TechnicalNotes

GPS Pathfinder Office Software

POWERFUL AND EASY-TO-USE GPS DATA PROCESSING SOFTWARE

Having accurate and up-to-date information is essential in today's changing and competitive environment. GPS Pathfinder® Office, developed by industry pioneer Trimble, provides a seamless connection between field data collection and your GIS, ensuring that the best possible data is the foundation for confident decision making.

The GPS Pathfinder Office software adds value to your GIS data collection and data maintenance projects by enabling you to pre-plan your data collection session—making field work more productive. And with powerful tools for viewing, editing, differential correction and filtering, you output only the most consistent, reliable and accurate data to your GIS. With better data, you make better decisions.

Trimble

TRIMBLE TECHNOLOGY MEETS YOUR NEEDS

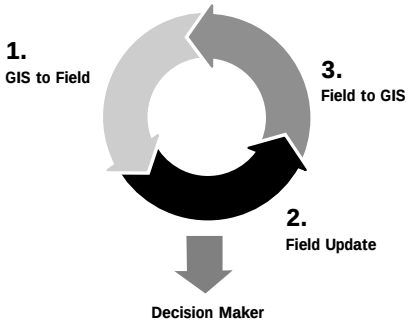
WHY GPS?

GPS technology is fast and accurate and, without doubt, the most cost-effective method of providing position data for features in a GIS database. GPS is a worldwide navigation system that makes it possible to collect data virtually any time or any place in the world with a common standard of accuracy and dependability. Powerful GPS receivers, such as the Trimble GPS Pathfinder Power, Pocket, Pro XR, Pro XRS and GeoExplorer® 3 systems used in conjunction with a variety of differential correction sources, can provide on-the-spot accurate data.

WHY GPS PATHFINDER OFFICE SOFTWARE?

GPS Pathfinder Office software gives you the power of advanced Trimble GPS technology. In 1987, Trimble pioneered the introduction and use of GPS/GIS data collection systems. Since then, GPS has become the premier tool for providing position information.

Trimble has continued to lead the way. In 1999, the company pioneered a new concept of GPS/GIS data maintenance. Advanced GPS technology enables you to relocate features graphically; to verify and update positions and attributes; to add new features; and to easily integrate the changes into your GIS database.



GPS Pathfinder Office software is a key component of Trimble's advanced GPS/GIS data maintenance system. This software is the result of many years of experience building GPS tools for those who manage and utilize urban, utility and natural resource databases.

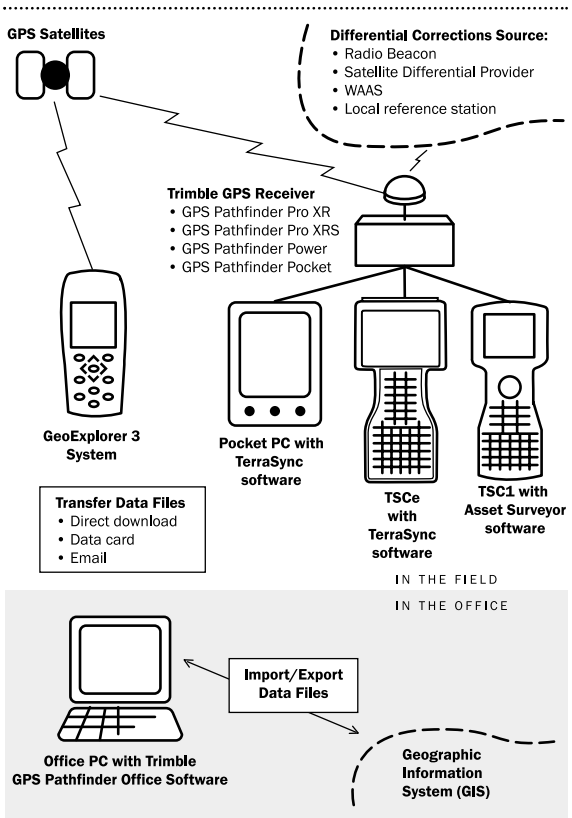
GPS Pathfinder Office software has a full-range of tools that address all aspects of GPS-based geographic data collection, update, and processing. This Microsoft Windows-based software makes it possible to quickly and easily prepare for fieldwork and process collected data for export to your GIS.

Utilities and governmental organizations use GIS information to plan and implement maintenance, new construction and repairs. The result is improved service quality and cost-effectiveness. Government and private organizations use GIS information to manage and protect resources—whether for maximum yield, for maximum profit, or for multiple use. Accurate information helps ensure policy and decisions are sound.

GPS Pathfinder Office software is a key component of all of Trimble's GPS/GIS systems. These systems are designed to maximize your data management capabilities and options. Use GPS Pathfinder Office to plan fieldwork; create data dictionaries; transfer files; differentially correct, view and edit data; and import and export data. The GPS Pathfinder Office software integrates seamlessly with:

- GPS Pathfinder Pocket receiver with TerraSync™ software.
- GPS Pathfinder Power, Pro XR, and Pro XRS systems with TerraSync or Asset Surveyor® software.
- GeoExplorer 3 systems.
- Trimble Reference Station (TRS™) software.
- GPS Pathfinder Tools software development kit.

Choose the solution that best meets your requirements, and realize the benefits of better decisions from better data.



FEATURES AND BENEFITS

Ensure Quality Data

The ability to create a data dictionary or import an existing data dictionary as a template means newly collected data is compatible with existing data. Trimble GPS Pathfinder Office software also makes it easy to verify and update data by importing existing GIS data files.

You can also use GPS Pathfinder Office software to view a map of original and updated data to ensure that the data meets your quality standards before exporting it to your GIS.

Save Time

A powerful Batch Processor allows you to save time processing data. You can set up the software to seamlessly download, process, and export your data to your GIS—even when you are not at your desk. You don't even have to come into the office in order to upload and download the data—using Trimble's TerraSync software you can receive and send files directly from the field via email. Configure the software to automatically search the Internet for a suitable base station for differential correction to save even more time.

Easy to Learn and Use

GPS Pathfinder Office operation is intuitive, with easy-to-use screens, seamless data flow, and a comprehensive online Help system. Large amounts of data are handled with ease.

Data Compatibility

The ability to export data in a large number of coordinate systems and to a wide variety of GIS packages means you won't waste time ensuring data is compatible with your GIS system or with existing data.

File formats supported include ArcView Shapefile, MapInfo MIF, Microsoft Access MBD, dBase, AutoCAD DXF, and more. Additionally, the software has the ability to overlay your field data with both raster and vector-format data.

USING TRIMBLE GPS PATHFINDER OFFICE SOFTWARE

Configuring the GPS Pathfinder Office Software

Creating Project Files

A project is a set of computer folders that store data files for a particular job. Project files allow you to efficiently organize related data files so they can be quickly located. These files are particularly useful when more than one person is using the same computer to process field data.

Coordinate System

Coordinate systems are used to convert GPS data, which is collected on a curved grid, to a form where it can be used on the planar grid typically used in a GIS. Coordinate systems differ by region because the earth is not perfectly round.

A coordinate system lets you display collected GPS positions in relation to background maps, enter waypoint coordinates, print or plot maps, import/export coordinates from a GIS or spatial database, and enter manual positions.

Choosing the Correct Coordinate System

The GPS Pathfinder Office software displays and outputs GPS positions in a wide range of coordinate systems and zones. You can select a coordinate system from a list or create your own custom coordinate system. You can use custom coordinate systems in the office and transfer them to your GPS Pathfinder or GeoExplorer 3 system for use in the field.

Preparing For Field Work

The GPS Pathfinder Office software provides powerful tools for planning data collection activities.

Identifying the Best Time to Collect Data

With the GPS Pathfinder Office QuickPlan™ module, you can identify the times of the day when satellites will be best situated to provide accurate positional data for the areas you will be working in. This helps ensure that the data field crews collect is of the highest quality.

Data Dictionary

A "data dictionary" is a list of features and attributes that you plan to collect in the field. Whether you are collecting new data or updating existing data, a data dictionary ensures that the collected data is always consistent with your needs—even if more than one person is collecting it. In the field, the data dictionary structures and speeds data collection and makes it easy for crews to enter data in the correct format. This helps to ensure data uniformity and integrity, as well as compatibility with your GIS database.

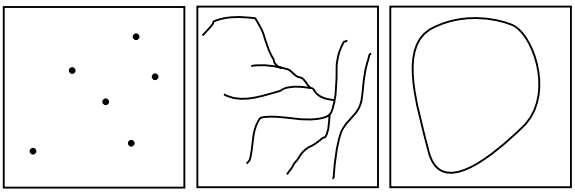
Creating a Data Dictionary

Use the GPS Pathfinder Office software to create data dictionaries that can be transferred to your Trimble field data collection software.

Using the Data Dictionary Editor, you can define the feature and attribute data to be collected in the field, create menu options, and set default values. Alternatively, you can use the Import Utility to convert an existing GIS file directly to a data dictionary.

Features and Attributes

In general, features are things that you want to identify, describe or locate. Trimble's TerraSync, Asset Surveyor, or GeoExplorer 3 software allows you to identify three types of features—point, line, and area. The way GPS data is collected differs for each type of feature.



Points	Lines	Areas
• Road signs	• Roads/Trails	• Parks
• Power poles	• Pipelines	• Wetlands
• Nesting sites	• Rivers	• Land parcels

For **point features**, GPS positions are collected and averaged as you stand at the feature.

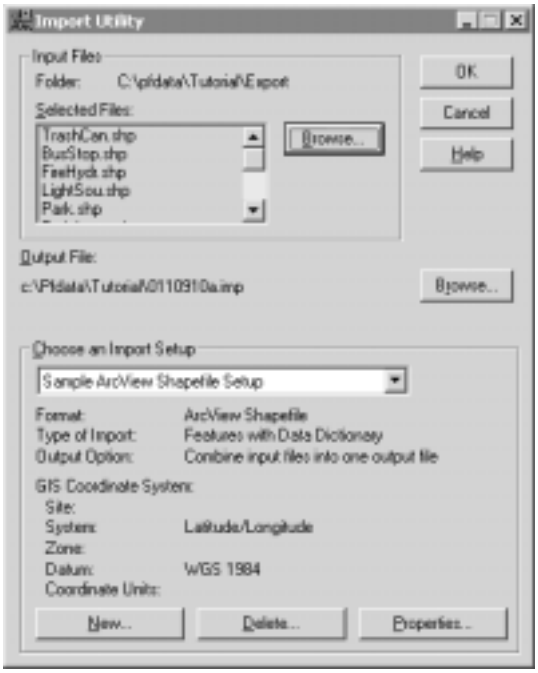
For **line features**, GPS positions are recorded periodically as you move along the feature. You can configure the system to record positions at regular intervals or to average a number of positions to get a more accurate vertex position. These positions are joined to form a line.

For **area features**, GPS positions are recorded as you move around the edges of the site (in the same manner as a line feature). These positions are connected to form the boundary of an area.

Data Maintenance

To verify or update existing data, use the Import utility to bring existing data from your GIS into the GPS Pathfinder Office software. Point, line, and area features, and their associated position and attribute information, can be imported from the following formats: ArcView Shapefile (SHP), Microsoft Access Database (MDB), dBase IV (DBF), MapInfo (MIF), and AutoCAD (DXF) and transferred to your field data collection system.

In the field, use real-time differential GPS (DGPS) to quickly relocate features that need updating. Back in the office, you can check updated data and seamlessly merge it back into your GIS using the GPS Pathfinder Office Export utility.



Preparing the Data Collector for the Field

Use the Data Transfer utility to transfer new data dictionaries, existing data files, and other files to your data collectors. If you are using Trimble's TerraSync software you can even e-mail the prepared files directly to field personnel, avoiding an unnecessary trip to the office.

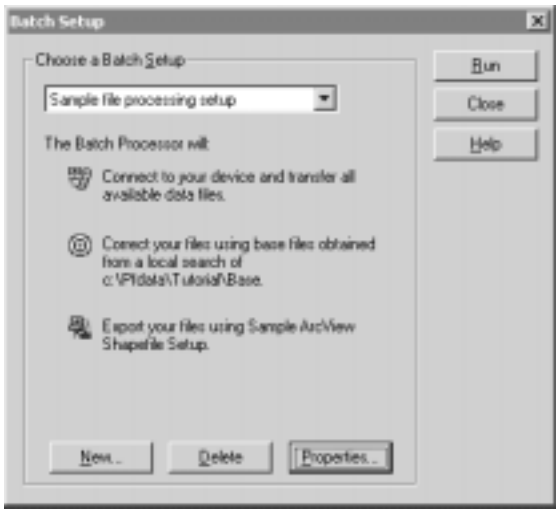
If you use a GeoExplorer 3 system, or TerraSync version 2.10 software, you can use the Configuration Manager to set up multiple units with the same settings before leaving the office. These settings can be locked and protected to prevent them from being changed in the field. This gives you confidence in the quality and integrity of the data.

BACK IN THE OFFICE

Back in the office, the GPS Pathfinder Office software makes downloading and processing data fast and easy. The Batch Processor lets you download, process and export data files—even while you are away from your computer.

Batch Processing

With the Connection Manager and Batch Processor, you can to set up your system to download and process routine data while you are away from the computer—even overnight. Using the Batch Processor you can automate data transfer, differential correction, and export of the data to your GIS. You can also use the processor to run a specific command, such as moving data to a network location or running your GIS software.



DGPS or Real-time GPS

A GPS position is subject to a number of errors that interfere with accuracy. Differences in the timing devices in the satellites and the receivers, orbit errors, the earth's atmosphere and receiver noise are just a few of the things that reduce accuracy. However, these errors can be removed by a process called differential correction. Differential correction can be done after the data is collected or as it is being collected in the field.

Field correction uses a telemetry link between the base station and the field data collection system. This is called real-time differential GPS (DGPS). Today, a variety of DGPS sources are available, these include MSK beacons found in coastal areas and major waterways around the world; commercial satellite-based services available world-wide; and, in the US, the government operated Wide Area Augmentation System (WAAS). By making use of real-time DGPS, you can easily relocate features, verify data and make decisions in the field.

If you are in an area not yet covered by any of these correction sources, you can make use of the existing network of reference stations to postprocess your data. Look for one of the following reference stations in your area:

- Trimble Reference Stations (TRS)
- GPS Pathfinder Community Base Stations (CBS)
- Continuously Operating Reference Stations (CORS)
- University NAVSTAR Consortium (UNAVCO) reference stations
- International GPS Service (IGS) reference stations.

The **Differential Correction** utility provides a list of some of the sites available, and can automatically search for the correct base data and download files directly from these sites.

Differential Correction

If your field data was collected without a real-time differential source, or if coverage was intermittent, you will need to postprocess the data to improve its accuracy.

You can postprocess your data in GPS Pathfinder Office. When correcting the data, the software will automatically detect uncorrected GPS positions and correct them for you. You can browse the Internet to locate base station files for differential correction based on your work location and the time of day.

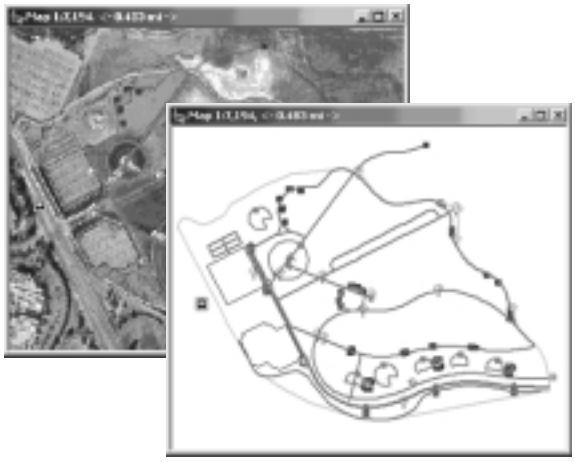
Using Trimble's unique SuperCorrect™ technology, available with TerraSync software version 2.10 or later, you can re-process your data in the office to improve positional yield and accuracy. Using SuperCorrect you can postprocess your field data using different filters and settings to what you may have used in the field, giving you complete control over data integrity.

Viewing Data

Before transferring processed data to the GIS or database, visually check the data to confirm it is complete and error-free. The GPS Pathfinder Office software offers two options for viewing your data—a map view and a time line view.

Map View

The Map view can display a number of data files at a time. Choose from a wide range of fonts, symbols, colors and line styles to tailor your data display to match your GIS. Zoom, pan, and select features to view detailed information about them. And, you can also use the map to measure distances and graphically edit the data file to remove unwanted positions and features.



The ability to layer background files, both raster and vector, makes it possible to view your collected data against aerial photographs and topographical maps. A variety of data formats are supported including MrSID, ArcView Shapefiles, AutoCAD DXF files, and georeferenced TIFF, JPEG and bitmap files. Data can even be downloaded from an Internet map server and used directly in the GPS Pathfinder Office software.

Raster Format

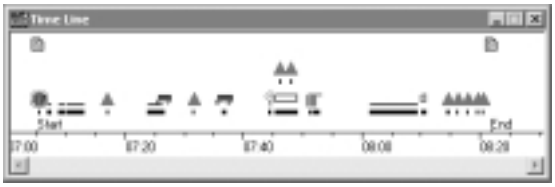
A raster file contains an image that is located in space with geocoordinates. Satellite images and aerial photographs used in GIS systems are provided as raster images.

Vector Format

A vector file contains a georeferenced line drawing or illustration. Typically, surveys and topographical maps are provided in a vector file format.

Time Line View

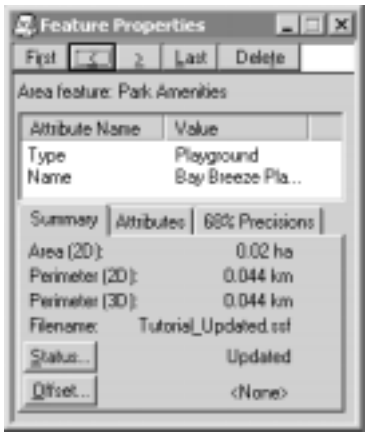
The Time Line allows you to display and review your data or locate a feature according to the time it was recorded.



Editing Data

GPS Pathfinder Office software offers a number of powerful tools that allow you to edit the field data, remove unwanted data points, or create line or area features from end or corner points.

Within the Feature Properties window, you can edit the attributes and offset information of any feature. And using the Position Properties window you can delete single individual positions from a feature. The Block Delete option allows you to delete all positions within a defined boundary.



Printing Files

When you require a map to carry to the field or use as a handout, you can send an onscreen map from the GPS Pathfinder Office software to any Microsoft Windows compatible printer.

Exporting Data Files to GIS

The Batch Processor is a convenient way to export large amounts of data to your GIS. However, you can also use the Export utility to configure and transfer data. A wide variety of common GIS file formats are supported. Or, you can call up a template that can be used to create your own ASCII format. The Export option allows you to filter features with specific attributes so you can export just that data. You can also filter out data that does not meet your quality standards.

File formats supported include ArcView Shapefile, MapInfo MIF, Microsoft Access MBD, dBase, AutoCAD DXF, and more.

CONCLUSION

Trimble GPS Pathfinder Office software is the vital link between GPS field data collection and your GIS system.

The software offers a wealth of timesaving tools, making it easy to collect, update, and manage large quantities of data. With consistent, reliable data, you'll have the information at your fingertips to make quality decisions.

SYSTEM REQUIREMENTS

Recommended Hardware

Computer

Pentium 133 MHz microprocessor
64 MB of RAM (32 MB minimum)
160 MB hard disk (80 MB minimum)
CD drive

Operating System

Microsoft Windows 95, 98, Me, NT 4 (service pack 4 or later), 2000, and XP (Windows 95 minimum)

Internet

LAN connection or 28,800 bps dial-up modem Internet connection

Standard Components

Software CD
On-line documentation
Getting Started Guide
Release Notes
Tutorial and sample files

Languages

English, Spanish, Portuguese, French, German, Russian, Chinese, Japanese, and Korean.

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