

Technology Source Book
Enabling Technologies for
UN Peacekeeping Operations

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"We also will review U.S. contributions to peacekeeping, as well, to assess gaps that the United States is uniquely positioned to fill, like base camps we are building and helping the UN build for peacekeepers in the Central African Republic; to better share the U.S. military's knowledge of confronting asymmetric threats; and to help the UN deploy advanced technology."

- U.S. Vice President, UN Summit on Peacekeeping Operations, September 2014

"We will work vigorously both within the U.N. and other multilateral institutions, and with member states, to strengthen and modernize capacities—from peacekeeping to humanitarian relief—so they endure to provide protection, stability, and support for future generations."

- U.S. National Security Strategy, February 2015

"Strengthening partners is fundamental to our security, building strategic depth for our national defense."

- U.S. National Military Strategy, June 2015

Introduction

The Technology Source Book (TSB) is the result of an ongoing collaboration between the United Nations (UN) Secretariat Staff and the United States Department of Defense (DoD) to identify technologies to enhance the effectiveness of UN Peacekeeping Operations (PKO). The TSB is a compilation of proven candidate technologies, considered to have high potential for application in Peacekeeping Operations.

The TSB has been produced at a time when UN peace operations have reached all-time high levels of cost, complexity and risk, and are under historic stress. At the same time UN peacekeeping operations are more critical than ever to international peace and security, as they contribute directly to the U.S. national security interest to prevent, contain, and resolve armed conflict. The development of the TSB is therefore part of a larger effort to respond to the urgent need to close gaps that are critical enablers for the success of current and future UN PKOs.

The collaboration between the United Nations (UN) Secretariat Staff and the United States Department of Defense (DoD) produced the following six focus areas to guide the technology support effort:

- Expeditionary Basing, Services, and Logistics: The objective is to identify technology solutions to enable quick and efficient base construction and sustainment in expeditionary locations
- Survivability and Protection of Forces and Civilians: The objective is to identify technology solutions to protect, deter, detect, assess, and respond to threats to UN forces and civilians
- Information Led Operations and Situational Awareness: The objective is to identify technology solutions to enable improved and effective information sharing, communications and situational awareness

- **Planning:** The objective is to identify technology solutions to enable improved planning across strategic, operational and tactical levels
- **Training:** The objective is to identify technology solutions to enable improved training across strategic, operational and tactical levels
- **Medical Support:** The objective is to identify technology solutions to improve basic and advanced life support and patient movement within the mission area and via medical evacuations

In February 2015, 70 attendees from the UN, US Government and Non-Governmental Organizations met at the National Defense University for the first Table Top Discussion (TTD 1) to refine requirements associated with the focus areas of Expeditionary Basing, Services, and Logistics, Survivability and Protection of Forces and Civilians, and Information Led Operations and Situational Awareness. TTD 1 resulted in a plan of action to facilitate DoD technology support to UN PKO. The TSB was highlighted as a major effort to enable the plan.

In July 2015, more than 80 representatives from the UN, US Government, and Non-Government Organizations met at NDU for the second Table Top Discussion (TTD 2). During TTD 2, the three additional focus areas were reviewed; Planning, Training, and Medical Support. TTD 2 produced further understanding of relevant UN mission gaps, and potential technologies and innovative solutions to fill them. Highlights of the TSB were presented and discussed, and the working group made headway in refining both the focus areas and key technology solutions.

Development Process

The development team followed a five phased approach to build the TSB:

1. **Shortfall Analysis:** This phase consisted of a review of the current PKO environment, desired end-state, and identifying the capability shortfalls or operational needs.
2. **Key Data Elements:** Templates with key elements were identified to guide the selection of technologies.
3. **Technology Recommendations:** Surveys of technology providers and collection of technology recommendations took place to build the preliminary database of technologies.
4. **Integration of Technologies:** Technology recommendations were assessed against UN PKO stated needs to produce the initial menu of technologies. These set of technologies were presented and discussed in the TTD 2.
5. **Revision and Final Consolidation:** A final revision, decision for inclusion, and packaging of the selected technologies in the TSB was the last phase in the approach.

More than 50 organizations from the DoD Science, Technology, and Acquisition community were contacted and surveyed, and expertise sought from across all six technology focus areas to produce this first edition of the TSB. The technologies herein

are tested and operationally demonstrated DoD government off-the-shelf (GOTS) and commercial off-the-shelf (COTS) equipment. DoD organizations submitted technologies via a standardized template that included key data elements. These data elements served as the major criteria for inclusion in this TSB:

- **UN PKO Focus Area:** Identifies which of the six (6) UN shortfall areas the technology addresses.
- **Cost:** Provides an approximate range of equipment purchase cost.
- **Description:** Short description of the technology.
- **Concept of Operations:** Preliminary Concept of Operations (CONOPS).
- **UN Need or Gap:** UN need or gap addressed.
- **Anticipated Benefits/Return on Investment (ROI):** Quantifies the expected benefits offered by the technology using quantitative and qualitative data.

All technologies are Technology Readiness Level (TRL) 8 (Actual system completed and qualified through test and demonstration) and TRL 9 (Actual system proven through successful mission operations) as specified in DoD 5000.2-R, Mandatory Procedures for Major Defense Acquisition Programs (MDAPS) and Major Automated Information System (MAIS) Acquisition Programs, Appendix 6, Technology Readiness Levels and Their Definitions, April 5, 2002. See Table 1 below.

Table 1 - Technology Readiness Levels

<u>Technology Readiness Level</u>	<u>Description</u>
1. Basic principles observed and reported	This is the lowest "level" of technology maturation. At this level, scientific research begins to be translated into applied research and development.
2. Technology concept and/or application formulated	Once basic physical principles are observed, then at the next level of maturation, practical applications of those characteristics can be 'invented' or identified. At this level, the application is still speculative: there is not experimental proof or detailed analysis to support the conjecture.
3. Analytical and experimental critical function and/or characteristic proof of concept	At this step in the maturation process, active research and development (R&D) is initiated. This must include both analytical studies to set the technology into an appropriate context and laboratory-based studies to physically validate that the analytical predictions are correct. These studies and experiments should constitute "proof-of-concept" validation of the applications/concepts formulated at TRL 2.

<u>Technology Readiness Level</u>	<u>Description</u>
4. Component and/or breadboard validation in laboratory environment	Following successful "proof-of-concept" work, basic technological elements must be integrated to establish that the "pieces" will work together to achieve concept-enabling levels of performance for a component and/or breadboard. This validation must be devised to support the concept that was formulated earlier, and should also be consistent with the requirements of potential system applications. The validation is "low-fidelity" compared to the eventual system: it could be composed of ad hoc discrete components in a laboratory.
5. Component and/or breadboard validation in relevant environment	At this level, the fidelity of the component and/or breadboard being tested has to increase significantly. The basic technological elements must be integrated with reasonably realistic supporting elements so that the total applications (component-level, sub-system level, or system-level) can be tested in a 'simulated' or somewhat realistic environment.
6. System/subsystem model or prototype demonstration in a relevant environment (ground or space)	A major step in the level of fidelity of the technology demonstration follows the completion of TRL 5. At TRL 6, a representative model or prototype system or system - which would go well beyond ad hoc, 'patch-cord' or discrete component level breadboarding - would be tested in a relevant environment. At this level, if the only 'relevant environment' is the environment of space, then the model/prototype must be demonstrated in space.
7. System prototype demonstration in a space environment	TRL 7 is a significant step beyond TRL 6, requiring an actual system prototype demonstration in a space environment. The prototype should be near or at the scale of the planned operational system and the demonstration must take place in space.
8. Actual system completed and 'flight qualified' through test and demonstration (ground or space)	In almost all cases, this level is the end of true 'system development' for most technology elements. This might include integration of new technology into an existing system.
9. Actual system 'flight proven' through successful mission operations	In almost all cases, the end of last 'bug fixing' aspects of true 'system development'. This might include integration of new technology into an existing system. This TRL does not include planned product improvement of ongoing or reusable systems.

Through anticipated continued collaborative efforts, there will be opportunities to review and evaluate the TSB technologies in the context of UN PKOs. Additionally, selected technologies could be field tested in UN PKO training centers or low threat operations as part of pilot efforts to ensure Troop and Police Contributing Countries' peacekeepers have every opportunity to familiarize themselves with the technology in low risk environments. By following this methodology, this TSB will continue to evolve in a way

that most effectively serves and supports UN PKOs. To date, this effort has identified 44 technologies to potentially support UN PKOs. Those technologies are listed in the TSB.

This TSB and its six focus areas are closely aligned and complementary to the priorities of the UN Expert Panel on Technology and Innovation. The focus areas are a suitable way to address the UN PKO priorities and capability gaps. See Table 2 below.

Table 2: UN Expert Panel to DOD Tech Sub-Working Group Focus Area Alignment

<u>UN Expert Panel</u>	<u>DoD Technology Sub-Working Group Focus Area</u>
Getting the Basics Right: <ul style="list-style-type: none"> • Safety and Security • Shelter • Water • Communications and IT 	<ul style="list-style-type: none"> • Expeditionary Basing, Services and Logistics • Survivability and Protection of Forces and Civilians • Information Led Operations and Situational Awareness • Planning • Training • Medical Support
Operational Priorities: <ul style="list-style-type: none"> • Protection of Civilians • Interoperability • Federated Mission Networks • Medical Support 	
Mission Support: <ul style="list-style-type: none"> • Managing the Remote Back Office • Supply Chain Resilience 	

Summary

The technologies described in this TSB provide a few of the many technologies that may prove beneficial to enhance the effectiveness of UN PKOs.

This TSB is intended to serve as a living document, with new technologies added as they become available, or removed as they are added to the UN inventory. Further, field testing under PKO scenarios and environments may be critical to ensure relevance and the availability of associated operational concepts and Tactics, Techniques and Procedures prior to operational employment.

Point of Contact

To receive additional information on the capabilities described in the TSB, contact the U.S. Mission’s Military Staff Committee (MSC) within the United States (US) Mission to the United Nations (UN). Contact USA 1-212-415-4150 or 1-212-415-4264.

Candidate Technologies for Expeditionary Basing and Logistics

Technology 1: US Army Force Provider



UN PKO Focus Area
Expeditionary Basing and Logistics

Approximate Cost
Varies depending on the configuration requested. \$250K (single component) to several \$ Million for complete camp.

Description: Force Provider is a modular base camp life support capability that supports personnel in 150 person increments with environmentally controlled billeting, food services, hygiene, power generation and distribution, petroleum and water storage and distribution, laundry facilities, and shower water recycling. Available in hardwall variant (20' ISO Containers) and softwall variants (TriCONs and Tents). The operational user provides food, potable water, fuel, trash disposal, and black water disposal. Optional Equipment includes morale, welfare, & recreation; admin support facilities; shower water reuse system; cold weather kit; prime power kit; electric kitchen complex; waste water trailer; site preparation equipment.

Preliminary CONOPS: The Force Provider is stored by the UN and pre-positioned for ease of transport. Upon mission assignment, the UN contracts to setup and maintain the system in the area of operation. UN, TCC, and PCC forces and civilians deploy (redeploy) to the location for 45 days to 2 years and utilize the system as their base of operations. Upon mission completion, the system is packed, shipped, and refitted for future missions.

UN Need/Gap: Need for modular, modern expeditionary shelter solutions and expeditionary power technologies.

Anticipated Benefit/ROI: Provides durable, readily deployable, expeditionary basing capability that is configurable to a range of missions, personnel requirements, climates, and terrain conditions.

Technology 2: ZeroBase Energy T-SERIES



UN PKO Focus Area
Expeditionary Basing and Logistics

Approximate Cost
\$100,000 - \$200,000

Description: ZeroBase T-SERIES is a remote power generation and management system housed in an off-road trailer chassis. T-SERIES is a commercial off-the-shelf (COTS) product that has been tested by the U.S. Army and received safety confirmation and safety release. T-SERIES is in use by U.S. Army and has been provided to Egypt by U.S. Army Corps of Engineers for border security and to Honduras by U.S. Southern Command for counter-narcotics operations. T-SERIES reduces the fossil fuel requirement for power. The system collects energy from Solar Photovoltaic (PV), stores energy in an advanced battery, and manages power in multiple voltages and frequencies. The system regulates the fuel generators' operation to increase energy efficiency and reduce maintenance.

Preliminary CONOPS: In austere operating environments, where grid power is unavailable or unreliable and the fuel supply for generators may be interrupted, T-SERIES reduces the fuel requirement to power shelters and operation centers and provides a baseline level of power from Solar PV. T-SERIES outputs multiple voltages and frequencies, overcoming interoperability challenge of using equipment from multiple sources.

UN Need/Gap: Alternative sources of energy.

Anticipated Benefit/ROI: Reduced fuel requirements, reduced generator maintenance, improved energy reliability, within the mission area to include the forward edge. Additionally, enables improved power management.

Technology 3: Trinity 2000 Deployable Advanced Lightweight Lithium-ion Hybrid Kit



UN PKO Focus Area
Expeditionary Basing and Logistics

Approximate Cost
\$30,000 - \$40,000

Description: Trinity ALLY™ System is a hybrid micro power area network comprising of flex-fuel energy generation, harvesting, and storage modules. These man portable, light weight hybrid systems are capable of delivering 1200 watts of continuous AC or DC power from the Flex-Fuel Generator and 1000 watts of continuous AC power from the 100% silent power supply. The power storage and supply, housed in a small Pelican case, can power man portable devices for days at a time without needing to recharge the batteries. The system reduces fuel consumption by distributing power via a battery bank. The management system senses the battery level and auto starts/stops the generator to maintain a charge. Commercial-off-the-shelf system (COTS) currently fielded by the U.S. Army, Navy, Marine Corps, and Air Force.

Preliminary CONOPS: UN Peacekeepers employ the system to provide hybrid power for small unit operations at the forward mission area.

UN Need/Gap: Alternative energy sources.

Anticipated Benefit/ROI: Reduced fuel requirements, reduced generator maintenance, and improved energy reliability within the mission area to include the forward edge.

Technology 4: ZeroBase Energy FORGE



UN PKO Focus Area
Expeditionary Basing and Logistics

Approximate Cost
\$80,000 - \$100,000 for equipment and one year of maintenance

Description: ZeroBase FORGE is a rugged man-portable (three portable cases) remote power generation, energy storage, and management system. The system generates power from Solar PV, stores power in an advanced battery, and manages power in multiple voltages and frequencies. The system regulates fuel generators' operation to increase energy efficiency and reduce maintenance. Available in 2.5kW and 3.5 kW variants.

Preliminary CONOPS: In austere operating environments, grid power is unavailable or unreliable and fuel supply for generators may be interrupted. FORGE reduces the fuel requirement to power situational awareness and communication equipment. FORGE outputs multiple voltages and frequencies, overcoming the interoperability challenge of using equipment from multiple sources. FORGE is two-man lift for deployment to locations without lifting equipment.

UN Need/Gap: Alternative energy sources in expeditionary environments; Power management.

Anticipated Benefit/ROI: Reduced fuel requirement and generator maintenance; Enables use of equipment with voltage and frequency requirements; Power management/distribution.

Technology 5: Aspen 2000 DM Water Purification System



UN PKO Focus Area
Expeditionary Basing and Logistics

Approximate Cost
\$76,000 - \$100,000

Description: The Aspen 2000 DM is a compact, mobile, reverse osmosis system capable of producing up to 2000 gallons per day of drinking water from sources ranging from fresh surface or well water to heavy sea (salt) water. The energy required to operate the Aspen 2000DM is less than 1500 watts and is fully operational on 90/250VAC 50-60 Hz; or from a 24 to 28 VDC power source, the same used on military vehicles. The complete system operates on any of the small 2 KW or larger JP8 fueled military generators, or a small commercial generator. An activated carbon Post Filter conditions the product water removing any unwanted after taste and a “UV” ultraviolet exposure unit kills or inactivates any possible microbes and viruses.

Preliminary CONOPS: UN Peacekeepers deploy with the Aspen 2000DM to an austere environment and utilize the technology to produce potable water from salt, brackish, or fresh source water. The potable water is utilized as a peacekeeper water source and/or used as a potable water source for the local populace.

UN Need/Gap: Capabilities for expeditionary potable water production.

Anticipated Benefit/ROI: Improved capability to produce potable water from various sources.

Technology 6: Pre-positioned Expeditionary Assistance Kit (PEAK)



UN PKO Focus Area
Expeditionary Basing and Logistics

Approximate Cost
Approximately \$500,000

Description: A self-contained, hybrid powered system (solar and generator) providing power management, portable water purification, local (WiFi, 3G) and over the horizon communications and situational awareness capabilities. Each component may be used purchased and separately or as part of a system-of-systems approach. Ability to deploy quickly to austere environments. Low profile trailer allows the kit to be unloaded without removal of the container. Air (fixed and rotary), Sea, and Truck transportable.

- Water Purification: Aspen 2000DM (fresh, brackish, salt)
- Comms: Pico Cell (3G and WiFi) and BGAN; Mobile phones and handheld radios
- Power: Solar, Generator (3kW), lithium batteries
- Situational Awareness: Transformative Applications; Global Visual Information System (GVIS)
- Container: ISU-60
- Trailer: Low Deck Integrated Trailer (LDITS) (road and mild terrain; commercial and military truck towable)

Preliminary CONOPS: Peacekeepers utilize PEAK to purify water for their team and local populace, provide local and over the horizon communications, and situational awareness capabilities. Each component can be used separately or as part of a system-of-systems designed to be deployed quickly. The low profile trailer allows the kit to be deployed from an aircraft or shipping container without the aid of a crane or forklift.

UN Need/Gap: Communications, situational awareness, and water purification in austere environments.

Anticipated Benefit/ROI: Provides a proven self-contained, renewably powered system providing portable water purification, communications and situational awareness capabilities.

Technology 7: Water Quality Analysis Set – Purification (WQAS-P)



UN PKO Focus Area
Expeditionary Basing and Logistics

Approximate Cost
\$3,000 - \$4,000

Description: WQAS-P is a one-person portable suitcase kit containing equipment for testing water quality. The set contains Commercial-Off-The-Shelf components capable of measuring the temperature, chlorine, pH, turbidity, and total dissolved solids (TDS), concentration of the water being tested and monitored. The kit is self-contained in a gasketed waterproof case. Foam inserts secure equipment in the case and protects sensitive instruments. This kit is used for the assessment of raw water quality at potential water points for water purification, in operations to monitor the treatment process, and to perform chemical analysis in assessment of the quality of potable water in support of the water purification mission.

Preliminary CONOPS: UN Peacekeepers deploy with a water purification kit to an austere location where local water sources available. Peacekeepers test the source water (influent) with the kit to ensure it is suitable for potable water production – initial and periodically. Peacekeepers utilize the kit to test effluent and the stored water to ensure it is safe to drink.

UN Need/Gap: Limited expeditionary capability to test and verify water is suitable for human consumption (drinking water quality).

Anticipated Benefit/ROI: Maintaining drinking water quality is a primary concern. WQAS-P provides a one-person portable suitcase kit containing the necessary equipment for testing water quality.

Technology 8: Solar Portable Alternative Communications Energy System (SPACES)



UN PKO Focus Area
Expeditionary Basing and Logistics

Approximate Cost
\$10,000 - \$15,000

Description: The Solar Portable Alternative Communications Energy System (SPACES) is a folding, portable solar panel system that provides energy to recharge BB-2590 batteries and to power external devices. The Star Power Module provides and uses various cable configurations to accept energy from different renewable energy power sources (DC/AC, Vehicle, Solar and BA-5590 Battery Equivalents). The Charge Controller unit converts renewable energy sources into a power output capable of recharging two BB-2590 Li-Ion batteries in 5 to 6 hours or power battery operated devices (laptop, radios) etc.

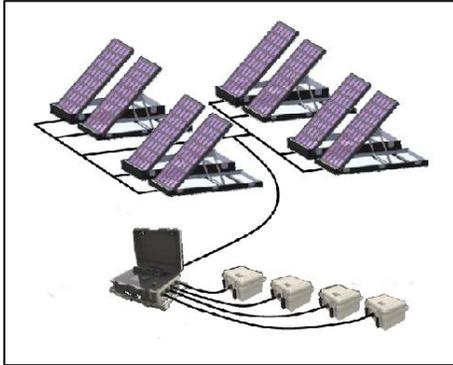
The SPACES Star Power module can accept a maximum of 320 watts from various DC input power sources ranging from 9 VDC to 33 VDC. The module only accepts DC power. The module is fielded with two 12-volt solar panels. Output is 12-35 VDC or 115VAC @ 120 W, modified or pure sine wave using a Micro Inverter.

Preliminary CONOPS: UN Peacekeepers employ SPACES in austere environments to charge/power equipment such as cellular phones, batteries, and laptop computers.

UN Need/Gap: Alternative energy sources.

Anticipated Benefit/ROI: Provides a reliable expeditionary and back-up power source from alternative energy sources, thus reducing requirements for generators and reducing the logistics requirements.

Technology 9: Ground Renewable Expeditionary Energy Network System (GREENS)



UN PKO Focus Area
Expeditionary Basing and Logistics

Approximate Cost
\$25,000 - \$35,000

Description: The Ground Renewable Expeditionary Energy Network System (GREENS) is a man transportable module system with renewable energy collection and storage capabilities that can energize Communicational / Electrical equipment, sensors and radios. The GREENS uses arrays of solar panels and rechargeable batteries to provide an average continuous output of 300 Watts enough to power a battalion combat operations center (COC). GREENS is fielded with four solar panels of 1.6kW capability. This fills the gap between what a large power generator and a battery provides. In addition to renewable energy the GREENS can also be hybridized with generators and vehicle power to provide an intelligent small-scale energy management system.

Preliminary CONOPS: UN Peacekeepers employ GREENS in austere environments to charge/power equipment such as combat operations centers and other equipment.

UN Need/Gap: Alternative energy sources.

Anticipated Benefit/ROI: Provides a reliable expeditionary and back-up power source from alternative energy sources, thus reducing requirements for generators and reducing the logistics requirements.

Candidate Technologies for Survivability and Protection of Forces and Civilians

Technology 1: SABRE 5000	
	
<u>UN PKO Focus Area</u> Survivability and Force Protection of Forces/Civilians	<u>Approximate Cost</u> \$21,000 - \$35,000
<p>Description: SABRE 5000 has multiple configurations to allow detection of narcotics, explosives, and chemical warfare agents and toxic industrial chemicals (CWA/TIC). SABRE 5000 is programmed to detect and identify over 40 threat substances in approximately 20 seconds. SABRE 5000 is capable of analyzing either trace particle or vapor samples. The operator can select the best analysis method for the suspected threat to yield the most accurate analysis results. Switching between sampling modes takes seconds.</p> <ul style="list-style-type: none"> • Explosives - RDX, PETN, TNT, Semtex, TATP, NG, Ammonium Nitrate, H2O2 and others • Drugs - Cocaine, Heroin, THC, Methamphetamine and others • Toxic industrial chemicals - Hydrogen Cyanide (HCN), Phosgene, SO, NH and others • Chemical warfare agents - Nerve and blister agents such as Tabun, Sarin, Soman, Cyclosarin, Agent VX and Vx <p>Preliminary CONOPS: UN and TCC/PCC personnel employ the SABRE 5000 to aid in trace or vapor detection of explosives, narcotics, chemical agents and vapor detection of peroxides in real time (seconds) on scene, sensitive site exploitation events, check points or ports.</p> <p>UN Need/Gap: Detection of threats and contraband at the point of incidence to reduce detection time.</p> <p>Anticipated Benefit/ROI: Perform immediate onsite analysis of narcotics, explosives, chemical warfare agents, and toxic industrial chemicals providing an effective means to screen personnel and material and save time and money associated to offsite analysis.</p>	

Technology 2: Entry Control Point (ECP)



UN PKO Focus Area
Survivability and Force Protection of
Forces/Civilians

Approximate Cost
Approximately \$600,000 for
Medium Size ECP

Description: Integrated system of systems that includes surveillance, physical barriers, and hazardous material screening to control vehicle and personnel access to designated UN facilities. These integrated technologies allow for the ECP to actively seek out, detect, delay, segregate, detain and respond to viable threats with increased standoff and precision from a common operating picture, thereby reducing threat to peacekeepers and facilities.

Preliminary CONOPS: Peacekeeping forces establish Entry Control Points at designated locations as part of a base or facility perimeter defense. When a guard force knowledgeable in established access control policies and procedures operates ECP, ECP can defeat or neutralize most likely vehicle-borne improvised explosive device (VBIED), personnel-borne improvised explosive device (PBIED), direct fire and indirect fire threats.

UN Need/Gap: Improved base security and force protection measures.

Anticipated Benefit/ROI: While increasing the Entry Control Points' protective posture by providing additional standoff and persistent surveillance, the integrated solution effectively reduces Entry Control Points' guard force task requirements and improves real-time decision-making.

Technology 3: HazMatID 360



UN PKO Focus Area
Survivability and Force Protection of
Forces/Civilians

Approximate Cost
\$50,000 - \$100,000

Description: HazMatID 360 uses Fourier-Transform Infrared Spectroscopy (FT-IR) and an extensive on-board spectral library to rapidly identify solid and liquid chemicals based on their distinct molecular fingerprint. Mixture analysis, combined with chemical hazard classification capabilities, enables advanced data handling and comprehensive analysis of hazardous materials in the field. It has built-in Bluetooth wireless communication to allow immediate data transmission to a command center and includes PEAC® decision support software, which provides detailed information regarding managing hazardous chemicals. HazMatID 360 is capable of identifying over 32,000 substances including:

- WMD - nerve & blister agent
- Toxic industrial chemicals (TIC)
- White powders
- Explosives & Clan Lab precursors
- Drug precursors
- Common chemicals
- Forensic drugs
- Pesticides

Preliminary CONOPS: UN Peacekeepers employ the HazMatID 360 to identify hazardous materials, to prevent further contamination from liquid or solid chemical contaminants, to enable proper handling of the materials, and to support information flow of collected sample data to enhance/support decision making.

UN Need/Gap: Protection of forces and civilians.

Anticipated Benefit/ROI: Provide an effective and rapid means to address hazardous materials.

Technology 4: Modular Protective System (MPS)



UN PKO Focus Area
Survivability and Force Protection of
Forces/Civilians

Approximate Cost
\$3,000 - \$4,000 per linear meter for a 2.5
meter tall wall

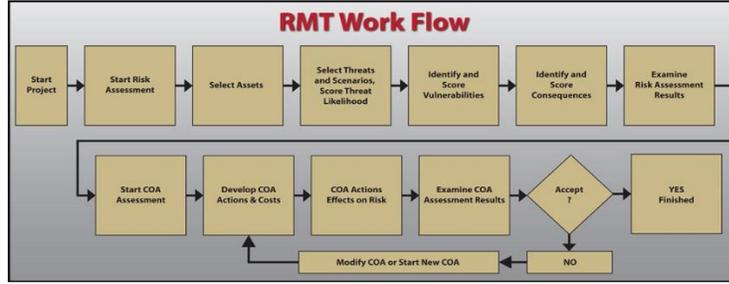
Description: MPS is a rapidly deployable wall revetment system that provides physical protection in austere environments. The system requires no fill material, no construction resources, no tools, and is not military occupational specialty (MOS) specific. The system utilizes lightweight space frames with composite armor panels that have been validated for protection against small arms, rockets and mortars, and blast loadings. MPS is a fully recoverable and reusable system; therefore it can be used for multiple deployments. The system easily packages into most shipping containers (quadcons, tricons, and 20-ft containers (6 meter)).

Preliminary CONOPS: MPS can be utilized to protect critical assets, such as Tactical Operations Centers, high value sensor systems, refueling stations, and security positions. The system is similar to other revetment systems, such as HESCO barriers or T-Walls and can be used in the same manner. Overhead protection can be obtained through the use of a few additional components.

UN Need/Gap: Force protection.

Anticipated Benefit/ROI: Provides an expedient alternative to HESCOs or T-Walls that doesn't require construction engineer resources. Therefore, it bridges the gap between having no protection and waiting for additional resources.

Technology 5: Fixed Site Risk Management Tool (FS-RMT)



UN PKO Focus Area
Survivability and Force Protection of
Forces/Civilians

Approximate Cost
No Cost

Description: FS-RMT is an unclassified computer-based tool with built-in help, pop-up, “How to Proceed” features, that is used to assess risk and assess courses of action (COAs) to mitigate risk for fixed sites. The tool can be used for protection decisions involving portions of buildings, entire buildings, or bases with many assets and structures.

Preliminary CONOPS: Upon receipt of mission, UN and TCC/PCC force protection personnel utilize FS-RMT as a decision support tool to identify, prioritize, reduce, and control risks – an all-hazards approach to protection. The personnel select the assets, threats, and scenarios to conduct the trade-off between risk reduction and resource requirements through risk scoring and prioritization, Course of Analysis (COA) assessment, and cost comparison.

UN Need/Gap: Reduce risk by applying a systematic and defensible process for identifying, prioritizing, reducing and controlling risks.

Anticipated Benefit/ROI: Offers a systematic, rational, and defensible process for identifying, prioritizing, reducing, and controlling risks and may reduce time and resources needed associated to force protection planning and decision-making.

Technology 6: Counter - Improvised Explosive Device (IED) Equipment and Training



UN PKO Focus Area
Survivability and Force Protection of Forces/Civilians

Approximate Cost
Approximately \$160,000 total with component prices. Components range from \$300 - \$37,000

Description: Collection of 12 supporting technologies establishes basic explosive hazard reduction and IED mitigation capability. Includes MMP 30 Robot, Vallon Mine Detector, EOD 9 Bomb Suit, EOD 9 Bomb Suit Helmet, Symphony ECM Jammer, Hook and Line Kit, M34 Blasting Machine, Firing Reel, M51 Blasting Cap Tester, Pan Disruptor, Disruptor Stand, Binoculars.

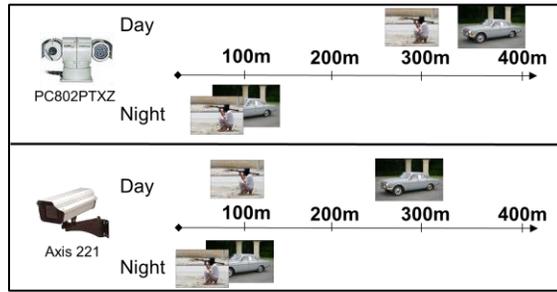
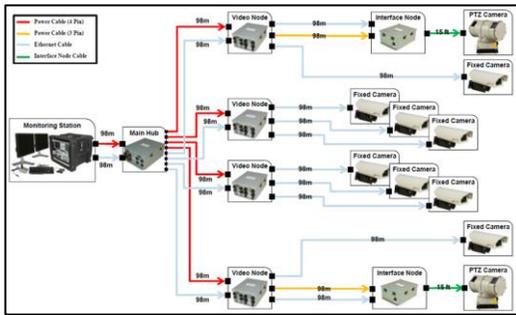
- Training: Explosive Hazard Reduction Course normally 4weeks in duration designed to train basic peacekeepers to locate and disable non-complex IEDs. IED Mitigation Course normally 5 weeks tailored for designated Explosive Ordnance technician /specialists for employment of advanced equipment/techniques.

Preliminary CONOPS: Trained teams employs equipment to clear convoy route; once located, IEDs are disabled by a specially equipped EOD/IED mitigation technician.

UN Need/Gap: Provides UN with integrated IED hazard reduction capability.

Anticipated Benefit/ROI: Provides peacekeeping units the ability to detect and disable IEDs in order to protect force, protect civilian population, and retain freedom of movement to accomplish its UN directed mission.

Technology 7: Rapid Deployment Integrated Surveillance System (RDISS)



UN PKO Focus Area
Survivability and Force Protection of Forces/Civilians; Information Led Operations and Situational Awareness

Approximate Cost
\$100,000 - \$150,000 initial purchase;
Approx \$9,000 per year for sustainment

Description: RDISS provides persistent day and night surveillance capability for small base camps (200m x 200m). A single person can monitor 10 or more cameras from one location. RDISS automatically records video in 1-hour segments. Older videos and snapshots are deleted from the system when storage becomes low. Video files from RDISS can be stored and shared for later analysis. Personnel can copy video files to a CD, DVD or USB devices. Still image snapshots from a live camera or recorded video file can be taken. Complete kit contains cameras (fixed and panning), hubs and nodes, monitoring stations, and backup battery, and cabling. Components can be wall-mounted or secured to a flat surface (Hardware provided).

Preliminary CONOPS: UN and TCC/PCC personnel utilize RDISS to monitor activities outside of their base or on a border. The RDISS is installed by 3-4 personnel in less than a day. On a rotational basis, a single person monitors the 10 cameras from the base operations center. Still images and video files can be stored on personnel provided devices and shared for later analysis.

UN Need/Gap: Limited ability to provide real-time visibility to enable monitoring of mission areas to enable operational assessments and to enhance the safety and security of personnel.

Anticipated Benefit/ROI: As a relatively easy to setup, operate, and maintain persistent surveillance system, RDISS improves base security through surveillance deterrents, provides greater coverage, enables early detection, and enables TCC/PCCs to employ personnel for activities other than security surveillance.

Technology 8: Maveric Small Unmanned Aerial System (SUAS)



UN PKO Focus Area
Survivability and Force Protection of Forces/Civilians; Information Led Operations and Situational Awareness

Approximate Cost
\$125,000 - \$175,000;
Includes 3 aircraft and support equipment

Description: Maveric is a small unmanned aerial vehicle (UAV). Weighing 2.5 pounds, it is hand launched by a single person in under five minutes. The vehicle transmits live video imagery and metadata to a Ground Control Station (GCS) and/or remote video terminal (RVT). This capability allows the operator to navigate, search for items of interest and record information for later analysis. The aircraft can be launched or recovered in minutes on unprepared terrain without special equipment. The system employs a self-stabilizing aircraft configuration with stability augmentation avionics, and provides ease of control and steady video imagery. All components are lightweight and easily carried via backpack. The Maveric is powered by rechargeable Lithium Polymer (Li-Po) battery packs and flies for 40-75 minutes. It also has low visual, acoustic, and thermal signatures. The sensor package includes an electro-optical (EO) color camera in the nose and a fixed side-view EO camera in the payload bay. The system is typically operated by a one or two-person team, consisting of a Vehicle Operator (VO) and a Mission Operator (MO). The VO has the final authority in all matters relating to the flight, and is considered the Pilot-in-Command (PIC). The System is contained in a single case. Available in military and commercial variants.

Preliminary CONOPS: UN Peacekeepers employ Maveric to provide medium range surveillance over the area of operation providing information on movement of persons/vehicles, route reconnaissance, force protection and convoy security, and search and rescue.

UN Need/Gap: Limited capabilities for mobile and persistent surveillance.

Anticipated Benefit/ROI: Enables improved situational awareness through the use of persistent surveillance capabilities across a wide mission area of operation.

Candidate Technologies for Information Led Operations and Situational Awareness

Technology 1: All Partner Access Network (APAN)



<p><u>UN PKO Focus Area</u> Information Led Operations & Situational Awareness</p>	<p><u>Approximate Cost</u> There is no cost or fee associated when using APAN users accounts or Groups</p>
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Description: APAN is a web-based, dot-org, information sharing and collaboration tool that may be accessed any time, from anywhere, by any user with an internet connection, including web-enabled mobile, personal devices via APAN Lite. APAN is provided as a DoD hosted, COCOM sponsored, “Software as a Service” (SaaS) solution. As a platform/service, APAN is a community of communities and groups that leverage Web 2.0 social networking and collaborative tools to create a “Value Network”. A net-centric suite of capabilities for effective, non-classified information sharing and collaboration and coordination with a broad range of stakeholders and mission partners, to include: DoD, UN, TCC, PCCs, Host Nation Government, NGOs, and International Organizations. Enables building of partnerships, groups, and virtual communities to more effectively meet mission needs, objectives, and priorities.

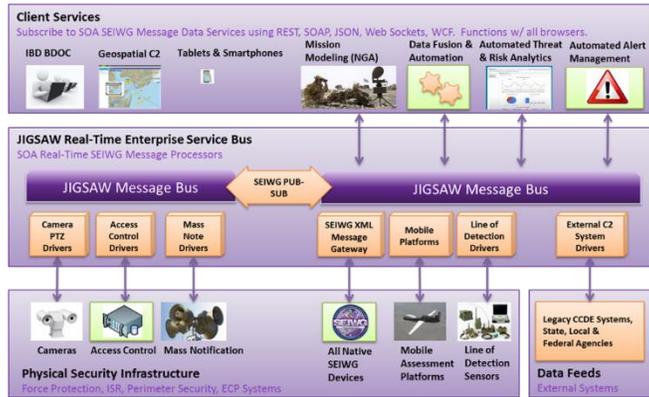
Preliminary CONOPS: Users employ APAN as a means for information sharing and collaboration between PKO forces and other mission stakeholders operating within the contingency area, as well as those supporting remotely, to improve information exchange, collaboration, and coordination for improved Situational Awareness, Decision Making, and mission effectiveness. UN implements APAN as a Social Networking Service (SNS) to include Communities of Interest (CoIs), or Communities of Practice (CoPs) around a specific topic, goal, or mission. Members collaborate together by posting information in blogs, forums and Wikis and by participating in live discussions, and leveraging relationships built in the virtual community.

UN Need/Gap: Information exchange, situational awareness, collaboration and coordination of PKO activities.

Anticipated Benefit/ROI: Provide Peacekeepers with a no-cost, minimal maintenance information exchange and collaboration tool to improve coordination and execution of mission goals and objectives.

<p>Technology 2: GeoSHAPE Geospatial Information Flow Application</p>	
	
<p><u>UN PKO Focus Area</u> Information Led Operations & Situational Awareness</p>	<p><u>Approximate Cost</u> There is no cost for GeoSHAPE and Arbiter software.</p>
<p>Description: GeoSHAPE is the integration of a geospatial portal, a web mapping client, and a mobile application (Arbiter), that leverages existing mobile networks and WiFi infrastructure. Together, these technologies enable creating, sharing (publishing), integrating, and visualizing geospatial (geographically referenced) data for improved situational awareness and decision-making. GeoSHAPE and Arbiter support: publishing and discovery of data layers; distributed collaboration; user-generated comments; user annotations; data provenance and integrity; and data consistency in intermittently connected environments. GeoSHAPE and Arbiter are non-proprietary, open source and open architecture platforms. www.geoshape.org</p> <p>Preliminary CONOPS: While on patrol, a peacekeeper uses smart hand-held devices (phones or tablets) equipped with the GeoSHAPE mobile app (Arbiter) to create a wide range of geospatial reports: personnel, equipment, operations, infrastructure, weather conditions, ground conditions, etc. When operating in connected environments (via 3G/4G or WiFi), the data is relayed near real time to PKO headquarters, where it feeds either a common operating picture (COP), or a user defined operational picture (UDOP) to improve situational awareness and aid decision-making. For operations in disconnected environments (no 3G/4G network or WiFi connection), the information is stored on the device until the individual can connect via a working 3G/4G or WiFi network; at that point the information is synchronized with the GeoSHAPE server and the other devices on the GeoSHAPE network.</p> <p>UN Need/Gap: Need for improved situational awareness geospatially in limited bandwidth environments.</p> <p>Anticipated Benefit/ROI: Publishing and Discovery of Data Layers provides central libraries through which users can publish their data layers and visualizations, as well as discover the data layers and visualizations published by others. These repositories also provide for the conveyance of trust based on peer reviews of the underlying data.</p>	

Technology 3: Joint Interface Group for System Architecture Workspaces (JIGSAW)



UN PKO Focus Area
 Information Led Operations & Situational Awareness; Survivability and Force Protection of Forces/Civilians

Approximate Cost
 \$150,000 - \$200,000 for a standard size Forward Operating Base; Approx. \$15,000 in sustainment cost per year

Description: To improve command and control capability for sensor and system control and feeds, SPAWAR developed an application which is displayed on a common operating picture to quickly and easily integrate sensors (e.g. radar, unmanned ground sensors, intrusion Detection, and video) and system (e.g. force protection, unmanned aerial systems, mass notification, access Control) drivers into a common interface control method using a novel Add-In Driver Technology. These drivers provide a highly flexible means of creating system interfaces to the message bus. Allows various independent sensors and systems with various protocols the ability to be controlled and viewed through a single COP eliminating redundant software development tasks.

Preliminary CONOPS: UN and TCC/PCC peacekeepers employ JIGSAW to eliminating redundant software development tasks that occur when integrating new systems/sensor into Command & Control. JIGSAW System Architecture uses Add-In Driver Technology to reduce the software development tasks, improve efficiency for C2 Operators, and improving information assurance testing efforts.

UN Need/Gap: Capabilities to improve interoperability of systems and command and control.

Anticipated Benefit/ROI: Provides a low cost means to integrate disparate sensors and systems utilized for force protection. The ROI increases significantly as the size of the operating base increases and the number of systems and sensors increase.

Technology 4: InstantEye Unmanned Aerial System



UN PKO Focus Area
Information Led Operations & Situational Awareness

Approximate Cost
\$5,000 - \$10,000

Description: InstantEye is a small (<20cm), lightweight (<200g), expendable, hand or canister launched airborne surveillance system that provides electro-optical or infrared imagery. The vehicle weighs less than one pound and can go from a stowed configuration to airborne in under 30 seconds to provide rapid situational awareness and tactical sensor operation for 30 minutes. The vehicle requires minimal training and offers both manual and assisted controls. Utilizing the Ground Control Station’s viewer, the pilot can control the vehicle and reposition the vehicle’s camera during flight. Precision position hold enables continuous surveillance with minimal correction. Possible payloads are Infrared LED, GoPro HD, and FLIR.

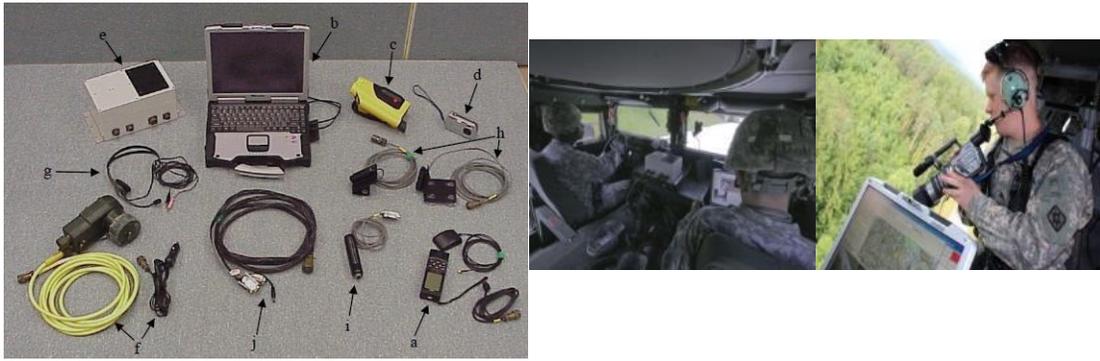
Additional information is available at www.psitactical.com/product.html

Preliminary CONOPS: Peacekeepers employ InstantEye for route reconnaissance in advance of convoy through urban area to identify choke points, and if necessary, select alternate routes. Peacekeepers employ InstantEye to monitor crowd movement and use it to trigger deployment of auxiliary response elements.

UN Need/Gap: Limited capabilities for mobile monitoring and surveillance.

Anticipated Benefit/ROI: Low cost aerial surveillance capability that provides electro-optical (EO) and infrared (IR) imagery to portable device/smartphone. Supports multiple peacekeeping focus areas, requires no infrastructure, and minimal training to employ.

Technology 5: Automated Route Reconnaissance Kit (ARRK)



UN PKO Focus Area
Information Led Operations &
Situational Awareness

Approximate Cost
\$40,000 per system

Description: The ARRK provides an adaptable, easy to use, mounted reconnaissance package that allows rapid collection, processing, and analysis of route reconnaissance data on a wide spectrum of mounted (ground and/or air) reconnaissance missions or for special data collection needs. The ARRK collects photographs, voice recordings, global positioning system (GPS) locations, accelerometer data, and gyroscope data streams in three dimensions. The ARRK includes GPS, computer and accessories, laser range finders, cameras, microphones, and gyroscopes and accelerometer.

Preliminary CONOPS: ARRK continuously collects route reconnaissance information and performs routine calculations without stopping or leaving the vehicle. Minimizes time required for personnel to collect and share spatial information to support route reconnaissance, site surveys, post disaster assessment, route clearance, port assessment and trafficability.

UN Need/Gap: Limited route reconnaissance capabilities.

Anticipated Benefit/ROI: The capacity to conduct route reconnaissance and analyze reconnaissance data while reducing time, minimizing security risks, and improving accuracy, compared to conventional route reconnaissance methods.

Technology 6: TeleEngineering Communications Equipment



UN PKO Focus Area
Information Led Operations & Situational Awareness

Approximate Cost
\$85,000 - \$100,000 per system

Description: Satellite-based system leverages commercial-off-the-shelf technologies in an integrated solution that enables the user to send and receive data and conduct video teleconferences in a classified or non-classified manner. It may be used to place phone calls, access the internet, and send and receive e-mail traffic. Conferencing codec capable of integrated services digital (ISD) network and internet protocol (IP) based conferencing. Multiple configurations available including fixed site and deployable.

Preliminary CONOPS: UN peacekeepers utilize the TeleEngineering communications equipment to provide communications infrastructure in deployed and fixed sites in areas where communications are non-existent or sporadic.

UN Need/Gap: Limited communications capabilities in mission areas with little to no operational communications infrastructure.

Anticipated Benefit/ROI: The satellite-based system allows personnel the capability to conduct reachback through video conferencing and data transfer resources.

Technology 7: Radio Interoperability System (RIOS) Equipment



UN PKO Focus Area
Information Led Operations & Situational Awareness

Approximate Cost
\$95,000 - \$150,000

Description: RIOS is a communications system that integrates radio frequency and internet protocol supported devices into a single communications architecture. RIOS offers the ability to interface radios, computers, IP video feeds and smartphones within a common multi-user interface. The interoperability gateway offers 6, 8, 16 or multiples of 16 input channels for radio entry points. The interoperability gateway features the ability to support all conventional radios, HF, VHF, UHF, 700/800 MHz trunking, conventional and military radios.

Preliminary CONOPS: UN and TCC/PCC forces and civilians of different countries and regions deploy to area of operations with their standard communications equipment. The HQ element employs RIOS to provide connectivity among Mission Headquarters and peacekeepers operating in field locations. RIOS enables improved command and control and situational awareness across disparate systems.

UN Need/Gap: Lack of interoperable radio and other communication systems among the UN Headquarters, TCCs, and PCCs.

Anticipated Benefit/ROI: Integrates existing radio frequency and internet protocol supported devices into a single communications architecture.

Candidate Technologies for Medical Support

Technology 1: Combat Application Tourniquet (CAT)	
	
<p><u>UN PKO Focus Area</u> Medical Support</p>	<p><u>Approximate Cost</u> \$25 - \$50 each</p>
<p>Description: Catastrophic loss of blood is one of the primary reasons for death from injury. The Combat Application Tourniquet™ (CAT) is a small, lightweight tourniquet that may be applied with a single hand to completely occlude arterial blood flow in an extremity. Based upon testing conducted by the U.S. Army Institute of Surgical Research, the Surgeon General directed that the CAT tourniquet be the primary tourniquet issued to all Army Soldiers. CAT is a component of the Improved First Aid Kit (IFAK) and the Warrior Aid and Litter Kit (WALK). The CAT addresses the need to minimize blood loss from physical trauma to enhance the victim’s chances of survival.</p> <ul style="list-style-type: none"> • Training versions are available from the CAT vendor. <p>Preliminary CONOPS: Provides individuals (including the wounded victim) the capability to stem blood loss by easy, single person tourniquet application.</p> <p>UN Need/Gap: Limited capabilities for initial trauma care at the point of incidence.</p> <p>Anticipated Benefit/ROI: Improved casualty care through Self-Aid/Buddy-Aid (SABA) to control and stop severe hemorrhage and save lives.</p>	

<p align="center">Technology 2: Improved First Aid Kit (IFAK)</p>	
	
<p align="center"><u>UN PKO Focus Area</u> Medical Support</p>	<p align="center"><u>Approximate Cost</u> \$265 - \$350</p>
<p>Description: Weighing one pound, the Improved First Aid Kit (IFAK) consists of the following expendable medical items packaged inside a standard ammunition pouch: Combat Application Tourniquet, Bandage Kit, Bandages, Adhesive Tape, Nasopharyngeal Airway, Examination gloves, Gauze Dressing, Insert, Re-supply Kit.</p> <p>Preliminary CONOPS: UN personnel and TCC/PCC forces employ IFAK medical items to perform initial aid on military/police forces and civilians following a casualty event (e.g. improvised explosive device detonation, gun shot, vehicular accident) until follow-on medical support is available.</p> <p>UN Need/Gap: Limited small emergency kits to perform basic triage in the field at the point of incident.</p> <p>Anticipated Benefit/ROI: Increases capability to provide Self/Buddy-Aid; Provides interventions for two leading causes of death on battlefield – severe hemorrhage and inadequate airway; Increases survivability during dispersed ops; Pouch allows for mission specific “add-ins”.</p>	

Technology 3: Combat Gauze



UN PKO Focus Area
Medical Support

Approximate Cost
\$20 - 30 per case
(25 pouches per case)

Description: Coated sterile gauze, 3 inches by 4-yard roll. Proven on the battlefields of Iraq and Afghanistan, gauze is impregnated with kaolin, an ingredient that stops bleeding fast when applied with pressure.

Preliminary CONOPS: Trauma is a major cause of death and disability and the second most expensive healthcare problem in the U.S. Approximately 40% of trauma-related deaths are due to bleeding or its consequences, establishing hemorrhage as the most common cause of preventable death in trauma. UN Peacekeepers utilize the combat gauze to stem blood loss from injury: pressure and coagulation.

UN Need/Gap: Address the immediate and primary requirement to stem/stop blood loss caused by severe injury.

Anticipated Benefit/ROI: This treated gauze, applied with manual pressure, promotes clotting within minutes from application and dramatically improves chances for the victim's survival.

Technology 4: Magellan-2200 Model 1



UN PKO Focus Area
Medical Support

Approximate Cost
\$20,000 - \$25,000

Description: The Magellan-2200 Model 1 is intended for spontaneous, manually assisted or automatic ventilation of patients during anesthesia. It is pneumatically powered and contains an electronic ventilation monitor that is A/C or battery powered. The Magellan-2200 may be mounted on a tabletop or on a mobile cart. It may be used to deliver gases and anesthetic vapor.

The Magellan is capable of monitor/alarm functions for oxygen concentration, breathing pressure and respiratory volumes and is compact, robust, flexible, easy to move, and designed for military field hospitals, general civilian hospitals, office-based anesthesia and surgery centers of every description. All of the safety systems required are employed onboard and easy to utilize.

Preliminary CONOPS: UN and TCC/PCC medical personnel employ the Magellan capability to support surgical procedures when the patient requires anesthesia closer to the point of incidence.

UN Need/Gap: The need to provide robust medical support to personnel in the field charged with both immediate and follow-on medical care to the wounded.

Anticipated Benefit/ROI: Provides a mobile capability to provide ventilation and anesthesia closer to the point of incident enabling treatment within the period to greatly improve survivability of the patient.

Technology 5: Life Support Trauma and Transport (LSTAT)



UN PKO Focus Area
Medical Support

Approximate Cost
Approx. \$5,000

Description: Life Support for Trauma and Transport (LSTAT), Model 9602B, is a self-contained, stretcher-based miniature intensive care unit designed by the United States Army to provide care for critically injured patients during transport and in remote settings where resources are limited. LSTAT contains conventional medical equipment that has been integrated into one platform and reduced in size to fit within the dimensional envelope of a North Atlantic Treaty Organization (NATO) stretcher. It has multiple integrated systems (ventilator, defibrillator, suction, hemodynamic monitors, infusion and invasive monitoring channels, capnography, blood analysis, and electrocardiography) that allow seamless monitoring and effective life-saving interventions during transport. The platform functions as a mobile ICU and has preliminarily been tested with success in combat settings. It allows uninterrupted monitoring, immediate response to physiologic changes, and reduction in human resource consumption.

Preliminary CONOPS: UN Peacekeepers with medical training employ the LSTAT to perform lifesaving procedures at the point of incident. Following initial treatment, the patient is transported to higher echelon medical care using the LSTAT.

UN Need/Gap: Limited readily available critical care options at or near the point of incident.

Anticipated Benefit/ROI: LSTAT is a safe and convenient method of in-hospital transport, allowing uninterrupted monitoring, immediate response to physiologic changes, and reduced human resource consumption. In austere environments, LSTAT can serve as a self-contained, intensive care unit for critically injured patients. During PKO when critically injured patients must be transported, LSTAT can provide care for critically injured patients during transport and in remote settings where resources are limited. See www.ncbi.nlm.nih.gov/pubmed/15217632.

Technology 6: Medical Equipment Sets (MES)	
	
<u>UN PKO Focus Area</u> Medical Support	<u>Approximate Cost</u> Variable depending on the set requested
<p>Description: Medical Equipment Sets (MES) developed by the U.S. Army to deliver Health Service Support to the operational force at Roles of Care 1 and 2 in accordance with Joint Publication 4-02 and U.S. Army Field Manual 4-02. MES includes equipment and consumable items required to provide pre-hospital, enroute, and forward surgical Health Service Support.</p> <ul style="list-style-type: none"> • MES Combat Life Saver (Unit Assemblage [UA] 245B) • MES Combat Medic (UA 246C) • MES Ground Ambulance (UA 256C) • MES Air Ambulance (UA257B) • MES Forward Surgical Team Equipment (UA 267C) • MES Tactical Combat Medical Care (UA 269B) • Other sets exist for a myriad of functions (e.g. dental, veterinarian) <p>Preliminary CONOPS: Peacekeeper and civilian health care supports the operational mission by fostering, protecting, sustaining, and restoring health. Placing the health care resources in the proximity of those who need health care is critical to mission success. The MES enables flexibility to changing requirements and places resources within supporting distance of maneuvering forces. Health care is provided continuously through progressive levels of treatment including pre-hospital care, enroute care, and hospitalization.</p> <p>UN Need/Gap: Limited capabilities to provide lifesaving care across Level 1 and 2.</p> <p>Anticipated Benefit/ROI: Variable. In general, reduced morbidity and mortality, improved mission readiness, morale, and civil-military relations. The rapid provision of forward medical care reduces morbidity and mortality, sustains the number of mission-capable service members and their morale, and supports civil-military operations.</p>	

Technology 7: Environmental Sentinel Biomonitor (ESB)



UN PKO Focus Area
Medical Support

Approximate Cost
\$10,000 - \$20,000 based upon single quantity orders

Description: The Environmental Sentinel Biomonitor (ESB) performs rapid screening and identification of toxicity from a wide range of industrial chemicals, to be used in conjunction with the Water Quality Analysis Set - Preventive Medicine (WQAS-PM). ESB significantly augments current detection capabilities by providing a presumptive screening capability that can rapidly identify toxicity in water. ESB provides identification for many toxic industrial and agricultural chemicals in water, including unsuspected or unknown materials and chemical mixtures. ESB comprises two devices: a cell-based electric cell-substrate impedance sensing (ECIS) device and an acetylcholinesterase (ACE) inhibition measuring device.

Preliminary CONOPS: The ESB provides peacekeepers with the capability to rapidly identify toxic industrial chemicals in drinking water, thereby decreasing the risk of disease and non-battle injuries (DNBI) in deployed peacekeepers. The near real-time toxicity data from ESB tests will support key decisions about the quality of field drinking water.

UN Need/Gap: Preventative Medicine personnel certify water potability, but field water tests for toxic industrial chemicals are limited.

Anticipated Benefit/ROI: The ESB system will significantly enhance the ability of the current Water Quality Analysis Set - Preventive Medicine to respond to hazardous chemicals in water, with rapid tests yielding results in 60-120 minutes.

Technology 8: Medical Contingency Requirements Workflow (MCRW)

Medical Contingency Requirements Workflow →

Projects ▾ Objects ▾ Reports ▾ Help ▾ Dashboard ▾

Logged in as: Mark Gindele, ✉ (197)

Create Clinical - Patient Stream Based Materiel Item Estimate

Create Sourcing - Conduct Health and Sourcing Analysis on a list of NSNs

Reports - Access all critical value-added reports for your projects

View MIE Library - Access to all past projects

Recent Activity	Last Updated
mb <small>MIE Adjust & Source 21 NSNs 3 Unhealthy</small>	08/17/2015
gg <small>MIE Adjust & Source 308 NSNs 8 Unhealthy</small>	08/07/2015
nn <small>MIE Adjust & Source 501 NSNs 199 Unhealthy</small>	08/07/2015
651500L006174 <small>MIE Adjust & Source 1 NSNs 0 Unhealthy</small>	07/30/2015

UN PKO Focus Area
Medical Support

Approximate Cost
Currently configured for the U.S. DoD;
Development will need to occur to meet UN needs

Description: MCRW is a DoD medical materiel contingency planning tool with the modeling capability to derive consumable class VIII materiel based on user input scenario and casualty data. It has the capability to develop project-specific medical materiel estimates tailored to the simulated contingency, which are then applied against [current DoD DLA] supply chain execution frameworks, and the results can be developed and shared on-line in a collaborative environment. MCRW helps the military services by maximizing supply chain efficiencies by providing a structured methodology identifying the most importance medical consumable items tied to clinical needs. This results in planning a more accurate and readily procurable class VIII item forecast for a contingency.

Preliminary CONOPS: Medical planning personnel utilize MCRW generated empirical data from combat and humanitarian/disaster events to determine injury estimates. Using those estimates it applies UN Service medical treatment information to determine anticipated medical item usage in the contingency (a Materiel Item Estimate-MIE). Generated MIEs can then be adjusted for additional variables that are determined by clinical and logistics Subject Matter Experts to arrive at the most representative model output.

UN Need/Gap: Improved capability to conduct medical logistics/supply planning.

Anticipated Benefit/ROI: Improving materiel planning reduces the initial investment required to meet scenario needs by eliminating oversupply and abandoned materiel. MCRW outputs can be adjusted for risk exposure depending on criticality of mission to reduce potential for shortfall.

UNCLASSIFIED

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Technology 9: Deployable Medical Equipment Training Courses Online	
	
<u>UN PKO Focus Area</u> Medical Support; Training	<u>Approximate Cost</u> No Cost
<p>Description: Available on line through the Joint Knowledge Online (JKO) website, these medical equipment training online courses are intended to familiarize operators and biomedical equipment specialists with operation and maintenance of deployable medical equipment supported by the US Army Medical Material Agency (USAMMA).</p> <p>These courses have been developed for 18 different equipment items, and are one to two hours in length. All courses include a set of multiple-choice questions to verify that students have met learning objectives and a certificate is generated for those who score above 80%.</p> <p>Each Operator course includes the following topics: Introduction, Equipment Set-Up, System Familiarization and Parameters, Operator-Level care and Maintenance, and Summary. Each Maintenance course includes the following topics: Introduction, Overview of the Medical Device, Safety Considerations, Setup and Preventative Maintenance Checks and Services (PMCS), Calibration Verification, and Summary.</p> <p>Preliminary CONOPS: Approved UN HQ and Peacekeepers (UN/TCC/PCC) register and attend the courses online and receive certification on medical equipment.</p> <p>UN Need/Gap: Training and certification operation, supply, installation and maintenance of medical equipment.</p> <p>Anticipated Benefit/ROI: Enables improved medical personnel mission performance with accessible training.</p>	

Technology 10: “Bair” Hugger Patient Warming Unit Model 505

UN PKO Focus Area
Medical Support

Approximate Cost
\$1,500 - \$3,500

Description: Consists of a Bair Hugger forced-air temperature management unit and disposable components including forced air blankets, patient warming gowns, and blood/fluid warming set. May be used in a myriad of clinical settings and for adult and pediatric patients.

Preliminary CONOPS: UN Peacekeepers with medical training utilize the unit to prevent and treat hypothermia, provide patient thermal comfort.

UN Need/Gap: Limited readily available critical care options at or near the point of incident.

Anticipated Benefit/ROI: In general types of surgeries, studies suggest that maintaining normothermia decreases the following: wound infection, myocardial infarction, ICU time, length of stay, mortality rates, the use of blood products, likelihood of mechanical ventilation and the probability of needing a transfusion.

Technology 11: Cold Pack Therapy Unit, ColPac Model C5



UN PKO Focus Area
Medical Support

Approximate Cost
\$2,000 - \$3,000

Description: ColPacs provide cold therapy to relieve pain for up to 30 minutes. The ColPac Cold Therapy pack helps control swelling and inflammation to soft tissue and can be used on injury, strains, sprains, muscle soreness, bruises, and swelling. The portable, stainless steel ColPac chilling unit chills cold packs. The refrigeration system of the ColPac Chilling Unit has been adjusted, tested and calibrated to chill the ColPacs to a temperature between 10 and 21 degrees F (-6 C to -12 C), which tests and observations have shown to be the optimum temperature range. No plumbing is required, only power from standard electrical outlet. Available through commercial purchase.

- Closed-cell foam insulation
- Stainless steel, welded construction
- Heavy-duty compressor
- Interior chilling coils
- 3” swivel-type rubber casters for silent, friction-free movement of mobile units
- Drain valve for cleaning and defrosting
- Available in 155V and 220 V configurations.

Preliminary CONOPS: UN Peacekeepers employ the ColPac to chill cold packs and other material to provide cold therapy as necessary for patients.

UN Need/Gap: Limited readily available critical care options at or near the point of incident.

Anticipated Benefit/ROI: Cold is one of the most common types of noninvasive and non-addictive pain-relief therapies for muscle and joint pain. In general, a new injury will cause inflammation and possibly swelling. Cold therapy will decrease the blood flow to the injury, thereby decreasing inflammation and swelling.

Technology 12: M-Turbo Portable Ultrasound System



UN PKO Focus Area
Medical Support

Approximate Cost
\$15,000 - \$80,000 depending on configuration

Description: The SonoSite M-Turbo portable ultrasound provides abdominal, nerve, vascular, cardiac, venous access, pelvic, and superficial imaging. It is equipped with SonoGT to provide wireless connectivity and workflow integration for anesthesia, emergency medicine, critical care and other acute point-of-care requirements as well as Color HD technology to provide increased diagnostic information and better visualization of color flow, particularly in low flow states.

The optional use of SonoRoam technology enables wireless image transfer from the M-Turbo system to a PACS system via DICOM and to a personal computer via SiteLink so that clinicians can quickly retrieve the information from any location.

Available through commercial purchase.

Preliminary CONOPS: UN physicians and trained medical professionals will employ the M-Turbo Ultrasound system to accomplish the imaging necessary to support emergency medicine and critical care.

UN Need/Gap: Limited readily available critical care options at or near the point of incident.

Anticipated Benefit/ROI: Ultrasound imaging will provide UN medical staff with acute, point-of-care, diagnostic support demonstrably increasing the level of patient care.

Technology 13: Blood Cooling and Storage Refrigerator HMC-MIL-1 (Hemacool)



UN PKO Focus Area
Medical Support

Approximate Cost
\$6,000 - \$11,000

Description: This refrigeration unit protects critical blood supplies under field conditions. It is ergonomically designed for operations in adverse environments, incorporating features and controls to precisely maintain the required temperature for blood storage. Available via commercial purchase

- Precise temperature control under adverse conditions
- Easily transportable
- Can run on a variety of power sources including AC, DC, onboard batteries, and solar array
- Rugged design for demanding applications
- Available with Sled Rails, Wheels, or Skis

Preliminary CONOPS: Use as necessary to store and maintain critical blood supplies under field conditions.

UN Need/Gap: Limited readily available critical care options for blood storage at or near the point of incident.

Anticipated Benefit/ROI: The goal of blood preservation is to provide viable and functional blood components for patients requiring blood transfusion. Use of this storage unit will support UN medical field operations and directly impact the success of patient care.

Technology 14: MinXray model HF120/60HPPWV PowerPlus



UN PKO Focus Area
Medical Support

Approximate Cost
\$25,000 - \$40,000 depending on variant

Description: The MinXray model HF120/60HPPWV PowerPlus TM is a mono-block type high frequency portable x-ray unit that can be used with conventional diagnostic film or with solid-state digital radiographic sensors. It is supplied with the x-ray tubehead/collimator, detachable AC power cord, and detachable exposure cord with 2-stage exposure switch. This system's high frequency diagnostic x-ray unit is designed for use with the MinXray model XGS MKIV LW or equivalent stand capable of providing secure, stable support that allows for proper positioning of the x-ray unit for radiographic imaging.

Preliminary CONOPS: UN and medical personnel deploy the portable digital radiography imagery solution forward in the mission area to provide radiography support. The images are transferred to medical reach back personnel for review and diagnosis. The diagnosis enables care for the patient closer to the point of incident.

UN Need/Gap: Telemedicine and limited readily available critical care options at or near the point of incident.

Anticipated Benefit/ROI: Ability to provide X-ray screening at the point of injury & provide information to personnel at different locations for screening (telemedicine).

Candidate Technologies for Training

Technology 1: U.S. Army Training Management System (ATMS)	
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<p><u>UN PKO Focus Area</u> Training</p>	<p><u>Approximate Cost</u> Currently configured for the US Army; Development will need to occur to meet UN needs</p>
<p>Description: The Army Training Management System (ATMS) automates Army training management processes, standardizes collection of unit completed training, and establishes a standardized framework for documenting and recording completed individual and unit training. This multi-purpose system provides a standardized solution for use Army-wide by civilians and military. The system is used by individuals to track their records, by units, and higher echelons to track training status, and by the army to track completed mandatory training. ATMS is a controlled access system.</p> <p>Preliminary CONOPS: UN Headquarters and TCC/PCC leaders utilize a UN version of ATMS loaded with UN specific training requirements/tasks/doctrine and organizational structure (at larger UN level and mission levels) to store, manage, and update training records of UN personnel and peacekeepers.</p> <p>UN Need/Gap: Maintenance of training records through appropriate management systems.</p> <p>Anticipated Benefit/ROI: As a proven training management system employed by the U.S. Army, the development of a UN version will benefit from platform design, implementation, and lessons learned.</p>	

Technology 2: Army Training, Simulation, and Instrumentation



UN PKO Focus Area
Training

Approximate Cost
To be determined based on
resource requested

Description: The U.S. Army Program Executive Office for Simulation, Training, and Instrumentation (PEO STRI) has developed adaptive training and testing environments to enable improved mission performance. PEO STRI has developed simulation capabilities across the following areas: Combined Arms Tactical Trainers (CATT); Construction Simulation (ConSim); Field Operations (Field Ops); Training Devices (TRADE); and Instrumentation, Targets, Threat Simulators (ITTS).

A Desk Side Reference Guide is provided at the following link:
http://www.peostri.army.mil/PRODUCTS/2013_PEOSTRI_DSRG.pdf

Preliminary CONOPS: TCC/PCC utilize training simulations and testing environments to improve weapons familiarity, driving, medical aid, and construction.

UN Need/Gap: Improve the standards of basic and advanced soldier skills.

Anticipated Benefit/ROI: Proven training simulation, training, and testing environments enable the UN and the mission partners to improve mission performance.

Candidate Technologies for Planning

Technology 1: USACE Reachback Operations Center (UROC)



UN PKO Focus Area
Planning

Approximate Cost
Dependent on time and effort of subject matter experts to respond to request

Description: The UROC provides a “reachback” engineering capability that allows Department of Defense (DoD) personnel deployed worldwide to talk directly with experts in the United States when a problem in the field needs quick resolution. Deployed troops can be linked to subject matter experts (SMEs) within the Corps of Engineers, private industry, academia, and other DOD and Government agencies to obtain detailed analysis of complex problems that would be difficult to achieve with the limited expertise available in the field.

Reachback Engineer Data Integration (REDi) website provides a common database, mapping tool and robust user interface for submitting, managing, tracking and archiving all data and reachback support managed through the UROC related to the engineer reachback process and the Field Force Engineering program.

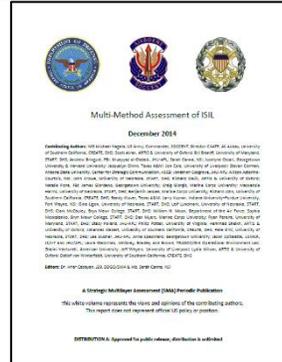
UROC staff members respond to incoming information requests and provide detailed analyses of diverse infrastructure problems, such as: flooding potential due to dam breaches; load carrying capacities of roads and bridges; field fortifications and force protection; design and repair of airports, port facilities, bridges, dams, railroads and roadways; and evaluation of transportation networks. The UROC provides comprehensive training and support to all deployed units and also maintains the data repository for collected engineering data used for infrastructure analysis.

Preliminary CONOPS: UN HQ and TCC/PCCs leverage subject matter experts (SMEs) from across USACE, the Army, DoD, private industry, and academia to provide rapid, reliable, and relevant solutions to engineering challenges within the mission area.

UN Need/Gap: Limited engineering capabilities within the mission area.

Anticipated Benefit/ROI: Provide subject matter expertise, 24/7, to support host nation and non-governmental organizations with engineering expertise.

Technology 2: Strategic Multi-Layer Assessment (SMA)



UN PKO Focus Area
Planning

Approximate Cost
To be determined based on the
assessment requirements

Description: Strategic Multi-Layer Assessment (SMA) provides planning support to US Combatant Commands with complex operational imperatives requiring multi-agency, multi-disciplinary solutions that are NOT within core Service/Agency competency. Solutions and participants are sought across US Government, academia, think tanks, and industry. The SMA utilizes subject matter expertise, qualitative and quantitative analysis, and modeling and simulation.

Longer term efforts are typically 6-9 months duration per effort and Quick-Look assessments in support of critical near term operational requirements require 1-2 weeks turn around. The SMA does not perform policy or intel assessments.

Preliminary CONOPS: The UN, a Troop Contributing Country (TCC), and/or a Police Contributing Country (PCC) submits a formal request through the US UN Mission or a U.S. Embassy for support to address a critical strategic problem. The resulting analysis product enables improved UN decision-making and planning through subject matter expert, quantitative, and qualitative analysis.

UN Need/Gap: Need an improved capability to enhance strategic planning and assessments.

Anticipated Benefit/ROI: Formal rigorous process leveraging multiple approaches to deliver agnostic analysis and recommendations.

Technology 3: UNITY



<p><u>UN PKO Focus Area</u> Planning; Information Led Operations and Situational Awareness</p>	<p><u>Approximate Cost</u> Negotiable depending on the concept of operations</p>
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Description: UNITY provides stakeholders with web based functionality to conduct: Regional and multinational non-classified information sharing; Mutually visible situation / event assessment and planning; Collaborative implementation, monitoring, and evaluation; Reusable / repeatable development and assistance frameworks

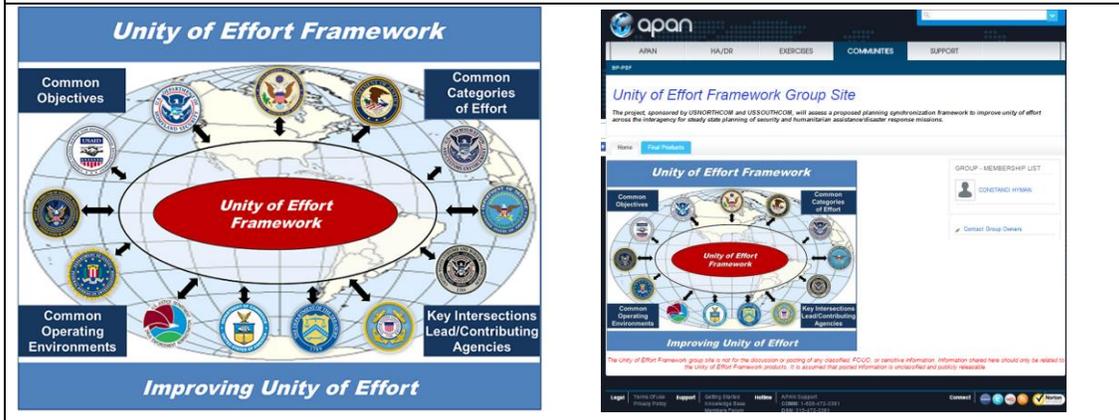
- **UNITY Dashboard** provides a fused data source view of project information, Foreign Assistance Dashboard programming, APAN related unstructured information and user-defined information for a country or area of interest for the user, based on profile.
- **UNITY Analytics** provides a multi-faceted view of disparate authoritative data from USG, NGO, and partner data sources relative to development, humanitarian relief, civil assistance and security cooperation.
- **UNITY Assistant** provides a method for comparing organizational planning information and identifying synergies or potential conflicts based on alignment of the objectives and activities.
- **UNITY APAN Search, RSS Feed Aggregator, Economic/Social Database Viewer, Resource Tool, and the Point-to-Point & Group Chat** functions support stakeholder collaboration and decision support within the assistance and development mission space.

Preliminary CONOPS: The UN utilizes UTILITY to perform adaptive planning to prepare for contingency operations in partnership with participating nations, NGOs, and the private sector. Partners participate within their own networks using common tools and without proprietary hardware or software.

UN Need/Gap: Need for improved information sharing and situational awareness capabilities; Need for improved planning tools.

Anticipated Benefit/ROI: Improved collaboration and planning across disparate stakeholders.

Technology 4: Unity of Effort Framework



UN PKO Focus Area Planning

Approximate Cost
 Framework instructions are no cost;
 Training and support negotiable depending
 on the Level of Effort (LOE)

Description: The Framework improves unity of effort for steady state planning at the theater/regional level. It helps to identify opportunities amongst U.S. government organizations for improved coordination and synchronization, thereby focusing similar efforts toward achieving national goals and objectives. The Framework is a planning aid designed to facilitate, inform, and improve unity of effort for the Joint Force. The Framework provides a way to visualize components of complex interagency missions and promotes improved understanding of interagency interrelationships for a given operating area based on roles, responsibilities, and authorities. Based on four principles: (1) Common understanding of the situation; (2) Common vision, goals and objectives for the mission; (3) Coordination of efforts to ensure continued coherency; (4) Common measures of progress and ability to change course if necessary. It occurs in three stages plus an optional follow-on fourth stage conducted in sequential order. The time required to complete each stage depends on the complexity of the mission or problem set and participation of interagency stakeholders and mission partners.

Preliminary CONOPS: Following some revisions to the framework to accommodate for UN mission planning process, the UN headquarters and mission levels utilize the framework to improve planning across multiple mission partners and organizations.

UN Need/Gap: Capability to enhance strategic planning and assessments.

Anticipated Benefit/ROI: Does not require a change to any ongoing internal organizational planning or programming processes; Provides a means for interagency organizations to reach a common view and understanding; Sets the stage for greater information sharing on capabilities, capacities, and activities.

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