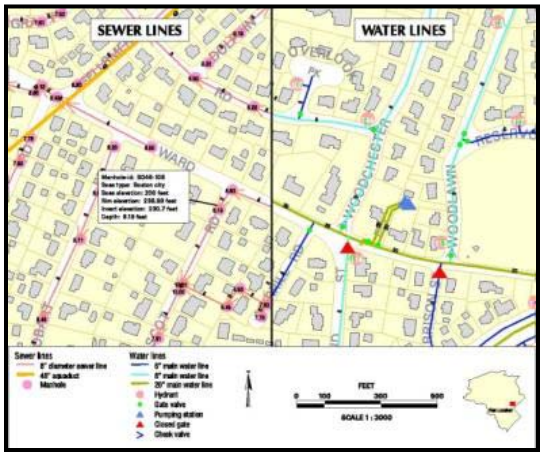


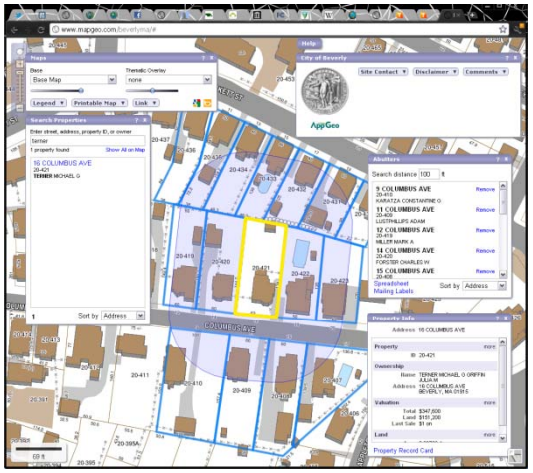

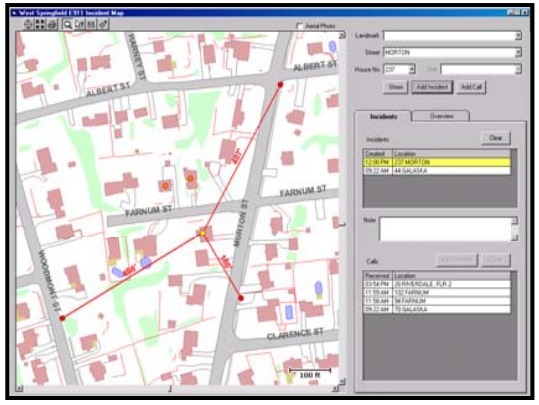

# Cape Cod Commission
## MASSACHUSETTS

# Industry Trends & Observations on Regional GIS

January, 2012

Michael Terner

Kathy Miller

AppGeo

# Introductions

- **Michael Terner**
  - Executive Vice President
- **Kathy Miller**
  - Client Services

# Agenda

- **Review of industry trends**
  - Drivers
  - Technologies
  - Approaches
- **Observations on regional GIS**
  - Based on our practice
- **Demonstration of MapGeo website**
  - Leverages industry trends
  - Describe regional use case
- **Questions & Answers**

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# Industry Trends

- GIS has gone mainstream
- Mobile as a driver
- Technologies
  - The further emergence of Open Source
  - HTML5
  - Cloud-based deployment
- Approaches
  - Small-town outsourced GIS

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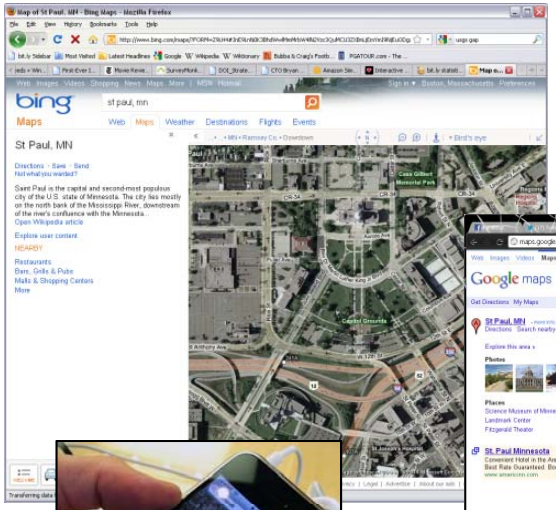
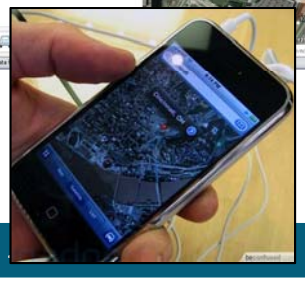
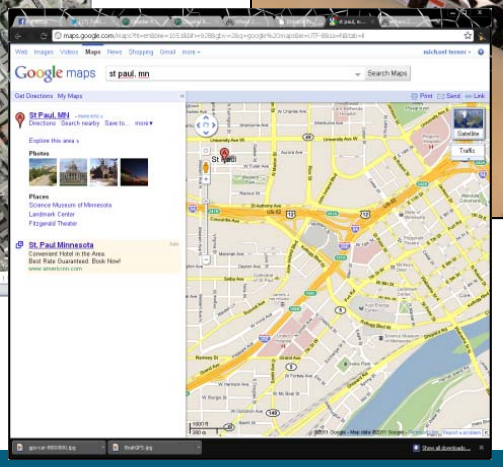
# The 21st century geospatial landscape has changed

## *More people know what GIS is*

- Volume of citizens using GPS, mobile mapping and commercial search engine mapping (e.g. Google) has exploded
- Have understanding of government involvement and investment
  - And, expectations for service delivery
- Many existing systems were planned without this in mind



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# Mobile as a driver

***A plethora of new devices and more ubiquitous broadband (3G/4G)***

- People want GIS capability on the devices they use most often



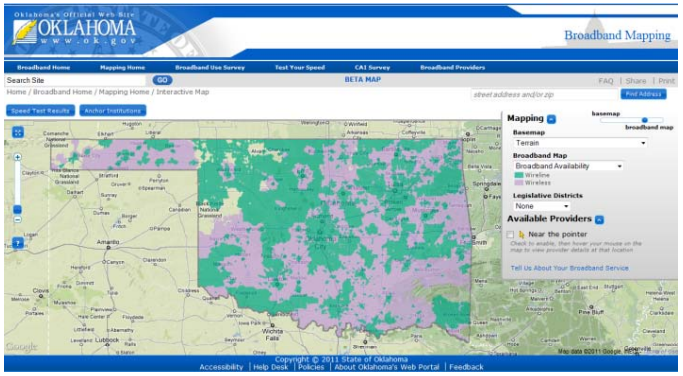

# The further emergence of Open Source for GIS

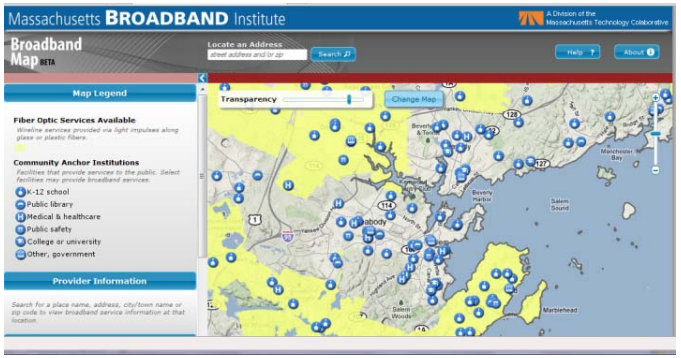
- **Directions podcast from 1/31/11 posed the question**
  - "Are Esri and Open Source Solutions the Only Options?"
- **There is increased maturity of the tools**
- **Clear viability for operational GIS**
  - Particularly for web deployments
- **There is an emerging business ecosystem to support open source GIS**

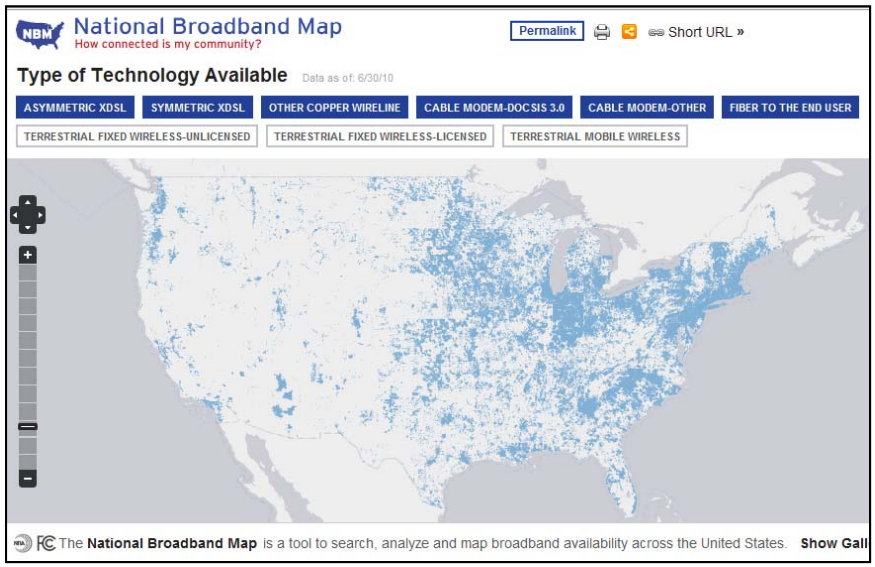
## *OSS & We're number 2!!!*

# Not an accident that we're hearing more about it now

- It's being put to use in high profile, meaningful ways
  - MassGIS as an early adopter in 2001
  - FCC/NTIA National Broadband Map
  - Several state Broadband Maps
  - US DOD wrote favorably on OSS technology

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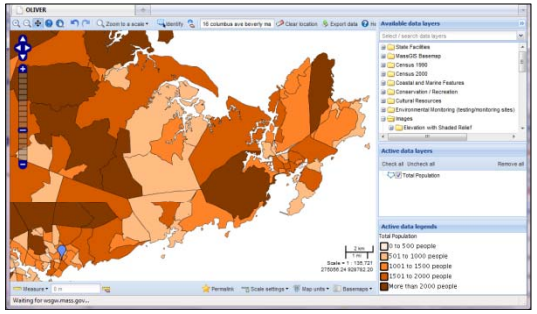
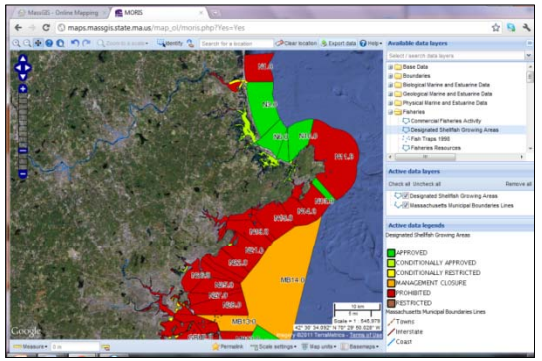
# What is MassGIS doing w/ OSS and why?

- Powers OGC compliant web services
  - Including consumable public services consistent with state's overall services oriented architecture
- Consumed by wide variety of public and agency applications
  - Including Oliver & Morris, public facing viewers



- **Why?**
  - Adopted OGC API over 10 years ago
  - In 2001, ArcIMS was not up to task of affordably publishing 100+ OGC compliant map services
  - Have viewed OSS as a supplement, *not* a replacement for Esri technology



# There are now companies that provide support and services for geospatial OSS

- OpenGeo is following the "Red Hat model"



**Professional open source value**

- Unified marketing story
- Integration of diverse components
- Installers and ease-of-use
- Training and documentation
- Contractual levels of support

*Slides from Paul Ramsay, used with permission.*

- ***Insurance:*** That if something is broken, some entity will help get it fixed; you can obtain support
- ***Assurance:*** That there is knowledge and expertise to assist you with deploying and solving problems with these tools

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# Using Open Source is not radical

## *Many commercial companies employ open source*

Google™

– Linux in its web farms

amazon.com®

– The Xen virtual machine environment

SAFE SOFTWARE

– 85 of 135 third-party libraries are OSS
  - Under 18 different OSS licenses

miles and miles of racks of generic boxes running Linux would not have been possible but for open source, and the fact that Google engineers are active in the communities of open source projects Google

*Slides from Paul Ramsay, used with permission.*

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# Open Source is not a panacea

## *Some challenges to understand & manage*

- Key quote at the FOSS4G conference:
  (**F**ree and **O**pen **S**ource **S**oftware for **G**eospatial)

  **"Free is the least important word in FOSS4G"**

- **Free does not mean that there are no costs**
  - You can/should pay for support
  - There are costs in training staff
  - Etc.

- Picking your tools
  - There are lots and it's a large marketplace
    - Server, desktop, DB, client framework, caching, ETL, etc.

*Technologies*

# What is HTML5?

- W3C standard
  - Not a GIS standard
  - World wide web consortium
- Emerging as the preferred immersive technology
- Puts onus on browser makers to ensure there is compatibility
- Avoids need for 3rd party plug-ins
  - Like Flash & Sliverlight


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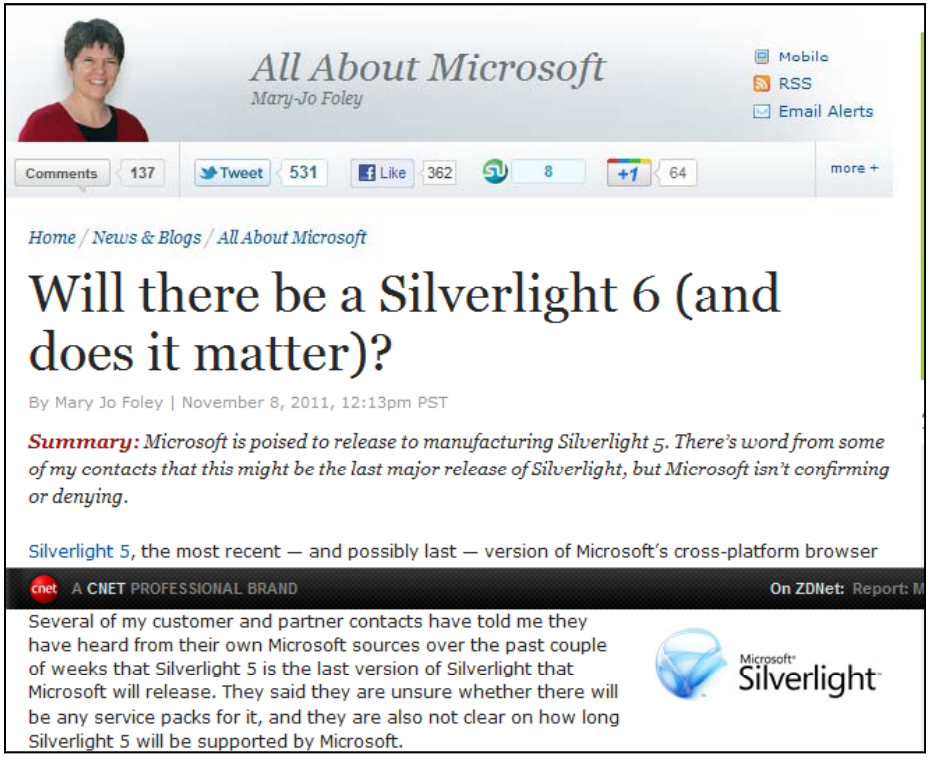
# HTML5 vs. other immersive technologies

- Flash and Silverlight are waning
  - In spite of GIS popularity
- Plug-ins are less desirable
  - Especially on **mobile**

# Recent announcements on Flash/Silverlight



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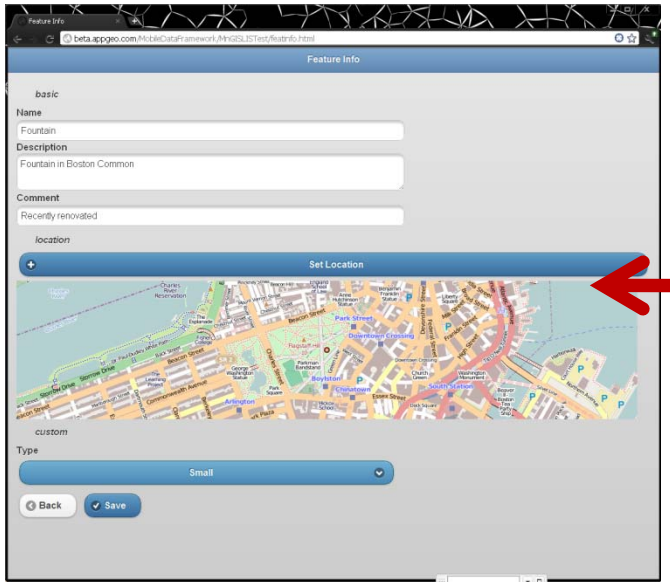
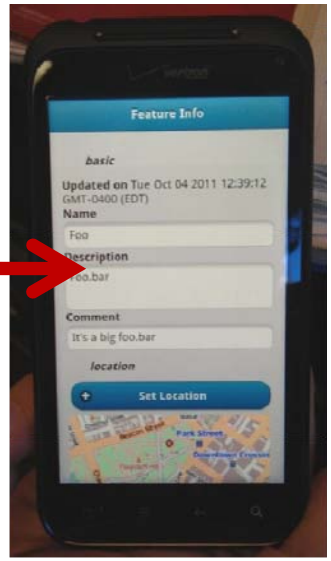
## *Key benefit*

# HTML5 allows for adaptive/responsive design


**Can run in full browser mode on a PC, or on a phone**

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# Cloud-based GIS hosting

***You don't need your own data center, rent someone else's***

- Large companies with very large data centers rent you space in their "cloud"
  - Both commercial and **private clouds**
- Need to understand different cloud offerings
  - **IaaS**: **Infrastructure** as a Service – Amazon
    - Acquire virtual machines to run your apps
  - **PaaS**: **Platform** as a service – Esri ArcGIS.com
    - Utilize a platform for sharing data, setting up web services
  - **SaaS**: **Software** as a service – Salesforce.com
    - *Use* a Customer Relationship Management (CRM) system without *buying* software

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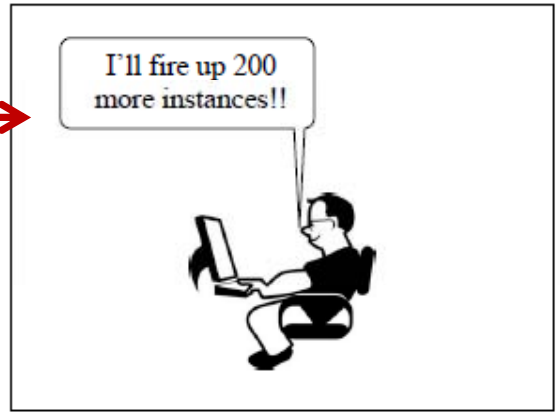
# Cloud based hosting

## *Things to know*

- Need to understand virtual machines
  - Can instantly provision more resources
- Very different cost model
  - Fixed costs of virtual hardware ($'s/hour)
  - Data storage cost
    - $.14 /GB/Mo = $1,860 /TB/Yr
  - Usage fees for data access
    - $.01 /10,000 file accesses means 1,750,000 files = $1.75
- Compared with buying your own hardware and paying "lumpy" purchase costs
  - Spending the time to order, have delivered and install hardware




Tools where scaling is just a matter of spinning up instances.

*Image from Paul Ramsay, used with permission.*

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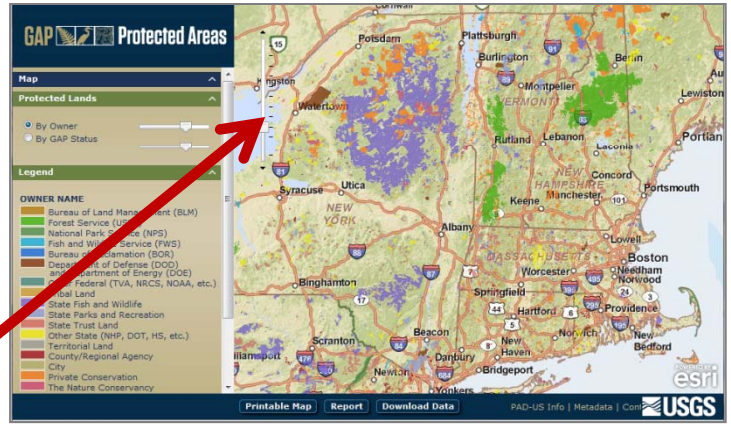
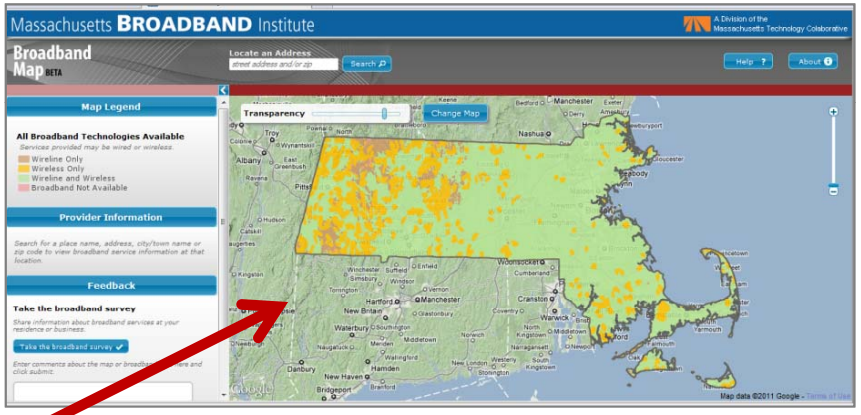
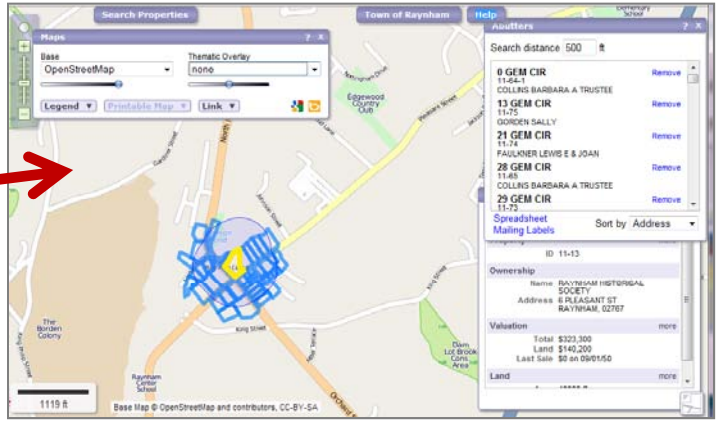
# Capitalizing on cloud-based map/tile services

- Use of other people's map services (PaaS)
  - Often national or global in scope
  - Often for free
- Esri has them
- Bing, MapQuest, Google
- OpenStreetMap (OSM)

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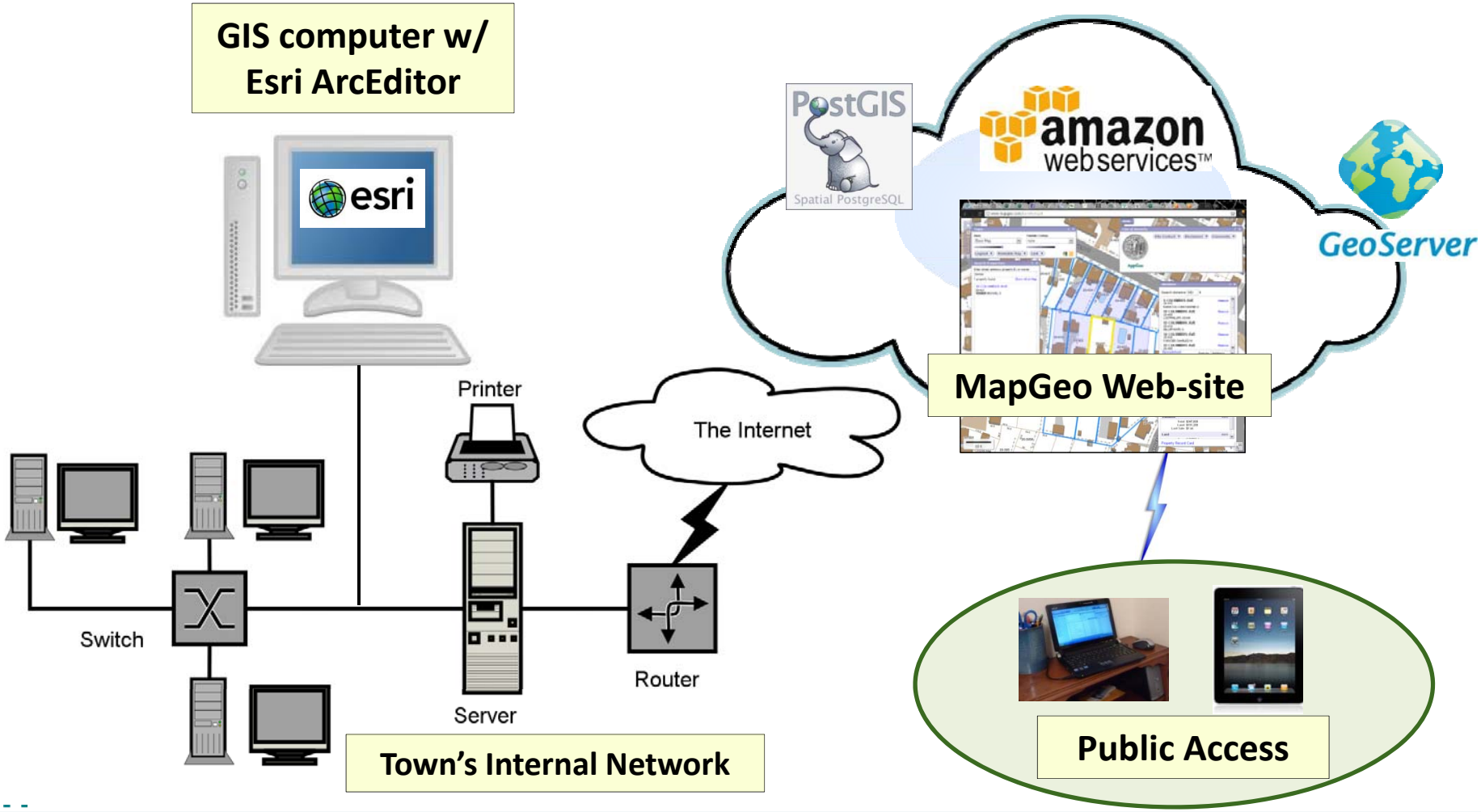
# North Reading's Proposed GIS Configuration

## *New approaches are enabled with higher quality, lower cost hosted solutions*



# Regional GIS Approaches

## *Observations from our practice*

- **Metropolitan Council, MetroGIS**
  - Minneapolis/St. Paul 9 County Metropolitan Region
  - "Shared regional solutions" prioritization planning
- **Connecticut Capital Region Council of Governments (CRCOG)**
  - 29 Metro Hartford communities
  - Developing a vision and supporting tools for regional GIS
- **Merrimac Valley Planning Commission (MVPC)**
  - 15 communities north of Boston
  - Tools to support hosting of local government sites

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- **One of the oldest and longstanding regional GIS**
- **Formally governed through the 9 member counties**
- **Pioneered the notion of "shared regional solutions"**

**Mission** (emphasis added)**:**

MetroGIS exists to **enhance the capacities** of its **principal stakeholders** to carry out their responsibilities in the most effective and economical way possible to expand stakeholders' capacity to address shared geographic information technology needs and maximize investments in existing resources through **widespread collaboration of organizations** that serve the Twin Cities metropolitan area.

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# Priority Recommendations for Modernization


- Builds on general findings originating from the survey and workshop
  - Improve upon regional solutions
  - Address being “old fashioned” and “process bound”
  - Adapt to become more “flexible and nimble”
- **Communication & Collaboration**
  1. Re-launch the web-site
  2. Social media presence
- **Data**
  3. ID and prioritize improvements to regional solutions
  4. Regional tile map service
- **Organizationally**
  5. Streamline MetroGIS processes
  6. Pursue public private partnership

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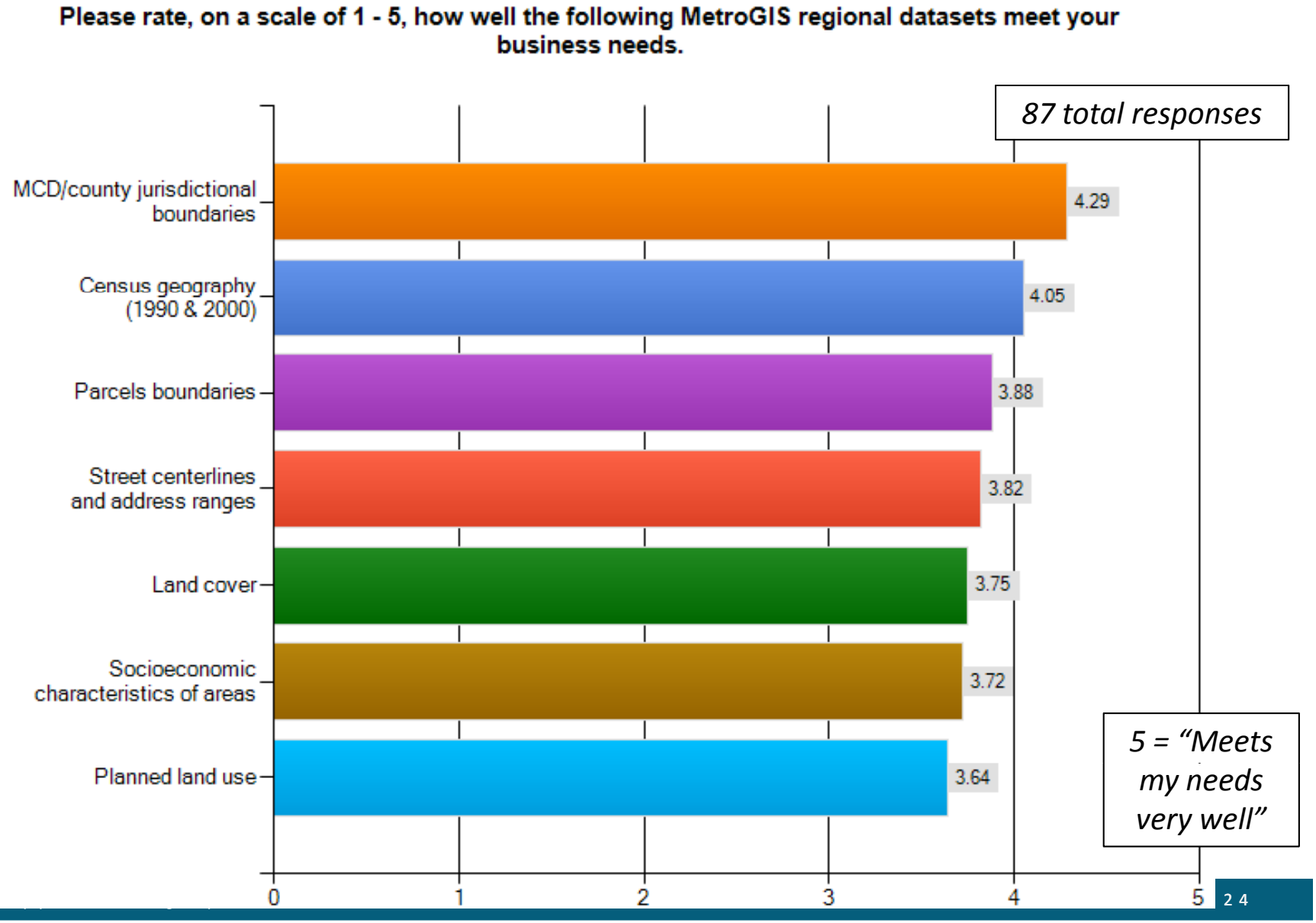
# Do the Regional Data Solutions Meet Your Business Needs?

## *Yes, for the most part*



# Do the Regional Data Solutions Meet Your Business Needs?

***Specific shortcomings of Centerlines ID'ed by stakeholders***

## Street Centerlines and Address Ranges

### Access

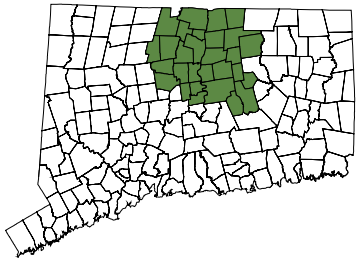
- It does not meet our need if it is unavailable for use by our organization
- address ranges and street names need verification
- Make available at no charge to non-profits and community GIS users
- Did not know it existed

### Attributes and Data Quality

- It needs to be fully routable with one way segments digitized in the direction of traffic. Address ranges need to be improved.
- More complete coverage of streets.
- Many uses for Street Centerlines. Positional Accuracy is not accurate, Many private streets not included, etc
- R/W width and nature of interest
- Right of way boundaries are also needed along with street centerlines
- Beyond centerline, there should be information as to the location of the R/W as well as the nature of the R/W interest (fee or easement).

# The Vision for CRCOG's GIS

## *Functional Components*



- Region wide **data repository –** all the best data in one place
  - Desktop users (CRCOG staff)
  - Web access (municipalities)
  - Data download (public, consultants, etc)
- Consumable **web services**
  - Map services (parcel, zoning, land use, centerlines, etc)
  - Image services (base mapping, digital orthos, state, regional & local)
  - Capability services (e.g. geocoding, routing)
- **Application** serving and support
  - Public facing viewer - make the data available
  - Regional view – Connecticut has no counties
  - Applications – beyond municipal boundaries
  - Applications – fill gaps for "have nots"
- **Regional standards** – zoning, land use, parcels

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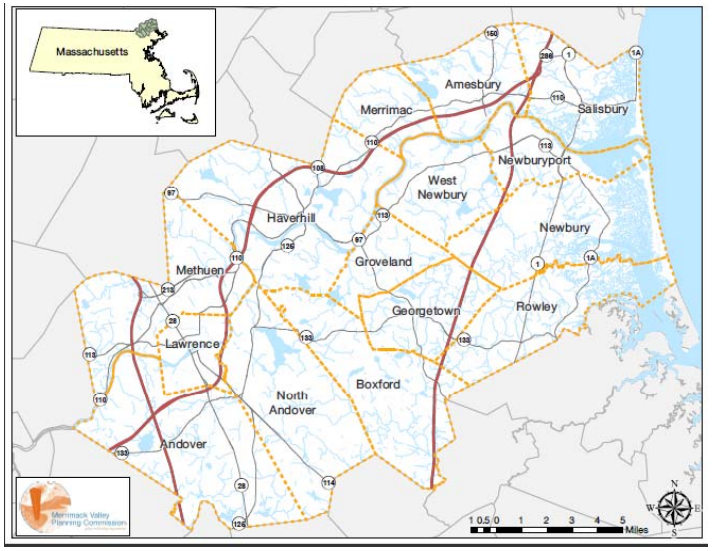
# MVPC

## *Providing hosted solutions to member communities*

- Has instituted “Regional Service Center” to help member communities
- Provides fee-based services for GIS
  - **4 key service areas:**
    - Geographic Information Systems (GIS)
    - Web-based mapping applications
      - Hosting of town web-sites
        - » Using AppGeo supplied GPV technology
    - Global Positioning System (GPS) data collection
    - Information Technology




- Majority of member communities take advantage of their offerings

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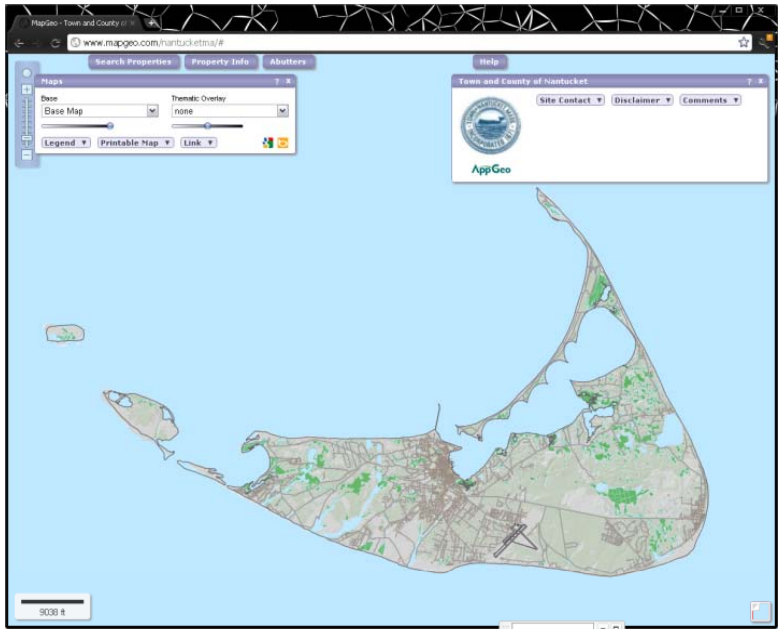
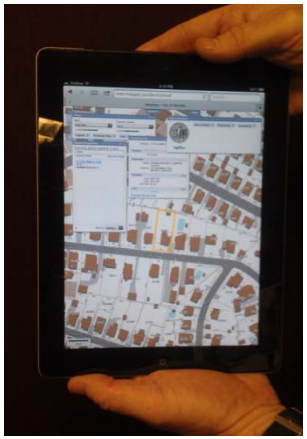
## *AppGeo's entry-level, public facing parcel viewer*




- Cloud hosted
- Open Source leveraged
- Built with HTML5
- Ready for regional
- Ready for mobile
- Subscription
  - Annual hosting fee
  - Free software improvements included
  - Every one gets the same offering



www.MapGeo.com

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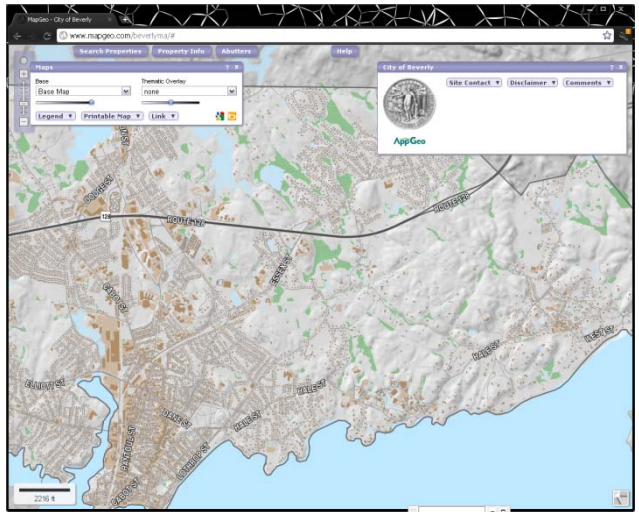
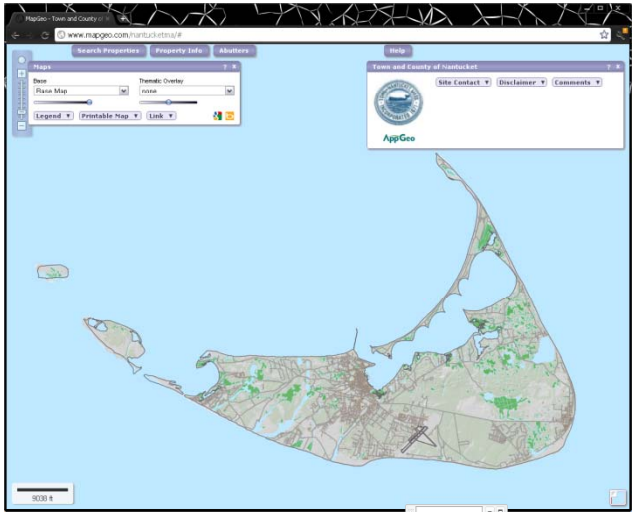
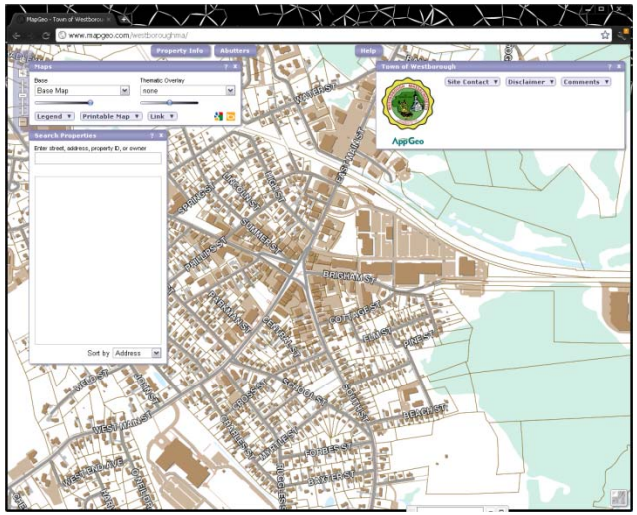
# MapGeo Demo

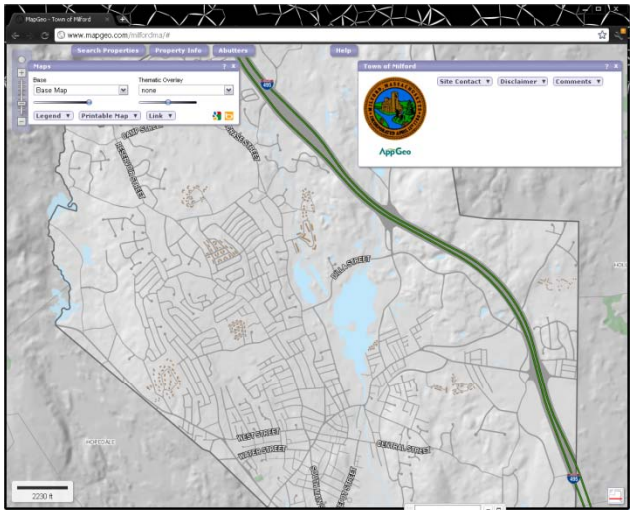
www.MapGeo.com

www.MapGeo.com/BeverlyMA









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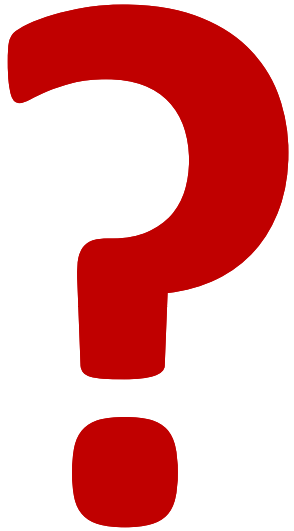
# Your questions



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