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# DEPLOYING A MUNICIPAL GIS WITH LIMITED RESOURCES



## ARCREADER & ARCPUBLISHER JUNE 23, 2009

DEPLOYING A MUNICIPAL GIS WITH LIMITED RESOURCES

ANDREW R. PORT, AICP, TOWN PLANNER – TOWN OF HANOVER, MASSACHUSETTS

# SUMMARY OF HANOVER'S GIS DEPLOYMENT

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Cities and Towns are a growing user group for Geographic Information Systems (GIS). Communities with limited funding and staff time must develop and maximize a GIS with great efficiency.

Hanover utilized the ESRI ArcGIS Software (with an ArcPublisher extension) to develop and deploy a broadly used municipal GIS without unnecessary expense by the Town. The system is now utilized daily as a resource by all town departments and public officials.

The initial funding for this system was designed to establish an efficient, low-cost, industry standard GIS platform for the Town to build on.

While complex maps and analysis continue to be developed by the Town Planner on an as-needed basis, the primary purpose of the "GIS Viewer" is to allow other municipal officials (most with limited or no GIS experience) regular access to the maps and data, and the ability to view, export or print basic maps on their own.

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## A “GET IT DONE” PERSPECTIVE

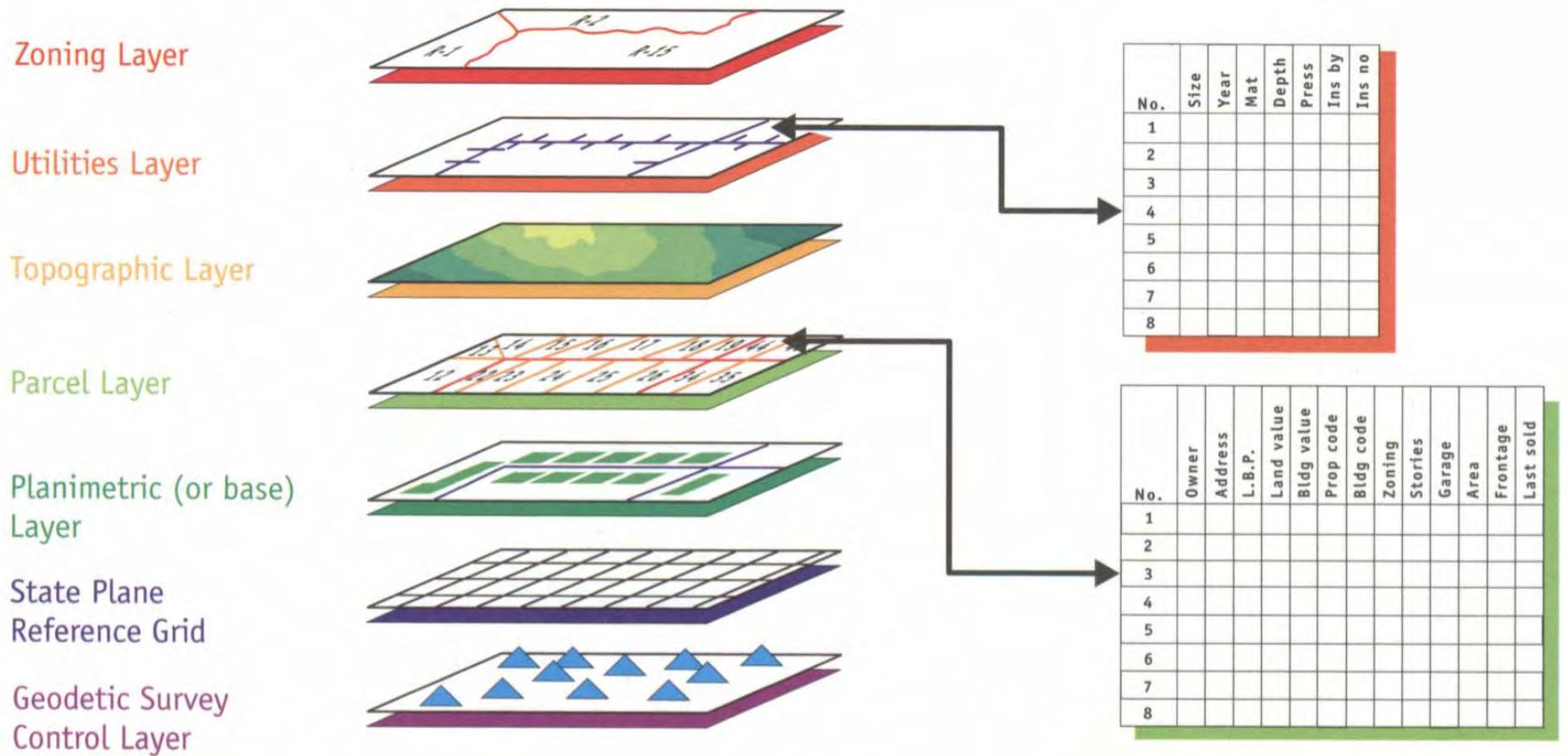
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- Planner & Town Official's Perspective
- Access to Property Information & Permitting Data
- Efficiency & Simplicity for Maintenance & Novice Users
- Regular Updates & Distribution (Network or Disk)
- Broad Use by Town Staff & Officials
- Limited Funding
- Limited Time for Updates & Development

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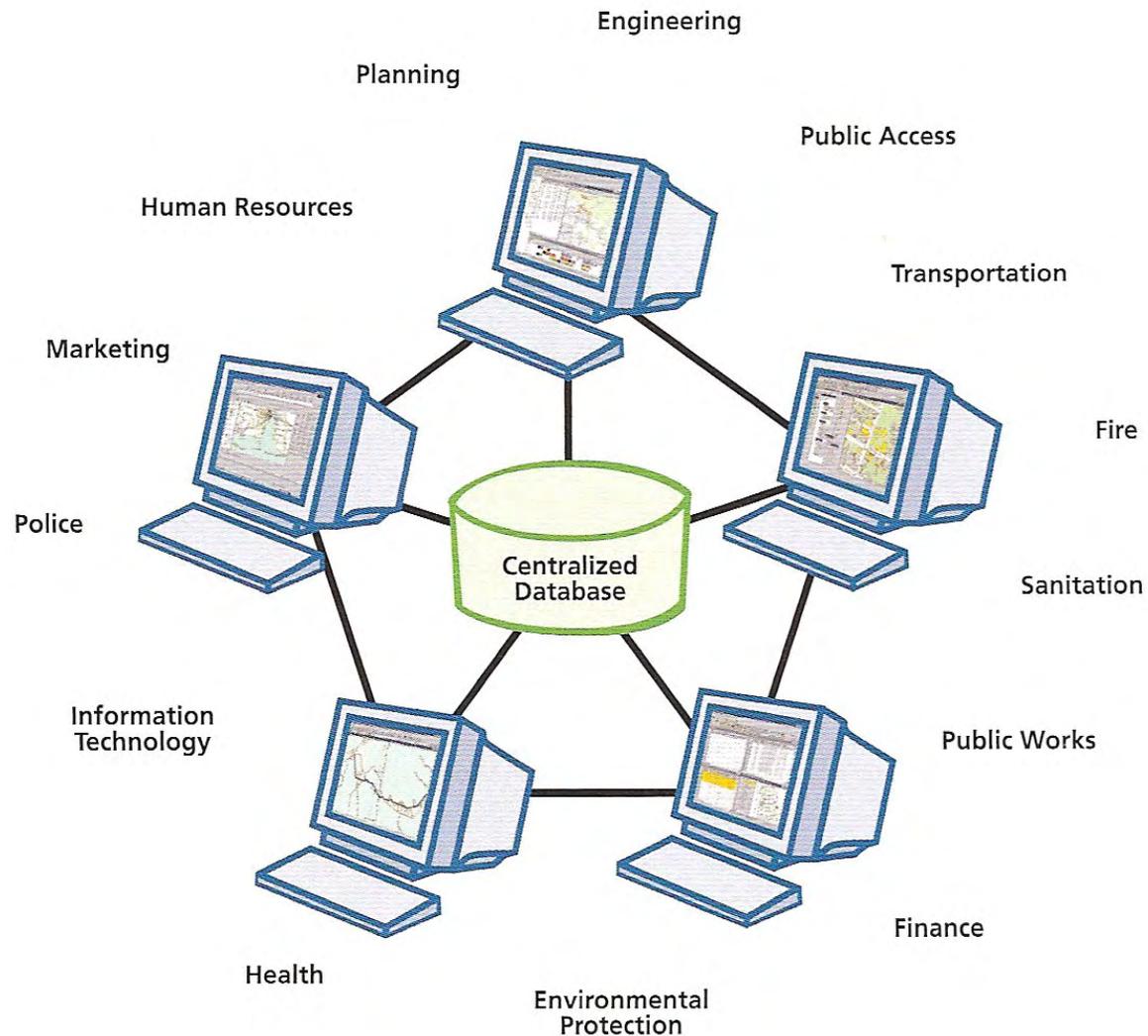
# GIS FROM A SMALL TOWN'S PERSPECTIVE



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# GIS FROM A SMALL TOWN'S PERSPECTIVE

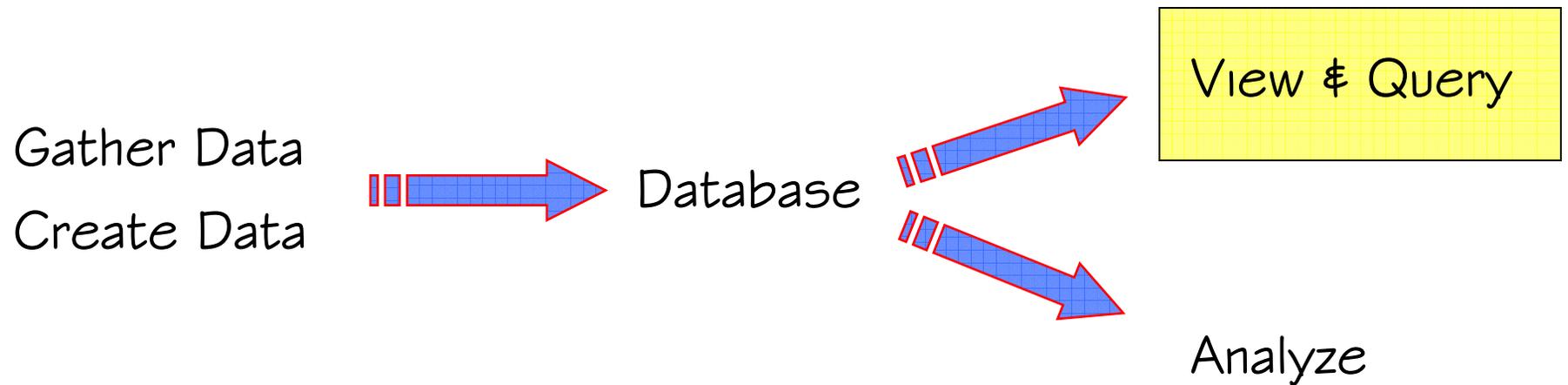


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# GIS FROM A SMALL TOWN'S PERSPECTIVE

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Most users need only view or query maps and data > Client Viewer

Select Users Create Maps & Data or perform Detailed Analysis > Full Version

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# HANOVER'S FUNDING FOR GIS

Year	Funds Expended	Project Summary
2000	\$300,000	DPW Consultant develops Aerial Mapping base for Drainage System Mapping. (High-quality Orthos & Topography Layers at 2 foot contours.) (MassGIS provides great aerial photography for free.)
2003	\$30,000	Assessors Consultant creates first digital parcel layer from paper map books. (MassGIS has parcel layers for many communities already.)  ("Georeferencing" a scanned parcel map can be done manually.)
2004	\$10,000	Town purchases computers and related hardware in order to implement and further develop the Town's GIS. (ArcView + ArcPublisher/ArcReader license) (Today a \$1,000 desktop or \$2,000 laptop is the starting point.)
2005	\$13,558	Hanover receives grant from MassGIS/EOEA pursuant to Digital Parcel File Grant Program in order to upgrade the existing parcel layer to MassGIS Level II Standards with current information from the Assessors Database.

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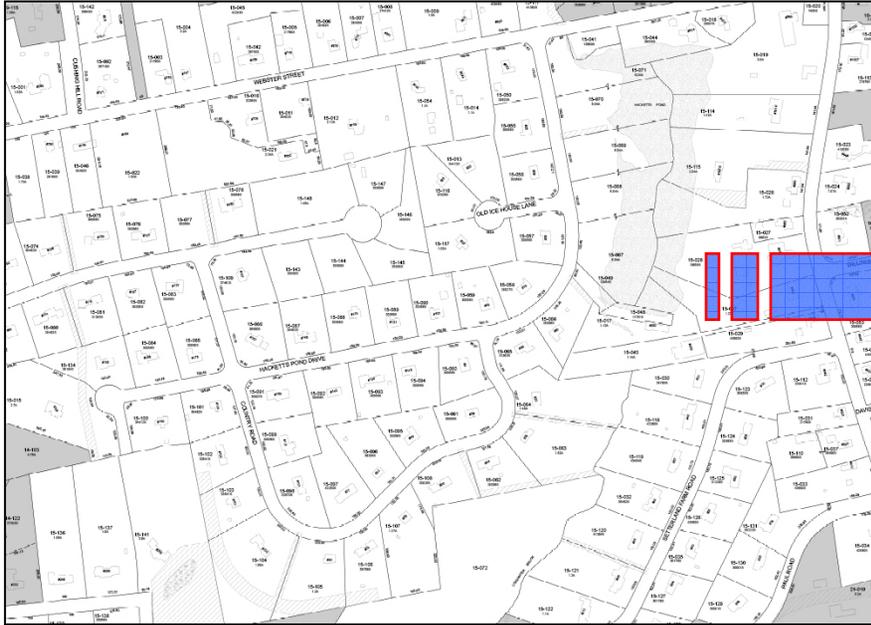
# MINIMAL FUNDING REQUIRED

Required	Estimated Cost	Project Summary
ArcGIS License (ArcMap)	\$1,500	Base GIS Software – Industry Standard from ESRI
ArcGIS License (ArcPublisher)	\$2,500	“Publish Maps with viewing capability for anyone with no further cost.
ArcReader Distribution Viewer	Free	Free viewer for maps created with ArcPublisher.
Computer	\$2,000	If not already available.
ArcGIS License (ArcScan)	\$3,000	If map scanning and digitizing will be done in-house. Parcel layer is the key base layer for everything else!
Consultant Services	\$30,000	If map scanning and digitizing will be done by a consultant.
Layer & Data Development & Updates	TBD	As necessary based on goals and needs of municipality. Local layers determined by community. Using base parcel layer and numerous layers already provided by MassGIS.

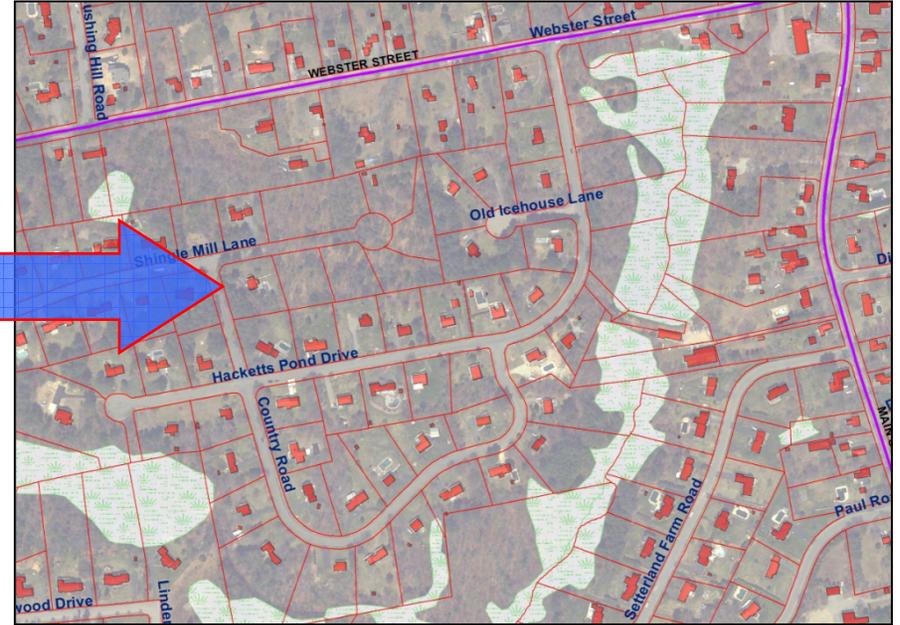
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# PARCEL LINES ARE THE ESSENTIAL (BASE) LAYER



Paper Assessor's Maps



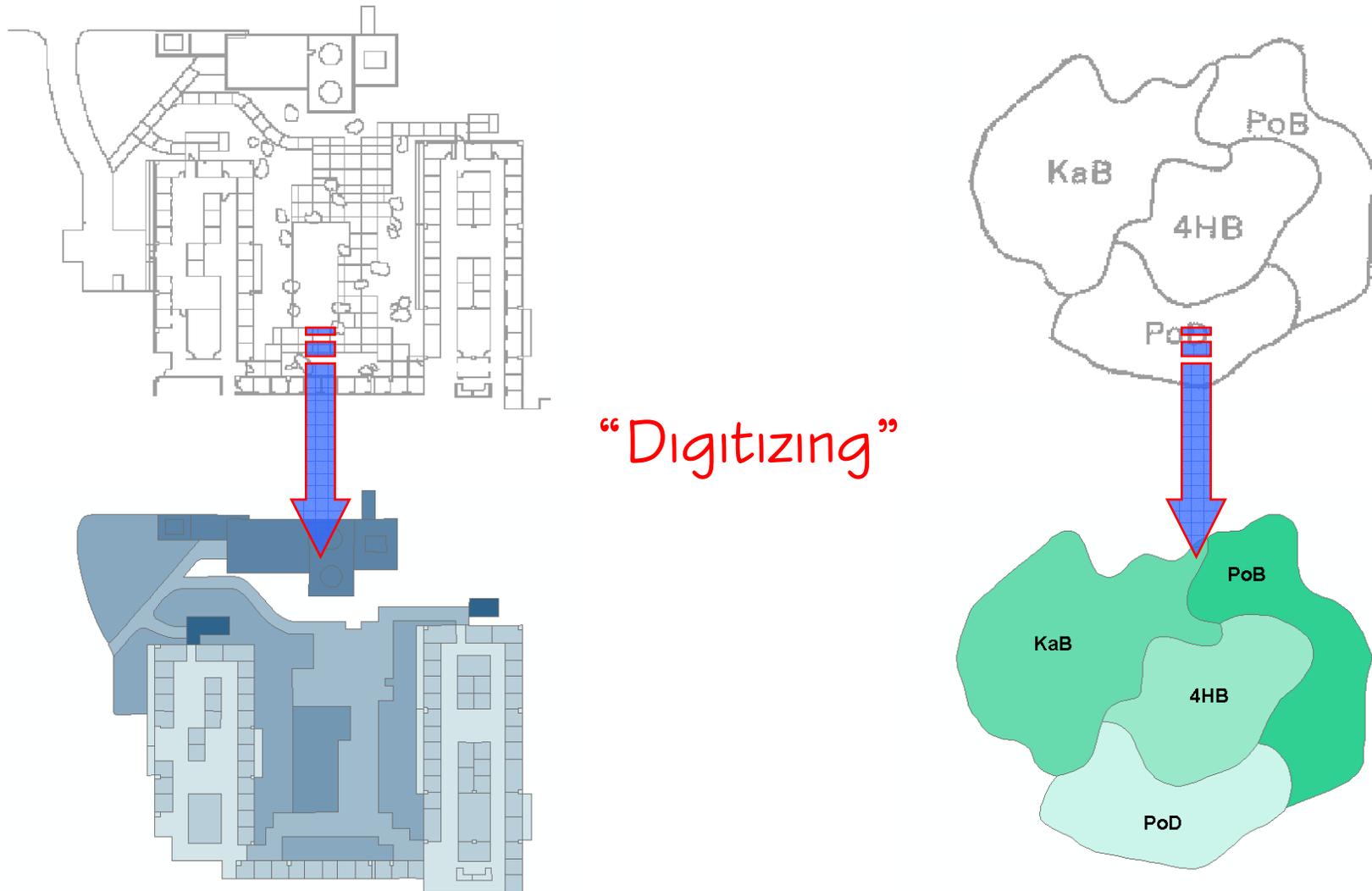
Digital Assessor's Maps

“Georeferencing”

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# ARCSAN EXTENSION VS. THE CONSULTANT



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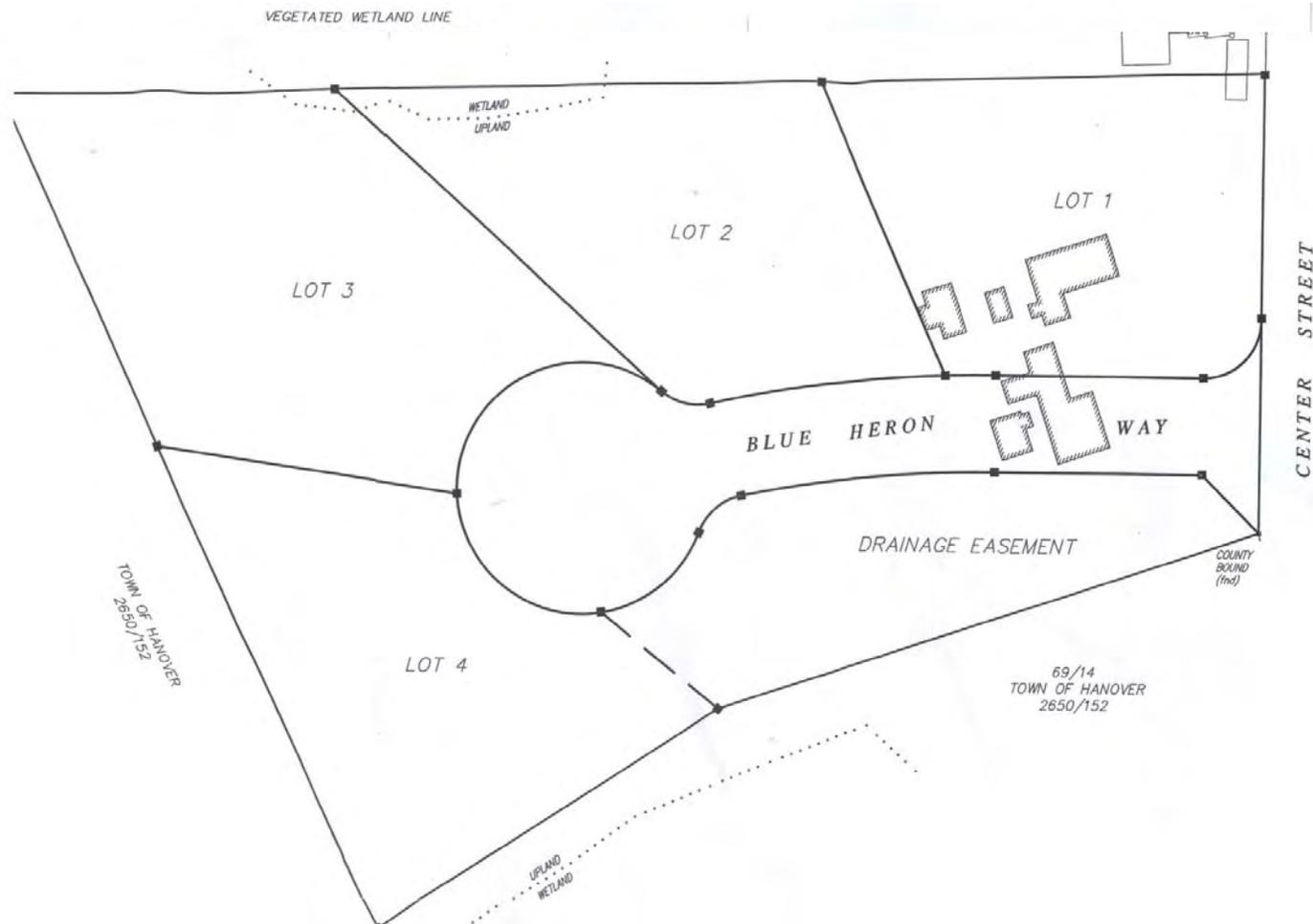
# SUBDIVISION UPDATES FROM CAD PLANS



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# REGULAR UPDATES FROM CAD PLANS



*Required: Consultant, CAD or Image Geo-referencing Tools*

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# DATA COLLECTION & DEVELOPMENT

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## Municipal Layers

- Parcel Lines
- Building Footprints
- Aerial Photos (optional)
- Topography (2 foot)
- Precincts
- Village Names
- Subdivisions
- Large Developments
- Critical Facilities
- Town Owned Land
- Open Space
- Greenways & Trails
- Zoning

## State Layers

- Town Boundaries (Surveyed)
- Wetlands (estimated)
- Aerial Photos  
(frequency in lieu of detail)
- Topography (3 meter)

*\* See extensive list  
on MassGIS website:*

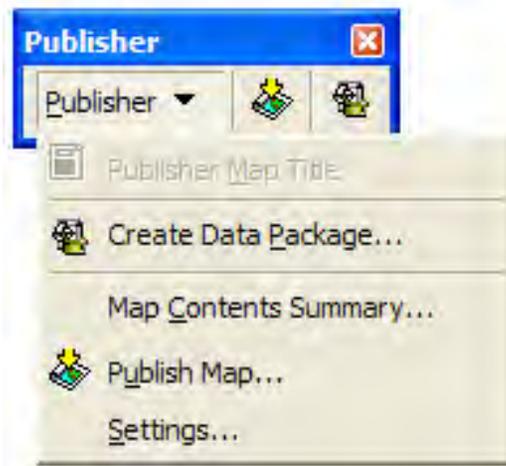
*[www.mass.gov/mgis/laylist.htm](http://www.mass.gov/mgis/laylist.htm)*

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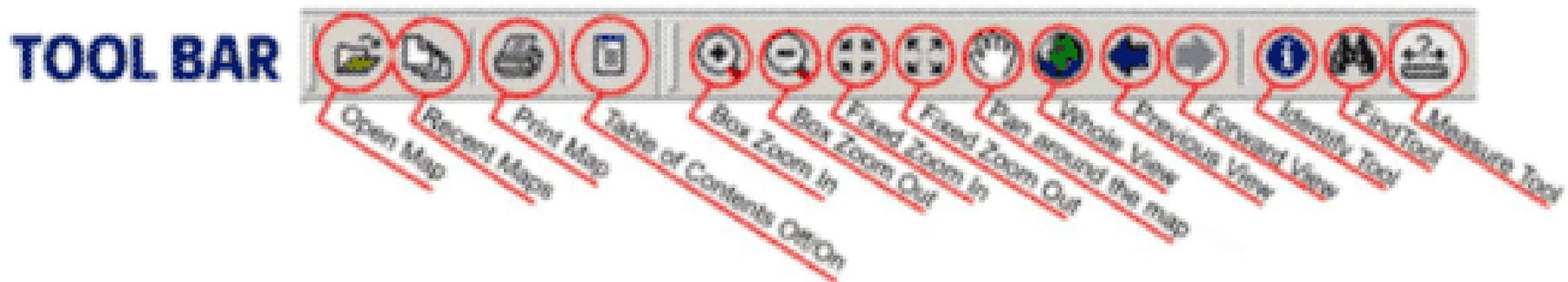
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# THE “GIS VIEWER” – ARCREADER DEPLOYMENT

## Publishing & Packaging ArcMap Projects & Data as PMFs



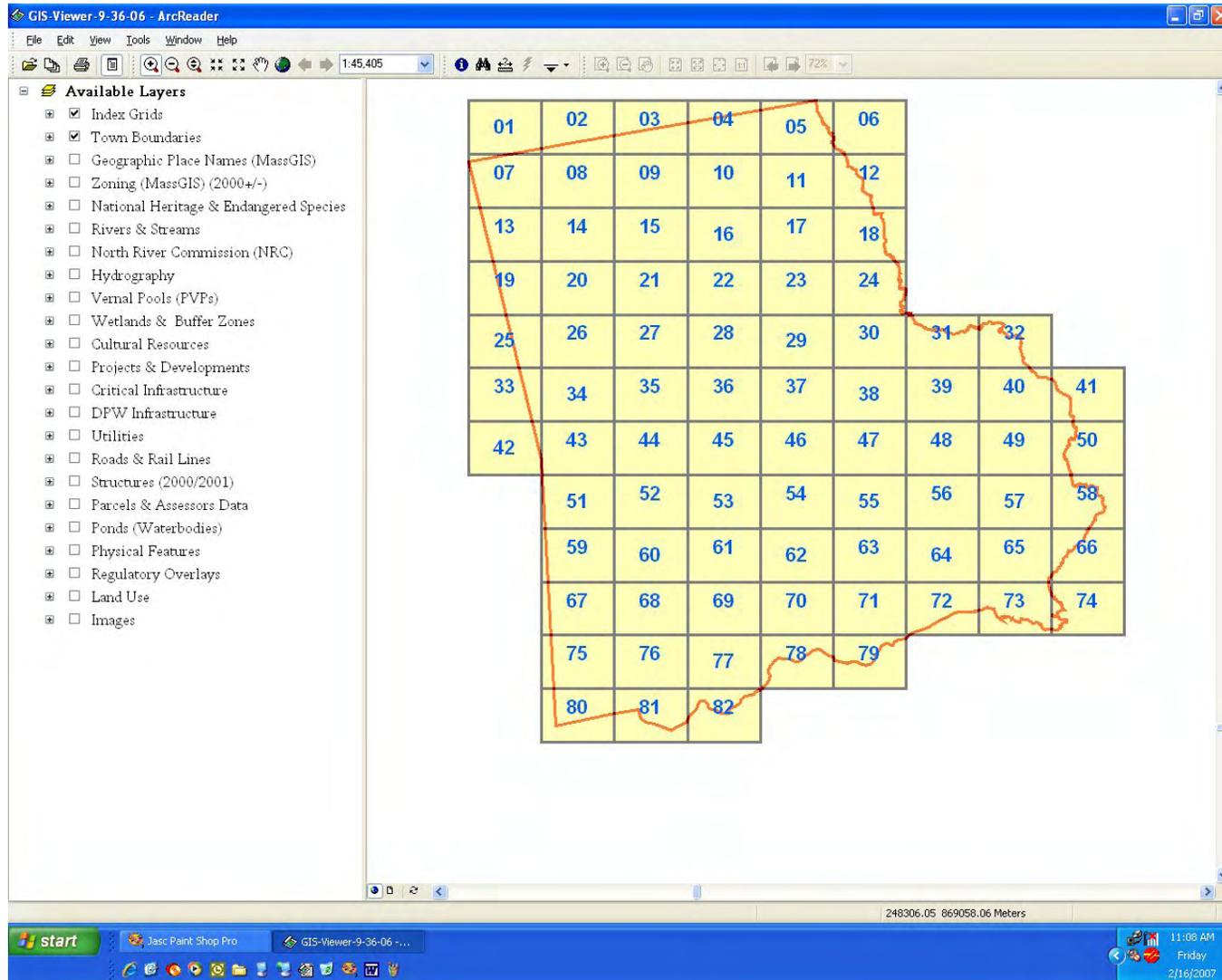
## ArcReader Toolbar



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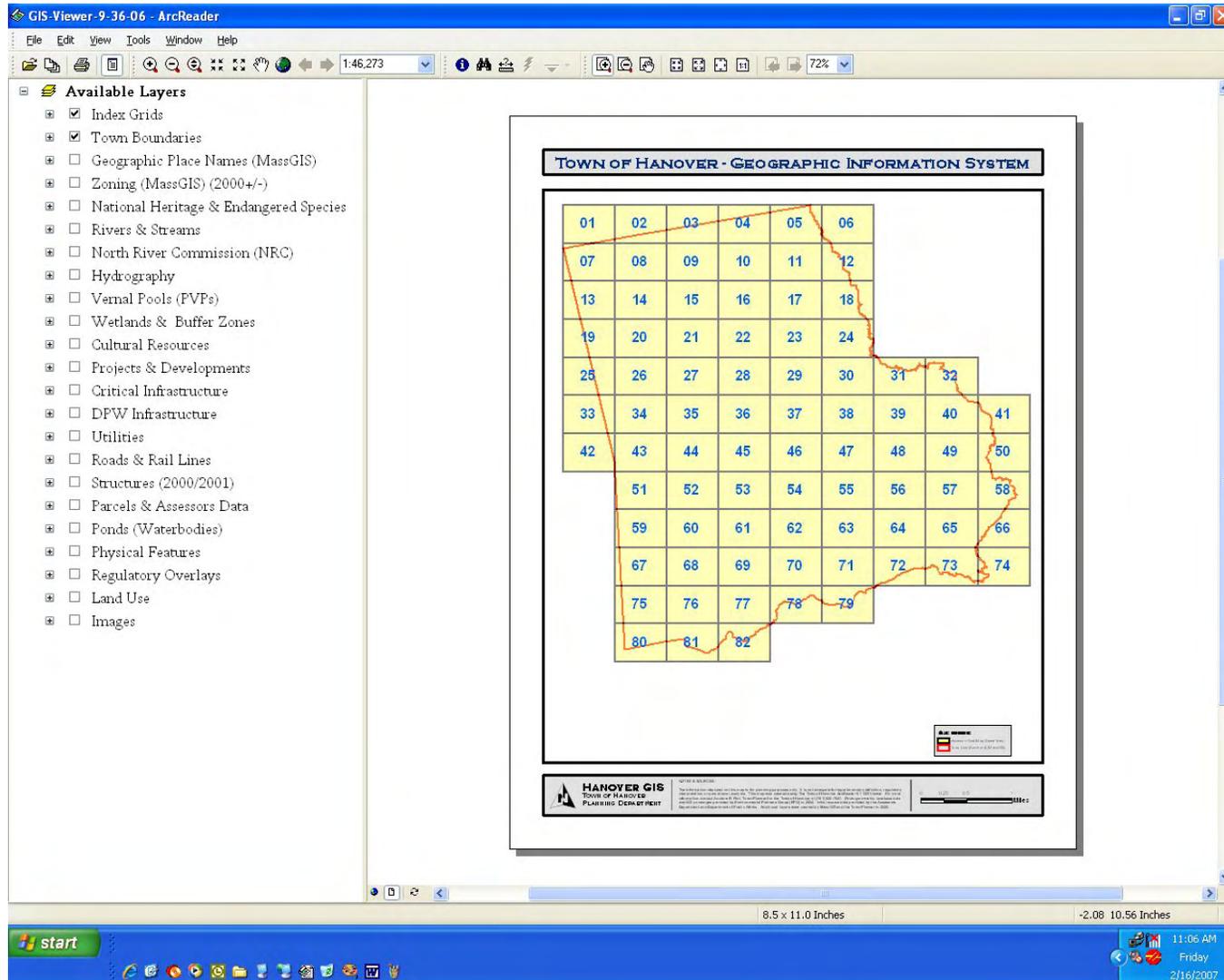
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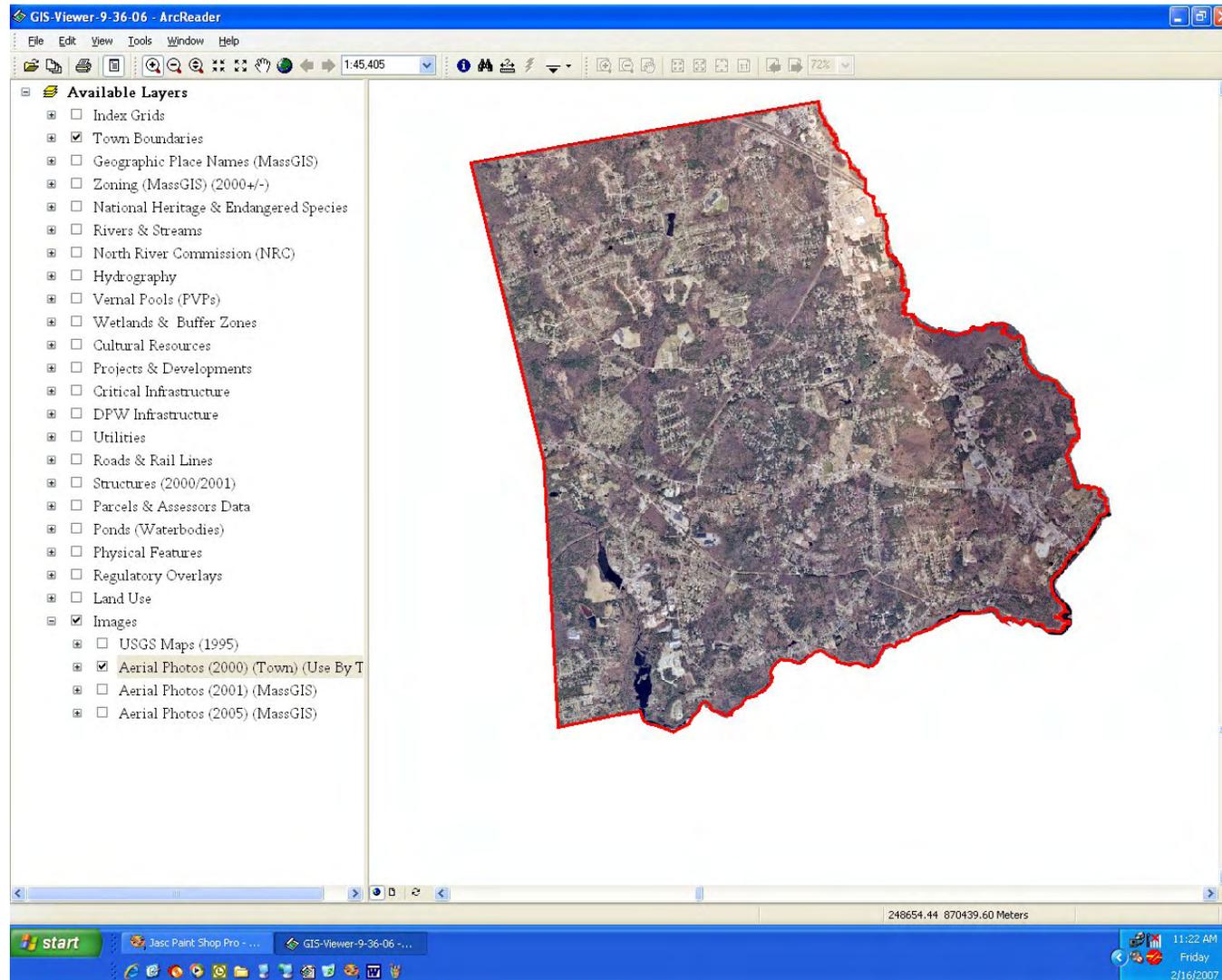
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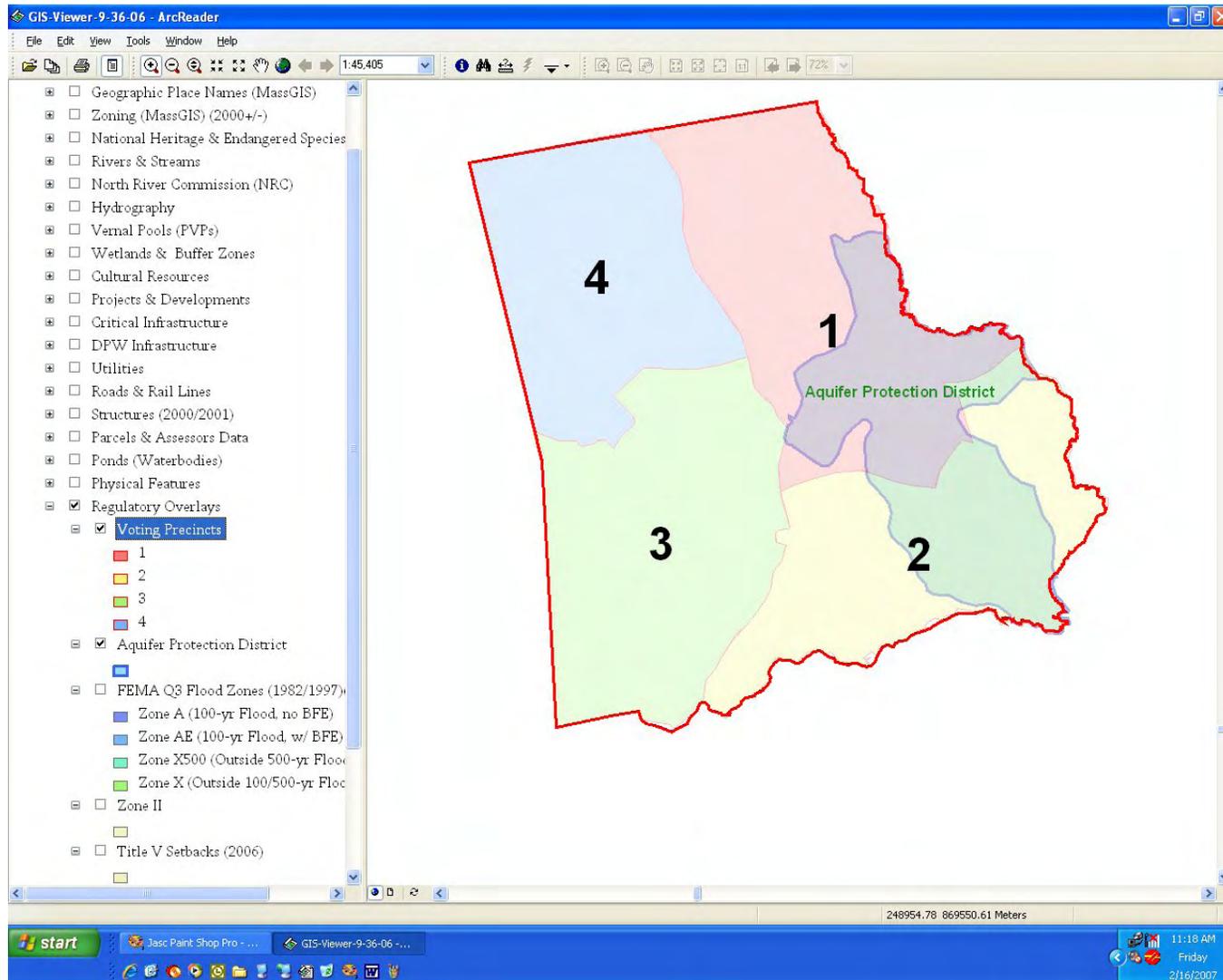
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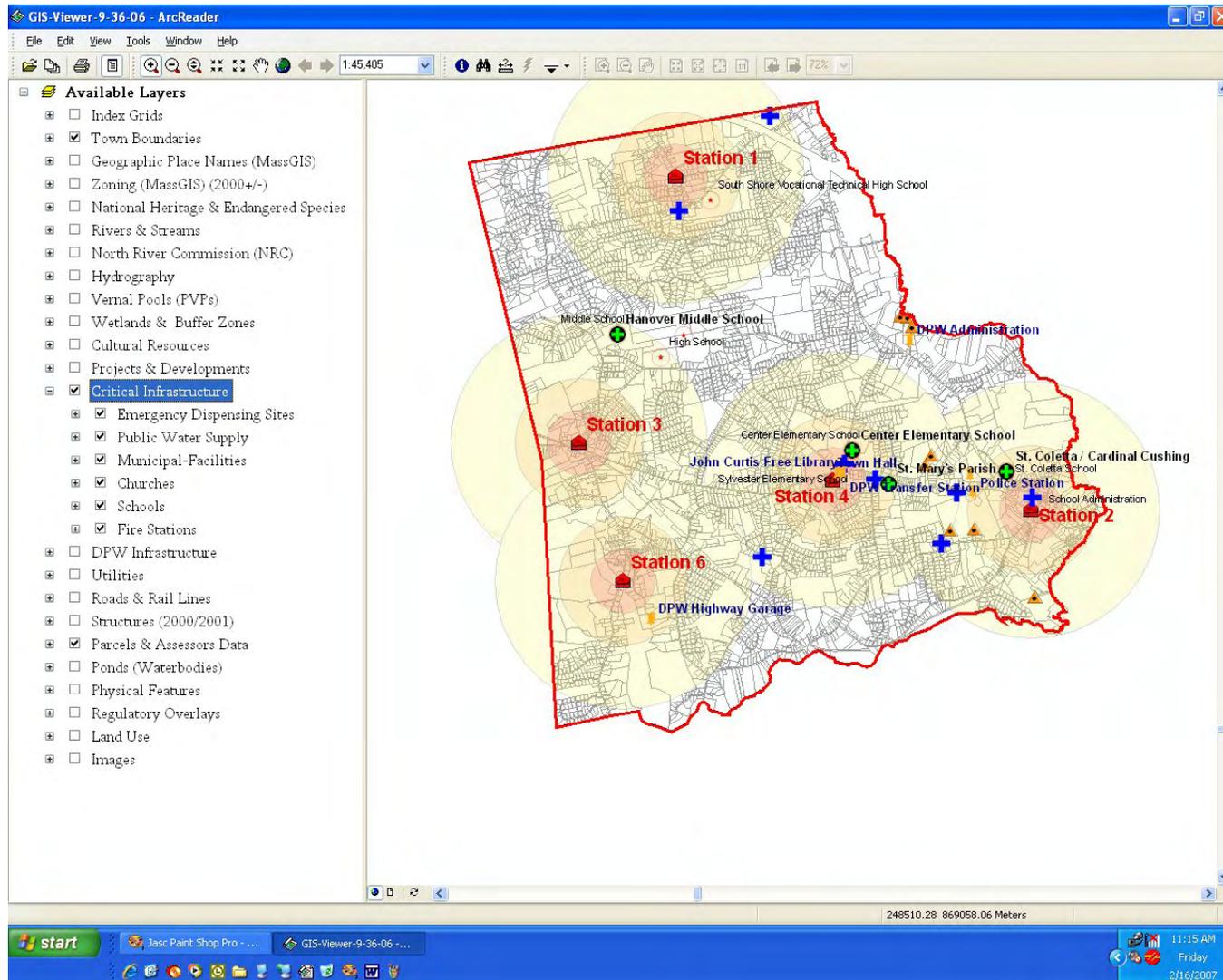
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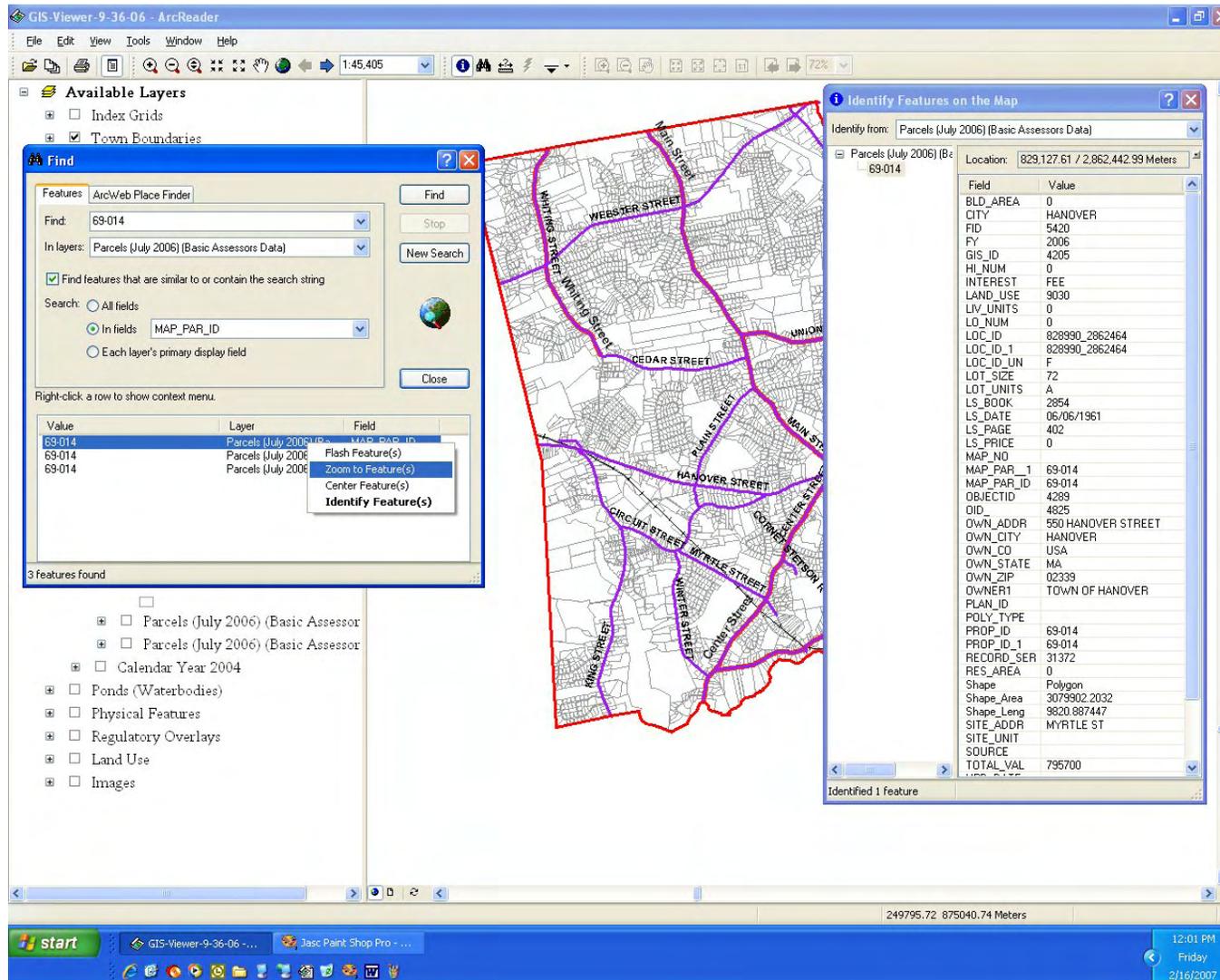
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## NEXT STEPS FOR HANOVER?

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Consultants Have Been Impressed by our Deployment  
but the “viewer” was just a beginning.

- Permitting Software / Add-On
- Online GIS accessible without ArcReader  
Download or Training for general public use.
- Additional map layer development.

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# HANOVER'S PERMITTING APPLICATION

“ViewPermit”  
Permit Tracking Database & Interface  
to be developed by  
ViewPoint Engineering, Inc.

The screenshot displays the ViewPermit web application interface. The main content area is divided into several sections:

- Property Info:** Address: 15 ABBEY LN, Owner: SHEPARD STEPHEN C, Parcel ID: 060\_136\_000, Lot Area: 0.4, Zoning: SRB, Property Use: 1010.
- Project Info:** Occupancy Type: Residential, Project Type: One & Two Family, Application For: Subdivision. Includes fields for Owner Name, Address, City, State, Zip, and Phone No.
- Property Restrictions:** A section for defining property restrictions, currently empty.
- SetBacks:** A table showing required and provided setbacks for Front, Back, Left, and Right sides, along with Open Space and Lot Coverage %.
- Project Status:** Project Status: Pending, Project Stage: Hearing 1, Progress: 80% (indicated by a progress bar).
- Bond Info:** Bond Amount: 0, Bond Issued Date: 3/11/2009, Release Date: 3/11/2009.
- Costs And Fees:** Project Cost: \$0, Total Fee: \$0, with a Calculate Fee button.

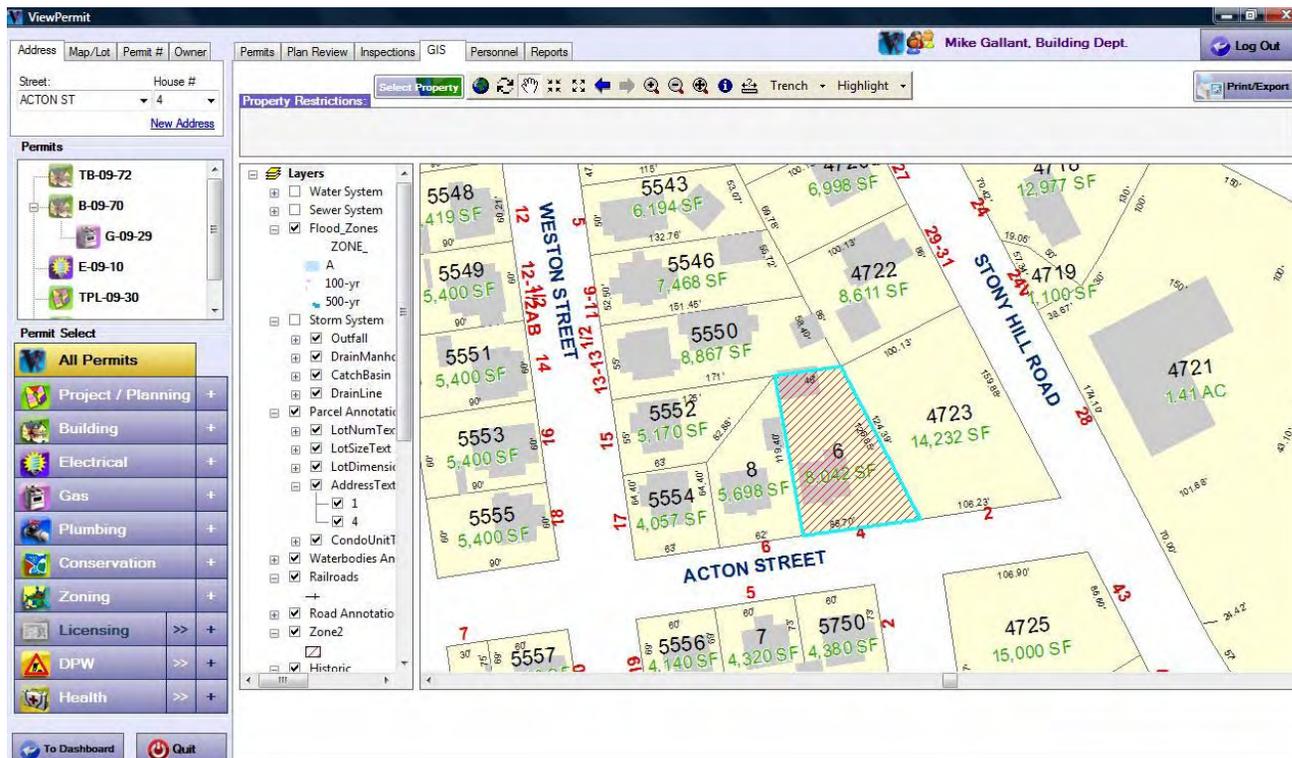
The interface also includes a left sidebar with a list of permits and a top navigation bar with tabs for Permits, Plan Review, Inspections, GIS, Personnel, and Reports.

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# MUNICIPAL PERMIT TRACKING SYSTEM

Microsoft Access  
Permit Tracking Database & Interface  
developed for the  
Massachusetts Permit Regulatory Office (MPRO)

The screenshot shows a Microsoft Access form titled 'Developments'. The form contains various fields for permit tracking, including:

- ID**: [Empty]
- Permit Num**: [Empty]
- Town Meeting Date**: [Empty]
- Zoning**: [Empty]
- Name**: Abby Woods
- Approval Expires**: 11/3/2006
- DevelopmentType**: HOUSING
- Type**: CONVENTIONAL
- Adj Street**: CARROLL ROAD
- PPR Status**: [Empty]
- Is 40B**: No
- Housing Type**: SF
- Completion Status**: RESCINDED
- Date Filed With Clerk**: [Empty]
- Num Lots Units**: 10
- Modification Status**: [Empty]
- Book And Page**: [Empty]
- Roadway Status**: [Empty]
- Application Date**: [Empty]
- Year Approved**: 2004
- Open Space Acres**: [Empty]
- Hearing Date**: [Empty]
- Board Decision Date**: [Empty]
- Principal Use**: [Empty]
- Comment**: [Empty]
- Sewage**: PUBLIC
- Water**: PUBLIC

At the bottom of the form, there is a status bar showing 'Record: 1 of 49', 'No Filter', and a search box.

Link to the MPRO & Download Site  
<http://www.mass.gov/mpro>

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## LESSONS LEARNED

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1. Don't Get Overwhelmed
2. Keep it Simple
3. In small communities or with limited resources, viewing & query capabilities may be more important than creating new data or analyzing
4. Learn and train in-house
5. Increase in-house capacity rather than an encouraging an over-dependence on consultants
6. Think before you spend
7. Ensure broad usage and access to encourage appreciation, future funding and overall success

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## ONLINE RESOURCES

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### Hanover “GIS Viewer” Summary

<http://www.hanover-ma.gov/maps-gis/gis-viewer/gis-viewer.htm>

### MassGIS – Available Data Layers for Massachusetts

<http://www.mass.gov/mgis/laylist.htm>

### ESRI Software & Extensions

(ArcMap, ArcReader, ArcPublisher, ArcScan, etc.)

<http://www.esri.com/products/index.html>

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## FREE 60-DAY TRIAL SOFTWARE

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# FREE !

ESRI ArcGIS / ArcView & ArcPublisher Evaluation CD

<http://www.esri.com/software/arcgis/arcview/eval/evaluate.html>

ESRI ArcGIS / ArcPublisher Extension Evaluation CD

<http://www.esri.com/software/arcgis/extensions/publisher/evaluate.html>

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## FOR MORE INFORMATION

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