

HANDOUT – FREE GIS TOOLS

INTRODUCTION

This handout outlines five free GIS tools available for use – ArcGIS Online, Google Earth, Google Maps, QGIS, and Ride with GPS – including skill level needed, key GIS capabilities, and the strengths and limitations of each program. Many of the tools, including ArcGIS Online, Google Earth, and Ride with GPS offer both free and paid subscriptions. This handout focuses on functionalities available in the free versions of each program and/or tool.

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FREE GIS TOOLS SUMMARY TABLE

GIS Tool	Platform(s)	Paid Subscription Available?	Great for....	But not ideal for...
ArcGIS Online	Web Browser	Yes	Creating, editing, and sharing GIS data	Handling large datasets (due to data size limitations for public accounts)
Google Earth	Web Browser Desktop Software	Yes	Drawing transit route alignments based on aerial imagery	Data analysis or geoprocessing
Google MyMaps	Web Browser	No	Creating a simple web map of point-based data	Polyline or polygon-based data
QGIS	Desktop Software	No	Advanced spatial analyses	Working collaboratively
Ride with GPS	Web Browser Mobile App	Yes	Drawing transit route alignments or other polyline data	Polygon or point-based data

CHOOSING THE BEST TOOL FOR YOUR DATA

Analysis or Project Need	Suggested Tool(s)
Draw transit route alignments (or other polyline data)	Google Earth Ride with GPS
Share an interactive web map or application	ArcGIS Online Google MyMaps
Conduct geoprocessing or other advanced spatial analyses (e.g., buffer, join, clip, project)	QGIS
Enhance point data with multimedia attachments and interactive content	ArcGIS Online Google MyMaps
Create presentation-ready interactive content	ArcGIS Online
Convert data from one format to another (e.g., KML to shapefile, table to points)	QGIS

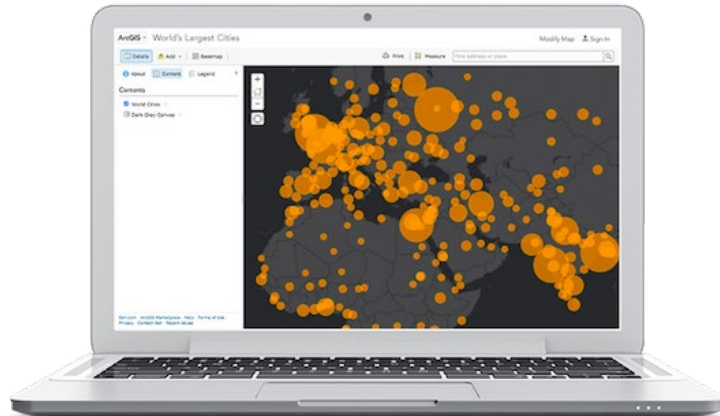
ARCGIS ONLINE PUBLIC ACCOUNT

ArcGIS Online allows users to build interactive web maps and apps using Esri's web-based mapping software. Users can upload, create, and share data to provide others with a place to interact with the data. Its data-driven mapping styles and analysis tools can be used to build location intelligence and share your insights online with others. ArcGIS Online can be used freely for noncommercial use.



ArcGIS Online

Mapping and analysis: location intelligence for everyone



URL: <http://www.arcgis.com>

Platform: Web Browser

Skill Level: Beginner to Intermediate

Paid Subscription Available? Yes

Key GIS Capabilities

- Create, upload, view, edit, export, and share GIS data
- Store data online (up to 2 GB for public accounts)
- Create and share web maps and apps
- Simple and intuitive interface for online mapping and data manipulation

Strengths

- Embed web maps into websites
- Integrates easily with other GIS data
- No software needed
- Wide variety of formats for data exports; shapefiles, geojsons, file geodatabases, KML/KMZ
- Wide selection of basemap options
- Ability to filter data and apply advanced styling based on data

Limitations

- Online content must be shared publicly and cannot be set to private
- Cannot participate in ArcGIS Online groups, a component of subscription-based accounts
- No access to Esri's analysis and geoprocessing tools
- No access to premium applications (e.g. Web AppBuilder, Dashboards, Experience Builder)

Additional Documentation & Resources

- [ArcGIS Online Frequently Asked Questions](#)
 - Questions relevant to public accounts include:
 - Does ArcGIS Online require a subscription?
 - Can I use ArcGIS Online free?
 - How much does it cost to use ArcGIS Online?
 - How much storage space do I get?
- [Esri Technical Documentation](#)
- [ArcGIS Online Pricing](#)
 - For upgrading from a public account to a paid subscription-based account

GOOGLE EARTH

Google Earth is a geobrowser that accesses satellite and aerial imagery, topography, ocean bathymetry, and other geographic data over the internet to represent the Earth as a three-dimensional globe. Google Earth combines satellite images of the entire Earth with numerous layers of value-added information such as roads, geographic boundaries, and places of interest.



URL: <http://earth.google.com>

Platform: Web Browser or Desktop Software

Skill Level: Intermediate

Paid Subscription Available? Yes

Key GIS Capabilities

- Easily locate using street addresses, coordinates, or by clicking locations on the map
- Draw point, line, and polygon data enriched with data tables
- Import and export KML/KMZ files
- Additional data layers available such as roads and geographic boundaries

Strengths

- Available in-browser or as standalone desktop program
- Maps can be embedded into web pages or shared via e-mail or URL
- Detailed up-to-date maps and data
- 3D capabilities

Limitations

- Maps and data are richest in urban areas
- Limited flexibility for labeling points
- Legends are not supported
- Lacks advanced spatial statistical analysis functions found in traditional GIS

Additional Documentation & Resources

- [Learn Google Earth](#)
- [Google Earth Help](#)

GOOGLE MYMAPS

Google MyMaps is a service offered through Google Maps that lets you use Google Maps as the underlying structure. Users can import, create, edit, and share custom datasets overlaid with Google Maps in addition to associating additional data to the points such as attribute information, photos, URLs, or other multimedia content.



URL: <http://www.arcgis.com>

Platform: Web Browser

Skill Level: Beginner to Intermediate

Paid Subscription Available? Yes

Key GIS Capabilities

- Add points or draw shapes anywhere
- Search for locations and save them to your map
- Import information from Google Docs and spreadsheets
- Personalize your map with stylized icons, colors, photos, videos, and pop-up boxes
- Export data layers to KML/KMZ for import into other GIS tools
- Export map and legend to PDF (limited functionality)

Strengths

- Maps can be embedded into other websites
- Build maps collaboratively, similar to Google Docs
- Browser-based and built into the Google Maps mobile application
- Share maps publicly or keep private

Limitations

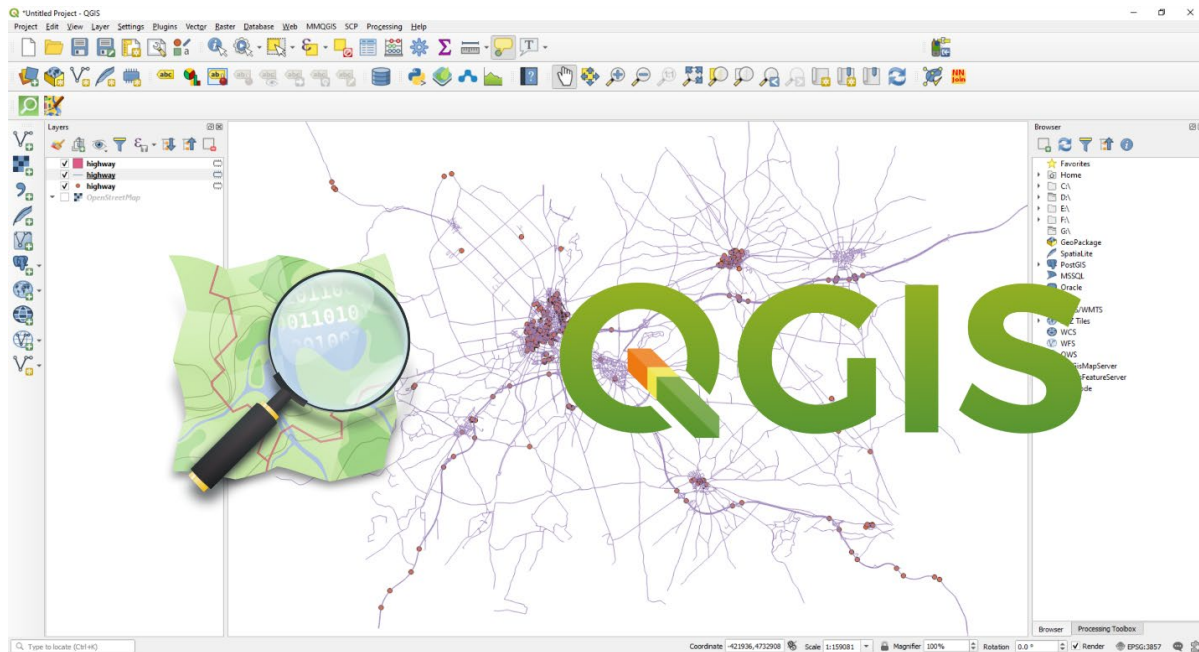
- Cannot import existing GIS data
- Functionality is focused on point data; limited options for creating polygon or line data
- Lacks advanced spatial statistical analysis functions found in traditional GIS
- No customization options for legend or other map features when exporting a map to PDF

Additional Documentation & Resources

- [MyMaps Help](#)
- [Everything You Ever Wanted to Know about My Maps](#)

QGIS

QGIS functions as a volunteer-driven free and open source geographic information system (GIS) software, allowing users to analyze and edit spatial information, in addition to composing and exporting graphical maps. QGIS supports both raster and vector layers, and vector data is stored as either point, line, or polygon features.



URL: <http://www.qgis.org>

Platform: Desktop Software

Skill Level: Beginner to Advanced

Paid Subscription Available? No

Key GIS Capabilities

- Create, import, edit, manage, and export data
- Explore big data and compose maps
- Analyze data using geometry tools, sampling, and geoprocessing
- Publish maps to the internet

Strengths

- Program functionality can be extended through free customized plugins
- PC, Mac, and Linux friendly
- Supports 3D visualization
- Import/export data into a wide variety of formats

Limitations

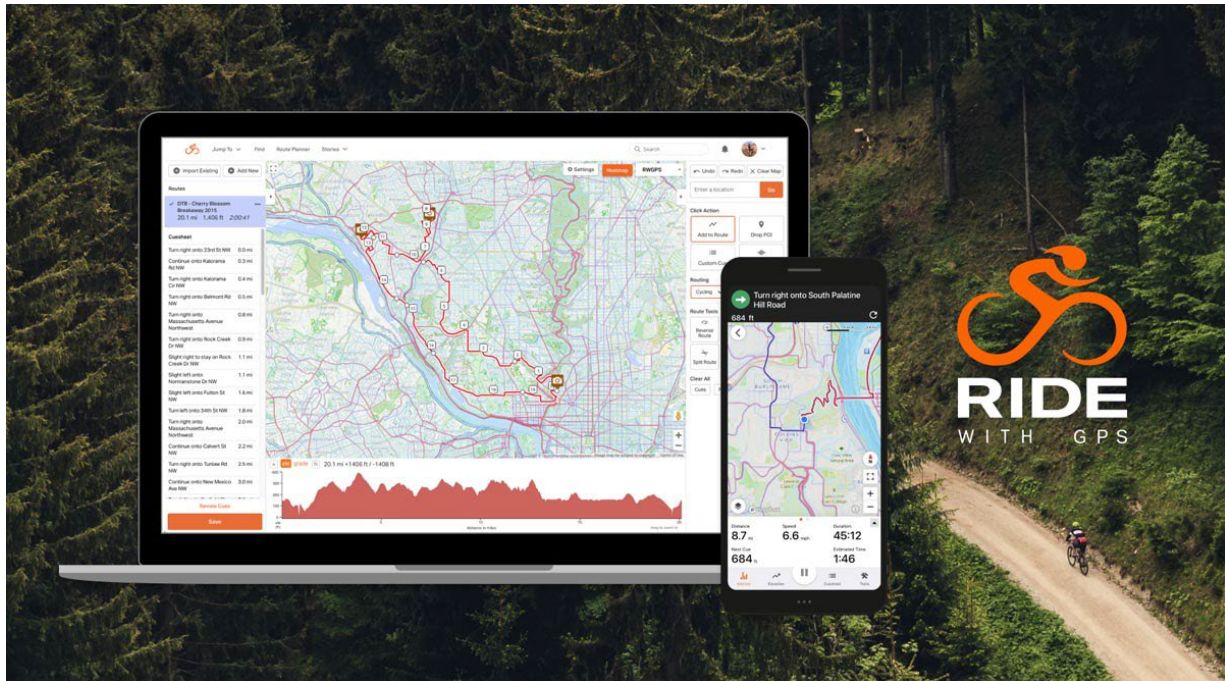
- Requires program download and install—no option for browser use
- Less beginner-friendly than other GIS platforms listed here and more time-consuming to learn
- Limited functionality for creating stylized maps

Additional Documentation & Resources

- [Documentation for QGIS 3.16](#)
- [Training Materials](#)
- [Free Ways to Learn QGIS](#)

RIDE WITH GPS

Ride with GPS is a bike route planner and cycling navigation application that allows users to both create routes and log their bike rides on the site. Though primarily geared toward cyclists for tracking activity, the application offers a simple interface for drawing routes, which has proven useful for transit professionals drawing transit routes in GIS. Data created in Ride with GPS can be imported into GIS software.



URL: <https://ridewithgps.com>

Platform: Web Browser and Mobile App

Skill Level: Beginner to Intermediate

Paid Version Available? Yes

Key GIS Capabilities

- Create and draw GIS routes
- Upload and export GPX, TCX, FIT, and KML files

Strengths

- Browser-based program with corresponding mobile application available
- Simple and easy user interface

Limitations

- Maps cannot be taken offline (internet access is required)
- Cannot print custom maps or route cue sheets
- Not ideal for point or polygon data

Additional Documentation & Resources

- [Ride with GPS Manual](#)
- [Advanced Route Planning and Editing](#)
- [Route Planner](#)
- [Trace Tool](#)