*Presentation on*

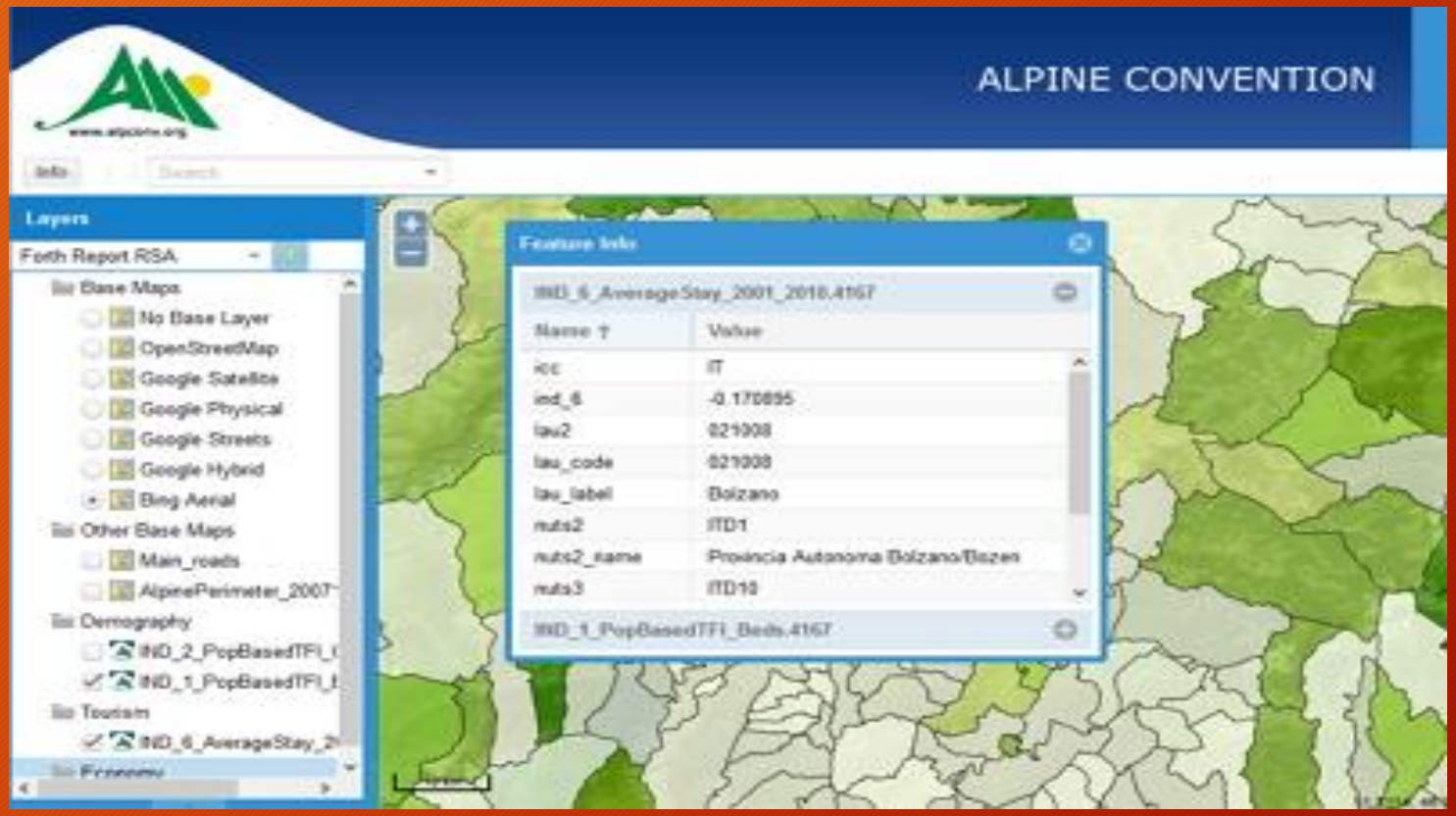
# Web Geographic Information Systems

By
Mr. Siddharth Swain

Supervised By
Mr. Debajyoti Ghosh

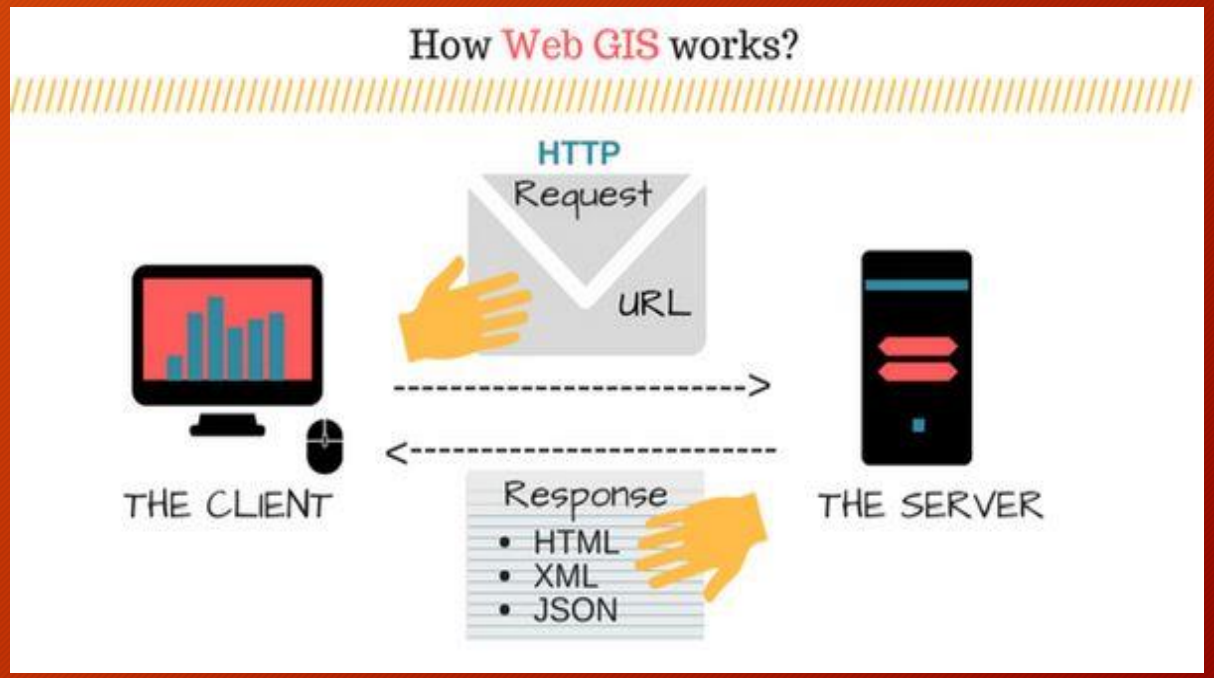
# What is Web GIS?

‘Web GIS’ is a type of distributed information system, comprising at least a ‘Server’ and a ‘Client’.



# How does Web GIS work?

1. The ‘Server’ has a **URL** so that clients can find it on the web.
2. The ‘Client’ relies on **HTTP** specifications to send requests to the server.
3. The ‘Server’ performs the **requested GIS operations** and sends responses to the client via HTTP.
4. The ‘Format’ of the response sent to the client can be in many formats, such as HTML, binary image, XML (Extensible Markup Language), or JSON (JavaScript Object Notation).



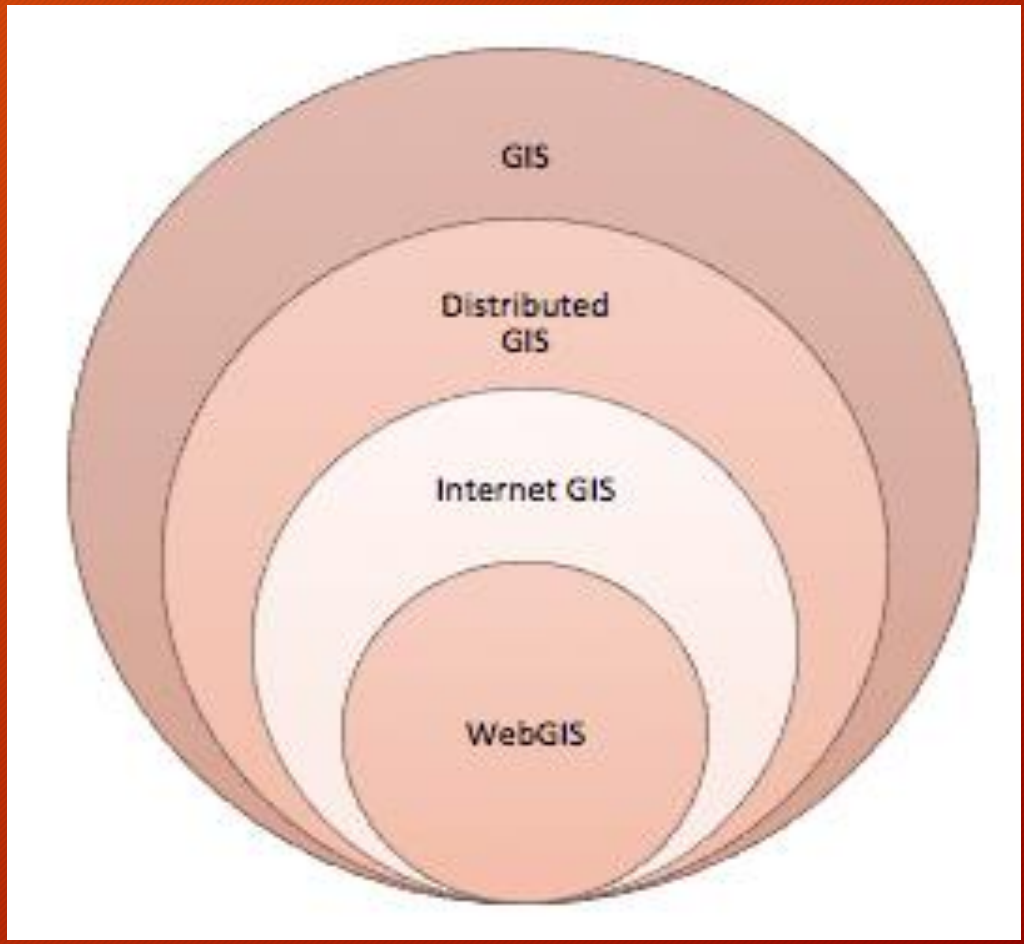
# What is the difference between Web GIS and Internet GIS?

**Internet Is 'Hardware Infrastructure'**

The internet is a massive combination of billions of computers and other connected devices located worldwide and connected via cables and wireless signals.

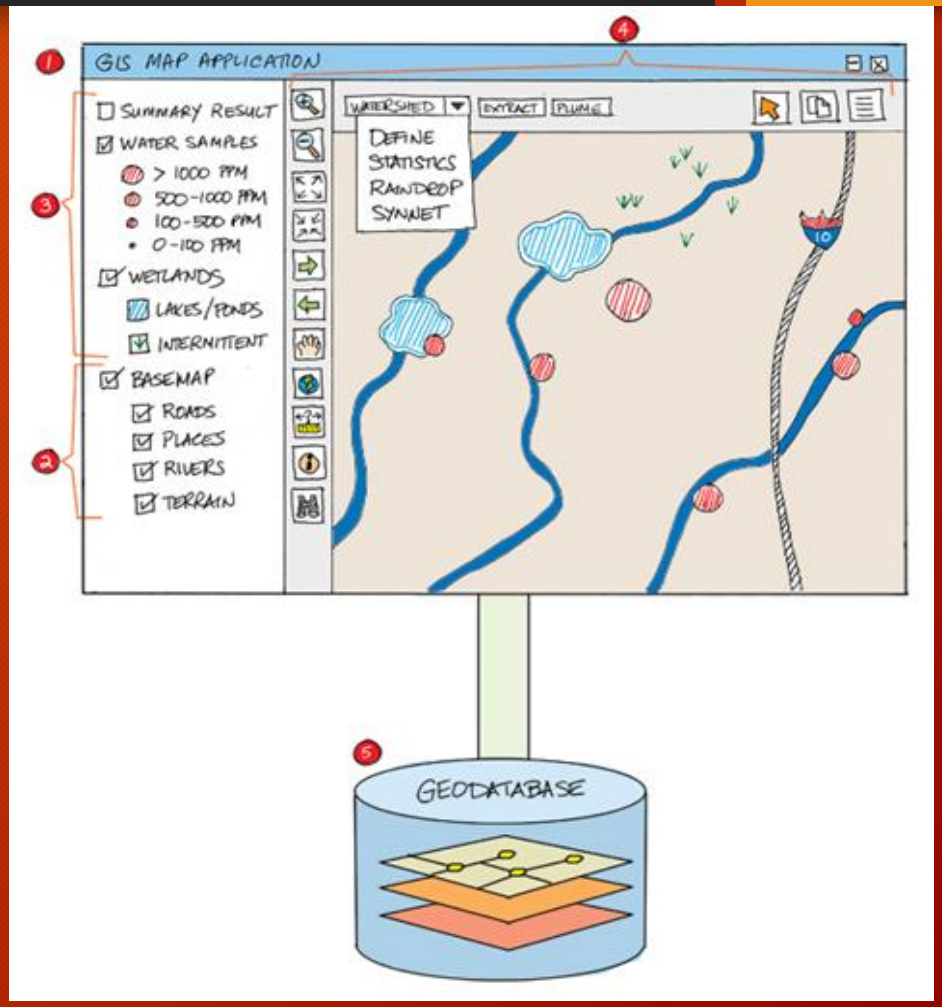
**Web Is the 'Information on the Internet'**

The web consists of billions of digital pages that are viewable through web browser software on your computers. These pages contain many types of content, including static content such as encyclopaedia pages and dynamic content like eBay sales, stocks, weather, news and traffic reports.



# 5 Essential Elements of a Web GIS – The Web Application

- The **'Web Application'** provides the software interface to the client, and its corresponding tools are used to visualize, interact with, and work with geographic information. It may be an application that runs in a **web browser**, or it could be a **mobile application** that works on a GPS-enabled field device or a smartphone, such as an iPhone.
- You have a number of application choices that you can use to build each web GIS application for your end users. Often, the **right choice depends on the set of functions, tools, and map displays required by the users' workflows**.
- Just as often, the choice of application will depend on the end user and his or her experience using computers and the setting in which the work is done (for example, in the field, in a remote office with slow Internet speeds, and so on).



# 5 Essential Elements of a Web GIS – Digital Basemaps

1. **Transportation** basemaps often contain roads, street names, points of interest, generalized land use, water bodies, and place-names.

2. **Topographic** basemaps often contain administrative boundaries, cities, water features, physiographic features, parks, landmarks, transportation, and buildings.

3. **Terrain** basemaps often contain shaded relief imagery, bathymetry, and coastal water features designed to provide a neutral background for other data layers.

4. **Imagery** basemaps often contain low-resolution satellite imagery for the world and high-resolution satellite imagery for select geographies around the world.

5. **Hybrid** basemaps often contain optional layers that you can toggle on and off as map overlays.

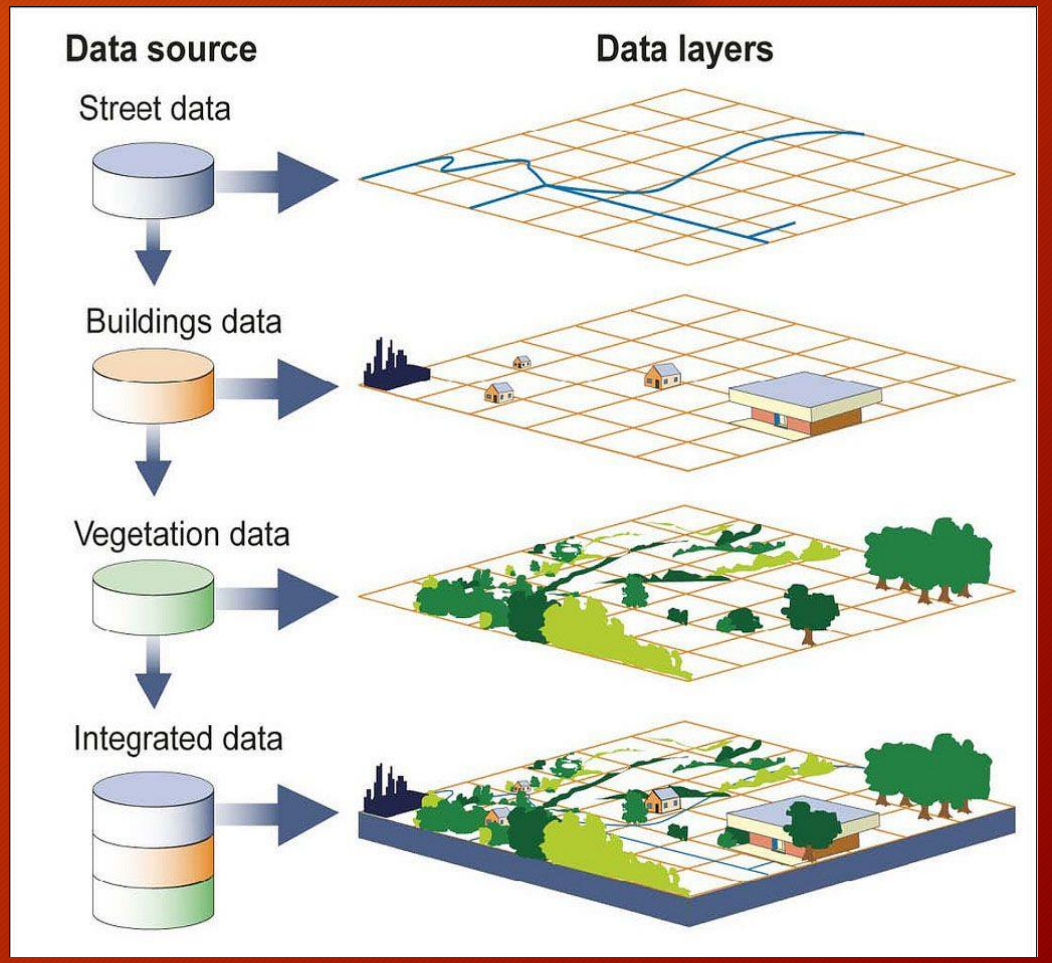
# 5 Essential Elements of a Web GIS – Operational Layers

These are layers that you work with directly or derive as the result of an operation (such as a query) in a web GIS application.

1. **Editing and data access layers:** These are the map layers that your users work with, for example, to edit features, perform queries, and select features for input to analysis.

2. **Query results:** In many cases, applications will make a query request to the server and return a set of records as results. These can include a set of individual features or attribute records. Users often display and work with these results as map graphics in their web GIS applications.

3. **Result layers that are derived from analytic models:** GIS analysis can be performed to derive new information that can be added as new map layers and explored, visualized, interpreted, and compared by end users.



# 5 Essential Elements of a Web GIS – Task and Tools

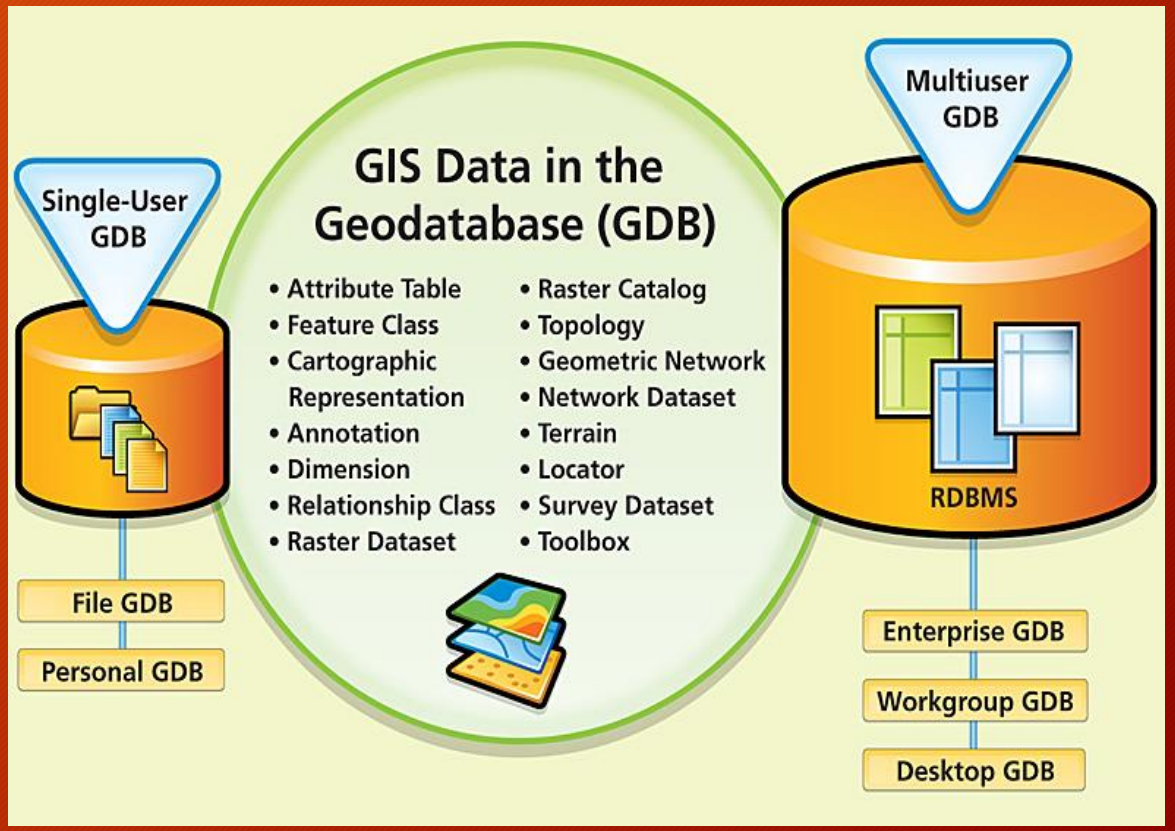
There are two ways to run your tasks:

1. **Have the client do it:** This method fits processes that are relatively easy and when the data needed is all on the client side. Typical examples include charting analysis results and generating heat maps based on a set of point features.

2. **Have the server do it:** This fits processes that are complex and when the data needed is not housed on the client side. Typical examples include finding and routing to the closest facility, calculating stream flows, and finding the best habitat by overlaying a number of data layers.

# 5 Essential Elements of a Web GIS – One or more Geodatabases

- Each GIS application depends on a strong geospatial data management framework that can hold the information used to support your application. This can be one or more geodatabases, a collection of shapefiles, various tabular databases and spreadsheets, CAD files, design files, imagery, HTML web pages, and so forth.
- Geodatabases are designed to support all levels of GIS implementation, from those that support the simplest geodata models to those that are quite sophisticated.
- Optimization, access time and performance are critical factors.



# Development Platforms for Web GIS

1. JavaScript
2. Java
3. Python
4. Elixir
5. Rust
6. Go
7. TypeScript
8. PHP
9. Ruby on Rails
10. C#
11. Swift

# Advantages of Web GIS

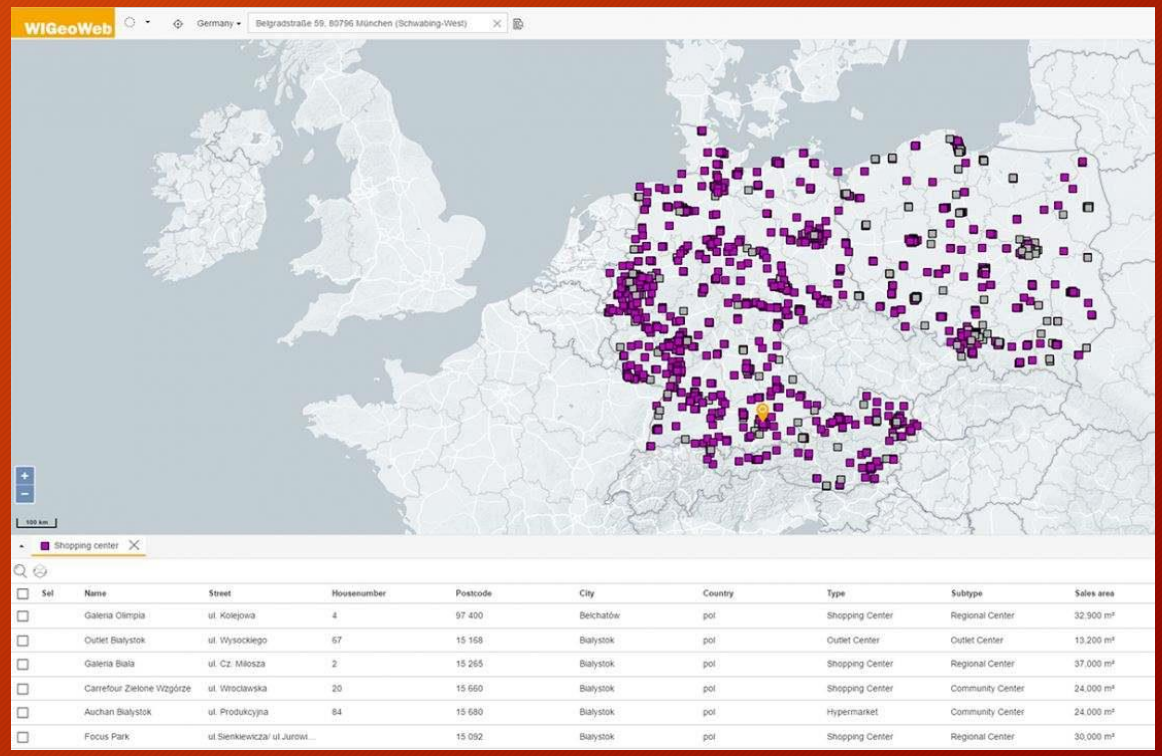
**A global reach:**

- Web GIS applications can be presented and accessed from anywhere in the world can access them from their computers or mobile devices.
- The global nature of web GIS is inherited from **HTTP**, which is **broadly supported**.
- Almost all organizations open their firewalls at certain network ports to allow HTTP requests and responses to go through their local network, thus **increasing accessibility.**

# Advantages of Web GIS

**A large number of users:**

- In general, a traditional desktop GIS is used by **only one user** at a time, while a web GIS can be used by dozens or hundreds of users simultaneously.
- Thus, Web GIS requires much higher performance and scalability than desktop GIS.



# Advantages of Web GIS

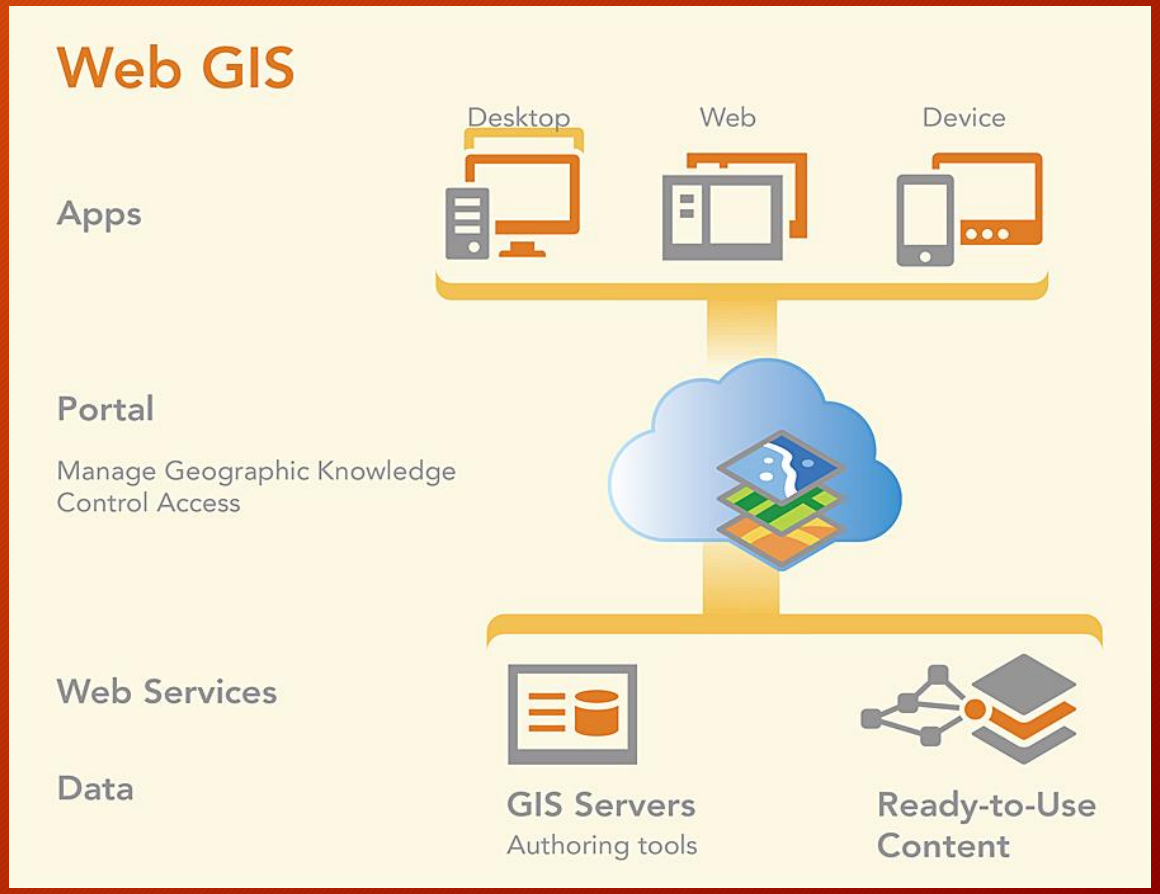
**Better cross-platform capability:**

- The majority of web GIS clients are web browsers: Internet Explorer, Mozilla Firefox, Apple Safari, Google Chrome, and so on.
- Because these web browsers largely comply with HTML and JavaScript standards, web GIS that relies on HTML clients will typically support different operating systems such as Microsoft Windows, Linux, and Apple Mac OS.

# Advantages of Web GIS

**Low cost as averaged by the number of users:**

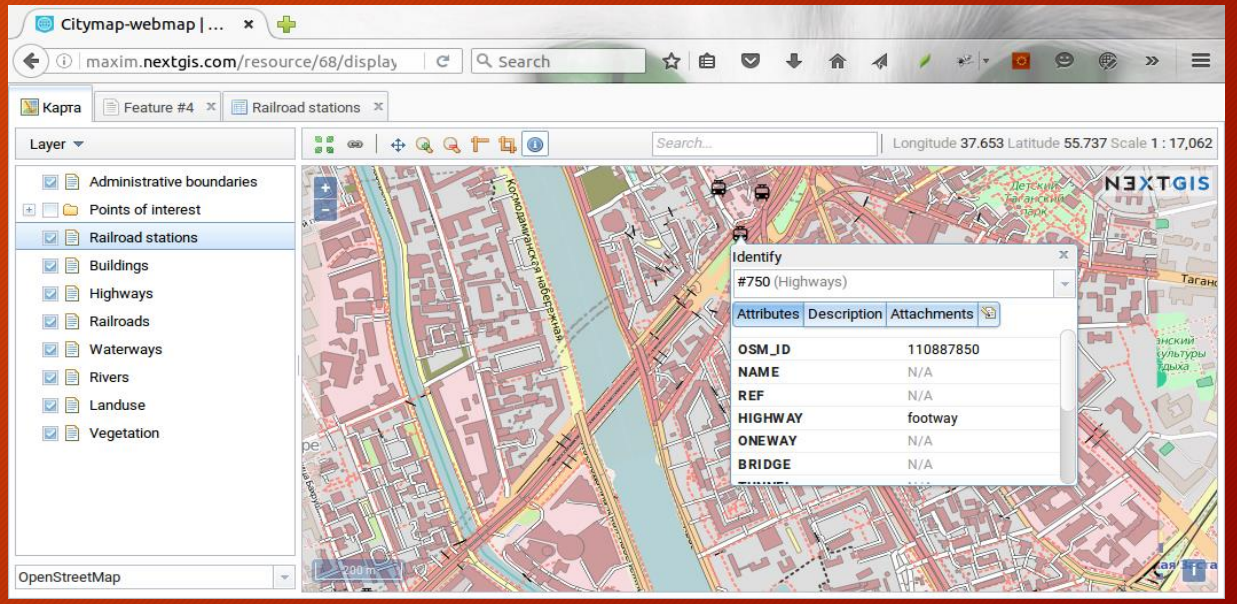
- The vast majority of Internet content is free of charge to end users, and this is true of web GIS. Generally, you do not need to buy software or pay to use web GIS.
- Organizations that need to provide GIS capabilities to many users can also minimize their costs through web GIS.
- Instead of buying and setting up desktop GIS for every user, an organization can set up just one web GIS, and this single system can be shared by many users: from home, at work, or in the field.



# Advantages of Web GIS

**Easy to use:**

- Desktop GIS is intended for professional users with months of training and experience in GIS.
- Web GIS is intended for a broad audience, including public users who may know nothing about GIS.
- They expect web GIS to be as easy as using a regular website. Web GIS is commonly designed for simplicity, intuition, and convenience, making it typically much easier to use than desktop GIS.



# Advantages of Web GIS

**Unified updates:**

- For desktop GIS to be updated to a new version, the update needs to be installed on every computer.
- For web GIS, one update works for all clients.
- This ease of maintenance makes web GIS a good fit for delivering real-time information.

# Advantages of Web GIS

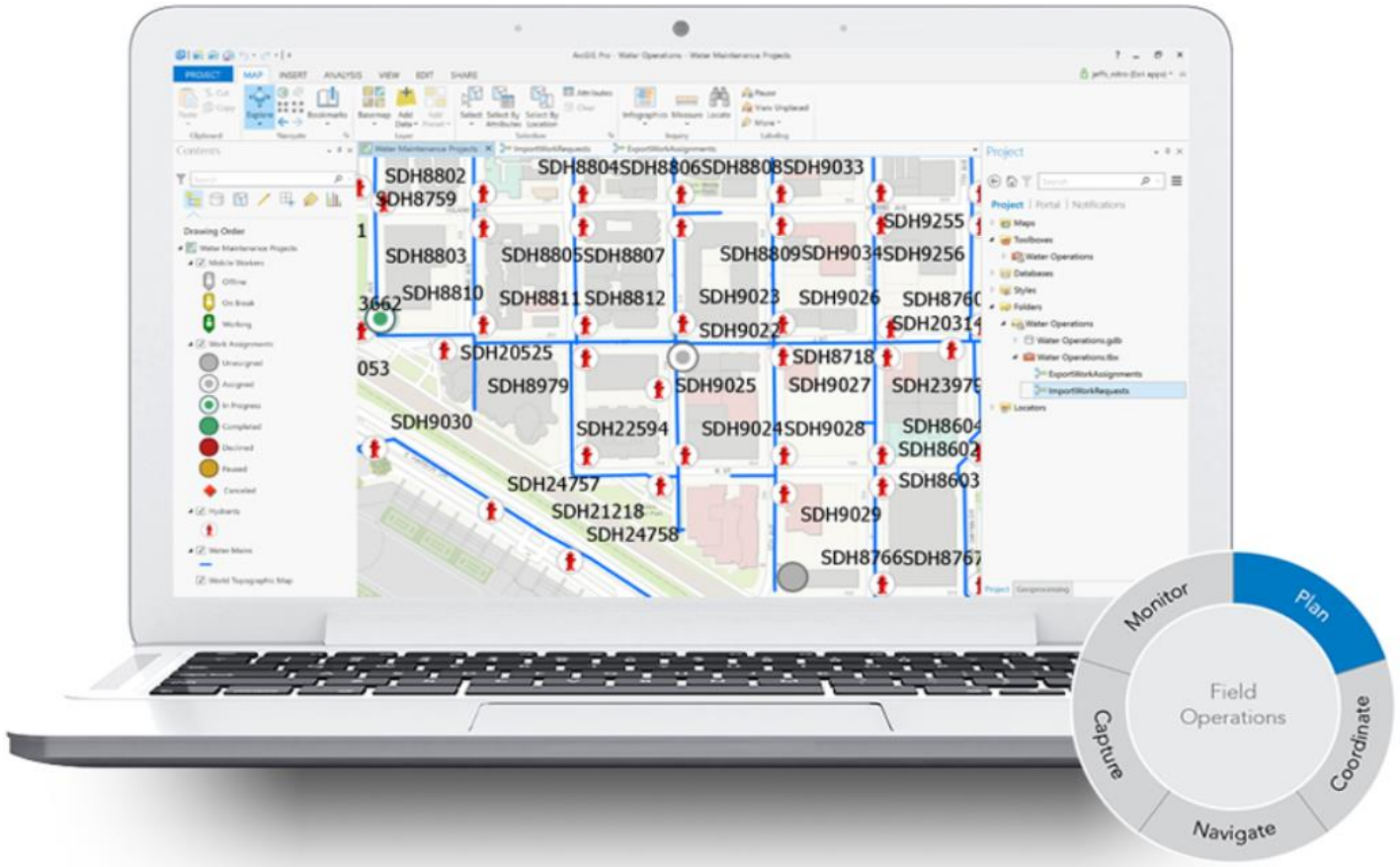
**Diverse applications:**

- Unlike desktop GIS, which is limited to a certain number of GIS professionals, web GIS can be used by everyone in an enterprise as well as the public at large.
- This broad audience has diverse demands.
- Applications such as mapping celebrity homes, tagging personal photos, locating friends, and displaying Wi-Fi hot spots are a few of the many current examples of web GIS.

# Integrated Workflow for Web GIS - Plan

## Plan

ArcGIS includes powerful mapping applications, ArcMap and ArcGIS Pro, that provide a common source of truth for planning field workforce operations. Think of it as a 360º view between the field and back office.

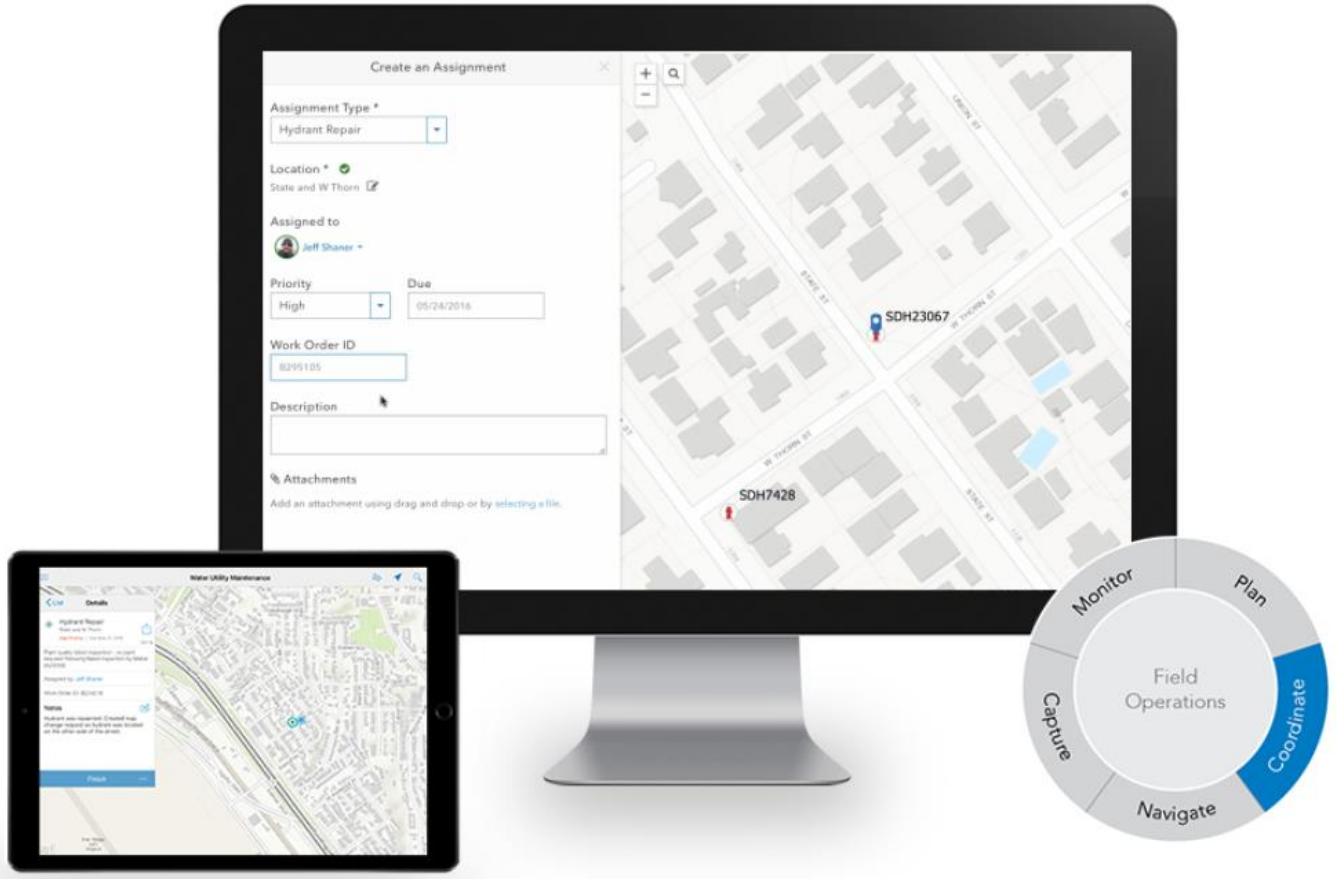


# Integrated Workflow for Web GIS - Coordinate

## Coordinate

Create projects and assign tasks to field workers using streamlined workflows designed to boost efficiency, reduce downtime, and cut operational expenses.

- With Workforce for ArcGIS, dispatchers can assign work, and field workers can report work status back.

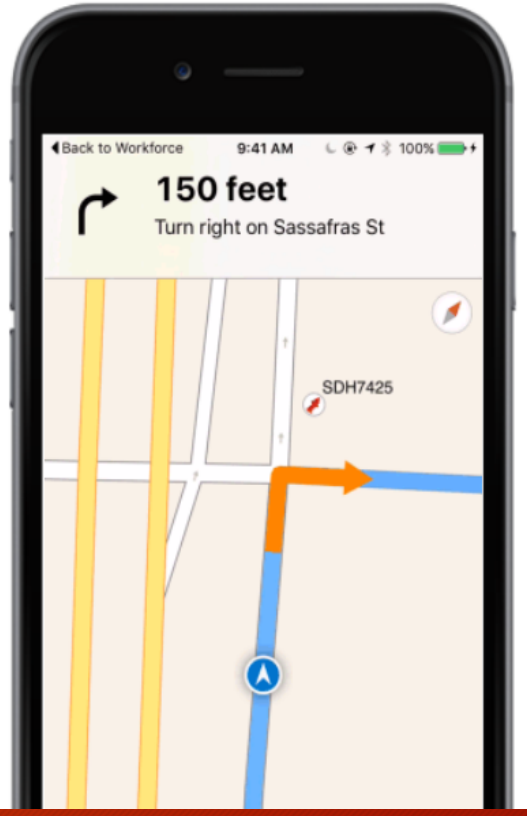


# Integrated Workflow for Web GIS - Navigate

## Navigate

Consistently meet deadlines by using the most efficient route so you can get there on time and get the job done.

- Get turn-by-turn directions, even for your private road networks, with Navigator for ArcGIS.

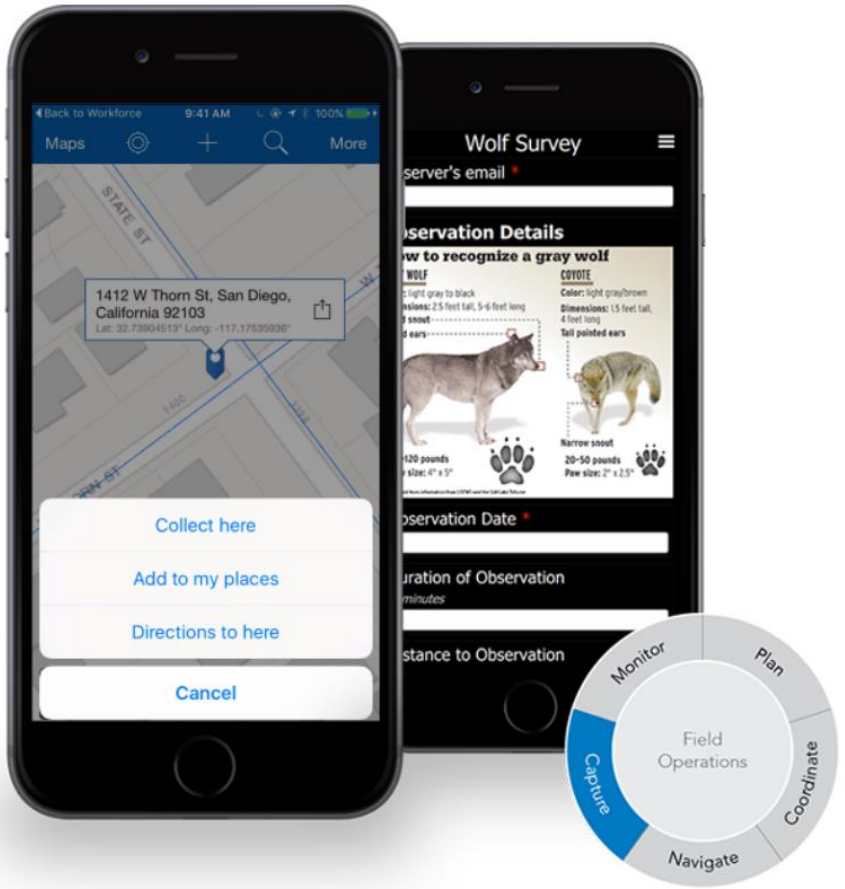


# Integrated Workflow for Web GIS - Capture

## Capture

Field data collection deserves a solution as specialized as the data it provides. Put everything on the map—asset information, survey results, and imagery.

- Collect data against a map using Collector for ArcGIS.
- Capture form-based data using Survey123 for ArcGIS.
- Turn drone-captured images into imagery products using Drone2Map for ArcGIS.

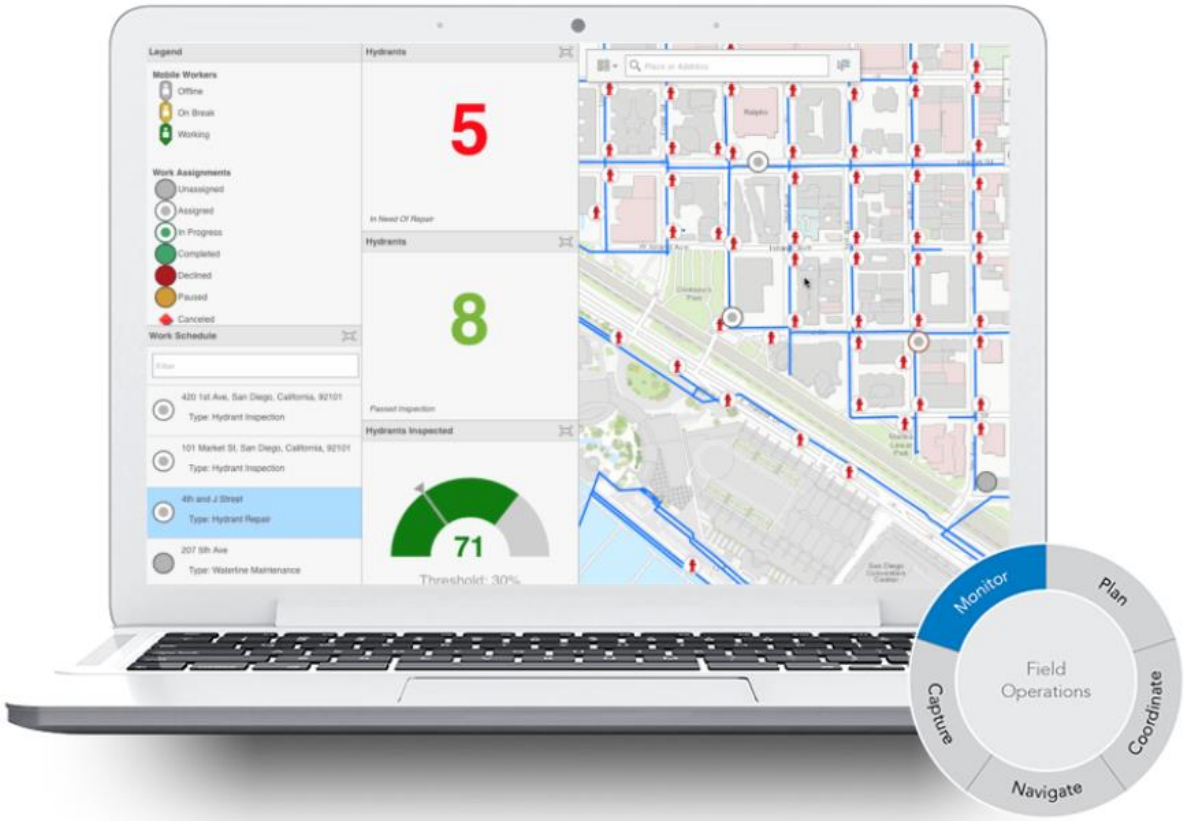


# Integrated Workflow for Web GIS - Monitor

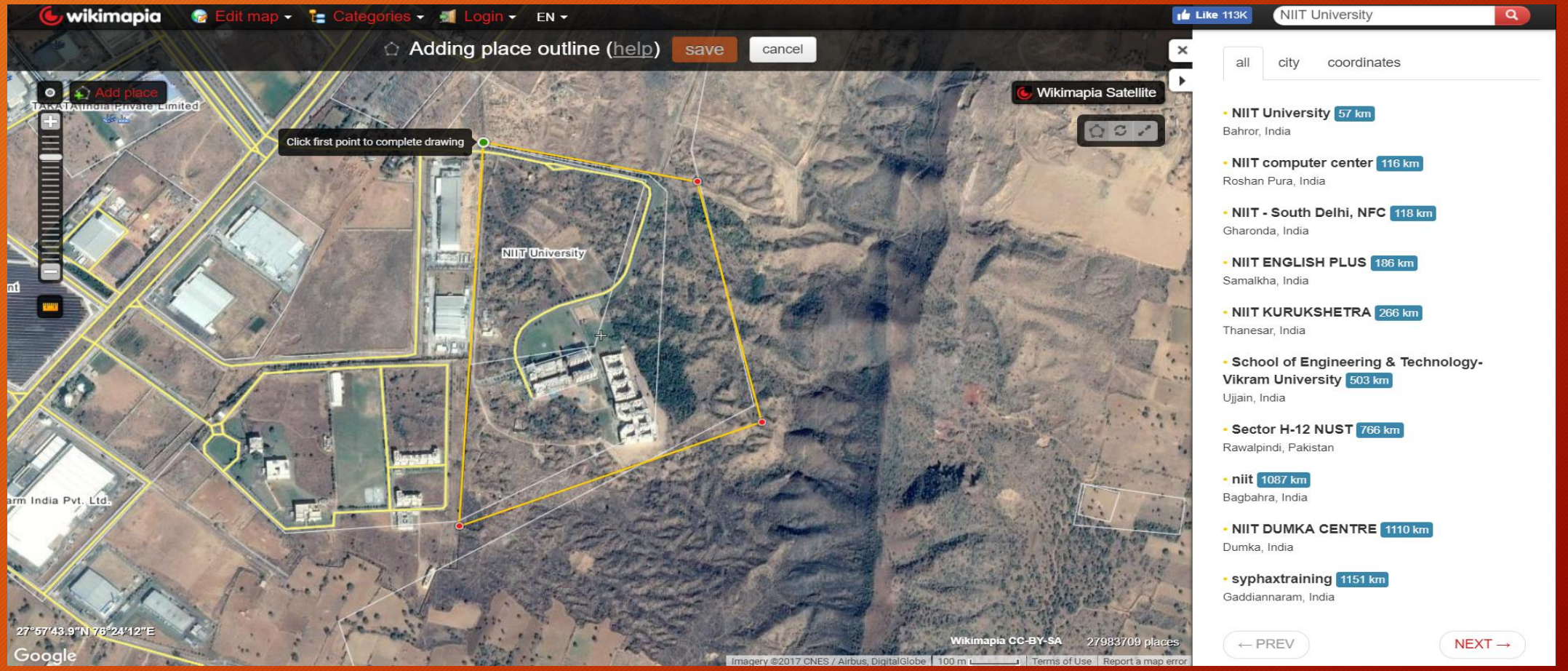
## Monitor

Stay on top of your field operations by monitoring, tracking, and reporting real-time data feeds to focus on what matters most.

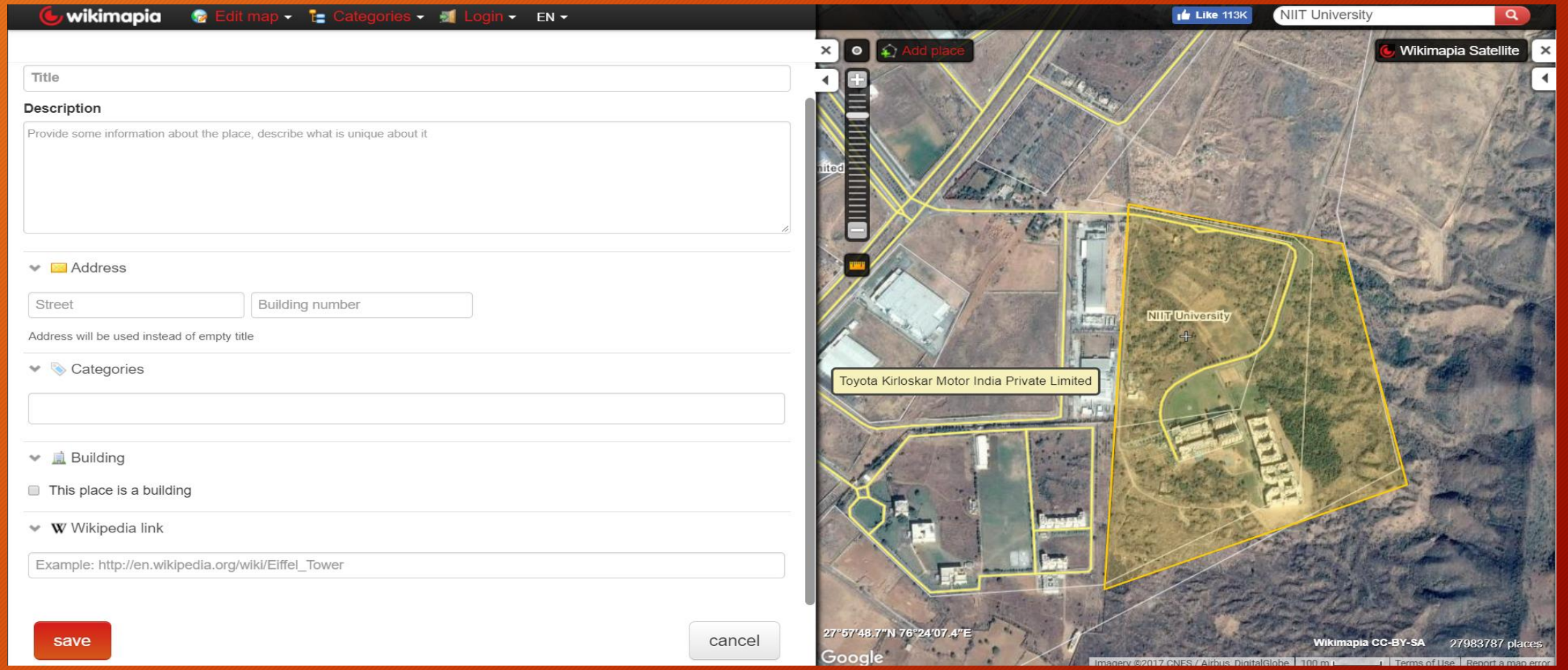
- Monitor field work status using Operations Dashboard for ArcGIS.



# Current Trends in Web GIS - WikiMapia



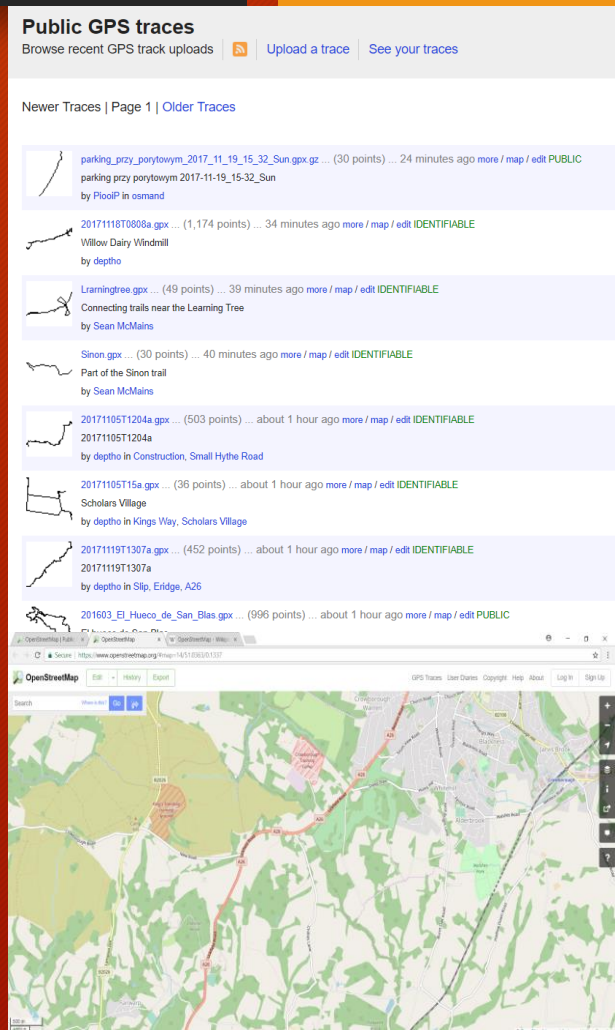
# Current Trends in Web GIS - WikiMapia



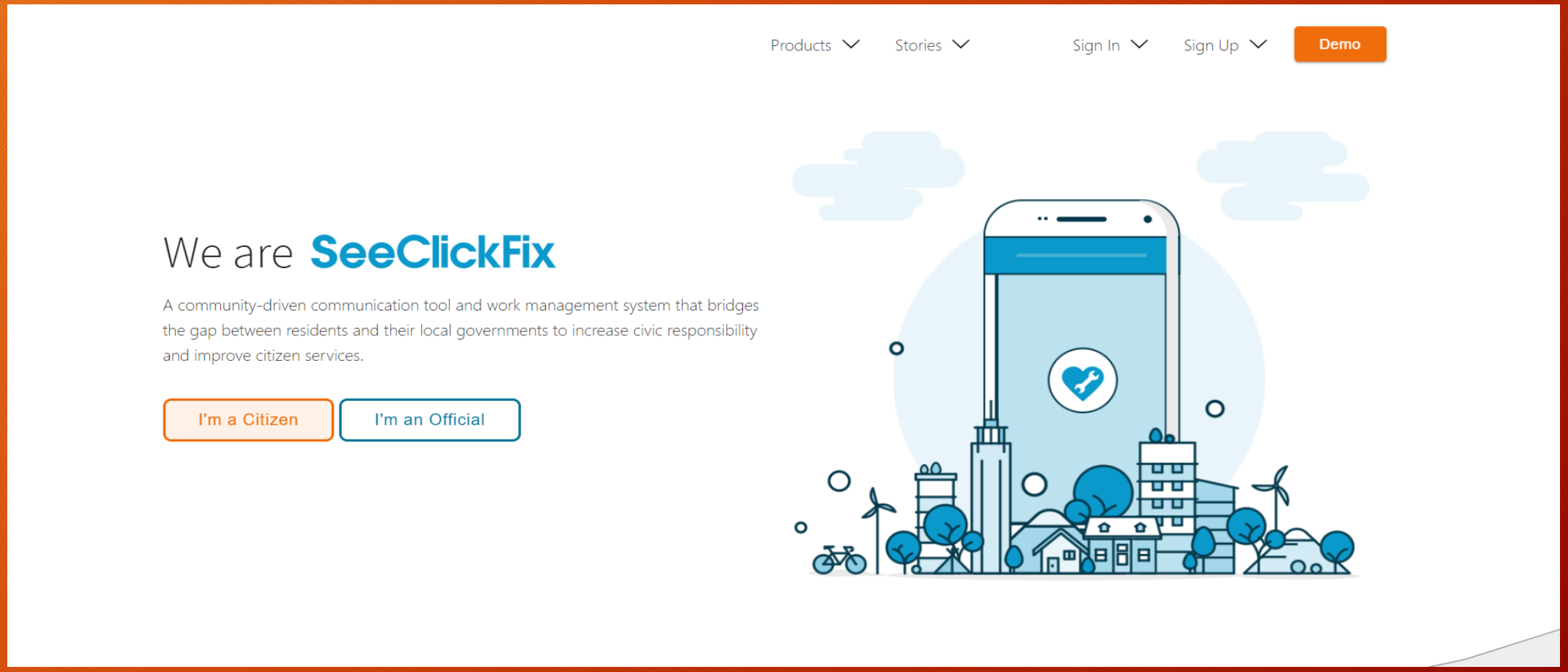
# Current Trends in Web GIS – Open Street Map

**OpenStreetMap** (**OSM**) is a collaborative project to create a free editable map of the world. The creation and growth of OSM has been motivated by restrictions on use or availability of map information across much of the world, and the advent of inexpensive portable satellite navigation devices. OSM is considered a prominent example of volunteered geographic information.

Rather than the map itself, the data generated by the OpenStreetMap project is considered its primary output. The data is then available for use in both traditional applications, like its usage Craigslist, OsmAnd, Geocaching, MapQuest Open, JMP statistical software, and Foursquare to replace Google Maps, and more unusual roles like replacing the default data included with GPS receivers. OpenStreetMap data has been favourably compared with proprietary datasources,though data quality in 2009 varied worldwide.



# Current Trends in Web GIS - See Clix Fix, etc. (Twitter/Fb/Flickr/Picasa)



# Future of Web GIS – Public Participation GIS

# Future of Web GIS – Geo Collaboration / Collaboration GIS

- Group of people using GIS technology to create a collaborative working environment to complete the same task.

  Eg:

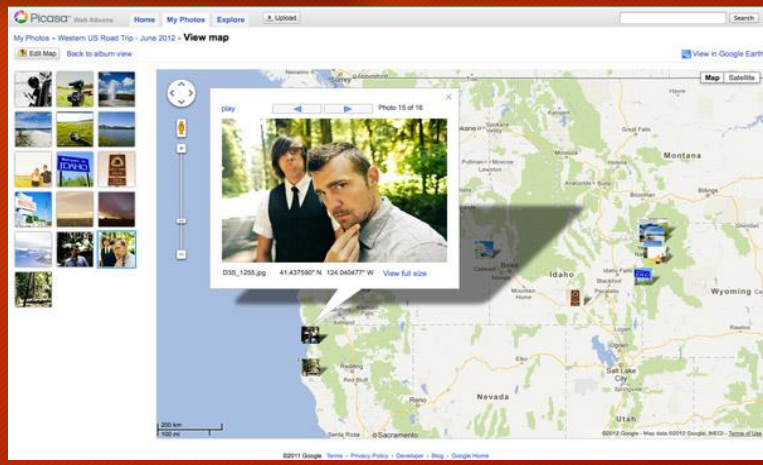
1. Facilitating Dialog: ability to talk or chat while viewing and interacting with the GIS.

2. Accounting for group behaviour: ability to know what others are doing.

3. Drawing Group Attention/ Collaborative Decision Making from separate locations.

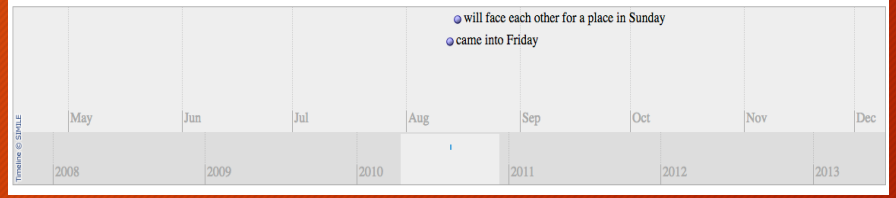
# Future of Web GIS – Automation & Integration of Various Technologies

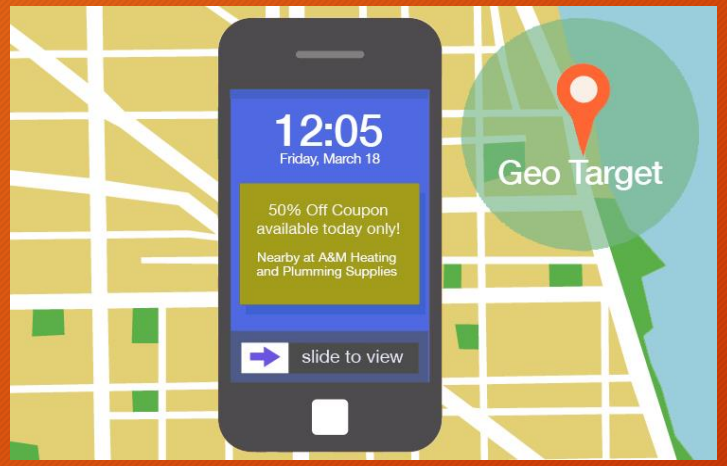
- 1. Geotagging
- 2. Geoparsing
- 3. Geotargeting




**Docdate: 2010-08-13**

Nadal and Murray set up semi showdown (CNN) -- Rafael Nadal and Andy Murray are both through to the semifinals of the Rogers Cup in Toronto, where they will face each other for a place in Sunday's final. Murray played some superb tennis in crushing the in-form David Nalbandian but Nadal had to recover from dropping the opening set to get past Germany's Philipp Kohlschreiber. Nalbandian won the ATP title in Washington last weekend and came into Friday's encounter on an 11-match unbeaten streak. But the fourth-seeded Briton, who has struggled to find his top form this season, brushed aside the Argentine in impressive fashion, securing a 6-2 6-2 victory in just 69 minutes. "It was probably one of the best matches I've played this year," Murray told the official ATP Tour website. "I served well and got the first good hits in a lot of the rallies, so I was able to dictate a lot of the points," added Murray -- who is the defending champion after winning the tournament in Montreal last year. Meanwhile, top seed Nadal also secured his place in the last four, but he was not as impressive as Murray in a 3-6 6-3 6-4 victory over Kohlschreiber In the evening session, third seed Federer will face a Wimbledon re-match with Czech Tomas Berdych, who beat him in the quarterfinals of the grasscourt tournament. The winner of that match will face either second seed Novak Djokovic or Jeremy Chardy of France for a place in the final.




(Based on User's Registration info/ Ip Address/ Gps data of users device)

# Future of Web GIS – Sensor Based Technology and Virtual World



Thank
you!