<u>**Arcpad and GPS Enhance Landscape Design**</u>

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Arcpad software and GPS hardware can be used to enhance the landscape design process. A new landscape design, whether it is a hiking trail or new community, is a graphic representation of how a landscape will appear. A careful process is followed through the design effort that leads a good designer to an enduring solution. Arcpad and GPS can be used to make the design process more efficient, accurate, sensitive to the environment, and attractive. Development of the hand held computer, or personal digital assistant (PDA), provides a new portable graphic platform for viewing and capturing information in the field. This combining this graphic platform with global position information (GPS) provides intriguing opportunities for the design process. ESRI has developed the Arcpad software program to run on PDAs and provides a graphic interface between for the designer that illustrates site information, the current geographic position, and a landscape design. Arcpad is a compact GIS program that allows the display of vector, raster, and annotation data while using GPS positional information from satellites. The combination of a PDA, GIS program, and GPS positions provides a powerful tool for design.

Landscape design follows a logical process the professional uses to prepare an enduring landscape that is functional, attractive, comfortable, and sensitive to the environment. This process begins with an inventory and analysis of the study area. Arcpad and GPS equipment have been used for a long time as an efficient way to collect a detailed and accurate inventory of study areas. Arcpad can be used to capture study area information and conditions in the form of points, lines, or polygons. These features can efficiently be captured and attribute information assigned while in the field. Customization of Arcpad provides an easy-to-use interface for any user to quickly capture information and attributes. Arcpad can be used in conjunction with digital photography and video to efficiently link inventory and analysis photography with actual GPS positions. Maps and Web pages can be easily produced from the digital photography by using software such as Arcmap and GPS Photolink or Media Mapper. Integrating digital photography with GPS information provides an innovative combination of tools for study area inventory and analysis.

Today, a tremendous amount of spatial information is available in a GIS format, which makes the inventory process more efficient. However, this existing spatial information may be inaccurate due to changing conditions or errors introduced when it was created. Arpad can be used to field check existing spatial information and even improve it in the field. Stakeholders can be involved in the design process by providing them with basic training them to use a PDA with GPS and the Arcpad program. The stakeholders can use the PDA and their knowledge of the study area to capture resource and condition information they consider to be important. Quality and sensitive landscape designs are built on a foundation of good inventory and analysis.
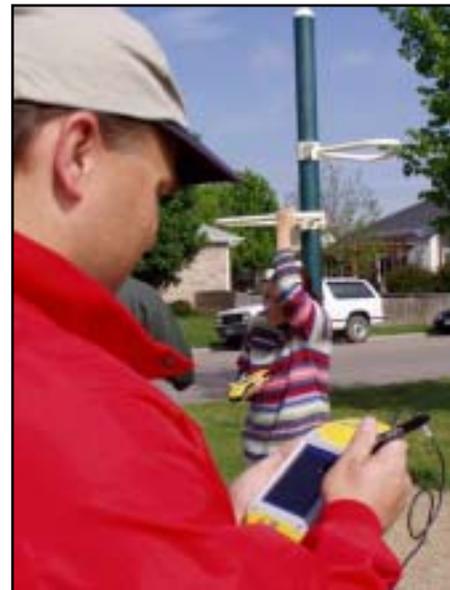


The next step in the landscape design process is conceptual design. Conceptual designs are the preliminary general forms and locations of features that are used to explore different design alternatives. There are often multiple conceptual designs prepared for a study area to explore the strengths and weaknesses of each design. Conceptual landscape designs that are first prepared in the design studio can be loaded onto the PDA and inside Arcpad. Geographic coordinates can be added to a digital copy of the design using Arcmap and exporting it as a tiff file with coordinates (geotiff). Using Arcpad, GPS position information, and a digital copy of the design; a person can "virtually walk-through" the design on site to evaluate its strengths and weaknesses. This "virtual" walk through is perhaps the most power use of Arcpad in the design process. It allows the designer, or the stakeholders, to evaluate and explore the design. The "virtual walk-through" may lead to design changes and verification of the design's qualities. The design can also be flagged at key points in the field to allow a stakeholders to walk through the conceptual design before it has even be finalized. Virtually walking



through a design is an extremely powerful tool that provides stakeholders with a better understanding of what the future constructed landscape will be like.

Draft and final designs are the next steps in the process. These phases of the design process can utilize Arcpad in similar ways as the conceptual design step. The designer can engage people in the design process by giving them a GPS and asking them to walk routes they would prefer for features such as roads or trails. Use of this hardware and software in the field has great potential for exploring other methods of stakeholder participation in the design process.



After a design has been finalized, Arcpad can be used to actually flag some features of the design such as the route for a trail. While using this hardware and software to locate designed features in the field is not highly accurate, it is a good method generally locate features in the field. When the design has been completed, the PDA and Arcpad can be used to perform additional data collection for environmental impact assessments. Perhaps the most common uses of Arcpad and GPS is the collection of existing landscape features such as buildings, roads, trails, etc. Arcpad can be used to create "as-built" maps, which show how the landscape was actually built. Actual landscape construction often varies from the final design due to site factors and changing programs.



These are just a few of the ways that Arcpad and GPS can be used in the design process. How would you like to go for a "virtual" walk through a landscape design before it is built or even finalized? Arpad and GPS truly have enhanced the landscape design process.