Maine Counties GIS Forum

How Can Geographic Information System Technology be Better Utilized by Maine County Government?

University of Southern Maine, Gorham Campus

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Maine Counties GIS Forum

Introductions

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What is a GIS?

- Definition
- Technology overview
- Data sets
- Applications
  - How is GIS used in Municipal/County Govt?

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Definition of GIS

- **Geographic Information System**
- ***An automated system composed of hardware, software, data and people used to create, store, display and analyze spatial data and related attributes***
- **GIS is not new**
  - **Automated systems are replacing manual systems**
- **A GIS answers questions, such as:**
  - *"where is it?"*
  - *"what is it?"*

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Distinguishing Characteristics of GIS

- Map information is stored as **layers**
- Map features are connected to **descriptive database** information (**attributes**)
  - Interrogate the map
    - Click on something to ask what is this feature?
  - Perform a data base query, see a graphic result
    - Where are the things that meet these criteria?
- Related Technologies, include:
  - CAD
  - Remote sensing/satellite imagery
  - GPS

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Data Stored as Layers

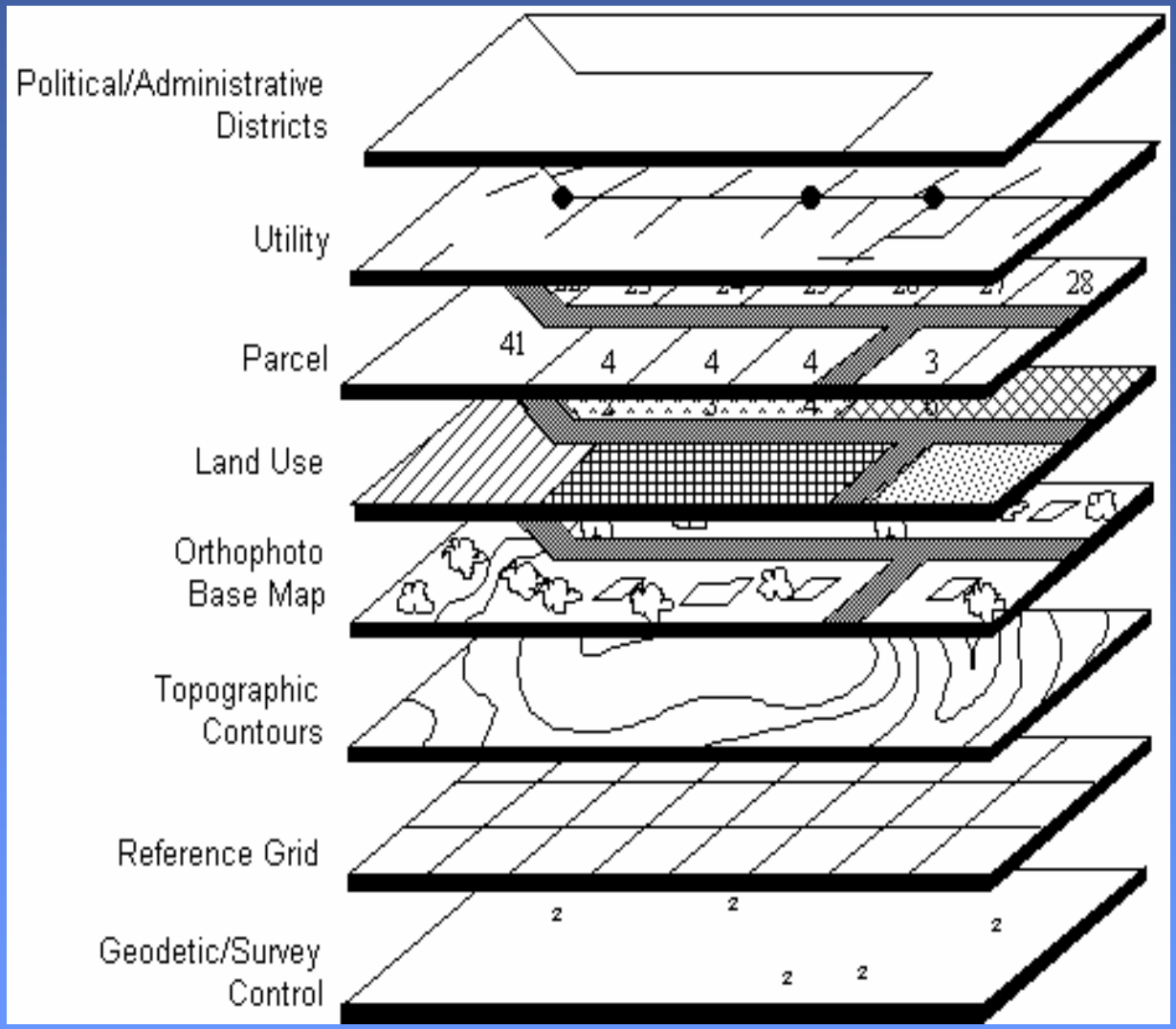

Image Courtesy of URISA

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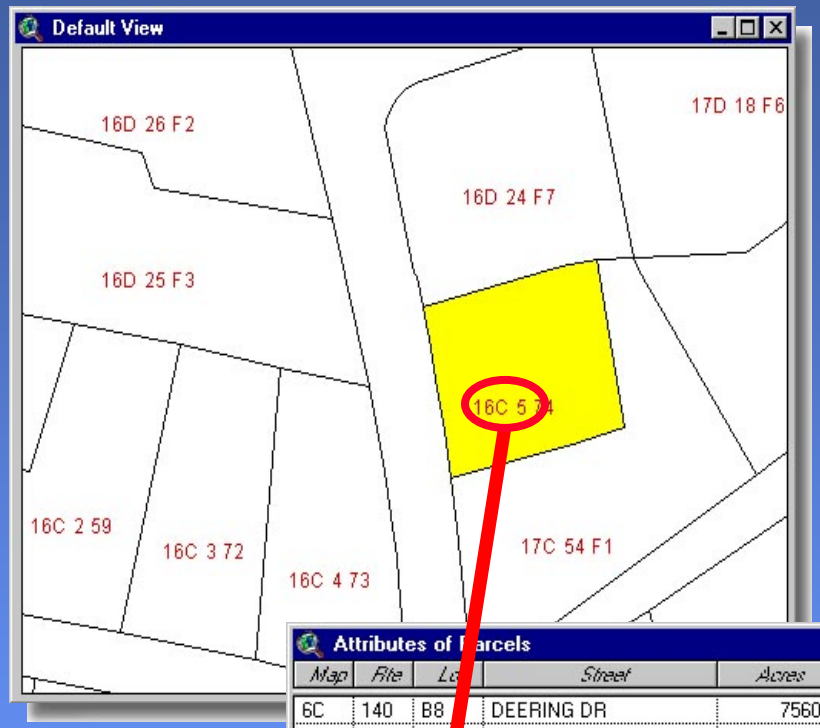
Map Features have Database Attributes



Attributes of Parcels

Map	Rte	Lot	Street	Acres	Lastname	Firstname	Loc_	Loc_street	
6C	140	B8	DEERING DR	75600	PAFF	ANDREW	50	DEERING	DR
6C	139	B7	DEERING DR	74700	KAZARIAN	ARMAND	60	DEERING	DR
10C	47	D1 5	VINEYARD AVE	190700	GRIFFIN	GENIE	220	VINEYARD	AVE
6C	138	B6	DEERING DR	74000	R A REAL ESTATE	TRUST		DEERING	DR
14C	64	D	STAGE HARBOR RD	131500	ROBERT WILSON I	II TRUST		STAGE HARBOR	RD
17C	54	F	QUASSON RD	240900	SWEENEY	ROBERT	4	SHORE	RD
6C	137		DEERING DR	74000	ANDERSON	H RUSSELL/ET AL	82	DEERING	DR
15C	6	1	MILL POND RD	0	SMITH	ROY	64	MILL POND	RD
16C	5	74	SHORE RD	208200	NISSMAN	HARVEY	20	SHORE	RD
15C	8	8	MILL POND LN	0	YEAW	COLEMAN	27	MILL POND	LN
5C	52	B4	DEERING DR	75200	SHERIN	KEITH	98	DEERING	DR
16C	87	65	HOMESTEAD LANE EAST	0	FORGERON	EDWARD	19	HOMESTEAD LANE	EAS
9D	56	G3	YOUNGS FARM LN	248000	KELLEY	PAUL	27	YOUNGS FARM	LN
9C	52	M3A	BARNHILL MARSH	33500	HARRIS	JULIE		BARN HILL MARSH	
14C	8	3	STAGE HARBOR RD	0	NORMAN	EDWARD	180	STAGE HARBOR	RD
2C		1	MAIN ST	91300	TOWN OF CHATHAM	/ S.C. CEMETAR		MAIN	ST

Each parcel polygon is assigned a unique identifier (map-lot). This unique ID corresponds to a row in the Assessor's CAMA system. This allows each parcel to be linked to a data record in the Assessor's data.

Same approach for all layers: roads, utility systems, zoning, etc.

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For example: Fire Hydrant "Attributes"

Attributes drive the map display

And allow you to interrogate for details

Size of hydrant from **FLOW_GPM** column

Date label from: **YR_INSTALL** column

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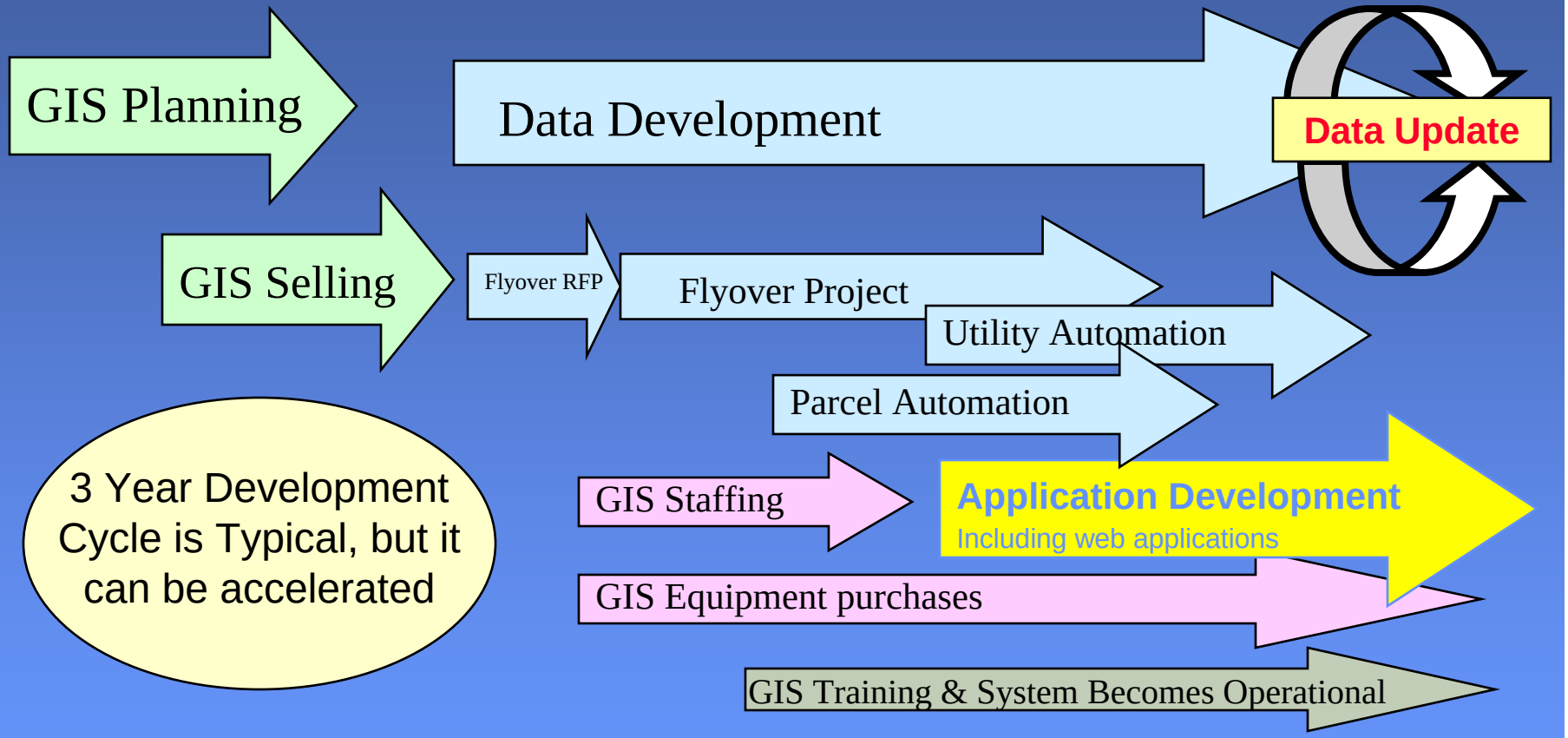
GIS Development Lifecycle

Temporal view



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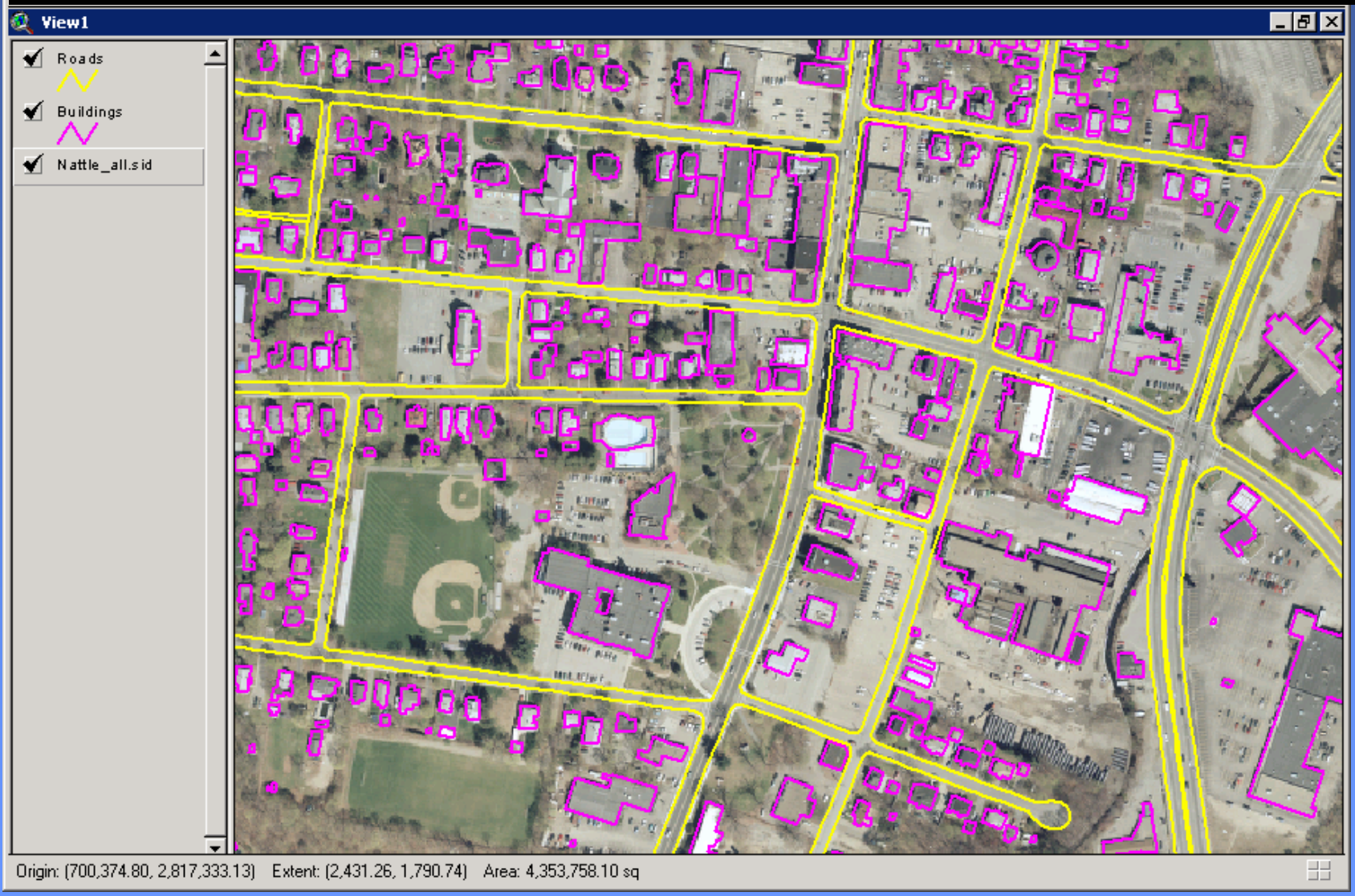
Base Map Data are Derived from Aerial Photography



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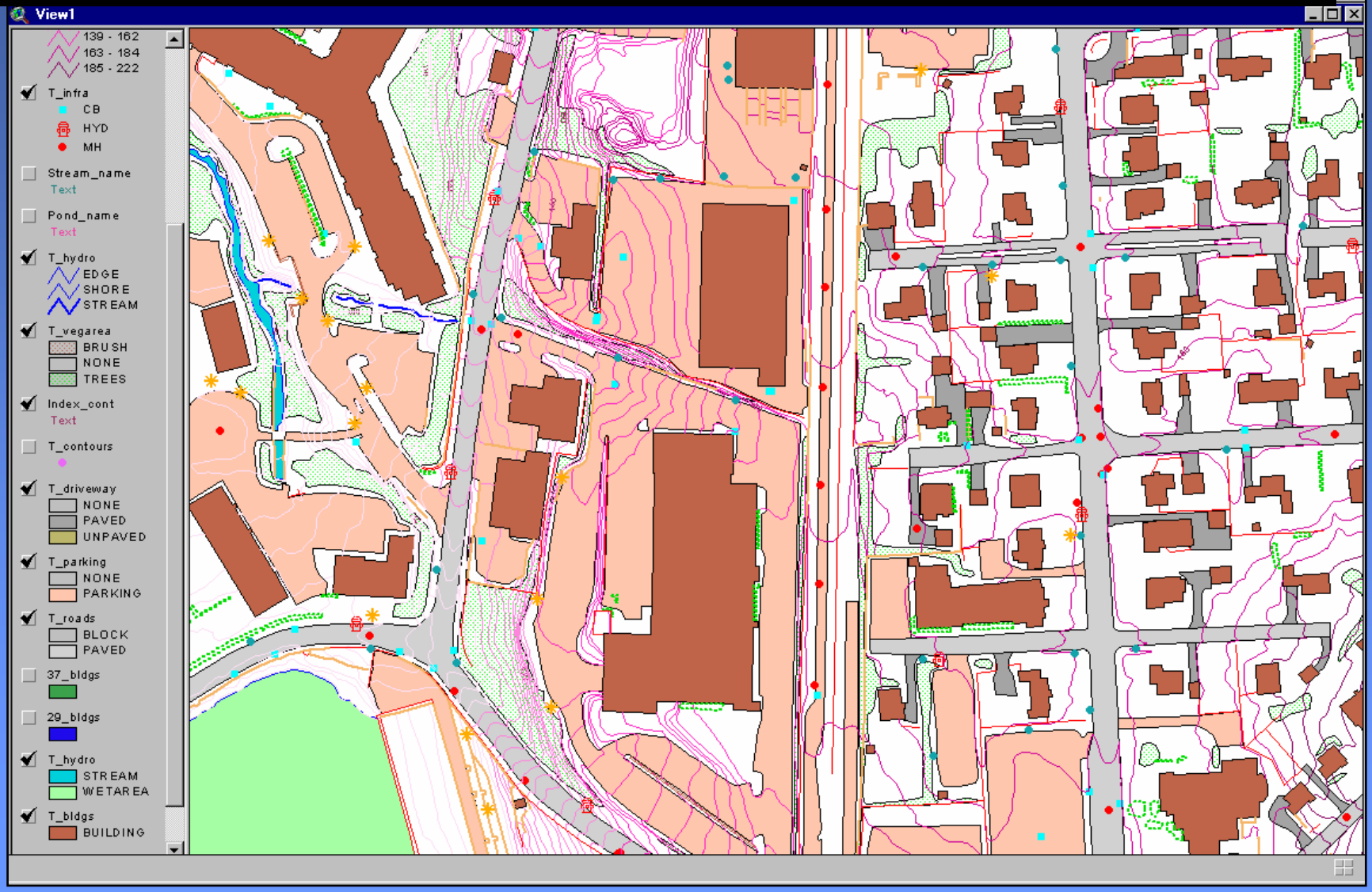
Digital Base Map Layers

Interpreted from flyover



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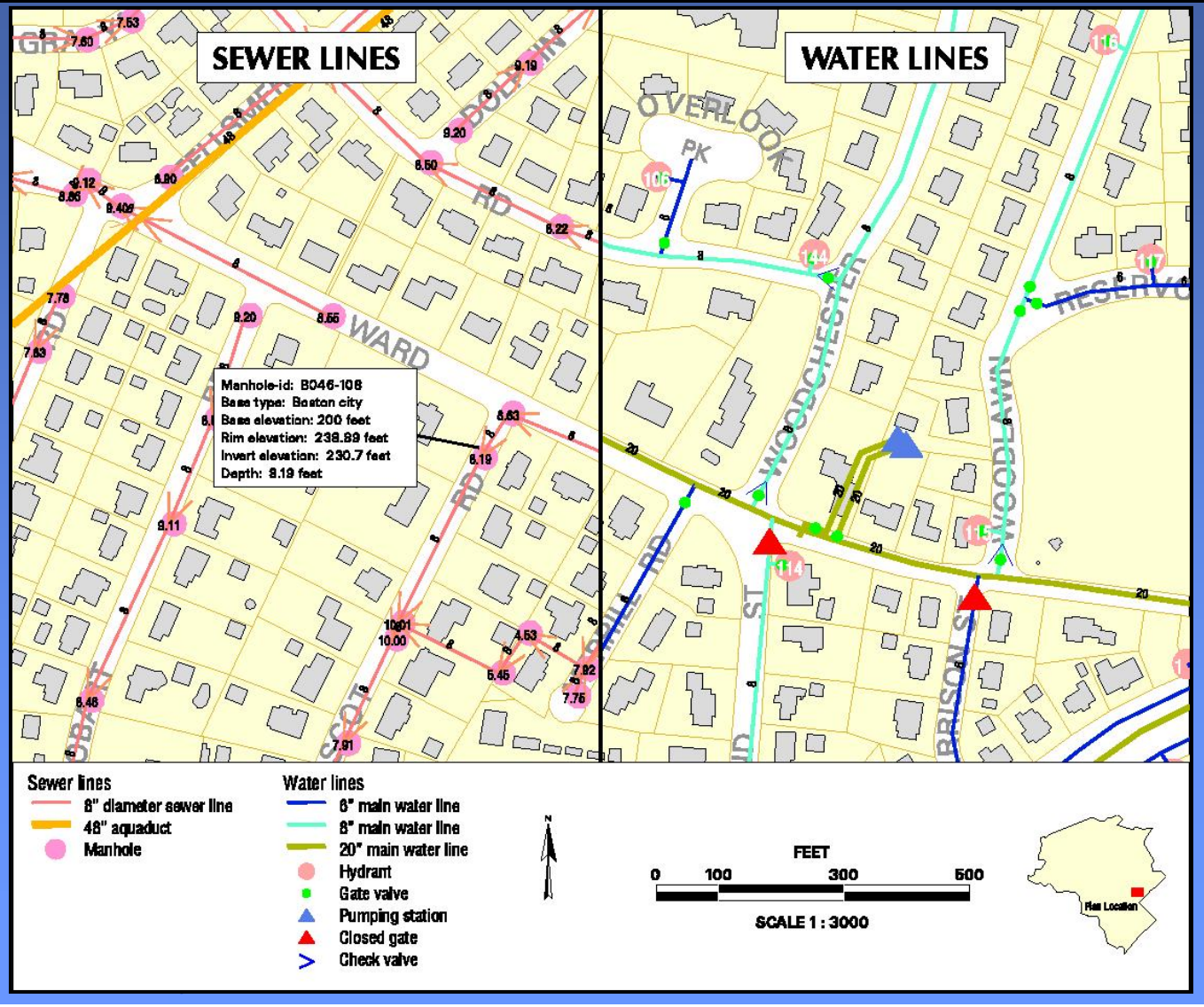
GIS Representation of Infrastructure Data



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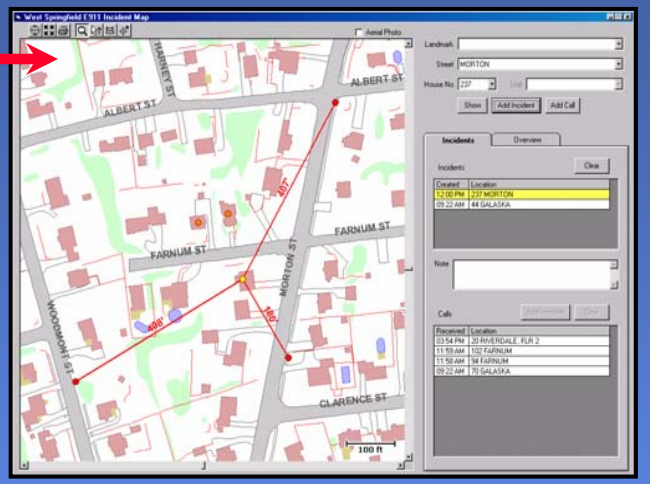
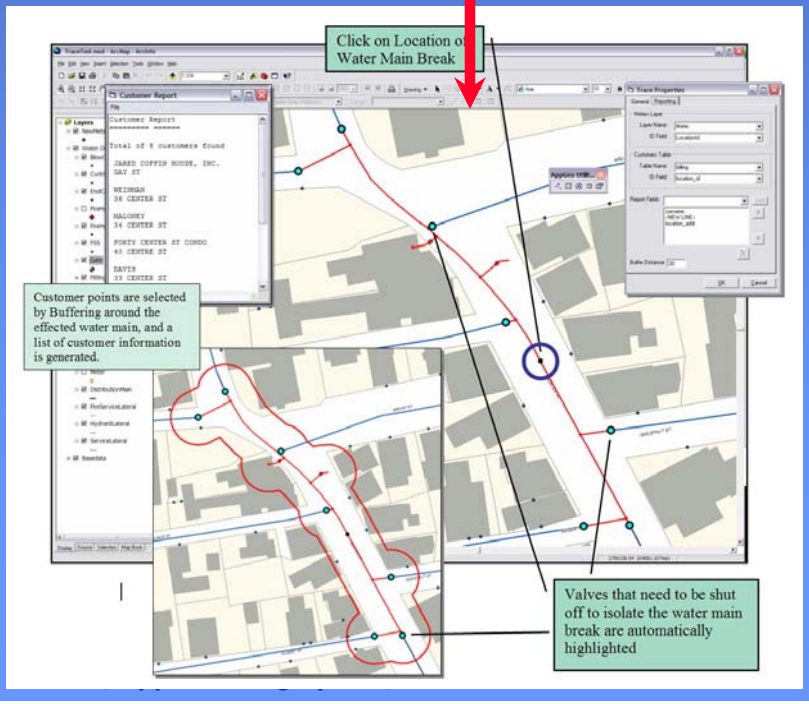
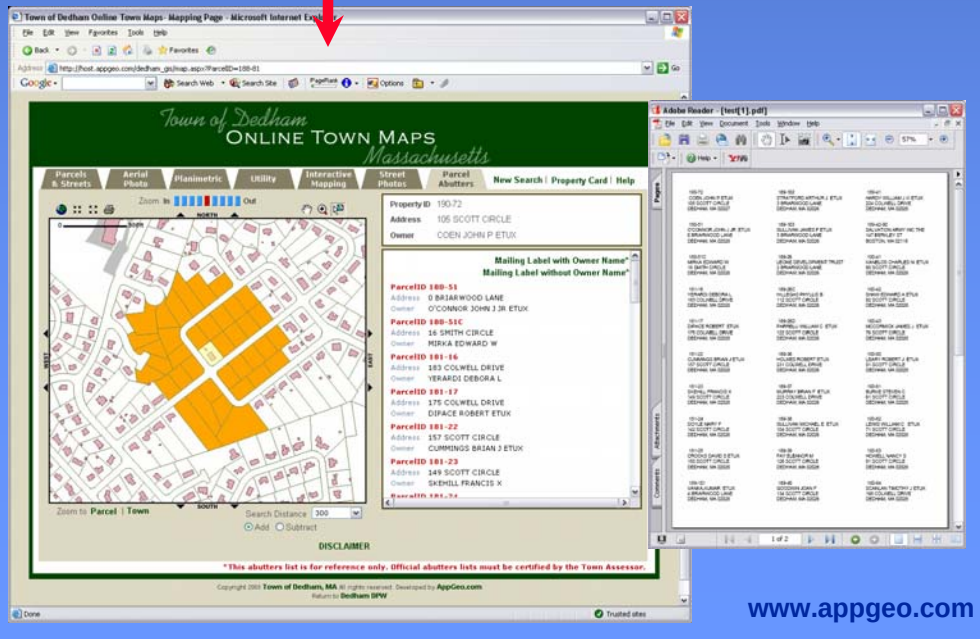
Examples of GIS-based Analysis & Spatial Queries

- Proximity analysis
- Buffer analysis
  - Abutter's queries
- Upstream/downstream tracing







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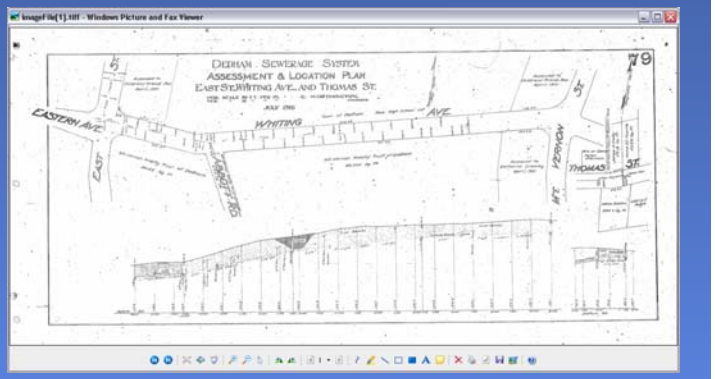
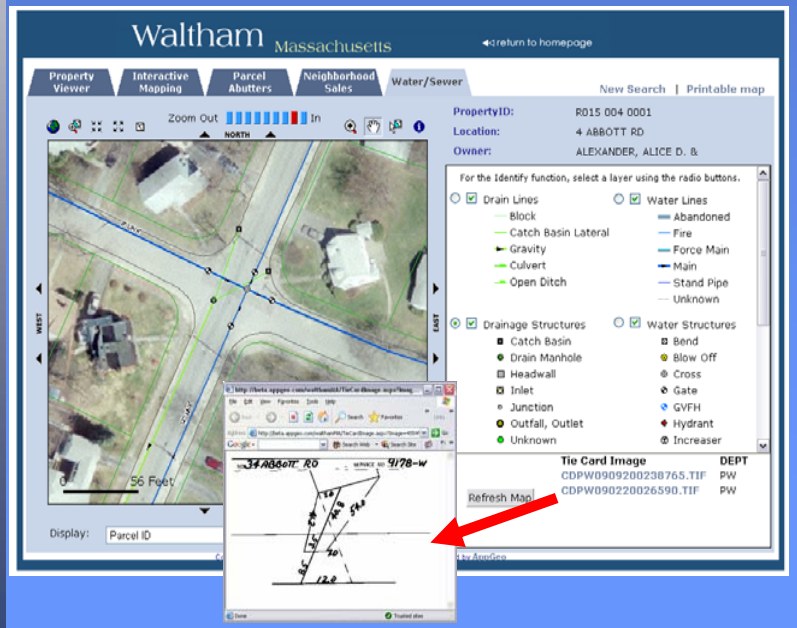
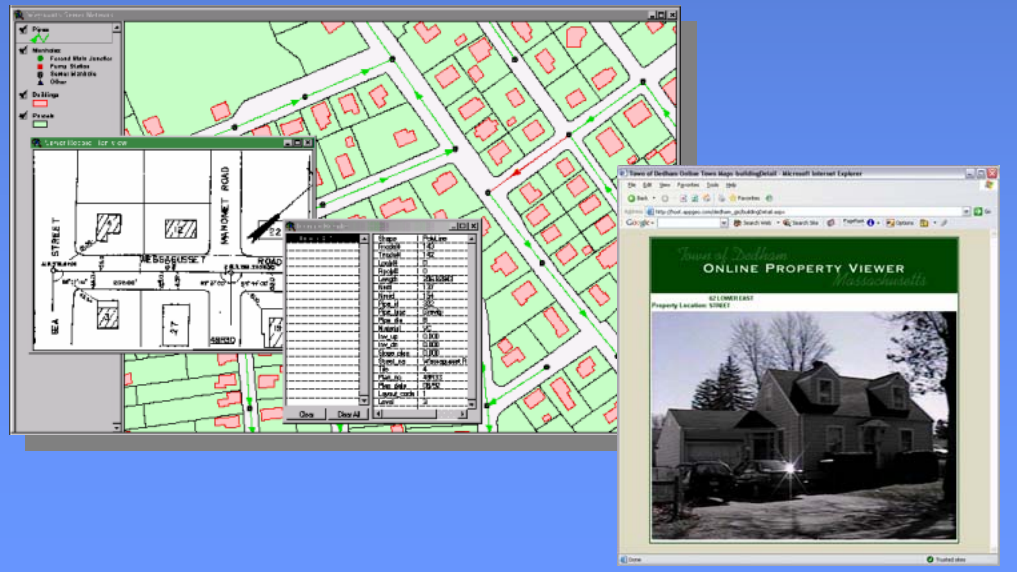
GIS Enabled Document Management

Providing access to images

- GIS can be used to retrieve scanned imagery
  - Photos
  - Scanned plans/record cards
  - Documents (e.g. deeds)







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Typical Municipal Applications

Myriad possibilities, priorities differ by community

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- **Assessor**
  - Assessor's map maintenance
  - Support of revaluation (thematic mapping)
  - Abutters notifications
  - Providing public access to data/maps via web
- **DPW/Engineering/Water & Sewer**
  - Water, sewer, drain system mapping
  - Water, sewer, drain network tracing
  - Infrastructure improvement planning
  - Support of special studies (e.g. Master Plans)
  - Support of construction activity
  - Logistics: *e.g*. snow plot routing
  - Document archive
- **Building Dept.**
  - Permit location mapping
  - Confirm permit applications with spatial criteria (e.g. zoning, historic district, wetlands)
- **Planning**
  - Support at public meetings
  - Zoning (mapping, appeals, bylaws)
  - Grant applications (ISTEA, CDBG)
  - Special projects (e.g. facility siting, economic development)
  - Development/sub-division approvals
- **Public Safety**
  - Support of dispatching
  - Development of "street books"
  - Sensitive receptors/hazards mapping
  - Crime analysis
- **Schools**
  - Redistricting
  - School bussing eligibility
  - School bus routing
- **Health, Conservation Comm., etc**

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Mature GIS Configuration

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- **Desktop GIS Package**
- For the ***Power Users***
- For example: ArcView

WkSta.

- **Workstation GIS Software**
- For the ***GIS Staff***
- For example: ArcInfo

Large Scanner

Plotter

Color Printer

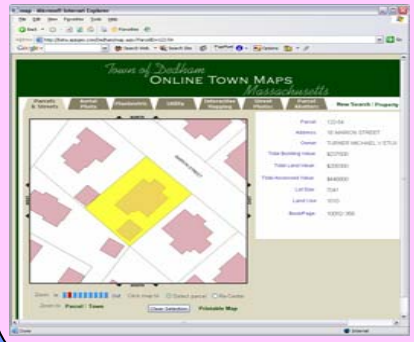
Local Area Network (LAN)

Browser based GIS

Internet GIS site for general public

and/or

intranet GIS site for town personnel



Links to Town Databases

CAMA

Water/Sewer Billing

School Enrollment

Permitting

GIS Server(s)

As necessary:

1) Simple file server
2) GIS web server (e.g ArcIMS)
3) GIS data server (e.g. ArcSDE)

Wide Area Network (WAN)

Annex Bldg(s).

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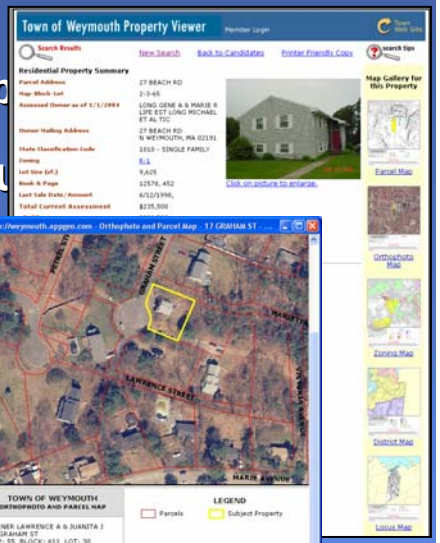
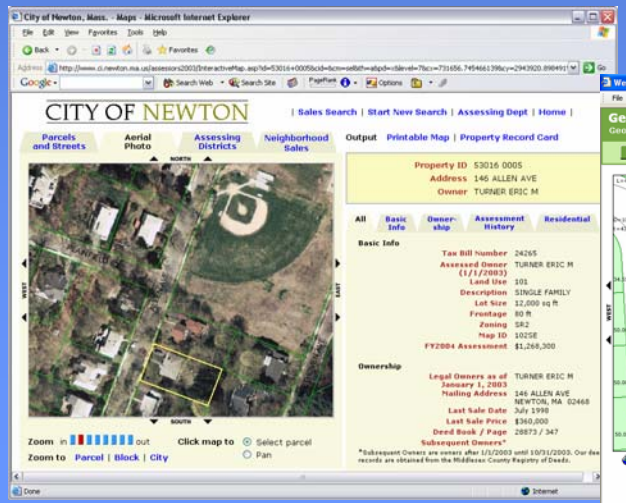
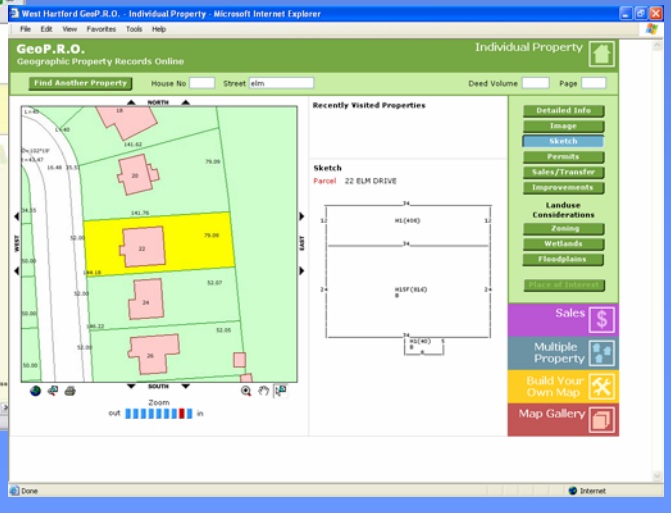
New Web-based GIS Technology

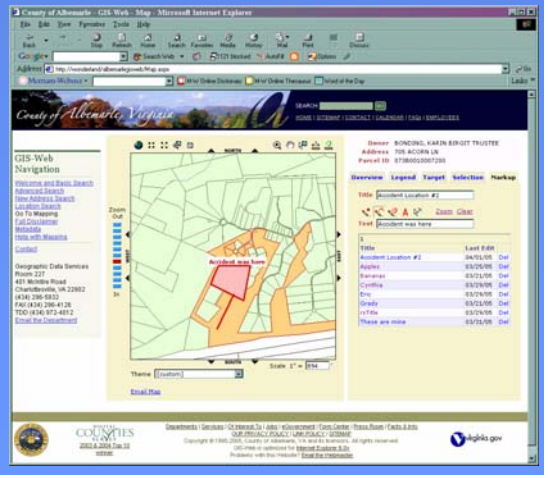
Major trend impacting the industry (and the world)

- Browser based applications make the most sense for end users
  - Additional benefit of making information available to the p
- Web-based GIS is replacing desktop GIS for most end u
  - 90% of the people use only 10% of the functionality
  - Web can easily deliver the most important 10%
- People know how to “browse the web”
  - Lowers barrier for leaning new software
  - Universal high-speed web access becoming a reality









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Web mapping:
One-stop shopping for all information on a parcel
Minimum number of clicks to info you need

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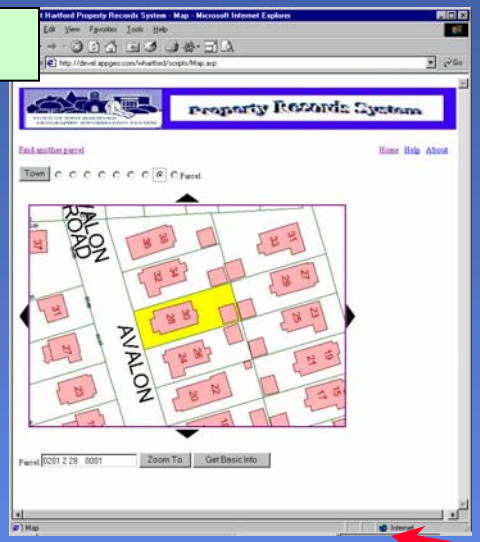
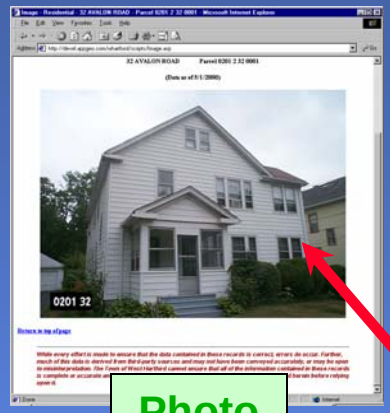
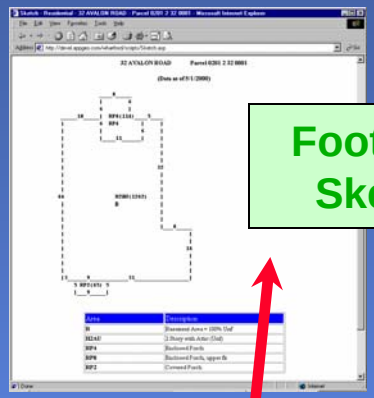
Map



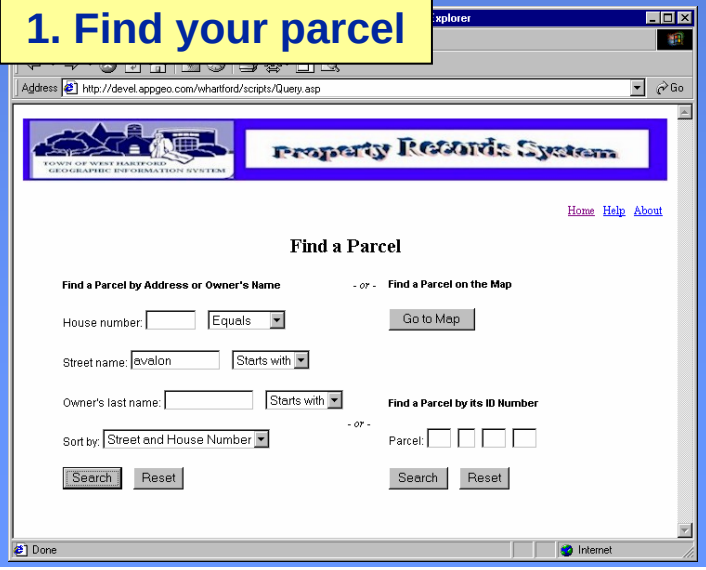


Photo

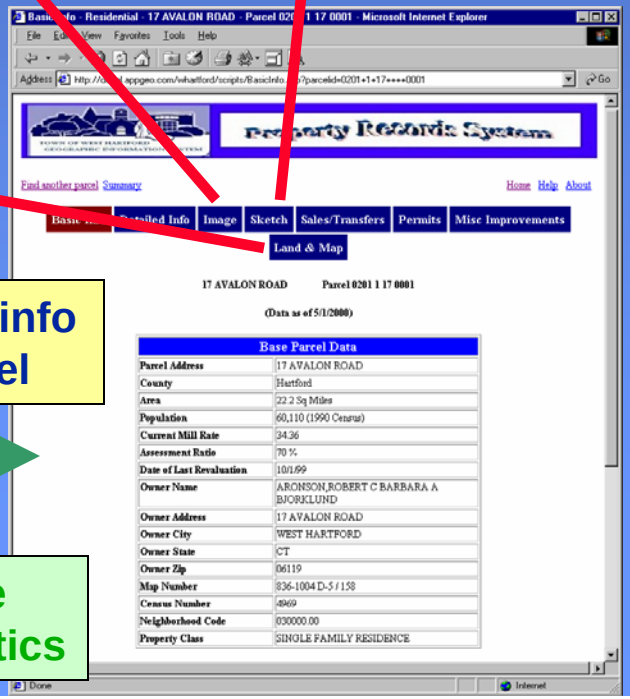


Footprint Sketch

1. Find your parcel



2. Retrieval all info for that parcel



Database Characteristics