What's New in Maptitude 2021

Maptitude 2021: New Features Overview

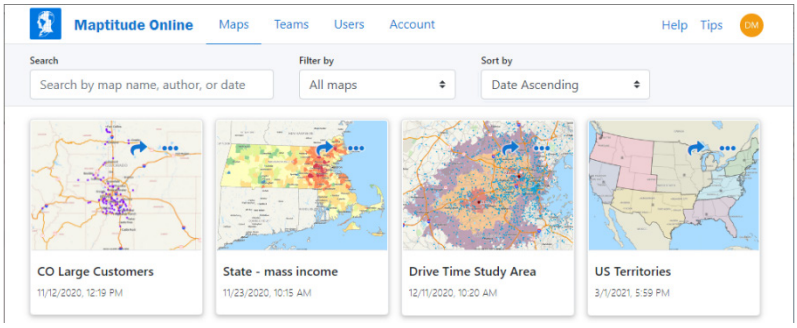
Maptitude 2021 is a major release of Caliper Corporation's popular Geographic Information System (GIS) and mapping software. The 2021 version provides the most up-to-date and accurate data available.

Maptitude 2021 provides the business value you expect when investing in mapping software. Maptitude includes the latest streets, postal data, and demographics. Maptitude 2021 is the fastest and most intuitive professional mapping application, with significant enhancements to sharing, visualizations, and logistics/operations analytics.

Key Features of Maptitude 2021

1. The most up-to-date geographic and demographic information available, including improved points-of-interest/landmarks, and new free USA data for building footprints and address points that are useful for site evaluation, direct mailing, and deliveries. Plus, a financial assets dataset that is essential for any organization that relies on wealth-related statistics.
2. Uploading maps to **Maptitude Online** allows you to **easily share your data** privately with your team or publicly as a web app.
3. **Maptitude is faster** with improvements to routing for multiple destination directions, quicker display of imagery and aerial layers, and more rapid opening and closing of maps.
4. One of the best features of MapPoint was being able to use sliders to adjust driving speeds by road type to make travelling along them faster or slower. Maptitude has taken this a step further by allowing you to **explicitly define speeds**.
5. The new Market Share (Huff Model) tool adds to our growing suite of logistics tools, **estimating potential sales** for your existing or proposed sites versus the competition, and showing you **areas with high and low market share**.
6. A variety of new visualizations have been added including **new chart types** for box plots, histograms, full stack bar charts, and radar charts. There are also new theme add-ins that allow you to **visualize multiple columns** of data as 3D cylinders or heat maps.
7. **Differentiating points** on a map is clearer when adding additional tables or spreadsheets, through the automatic use of different colored pushpins for each new map layer.
8. A new Google Maps toolbar allows you to see your current map location in any of the different **Google Maps views including Street View**.
9. Interoperability with **external data** has been expanded with support for multiple tracks in GPS data, support for DeLorme drawing files and Scalable Vector Graphics images, export to SQLite Tables, and support for projection files with either ESRI or OGC WKT definitions.
10. **Interoperability** with Maptitude has been expanded with fast PostgreSQL asynchronous handling and selecting, quick conversion of tables to NumPy Panda DataFrames, the Python 3 CaliperPy package, and the CaliperR R package.

Maptitude can map your information whether you have data from Google Maps, from a Microsoft mapping product such as MapPoint, or from Microsoft Office. You can analyze your information using the intuitive Maptitude 2021 mapping wizards and export your results as attractive, preformatted Excel or PDF reports, or **upload them to Maptitude Online for public or private sharing**.



Maptitude delivers easy-to-use professional mapping tools and data at the unbeatable price of only US$695 (or US$395 for upgrades.) For pricing and ordering information, please visit the Mapping Software Store, e-mail Maptitude Sales, or call US sales at +1 617-527-4700.

New Data

Maptitude 2021 comes standard with one detailed Country Package of your choice, and additional Country Packages can be purchased separately. Each Country Package includes a wealth of data unavailable in any other product, such as an up-to-date street layer with addresses for pin-mapping (geocoding) and travel time information for computing routes and drive-time rings. Features such as building footprints for many urban locations, railways, and named landmarks are also built into the software. The comprehensive landmarks range from public facilities to commercial buildings including businesses, restaurants, and retail stores, and include addresses and phone numbers where available. Where available, postal data and detailed demographics are shipped with the product.

As you switch between the countries you have purchased, Maptitude will seamlessly refresh the interface with country-specific tools such as Create-A-Map Wizard and tools for finding, pin-mapping, and routing. New Map Libraries allow you to easily create attractive geographic and demographic maps while locating unlimited numbers of addresses and territory-based records.

The basic global map that is provided with every Maptitude license enables you to view your data for anywhere on Earth, and it allows you to map your locations by coordinate, manually, or by any populated place (village/town/city).

United States

New U.S. datasets provide access to the most up-to-date geographic information available. Maptitude 2021 comes with October 2020 HERE® Map Content, which allows for accurate address locating and street visualization, in addition to robust data that you can use to calculate directions, drive-time rings, and drive-time territories. Speeds based on HERE Traffic Patterns are included.

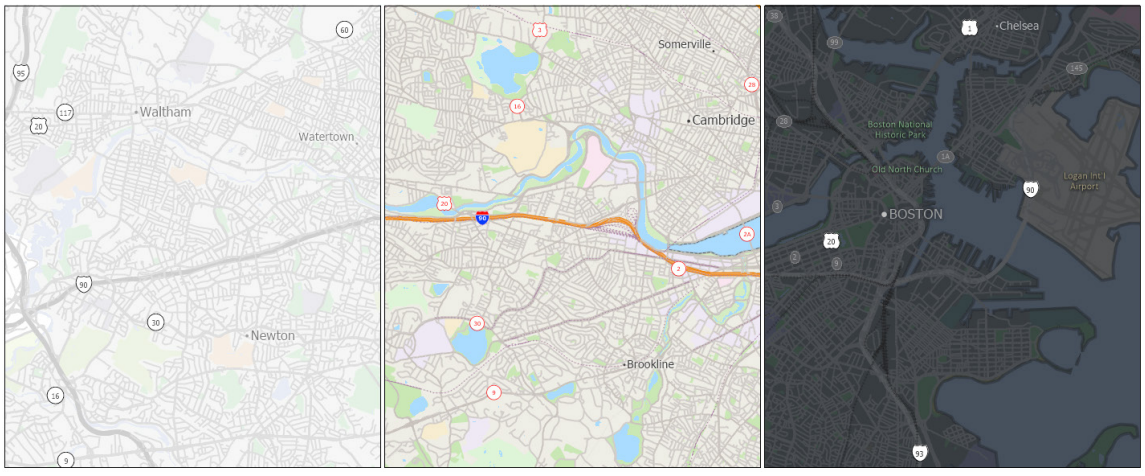
Other 2020 U.S. map layers from HERE include those for buildings, highways, railroads, and landmarks. The Points of Interest layer contains over 2.9 million named public and business locations.

Maptitude 2021 ships with the January 2021 ZIP Code update to ensure that you are using the latest data. The 5-digit ZIP Code boundaries are a nationwide area database with ZIP Codes for all 50 states, the District of Columbia, Puerto Rico, and the territories.

Other standard features of Maptitude 2021 are updated 3-digit ZIP Code areas and a point database of ZIP Code points for the entire country. The ZIP Code area layers extend into non-deliverable areas to provide complete coverage of the USA. The 3-digit and 5-digit ZIP Code areas include updated counts of businesses by detailed industry type (retail, finance, etc.), along with the number of employees working in each ZIP Code, and annual payroll figures. The ZIP Codes are also classified by their updated rural-urban commuting characteristics and with the numbers of hospitals, hospital beds, and healthcare providers.

The US Census boundaries (e.g., Tracts, Places, Counties, MCDs, MSAs, States) and the 3- and 5-digit ZIP code areas that come with Maptitude contain some or all of several demographic profiles from a variety of data providers. These sources include the 2010 Census and the 2019 American Community Survey (ACS) to name a few. This data is available for the USA, Puerto Rico, and the Territories. These layers include daytime population, and percent change (2018 to 2019) in population, median income, and mean income. The ZIP Code, Tract, County, and State layers also include updated buying power (disposable income for 2018) figures. Tracts also list updated banking compliance FFIEC data for 2020 and designated Qualified Opportunity Zones (QOZs).

Personal income and change in personal income BEA data for 2019 are included for States and Counties, and 2019 GDP (by total, goods, services, government, and by 2-digit NAICS code) and change in GDP BEA data for 2017 are included for Counties. 2025 population projections for Counties, States, and Tracts are included by age, race, gender, and ethnicity, and for population by 5-year increment for 2025-2060. The ***Demographic Map Librarian*** tool makes it easy to access a series of pre-defined thematic and shaded maps of these updated data and has new "Tribal Land," "USA (Dark Theme)," and "USA (Light Theme)" options.



Light theme, standard, and dark theme background overview maps

The Country Package updates under development are listed below:

Australia

- October 2020 HERE update with speeds based on noontime HERE Traffic Patterns
- Updated HERE postal boundaries and centroids

Brazil

- October 2020 HERE update with speeds based on noontime HERE Traffic Patterns
- Updated HERE postal boundaries and centroids

Canada

- October 2020 HERE update with speeds based on noontime HERE Traffic Patterns
- Updated 3-character postal Forward Sortation Area (FSA) boundaries and centroids (HERE)
- Updated 6-character postal point layer (HERE)
- New 6-character postal **area** layer (Caliper Created/Derived from HERE)
- 2020 Population estimates for Provinces

United Kingdom

- October 2020 HERE update with speeds based on noontime HERE Traffic Patterns
- Updated postal boundaries for the UK (HERE)
- Updated postal boundaries and postcode points for GB (Caliper)
- 2019 Estimated population by age and gender, UK

Mexico

- October 2020 HERE update with speeds based on noontime HERE Traffic Patterns
- Updated HERE postal boundaries and centroids

New Zealand

- October 2020 HERE update with speeds based on noontime HERE Traffic Patterns
- Updated HERE postal boundaries and centroids

Spain, Italy, France, United Arab Emirates (UAE), DACH (Austria, Germany, Switzerland, Liechtenstein)

- October 2019 HERE update with speeds based on noontime HERE Traffic Patterns
- Updated HERE postal boundaries and centroids (not available for UAE)

Network Analysis, Directions, and Routing

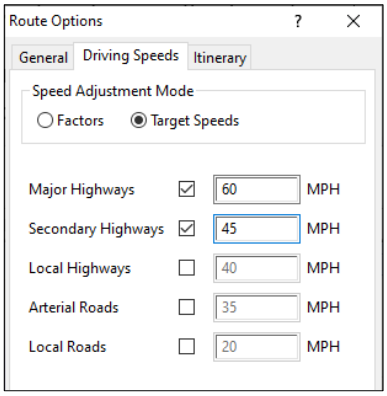
Maptitude 2021 gives you powerful tools to model routes, to calculate the distances and travel times between locations, and to display and analyze service provision over the road network.

Drive-Time Influence Areas Tool

The ***Tools>Routing & Directions>Drive-Time Influence Areas*** tool now:

- Works much more quickly and creates smoother boundaries.

Routing & Directions Manager



The ***Tools>Routing & Directions>Routing & Directions Manager*** now:

- Allows you to explicitly specify road speeds by road type, by typing the desired speed, in addition to adjusting speeds using sliders to make the speeds faster or slower.
- Supports faster routing for multiple destination directions.
- Allows the choice of routing on the US Major Street or Highway/Freeway layers.

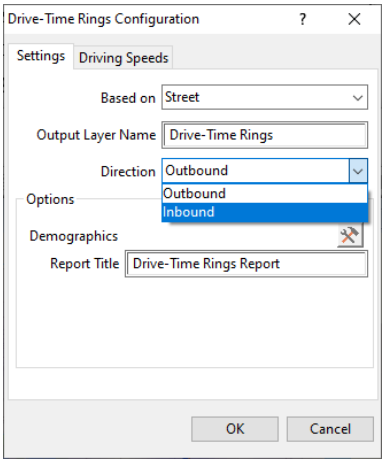
Routing Deliveries and Pickups Add-In

The ***Routing Deliveries and Pickups Add-In*** now:

- Allows you to find vehicle routes and customers by name.

Drive-Time Rings Toolbar

The Drive Time Rings Toolbar creates the most accurate drive-distance travel analysis on the market. The ***Tools>Routing & Directions>Drive-Time Rings*** tool now:



- Allows you to explicitly specify road speeds by road type, by typing the desired speed, in addition to adjusting speeds using sliders to make the speeds faster or slower.
- Allows you to build the rings **from** the central origin points (outbound) or **to** the origins (inbound). This allows you to see the service areas for your locations based on how long it takes customers to get **to** a store, or how long it takes you to deliver to your customers **from** a central location.
- Supports more accurate drive-time rings when rings are under one minute and in coastal areas.
- Allows the choice of routing on the US Major Street or Highway/Freeway layers, for long haul drive-time rings.

Distance and Travel-Time Tables Tool

Maptitude 2021 makes it easy to identify alternative service suppliers, backup field representatives, and closest locations. The distance and drive-time tool creates an Excel table that lists the costs of travel between any number of origins and destinations, allowing you to easily sort the data to identify the closest locations.

The ***Tools>Routing & Directions>Distance and Travel Time Tables*** tool now:

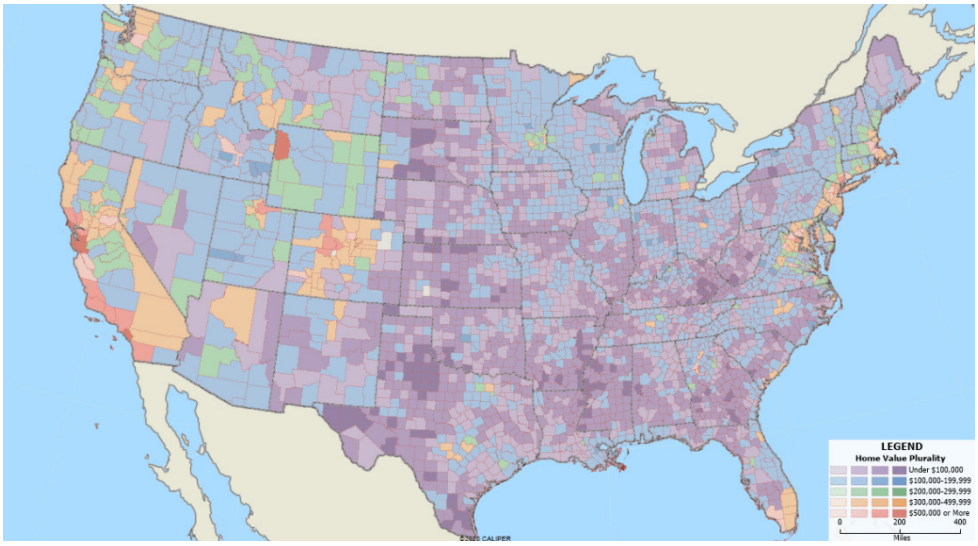
- Allows you to explicitly specify road speeds by road type, by typing the desired speed, in addition to adjusting speeds using sliders to make the speeds faster or slower.
- Allows Visible Features to be chosen for the origin set and destination set.
- Adds Traffic Model support when using the 3rd-party web service provider Google, via ***Tools>Routing & Directions>Web Services>Distance and travel Time Tables***. For example, you can obtain a Google Maps API web service license and then choose in Maptitude:
  - Best Guess, Pessimistic, or Optimistic that are used to obtain driving time estimates that assume differences in congestion, respectively, for average, lighter than average, or heavier than average traffic conditions, based on historical averages. This allows you to explore different scenarios and to perform a sensitivity analysis.

New Map Styles

Maptitude 2021 gives you the greatest flexibility to date in setting the styles of map features, themes, and selection sets.

Themes

- A free add-in "***Color Theme (Multiple Fields)***"
  - Color themes with multiple fields are a new way to visualize and compare your data. The theme allows you to map multiple patterns within a single map and help you see if different columns of data are related. The color ramp for each data field is combined into a grid-like legend.



- A free add-in "***3D Theme (Cylinders)***"
  - 3D cylinder themes are a new way to visualize your data in 3D. For example, if you have sales or volume data, you can present the information as tall cylinders with proportional sizes and colors based on the number of columns of data you are comparing.

New Database Functionality

Several new capabilities for geographic databases have been introduced.

- Enabled longer field names for several table types including Caliper Binary, ASCII, and CSV, increasing the field width name limit from 41 to 241 characters, allowing more descriptive column titles.
- Enabled export to Excel of empty/null values in numeric fields as numeric values.
- Enabled coded, numeric, fields in ***Dataview>Table>Modify>Attach Codes*** so that when a code is numeric the lookup value can now be text or numeric. Using codes saves space because long character strings are replaced with shorter codes.
- Added ***Tools>Editing>Conflate Line Segments*** that lets you interactively reshape line features in a layer to match the more accurate shape of lines in a different layer. For example, to improve the accuracy of a franchise boundary based on the geometry of roads or other features.
- Added a ***Dataview>Charts*** menu item in addition to the Charts button in the Standard toolbar.

Locating Data

The geocoding tools use the updated street and postal data, making location matching results more accurate than in previous versions of Maptitude.

- Improved geocoding, finding, and Create-a-Map Wizard handling of cities/counties with saint prefixes (e.g., "Ste. Genevieve County MO" or "St. Louis")
- Improved world city/town geocoding by city, province, and state
- Improved Locate by Coordinate handling with X and Y (longitude and latitude) now supporting text fields as well as numeric fields as input.

Improved Create-a-Map Wizard

Create-a-Map Wizard is now more robust and easier to use:

- The maps have been updated with the latest geography.
- The **Linked Records** feature now allows for linking to the County layer using separate County and State fields.
- The Wizard graphics have been updated and standardized, allowing for a more seamless and familiar experience as you work through the Wizard and when switching between Country Packages.
- The ***Map>Add Table/Spreadsheet to a Map*** tool automatically uses a different default color for each additional pushpin layer created, visually differentiating your data in the map.

Projections/Datums

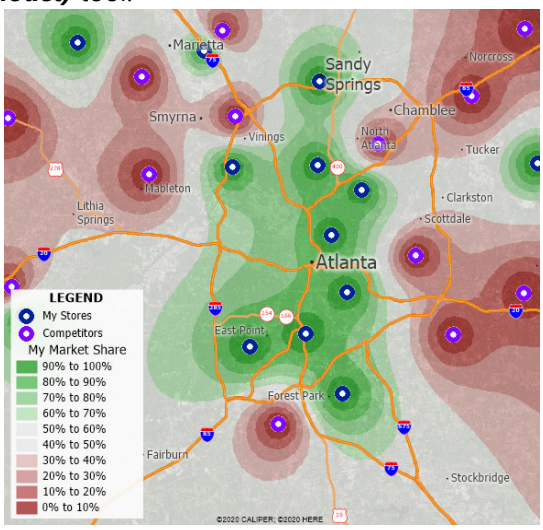
Maptitude 2021 has expanded support for datums and projections with:

- Better support for (*.PRJ) files with either ESRI or OGC WKT definitions
- Support for DEMs in ESRI grid format with WKT (*.PRJ) files

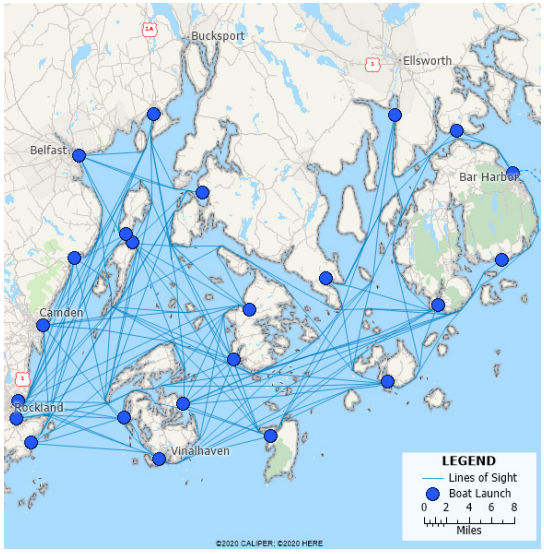
Analysis Tools

Completely new and innovative analytics were added to Maptitude 2021:

- The new ***Tools>Analysis>Market Share (Huff Model)*** tool:
  - Estimates potential sales for your existing or proposed sites versus the competition, based on the assumption that the further a customer is from a location, the less likely it is that they will visit that facility.
  - Shows you the areas with high and low market share based on factors such as population within a radius of your proposed locations calculated by either straight line distance or by driving distance/time. You can then explore the demographics of those markets, such as expenditure, assets, and disposable income.



- The ***Tools>Analysis>Facility Location*** tool supports a mix of area and point layers for clients and facilities, allowing, for example, your facilities to be a list of addresses and your demand to be demographics from a postal or census layer.
- The ***Tools>Analysis>Facility Location*** tool allows facilities to have a weighting of zero, allowing the analysis to run even if you have missing, unknown, or no values for a particular location.
- The ***Tools>Analysis>Facility Location*** tool allows Visible Features to be chosen for the client set, existing set, and candidate set.
- The ***Tools>Analysis>Weighted Center*** tool supports area layers in addition to point layers, allowing you to determine a central location using demographics from a postal or census layer.
- The ***Clustering Add-In***:
  - Creates a cluster centroid for each cluster.
  - Creates much more balanced clusters.
- The new ***Tools>Editing>Lines of Sight*** tool:
  - Creates a line layer in which the lines either avoid obstacles or are drawn only within the area covered by obstacles. For example, lines of sight between buoys can be created to avoid land areas or by staying within a water area layer, connecting all the buoys, and avoiding islands.
  - Creates a lines of sight layer that can be used with the ***Tools>Routing & Directions>Routing & Directions Manager*** to, for example, find the shortest path to visit a series of buoys that must be serviced.



Output Improvements

In Maptitude 2021:

- Added map uploading to Maptitude Online
  - The ***File>Share>Upload to Maptitude Online*** is a subscription-based tool that allows you to easily share your maps privately with your team members or publicly as a web application.
- Added Box Plot chart type
  - The ***Dataview>Statistics>Box Plot...*** chart allows you to visualize how one field changes over a series of data, giving a clear representation of the median value as well as how spread out the values are.
- Added Histogram Plot chart type
  - The ***Dataview>Statistics>Histogram Plot...*** chart allows you to group continuous data into ranges or group data categorically.
- Added Full Stack bar chart types
  - The ***Dataview>Charts*** Full Stacked bar chart types allow you to compare different columns of data, where each bar represents 100%, and segments in the bar represent different parts or categories making up the total.
- Added Radar chart types
  - The ***Dataview>Charts*** Radar chart types allow you to compare different columns of data, where each "star" represents a single data column. Typically, radar charts are created to show many "stars" with each star representing one observation for each record, such as different demographics for each state or sales territory.
- Added customizable format settings to ***Dataview>Charts*** for numeric chart data

Imagery Improvements

Accessing, creating, and visualizing image layers is a core feature of Maptitude:

- The ***Map>Imagery*** Web Map Layers consistently display faster and with appropriate resolution.
- The new ***Tools>Raster>Google Maps Toolbar*** opens a browser with Google Maps zoomed to your Maptitude map location, and displays either Google Streets, Google Terrain, Google Satellite, or Google Street View.

New Documentation

Maptitude continues to provide numerous ways to get you started with the software. The online Learning Portal has been updated, and new and revised tutorials are incorporated into the Maptitude Help.

In addition, a variety of comprehensive learning materials (including videos and live or pre-recorded training webinars) are available on the Caliper Corporation website. The training videos run in all browsers, with playback settings, as Vimeo and YouTube videos.

The Maptitude Help (***Help>Maptitude Help***) can be viewed within a web browser and has a modern browser-based interface.

Maptitude 2021 includes a Windows Microsoft Office style question mark icon on most windows. Clicking this will take you to the relevant section of the Help. You can also hover over any menu item and click F1 to access the updated Help. In addition, several message windows in Maptitude link directly to the relevant Learning Portal article.

System and Interface

Maptitude 2021 supports the latest Windows operating systems, file types, and common design elements.

- The software, installer, and download manager are less likely to be repeatedly flagged by anti-virus applications.
- The interface default font is now Tahoma (non-bold), which is a modern more aesthetic font, that better supports high resolution monitor screens.
- The measuring tools (Measure Distance, Measure Size, Measure Angle) in the Tools toolbar are now combined into a multi-tool toolstrip that supports descriptive text for each button.
- The opening and closing of many maps within a single workspace session is now faster.
- The ***Selection>Selection Toolbar*** has three new cursor icons for the selection tool when selecting by rectangle, circle, or shape.
- The redesigned **Aggregation Method** window now clearly distinguishes between the fields being chosen and filtered.

New File Import Support

- GPS Data (*.GPX) multiple tracks
- DeLorme (Street Atlas/Topo USA) drawing file (*.AN1)

New File Export Support

- SQLite Table (*.DB)

New Native File Support

- Scalable Vector Graphics (*.SVG)

Geographic Information System Developer's Kit (GISDK)

APIs

The GISDK .NET APIs make it easy to add mapping functionality to any Windows desktop application written in Python, C#, or any other .NET programming language.

Code examples and the user documentation for the Maptitude API have been updated for Maptitude 2021 and are included under ***Help>GISDK Help***.

The following functions have been added or modified:

- Charts.Histogram
- Routing.Router.Calculate option "Both": route starts at the first stop and ends at the last stop
- PostgreSQLConnect and PostgreSQLCommand Classes

Highlights of the API changes:

- CaliperPy Python Package
  - Replaces the Python caliperpy2 and caliperpy3 modules
  - Provides access to Maptitude and the .NET framework via any program written in Python 3.x
  - Works well with scientific Python distributions such as Anaconda Python
  - New Features
    - Improved support for Python 3 programming
    - Removed support for Python 2
    - Simplified RunMacro() calling arguments
    - Added new class "import caliperpy" for connecting to the GISDK across Python functions
    - Added translations of GISDK binary tables to and from NumPy Panda DataFrames that are extremely fast
    - Added date/time support
    - New example scripts for working with CaliperPy
- CaliperR R Package
  - Allows you to leverage Maptitude within an R session
  - Makes all GISDK macros and functions available, with results sent directly to your R environment over COM (e.g., a dataview in Maptitude becomes a data.frame in R)
  - Provides the R package via GitHub (https://github.com/Caliper-Corporation/caliperR) with package vignettes

GISDK Functions

Please see the "Listing of GISDK Functions" topic in the Online Help to view a full list of GISDK functions that were added, changed, or replaced in Maptitude 2021. Highlights of the GISDK changes:

- Better support for (*.PRJ) files with either ESRI or OGC WKT definitions
  - ConvertWKTtoProj()
  - ConvertProjtoWKT()

About Caliper

Caliper Corporation develops state-of-the-art Geographic Information System (GIS) software. With a focus on usability, Maptitude is designed to be the most cost-effective professional mapping software product on the market. Maptitude enables organizations to leverage their location-based data to improve decision making and planning while minimizing expenditure through competitively priced solutions.

Caliper is a privately held corporation and is a leading developer of mapping, redistricting, transportation, and GIS software.