



GeoExPT Mobile Edition

An Innovative Solution for Air Force
Mission Planners and Engineers in
the Field



GeoSpatial Expeditionary Planning Tool



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INTRODUCTION

GeoExPT (Geospatial Expeditionary Planning Tool) is designed to be a decision support tool for mission planners and engineers, providing the means to create geospatially accurate base layout plans, meet bed-down requirements, automate aircraft parking, and analyze and repair airfield damage for optimal selection of the Minimum Airfield Operating Strip (MAOS) in accordance with USAF standards.

United States Air Force (USAF) engineers in the field need an effective way to manage the complex task associated with base planning and Airfield Damage Repair (ADR) including construction of facilities, marking aircraft parking locations and paint stripping taxi lines on airfield surfaces, clearing unexploded ordinances on the airfield (i.e. UXOs), and repairing airfield damage after an attack.

It is important for planning engineers to determine possible conflicts or issues (e.g. terrain, utility lines, etc.) before construction starts as problems discovered during construction impacts the schedule and cost. In addition, aircraft parking plans are generated in GeoExPT and printed on paper for use in the field to actually paint aircraft parking lines on the airfield surfaces. However, this process does not always produce the most reliable or accurate results.

During airfield damage repair, time and safety is a critical factor and team location and progress needs to be tracked in real-time with the ability to communicate with the command center as well as other teams. Two-way radios may have worked last century but today there are better technologies to handle location awareness and communications. In addition, explosive ordnance disposal (EOD) teams need an effective way to identify and classify munitions discovered on the airfield without requiring engineers to upload a photo or return to an office to reference material.

GeoExPT was designed and developed to fully meet the needs and requirements of the USAF Civil Engineering (CE) community. Although GeoExPT is built with the latest technologies, as a

**WHY DO WE
NEED GEOEXPT
MOBILE
EDITION?**



traditional desktop application it provides the typical user interface allowing users to interact with the tools and map on a standard computer system display. As technologies and capabilities increase and as the CE community becomes more 'mobile' in working with systems and data, it would be ideal to apply some of the 'cutting-edge' technologies into GeoExPT Mobile that are becoming available today.

BRIDGING THE TECHNOLOGY GAP

During the planning and preparation stage, engineers use the latest technology and advanced solutions developed over decades (e.g. GeoExPT desktop) to create the plans and strategies to produce the best solution to meet the mission objective. But then engineers print out a paper based version to use in the field losing 80% of the metadata and planning factors that went into developing the solution. This gap in use of technology for planning but outdated execution leads to increase costs, schedule delays, and inefficiency that impact the overall mission. Engineers need a solution that will span this gap.

GeoExPT Mobile Edition will be the bridge for this gap providing a seamless solution for mission planners in the office all the way to the engineers in the field actually implementing and executing the plans.

REAL-WORLD CONTINGENCY BEDDOWN PLANNING

Currently, USAF engineers gather the best available vector and raster data for a location and build a 2D map display in an attempt to determine the best location for base layout plans. With GeoExPT Mobile, engineers and teams in the field will use Augmented Reality (AR) capabilities on their mobile devices to "see" simulated facility placements in the field in 3D of above ground and below ground facilities and utilities lines (e.g. water, sewer, etc.). This will provide a virtual walk-through of the environment to identify any potential conflicts or issues before initial construction. This capability would aid in the rapid and accurate setup of new bases at a forward operating locations.

**BRIDGING THE GAP
BETWEEN
TECHNOLOGICALLY
ADVANCED
PLANNING AND
OLD-FASHIONED
EXECUTION**



**VISUALIZATION
AND REAL-TIME
PLANNING**

VISUALIZATION OF TIME-PHASED PLANNING

The Basic Expeditionary Airfield Resources (BEAR) Order of Battle planning wizard and time-phased planning visualization tools within GeoExPT assist the mission planner in developing facility models and bed-down plans based on unit population and delivery schedule.

The Time-phased planning visualization tool creates time-phased facility models based on the selected UTCs and delivery schedule. With GeoExPT Mobile, time-phased planning will show a live view of the currently constructed facilities and allow mission planners the ability to visualize future construction by ‘swiping’ the display for each additional phase in the process.

REAL-TIME ASSET MANAGEMENT

During site construction, tracking materials and assets are important to ensure that the appropriate amount of materials and equipment are available when needed to avoid unexpected delays. GeoExPT Mobile will provide this capability by utilizing the mobile device as a barcode reader to track the inventory and provide real-time inventory management. The ability to track real-time inventory will allow engineers and commanders to be better informed and to make more intelligent, sound decisions that can have a direct impact on the construction schedule.

In addition, GeoExPT Mobile will provide engineers with access to site plans, blueprints, and Air Force documentation in the field. Engineers will no longer need to carrying around bulky paper-based plans or return to the field office to review Air Force regulation or guidance materials. It will all be available right from their mobile device.

VIRTUALLY ASSISTED AIRCRAFT PARKING

One of the more popular features in GeoExPT is the ability of the application to automatically create aircraft parking plans based on established DoD aircraft parking standards and AFI guidelines. Once the plans are generated and printed, engineers in the field



**NEW LEVEL OF
FUNCTIONALITY
FOR AIRCRAFT
PARKING**

will paint the appropriate aircraft marking lines and turning radiuses on the airfield surfaces based on the report. With GeoExPT Mobile, engineers 'walking' the airfield surface will be able to use Augmented Reality technology to use the built-in camera on the mobile device to view the airfield surface with the marking lines overlaid digitally on the display. This will show the engineers the precise location, via GPS, of where the lines should be painted. This will increase the accuracy and reduce the level of error introduced by trying to determine the exact location of marking lines by viewing and translating the printed parking plan report.

In addition, the exact location of aircraft can be superimposed on the mobile display to ensure aircraft are parked in the correct location. Standoff distances for jet blast can also be shown as buffers on the map to ensure proper distances are maintained.

IMPROVED SAFETY AND SECURITY FOR AIRCRAFT MUNITIONS

A major part of aircraft parking is accounting for munitions that are loaded on the aircraft and ensuring proper munitions explosive standoff distances are enforced. GeoExPT Mobile will enable munitions crews to scan or input the type and quantity of munitions loaded on the aircraft which will allow for real-time weapons inventory and ensure all munitions are properly accounted for security purposes.

**IMPROVED
SAFETY AND
SECURITY**

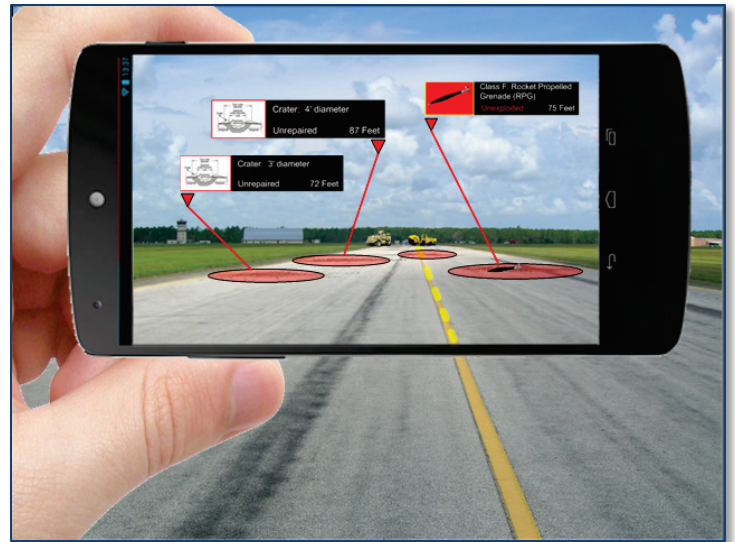
GeoExPT Mobile will also be able to display the munitions explosive standoff distance buffers on the map to determine if other aircraft are located in the danger zone. This will provide parking planners with instant feedback and a new level of safety.

ENHANCED AIRFIELD DAMAGE REPAIR

The major effort, after any enemy attack on an installation airfield, is the management of the Airfield Damage Repair (ADR) process and the ability to rapidly repair the airfield surfaces (i.e. taxiways, runways, etc.) and determine the Minimum Airfield Operating Strip (MAOS) to allow aircraft to quickly return to the air. GeoExPT Mobile will greatly enhance the safety and efficiency of this



process by allowing teams in the field to instantly identify and record damage, mark potential hazardous areas, determine and coordinate the appropriate repair and materials, and allow team tracking progress thereby giving commanders the real-time critical information needed to make informed decisions in the ADR process.



RAPID ABILITY TO IDENTIFY AND CLASSIFY DAMAGE

From lessons learned during Air Force exercises such as the Rapid Airfield Damage Assessment System (RADAS), ADR teams have discovered that damage identification is a major effort and critical need for teams assigned to rapidly detect, identify, and classify unexploded munitions and damage on the airfield.

GeoExPT Mobile will increase efficiency and reduce the time required to identify and classify damage for teams in the field.

INSTANTLY IDENTIFY AND CLASSIFY DAMAGE

- Repair Teams will have access to a damage library containing all the damage types with images to help in the damage identification process. In addition, EOD teams will access the library to help identify and classify unexploded munitions discovered on the airfield.
- GeoExPT Mobile will provide an automatic damage identification tool that will attempt to identify and classify damage automatically, similar to facial recognition software in use today.
- Teams will be able to input / update damage, acquire images, and capture video from within GeoExPT Mobile.



- Automatically calculate RQC values for airfield repair and view corresponding RQC worksheets

REAL-TIME TEAM TRACKING AND LOCATION AWARENESS

Commanders monitoring the ADR process need to know the current position of repair team members in the field and will be able to do this by tracking the physical location of each GeoExPT Mobile device. Real-time tracking information and team progress will help commanders stay better informed and allow more timely decisions that can increase team efficiency and reduce overall repair times.

GeoExPT Mobile will be location-aware providing the ability to deliver content and information to repair teams based on their physical location. Repair team movements will be displayed on the mobile map and teams can be sent additional work assignments or instructed to provide assistance to other teams in the vicinity based on their current location.

The goal of the air field damage repair process is to aid in the creation of the MAOS and returning the airfield to a functional state. GeoExPT Mobile will assist teams in this process by identifying locations on the map where Mobile Aircraft Arresting System (MAAS) and airfield lighting needs to be installed and will notify the team when their exact location matches that of what is to be installed.

**DATA SHARING
AND
COLLABORATION**

INFORMATION SHARING

Sharing information amongst teams enhances collaboration and allows teams to coordinate efforts when required. GeoExPT Mobile will provide built-in chat and Bluetooth data exchange capabilities so that teams can better communicate by sending messages and sharing data between devices.

SAFETY ALERTS

Safety is a big concern in the ADR process and GeoExPT Mobile can provide real-time warnings from the command center as well as other teams. In addition, GeoExPT Mobile will provide



geotriggers to provide location-based alerts when teams cross buffers (i.e. zones, areas, etc.) that have been marked as hazardous (e.g. UXO avoidance areas).

ANDRIOD MOBILE PLATFORM AND DISTRIBUTION

GeoExPT Mobile will be designed and optimized for the Android operating systems which will allow GeoExPT Mobile to run on popular mobile devices such as HTC One, Sony Xperia, Google Nexus, and the Samsung Galaxy product lines to name a few.

Mobile technology and the integration of mobile devices such as tablets and smartphones makes it easier than ever for organizations like AFCEC to support engineers in the field and provide a way to communicate, collaborate, and share data without being tied to traditional desktop and laptop systems.

Dynamic Software Solutions has worked closely with the Army and Air Force as GeoExPT has evolved over the years. With DS2's additional experience in Mission Planning and Army Special Forces, GeoExPT Mobile Edition will be developed similar to the Army's Nett Warrior system and run on devices with an NSA-approved version of the Android operating system. By using commercially available mobile devices, GeoExPT Mobile Edition will be powered by the latest technology and processors and will remain at the forefront of technology for mission planners and engineers.

MOBILE TECHNOLOGY IN THE FIELD

BENEFITS OF ANDROID

Android is one of the world's most popular mobile platforms and organizations like AFCEC can distribute and install private apps to Android devices through web browsers, email, or directly from a micro SD (Secure Digital) card.

Google Play is the content-delivery marketplace offered by Google and can be used to securely deliver private apps (e.g. GeoExPT Mobile) to AFCEC staff member Android devices.

- A Google Apps for Government domain can have a Private Channel on the Google Play Store



- Private Channels are assigned to organizations, not domains.
- Requires registration with Google Play as regular Google Play apps publishers on the Google Play Developer Console
 - ✓ There is a \$25 registration fee for the Google Play Developer Console.
 - ✓ Cannot publish apps for non-Android devices (i.e. no iOS or Windows phones / tablets).

CONCLUSIONS

Organizations such as AFCEC that embrace mobility will likely find that their business processes will become not just more efficient but will also reduce overall operating costs. The massive growth and adaptation of mobile technologies and apps around the world has lead to greater productivity and flexibility in the work environment and allows organizations to have an unprecedented level of connectivity.

GeoExPT Mobile will provide these same benefits for mission planners and engineers to help visualize site layout and aircraft parking plans; real-time inventory management of assets, materials, and repair teams; instant access to virtual libraries; location-based safety alerts; and collaboration and data exchange between teams that will increase the efficiency and effectiveness of expeditionary planning and airfield damage repair processes, all from the palm of their hands.

FOR MORE INFORMATION

For more information on GeoExPT Mobile Edition, call Dynamic Software Solutions, Inc. at 850-635-0198. Or visit us on the Web at <http://www.ds2corp.com>.

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