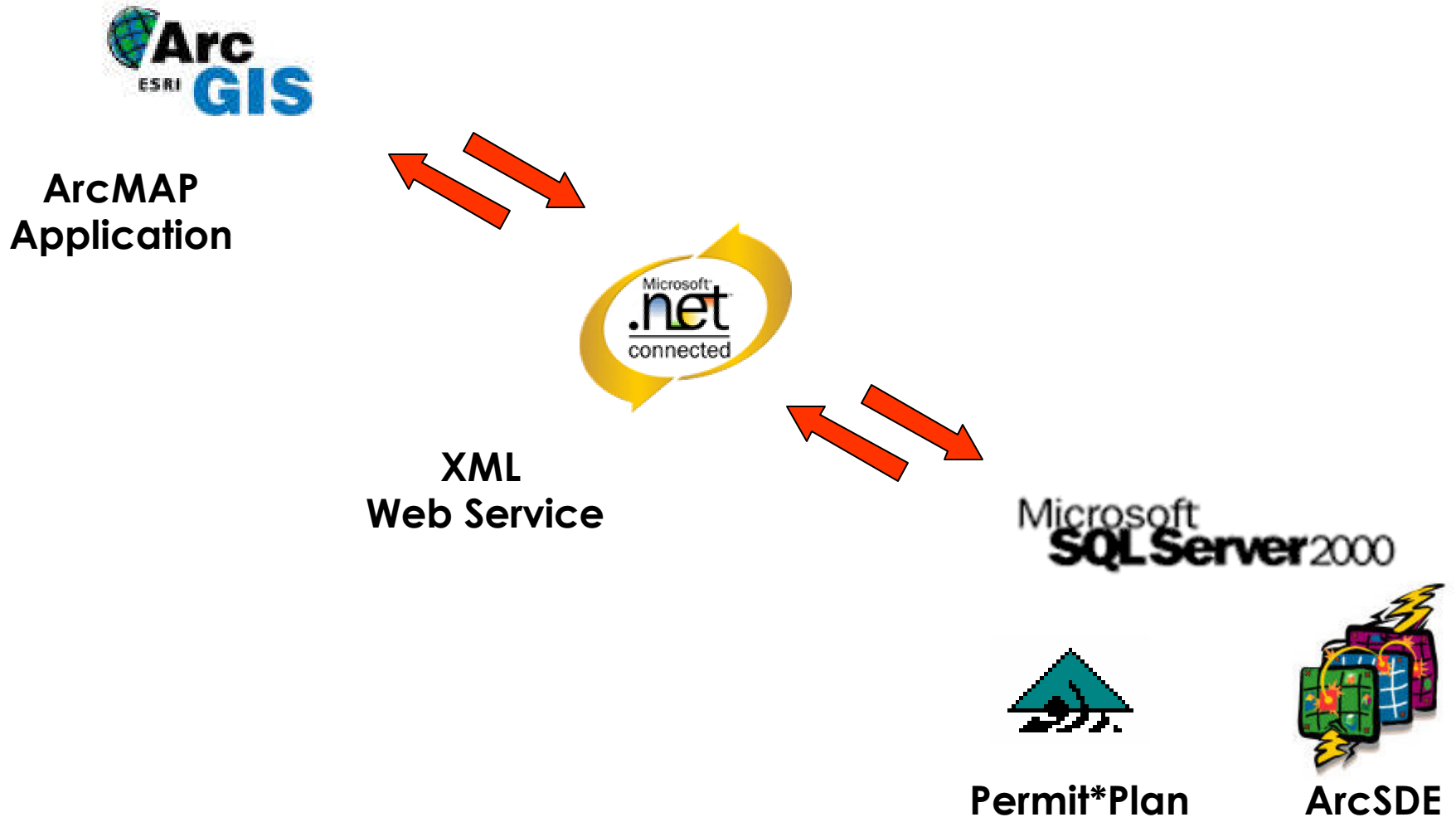


Microsoft Web Service

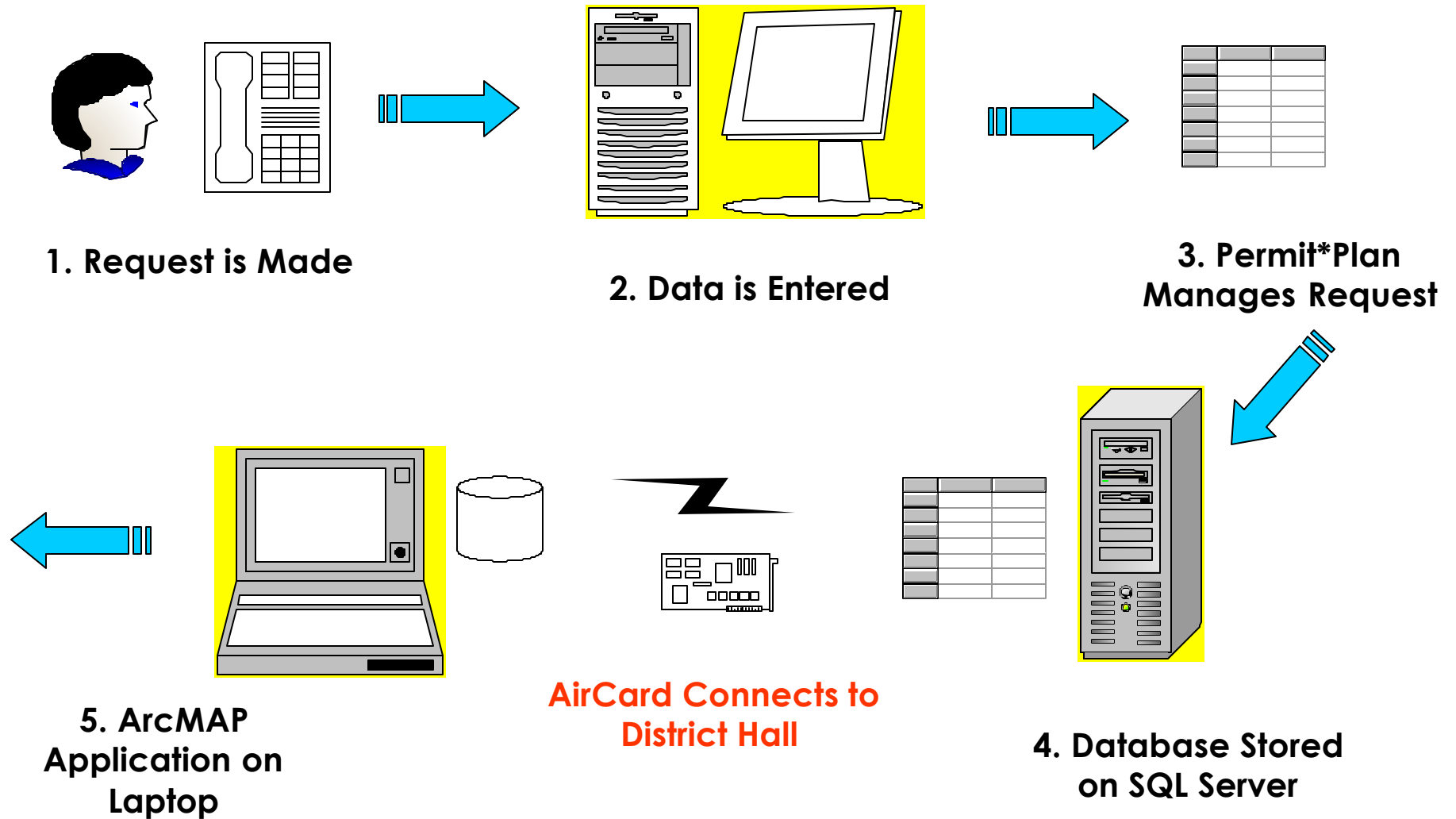


SQL Server Databases

System Architecture



System Architecture

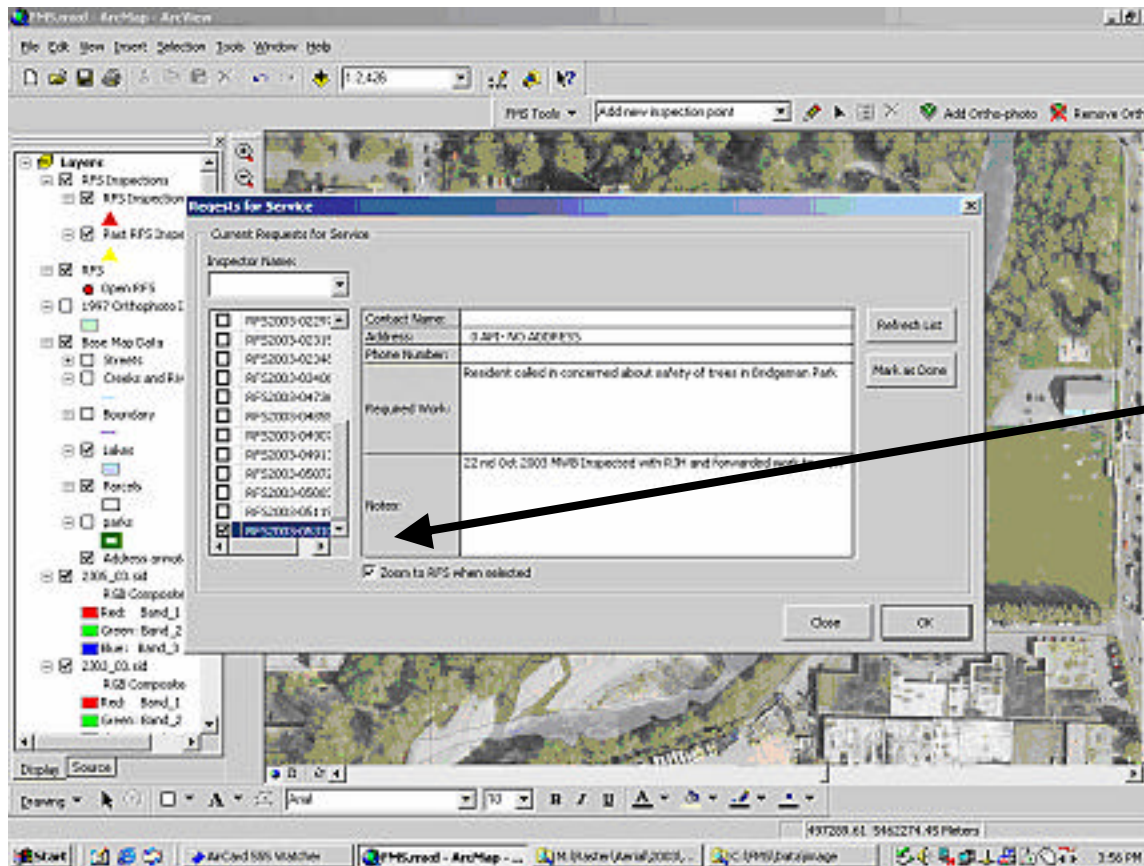


System Architecture

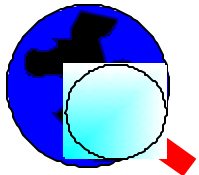
An XML string is passed from Permit*Plan and parsed by the Application

Each request is displayed as an individual record in the Inspector's task list

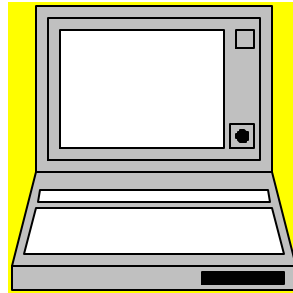
6. Inspector Selects Request for Service to Answer



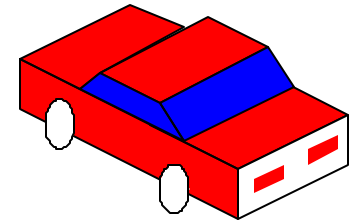
System Architecture



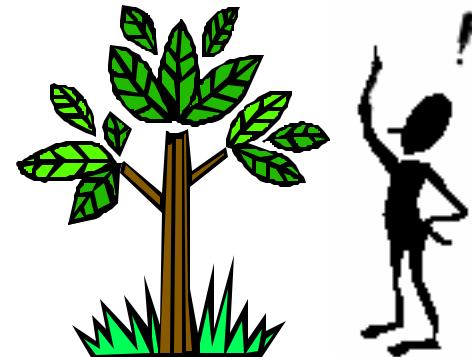
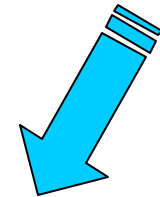
7. Geocoded RFS is Found



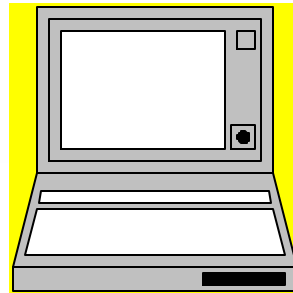
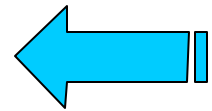
8. Zooms to Location on Screen



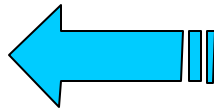
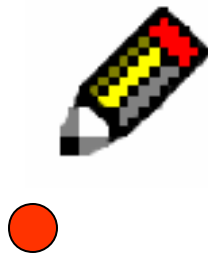
9. Inspector Drives to Location



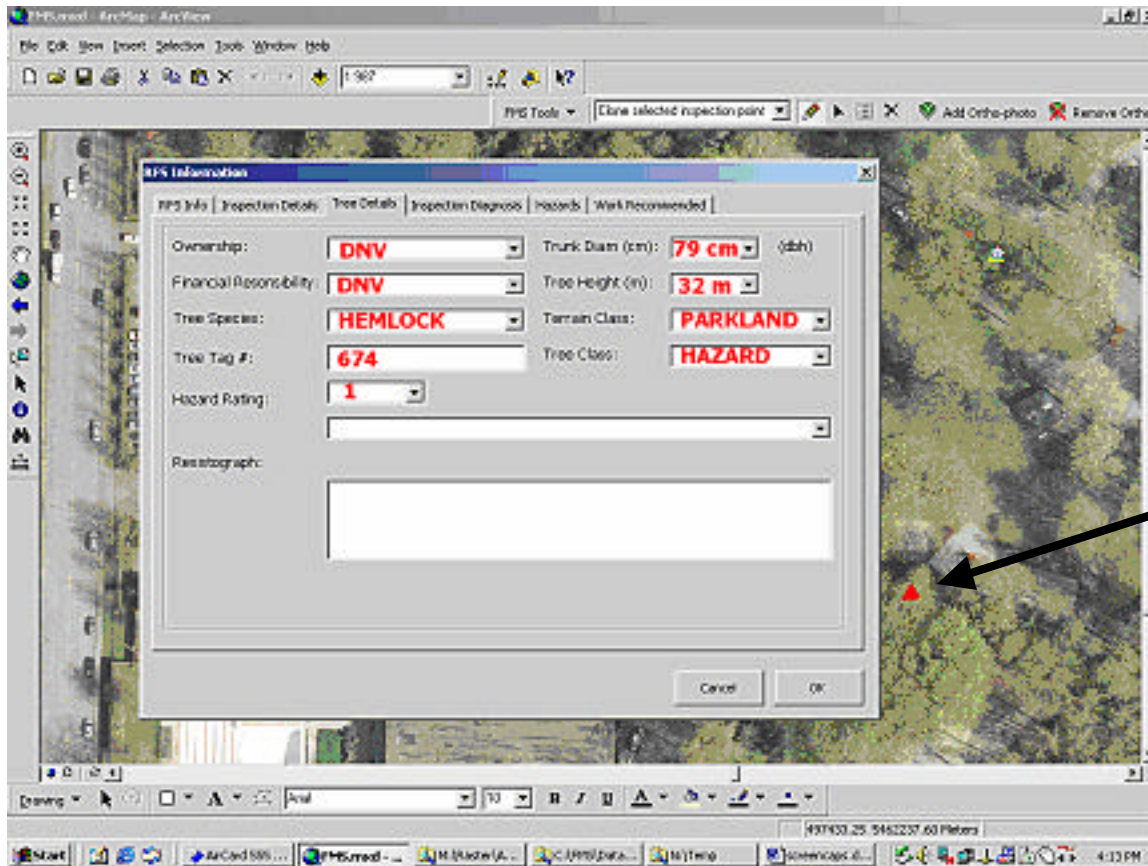
10. Inspector Finds Tree and Performs Inspection



11. Point Is Placed on Aerial Photograph



System Architecture

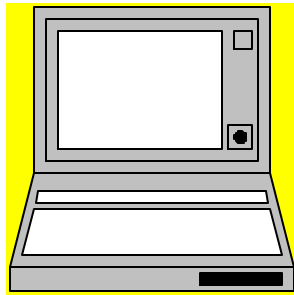


Once point is placed the attribute form pops up on screen

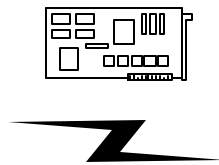
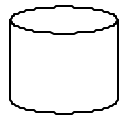
Attributes are standardized and entered using drop down boxes

12. Inspector Fills in all Required Fields

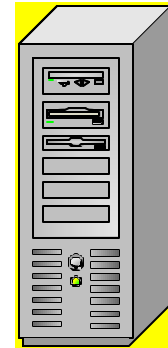
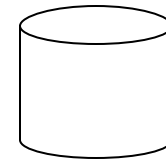
System Architecture



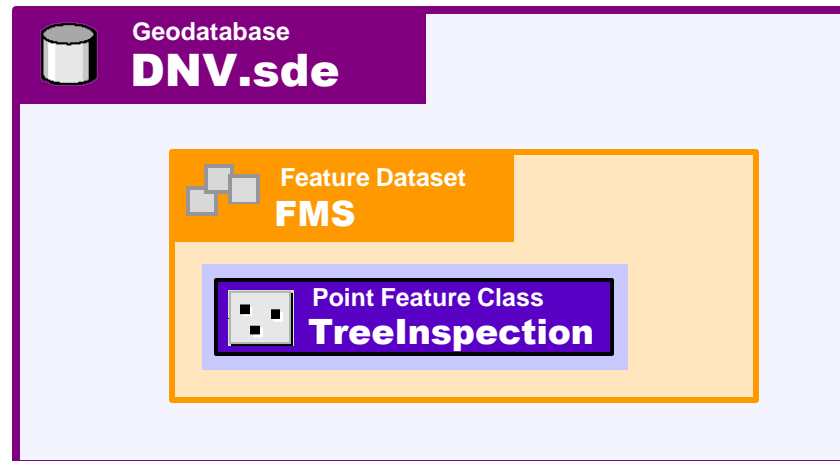
13. Stored in Personal Geodatabase on Laptop



AirCard Connects to District Hall



14. Point is Promoted to Enterprise SDE Geodatabase



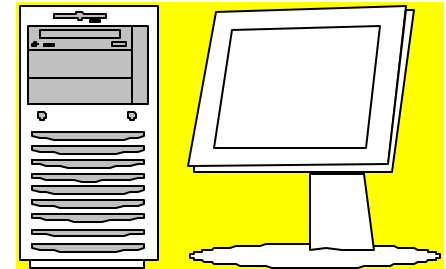
System Architecture



15. Lights Out Environment



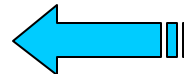
16. Scheduled Task is Triggered



17. Batch File Initiated



18. Crystal Reports Creates Work Order



19. PDF Report can be Printed or Emailed

Management and Analysis

Workflow Efficiency

Spatial Analysis

Workflow Management

- Reports used to look like this...

Filled out by hand

DETAILS OF TREE INSPECTION

Sketch:
Address:

DNV owner

Tree species, size and inspection details		Workplace hazards		
2 Cedar	Tree are not a hazard	Bip/Infant		
2 Hemlock	at this time.	Traffic		
2 D. Fir	Annual inspection per	Electrical		
	Possible limb failure - target house and garage.	Steep gradient		
		Deep water		
		Public safety		
		Tree unsafe to climb		
		Other		

DNV or private property?	<input checked="" type="checkbox"/> Public	Private	Other
Is there a target?	<input checked="" type="checkbox"/> Yes	No	-
Frequency of target? (circle)	<input checked="" type="checkbox"/> High	Medium	Low
Previously topped?	Yes	NO	-
Tip dieback?	Yes	NO	-
Heavy cone crop?	Severe	Moderate	<input checked="" type="checkbox"/> Low
Defects on bole?	Severe	Moderate	Low
Defects on limbs?	Severe	Moderate	<input checked="" type="checkbox"/> Low
Disturbance to roots?	Severe	Moderate	Low
Physical inspection recommended?	<input checked="" type="checkbox"/> YES	No	

Date: July 22, 2002

Name of inspector: _____

Form No. 17802

Workflow Management...

- ...now Reports look like this...

Automatically generated

 **The Corporation of the District of North Vancouver**
TREE INSPECTION REPORT

RFS Number: RFS2002-04331
Inspected by: MWB
Inspection Date: Friday, April 25, 2003

REQUEST FOR SERVICE DETAILS

Address: 5385 NANCY GREENE WAY Location Details: Grouse mountain Flying club would like to remove taller trees and replace with shrubs along strip beside capilano road at cleveland Park
Contact Name: ROMAN KANAK
Contact Phone:

TREE INSPECTION DETAILS

Ownership: — NA —
Tree Class: — NA —
Terrain Class: — NA —

HAZARD INFORMATION

Targets? NO
Target Frequency — NA —
Property Damage? — NA —

INSPECTION DIAGNOSIS



Asset management

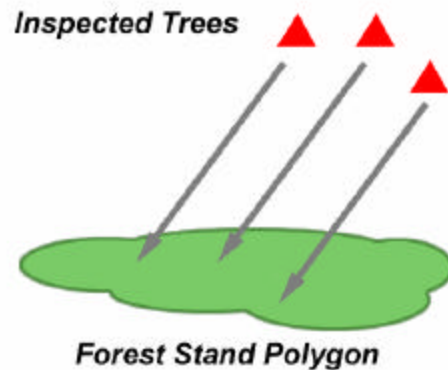
Arboricultural Staff can use FMS to:



- View multiple GIS layers
- Allow for easy visualization and assessment
- Proactively deal with an unhealthy area

Analysis Module

Inspected Trees affect our Forest Stands



<----- Tree inspection feature class.

<----- Forest stand feature class.

- Forest stands are dynamically related to tree inspections.
- Over time their health rating will increase or decrease depending partially upon tree inspections.

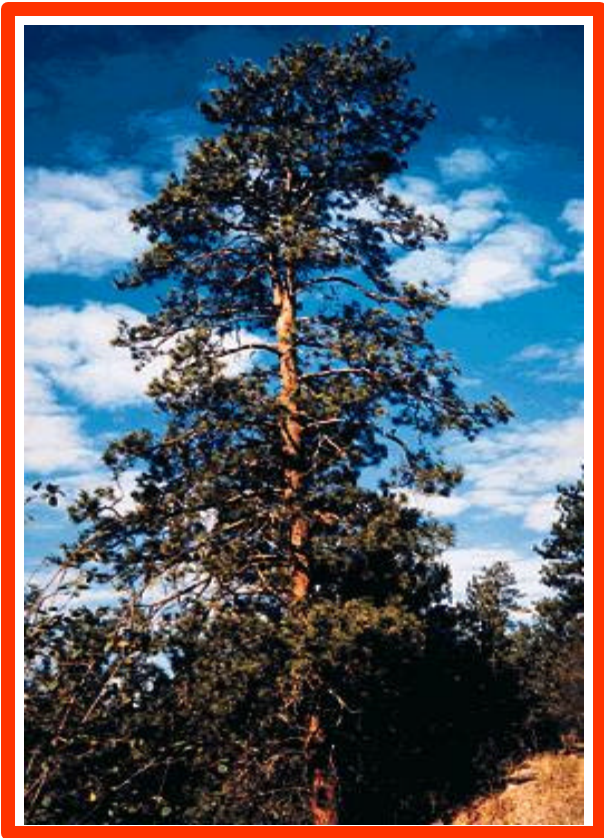
Project Summary

Environmental Stewardship

Corporate Returns

Future Uses

The Economic Benefit of Trees



- Trees manage storm water
- Filter air pollution
- Sequester Carbon
- Reduce risk of landslides
- Kyoto Protocol
- City of Salem Oregon = \$100 million

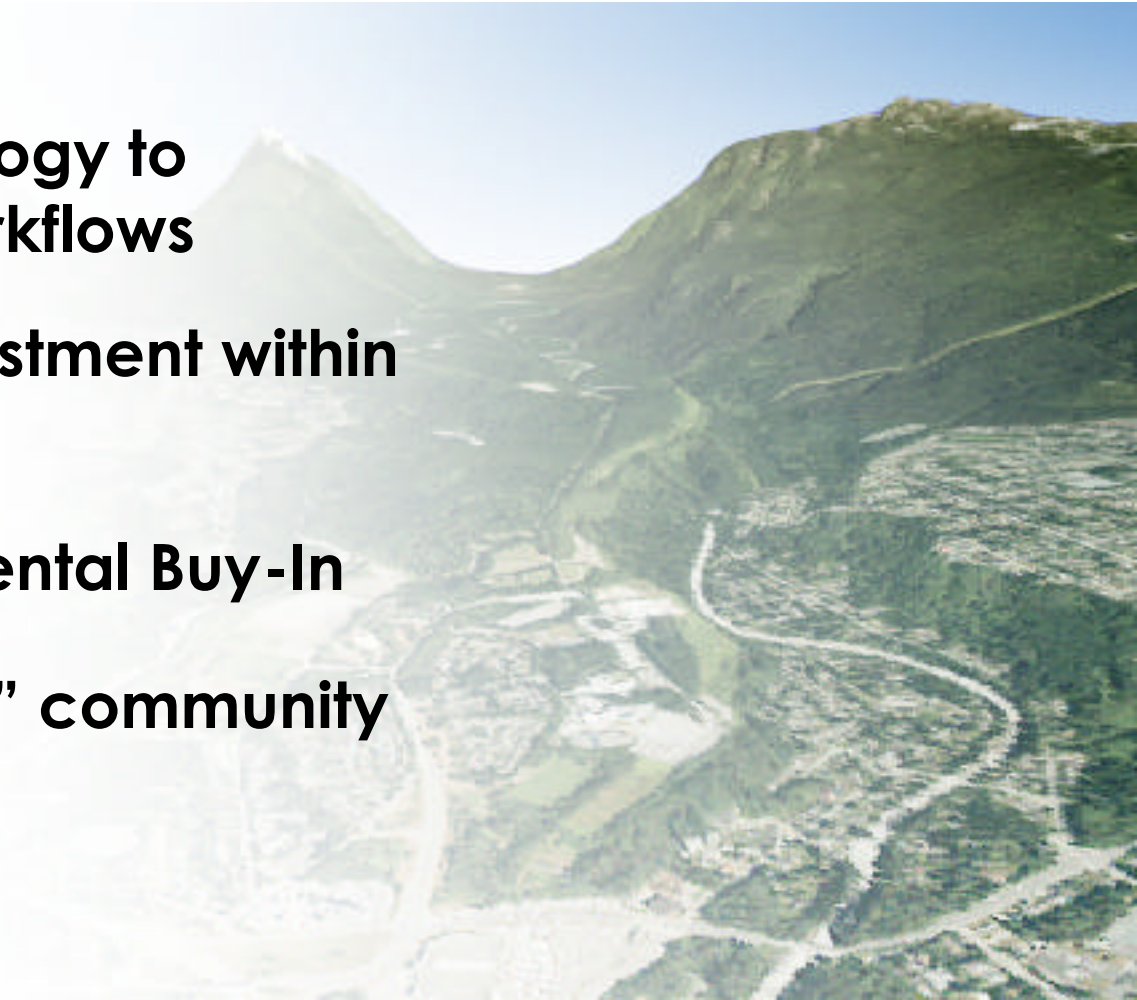
Project Specifics

- Built by GIS Department / Forte Consulting and GDS Consulting
- System will talk to other District Software
- Usability of Custom software



Corporate Benefits

- **Use of technology to streamline workflows**
- **Return on Investment within the first year**
- **Interdepartmental Buy-In**
- **“Smart growth” community planning**



Future Uses...



- **Trail infrastructure inventory**
- **Protecting the community from forest fires**
- **Mapping mosquito breeding-grounds**
- **Many more.....**

Conclusion

- Latest in GIS technology integration
- First step towards digital management of assets
- System can be extended to other departmental asset / liability management systems

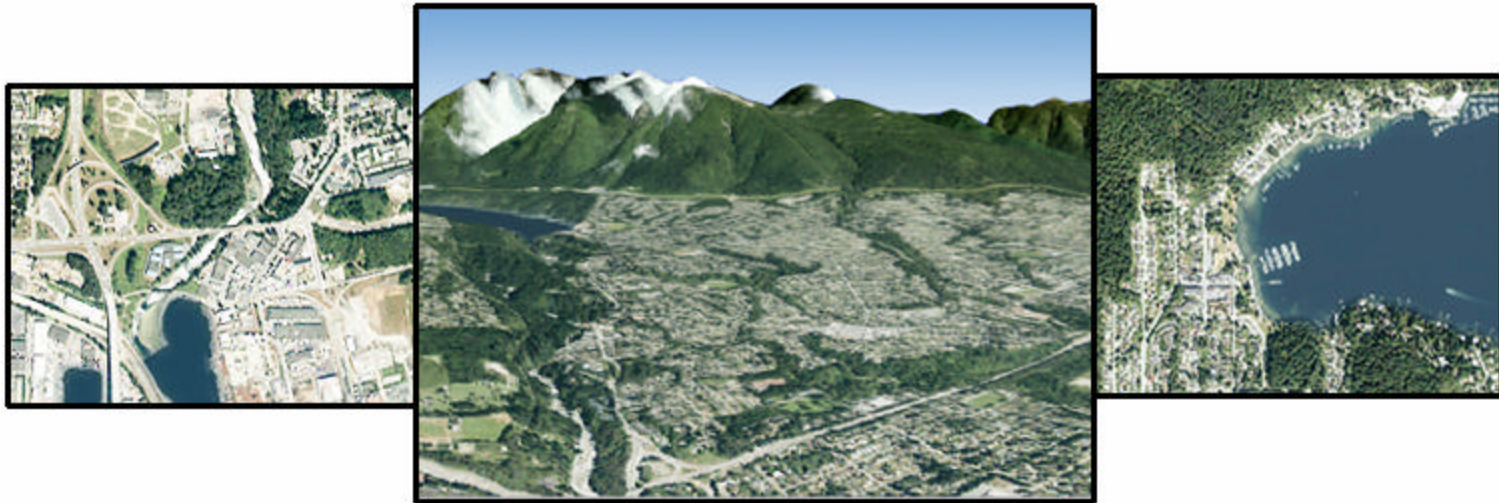


Questions ?

Thank you...



The District of North Vancouver's Forest Management System



Presented by
Mark Brown, Environment Dept
and Meaghan Taylor, GIS Dept