

## Environmental Consultants Use GPS Mapping to Evaluate Potential Impacts to Protected Trees at Proposed Residential Development Site



### PROJECT HIGHLIGHTS

- CAJA studied the environmental impacts of a proposed 229-home residential development, located 15 miles outside downtown Los Angeles
- Using the Trimble GeoXT GPS handheld, the team navigated the site and mapped more than 430 trees
- Each tree data point was collected with sub meter accuracy and relevant tree attributes, such as tree species (e.g. protected oak), tree diameter and tree health
- Biologists were impressed by the GeoXT handheld's rugged design, reliable accuracy, and all-day battery life
- CAJA realized a 10-fold increase in efficiency using the GeoExplorer series from Trimble

### PROJECT: Tree surveying project with GPS mapping

### PROJECT DATE: Ongoing

When a local developer was looking to begin a 229-home residential project in the San Fernando Valley in Los Angeles, CA, they turned to a trusted environmental consultant for guidance: Christopher A. Joseph & Associates (CAJA).

CAJA is a top consulting firm that specializes in environmental planning, research, and documentation. For more than 19 years, CAJA experts have guided clients in public and private industry through the environmental clearance process, providing a wide-range of services such as stand-alone environmental analysis (e.g., aesthetics/ views, air quality, noise, land use/zoning), environmental review management, preparation and oversight of mitigation monitoring, field data collection, GIS analysis, and much more.

The developer approached CAJA for assistance in preparing a series of critical reports, including biological impact reports required by the City of Los Angeles. The proposed project site is located in an area that includes native oak woodlands, which supports trees that are protected under a city ordinance. The 60-acre project area is also hilly, with dense brush that makes traversing and surveying the land more challenging.

"The purpose of our tree survey project was to determine if any protected oaks would be impacted by this residential development and to make recommendations on how to mitigate these risks," said Chad Flynn, GIS manager at CAJA.

In order to conduct the tree survey with the highest level of accuracy and efficiency possible, CAJA selected the Trimble® GeoXT™ handheld, a GPS receiver combined with a rugged handheld computer from the GeoExplorer® series.

"With the location of the site and challenging terrain, it didn't make sense to have our survey team collect data by hand because we thought it would take too much time

and leave room for costly errors," said Flynn. "We liked that the GeoXT handheld provides submeter accuracy, it's rugged, and that we can run ESRI ArcPad data collection software."

Before sending off the field crew, Flynn created a series of custom ArcPad data entry forms to maximize the speed and accuracy of data entry. These forms included pick lists from which values can be chosen instead of typed in manually and predetermined default values. Use of these custom data entry forms ensures efficient data collection and consistent data about each tree to help in the overall evaluation of the site.

Equipped with their GeoXT handheld, the CAJA two-person survey team traveled to the project site and got to work. Over the course of six visits they were able to survey and precisely map more than 430 trees. They used Trimble's real-time differential GPS corrections to obtain coordinates within submeter accuracy.

The team's landscape architect and biologist recorded attributes based on criteria as set forth by the City of Los Angeles Protected Tree Ordinance and included information such as tree species, tree diameter, and tree health. With a high level of data integrity and confidence in the collected information, the team was able to reduce the number of site visits, streamline post processing efforts, and maintain compatibility with CAJA's internal GIS database. High-precision data was also needed to conduct meaningful analysis and provide accurate results in CAJA's Tree Report.

"We calculated that the GeoXT handheld delivered about a 10-fold increase in efficiency to our tree survey project," said Flynn. "Collecting the data in a digital format allowed for a quick and seamless transfer of data. With this immediate realization and subsequent analysis, we were able to keep project costs down significantly."

## THE EQUIPMENT USED ON THIS PROJECT INCLUDES

- Trimble GeoXT 2005 series handheld
- Trimble Mission Planning software
- ESRI ArcPad software
- ESRI ArcGIS Desktop software

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Once the GIS department received the field data from the surveyors, the analysis could begin. Flynn downloaded the data from the GeoXT handheld and brought it into the ESRI ArcGIS Desktop environment. He then overlaid the developers "build area" plan, which was created in CAD, onto the tree map.

This spatial overlay enabled Flynn to clearly analyze which trees would be impacted by the proposed development plan and which would remain. Armed with this detailed tree map and environmental analysis, the developers were able to create and deliver alternative plans for their residential project to the city, which minimized the removal of protected oaks while maximizing the number of new residential units.

CAJA also used the GeoXT handheld to collect linear data about various drainages and creeks that were scattered throughout the proposed development site. This information was a critical component of a report required for the Environmental Impact Report. The team collected data about drainage width, depth, and presence of water and recorded it in the GeoXT handheld. With this data, Flynn and his team were then able to quantify the length and volume of potential and actual water flow.

Flynn believes the GeoXT handheld was a crucial tool in helping CAJA more quickly and efficiently develop accurate Environmental Impact Reports on behalf of its client. Flynn is also excited about the organization's plan to utilize Trimble technology in a greater number of CAJA projects in the future.

The GeoXT handheld will be used for future tree survey projects, and the team has plans to use the device to create visual simulations of sites as well. Visual simulations are often needed in Environmental Impact Reports to demonstrate how a project will meet certain aesthetics requirements, for example potential impacts to existing scenic views. By taking photos of proposed development sites and using the GeoXT handheld to digitally stamp highly-accurate coordinates on the images, the team can create a visual



mock-up of how a proposed site will look following project implementation.

"The GeoXT handheld allows us to capture high-accuracy coordinates of photo sites which we then can bring into a 3-D software environment to clearly show how, for example, a new 10-story building would fit into its surrounding," said Flynn. "By seeing the impact of developments before they're built, people are empowered to make more informed decisions based on facts, not perceptions."



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