Real-time Location-based Insight for
Mobile Security Forces Operations

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1.0 Introduction

Executive Summary: Today, (and since the Vietnam era) Security Forces (SF) personnel are dispatched on and off base for routine patrols, in response to incidents, and in support of sensitive convoys. These dispatches can easily result in trips covering 10s to 100s of miles at a time and several hours of time. And while a particular Security Forces (SF) Airmen might have their personal cellphone with them with GPS that lets them know where they are, unfortunately no one else knows where they are precisely in the Security Forces Dispatch Center or Base Operations Center or Command Post. Dispatch or Operations only knows where they were, when they last reported in by military radio (which does not have GPS) or Dispatch or Operations checks in the SF team and the team answers (if they do not immediately answer, it is assumed the reception is poor or the team is outside the vehicle or otherwise busy, e.g., they stopped for lunch; a non-response is not an immediate cause for concern—they'll try again later). In the meantime, the Security Forces team could have easily traveled 10s of miles from their last reported location. And during that time, if there is an emergency such as medical, vehicle accident or a hostile situation (ambush) suddenly develops, no one knows where the team is located or that they might need help. And thoughts that a SF Airmen can just rely on their cellphone to call in their location are misplaced as many locations and sites do not have reliable service or GPS reception, and under hostile situations are easily jammed or their location nefariously spoofed. All of these aspects not only put SF Airmen in harm's way, by not knowing their exact location and status can jeopardize the underlying military mission. There have been several such incidences within the last year, including death due to an accident by not being able to locate the Airmen till hours afterwards.

While military radios do not have GPS, the military's radio communications network can be accessed to derive real-time location similar to that of a cell phone location, including while a vehicle is on-the-move (OTM). With CompassCom's commercial off-the-self (COTS) solution it is possible to gain location-based insight from the military's radio, to include such things as not only where a vehicle is located but also its speed and estimated time of arrival (ETA) to a particular location. If an incident should occur, SF Dispatch, the Base Operations Center and the Command Post can know immediately and exactly where the vehicle stopped or last had a signal, especially if such a thing happened unexpectedly.

In support of the above, CompassCom is under contract to support the 90th Security Forces Group (Contract # - FA461324P0019, Effective Date 22 April 2024) with an initial presence at Travis AFB in Solano, CA (subcontractor on the Motorola Solutions, Inc. for the past 5 years in operational usage) for the 60th Security Forces Squadron. This installation makes an ideal pilot

study for establishing broader location-based insight military requirements. In this way, it would be possible to deliver a common solution that can be deployed worldwide as a secure and transportable solution, that also is able to operate in support of deployed combat operations. CompassCom's COTS software is already designed to enable interoperability across multiple wireless communication networks and devices, providing real-time location and status of assets in a geographic information system (GIS)-centric common operational picture. CompassCom's offering would qualify as a Commercial Solutions Opening (CSO) (DFARS 212.70) that can be specifically and rapidly customized to meet the broader Security Forces mission needs for home base and deployed teams, especially in order to meet the Air Forces CONOPS for operations in dispersed and austere locations where boundaries are loosely defined, and the U.S. presence might not be welcomed.

Support and funding are requested to collaborate to customize the CompassCom solution to meet both the militaries' unique requirements and the broader deployed mission needs.

Present Path to Success:

Once the CompassCom's software is installed at a base, all SF mobile vehicles with a military radio will be actively tracked and there will be unnecessary loss of life or mission compromise just because Dispatch or command did not know where a particular vehicle and team were located. Besides the personnel safety element above, there are additional benefits that the installation of the CompassCom solution provides:

1. Active Map Highlighting Real-Time Location Status. Additional Military operational value can be realized as incident responses to a location can be coordinated in real-time to arrive from different directions at the same time, creating a force multiplier response.
2. Improved efficiency in logistics and fleet maintenance based upon real use, saving money, reducing operational breakdown, and increasing availability and readiness.
3. Enhanced accountability for real-time operations (e.g., were they unnecessarily speeding) or after-action evaluation of real or training missions.
4. Data support for patrol route optimization based upon time of day (e.g., similar to FEDEX and UPS), along with meeting environmental initiatives and goals.

Air Force Direction:

Defenders use an abundance of manpower, vehicles and systems to secure resources, critical assets, and airfields and ranges. Historically, DAFI 31-101 has restricted commanders' ability to adapt security standards away from the prescribed requirements. This has hampered the easy adoption of a number of new technologies that would augment the efficiency of manned security operations. Chief of Staff of the Air Force General Charles Q. Brown Jr. has stated that the Air Force will not grow bigger in number; instead, the service must adapt to win wars. Air Force Security Forces

must innovate and align with currently available technology to drive a more robust security posture. If there was an adversarial attack CompassCom's solution could assist by not only by providing situational awareness (SA) the precise geographic location of our own Forces, but Defenders could call in the bearing and distance to the enemy "red force" group by knowing where our own vehicles are as landmarks. This would support and enable a "call for fire" to be delivered to the enemy location while protecting our own "blue forces" and minimizing collateral damage.

The CompassCom Location Data Engine housed in the radio units with an on-base solution can help create a more lethal, educated, effective, and ready force to meet the dangerous threats of today. Standardizing on a single platform across the Air Force ensures the safety, efficiency, accountability, and sustainability of security and operational missions and for deployed austere locations around the globe.

2.0 Capability to be Delivered

CompassCom has over 120 asset tracking clients worldwide with "completely connected workforces", and a track record of proven performance. The solution works because of its the location data engine (Figure 1) which brings asset information into one flexible and easily understandable and inter-communicable environment.

The objective for these systems is to deliver a real-time location platform that simultaneously supports wireless data from Motorola, broadband, and satellite communications networks. The data to the user is displayed through the ESRI Geographic Information Systems (GIS) centric Common Operating Picture (COP). The software provides the following unique capabilities housed in one technology application:

1. Asset location on a map
2. breadcrumbs with metadata
3. on-the-fly configurable map backgrounds and imagery
4. historic replay of individual or multiple assets, dashboards of asset performance,
5. geofence alerts
6. a reporting engine for after-action analytics.

How is this Accomplished by the present COTS solution:

This Commercial Off-The-Shelf (COTS) solution supports multiple deployment models:

1. **On-premises secure and hardened installation** behind the Air Force firewall, with integration to Motorola radios or local broadband wireless network controllers, including Team Awareness Kit (TAK) servers to connect directly to the Enterprise network. The CompassCom location data engine server supports a standard viewer and can report to

applications used by Command Posts. The solution also offers a standard connector to a TAK Server for integrating smartphone devices.
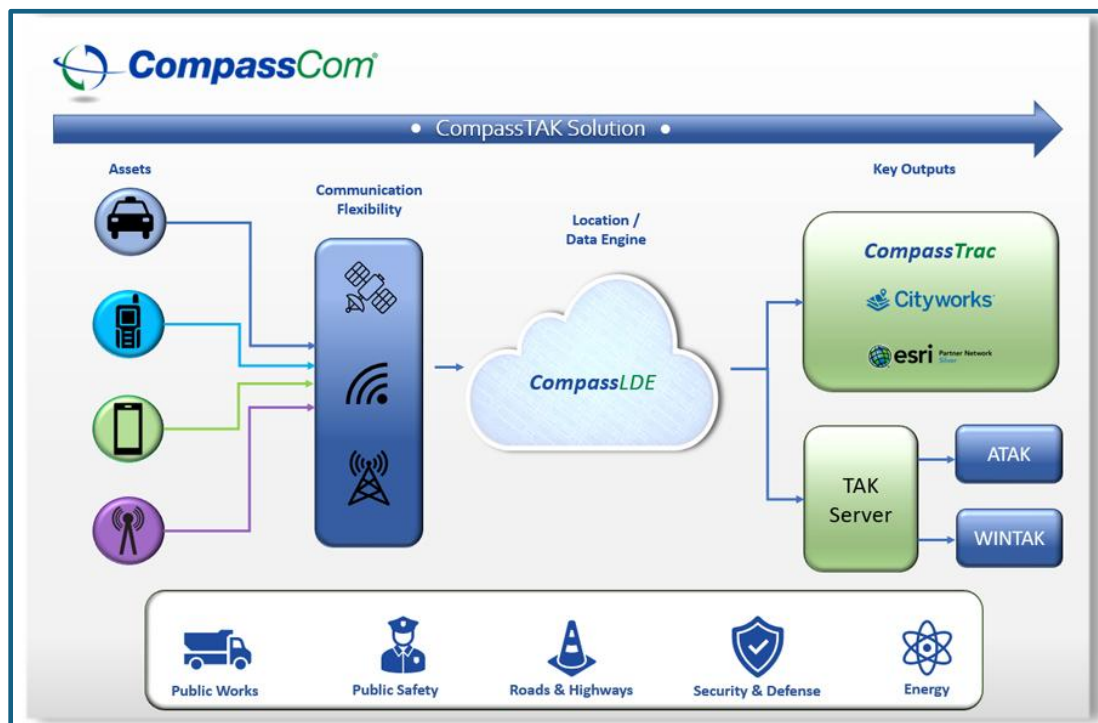

Figure 1. CompassCom Location Data Engine Single Platform Connectivity

2. **Centralized multiple base on-premises deployments.** Local or remote Command Post locations can log into the central system through the current secure Air Force connectivity network using landline, microwave, or SatCom. For low-bandwidth Command Posts, only essential location, and status messages (few bits) are sent with map data to ensure a fast and efficient user experience. Users with higher bandwidth connections can access the central system via a browser-based viewer within the secure firewall.

3. **Tactical remote deployment.** In many cases, remote deployments lack consistent wireless networks for communication between mobile handsets and vehicle-mounted radios. CompassCom can support remote and austere mission deployment using Motorola mobile radios. The system can utilize standard portable Motorola handsets and mobile base station radios deployed with a mobile Command Post. The master radio can interface with the portable jump-and-go real-time system on ruggedized laptops with preloaded mission maps. Remote systems can be backhauled using Starlink® or other satcom systems to mission HQ Command Posts. See Figure 2.
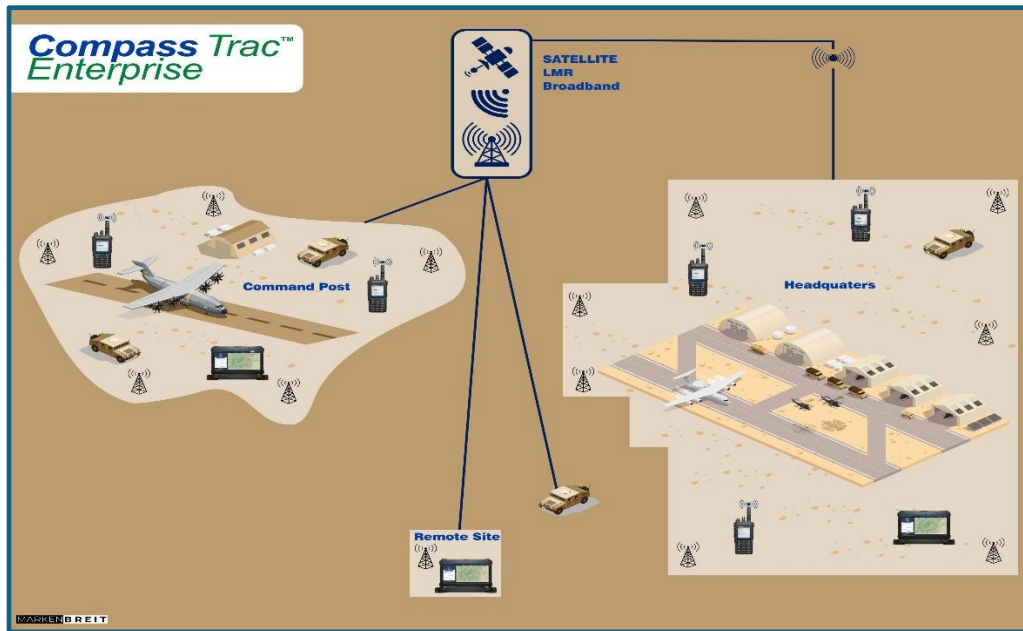
Figure 2. CompassCom Multiple Base On-Prem Deployment and Tactical Remote Deployment

The CompassCom platform is flexible and transportable to allow for easy global deployment, including the configuration of wireless network interfaces, Command Post IT, and GIS maps for a COP. Full situational awareness can be backhauled via Starlink or other transmission systems to HQ or other command posts globally. Mission Commanders would gain comprehensive insight and control over assets in real-time to ensure mission success. The system is designed to deliver real-time alerts in the map display or via email if the Motorola radio is equipped with an emergency button and the user presses it, whether on a handheld or in-vehicle radio, enhancing response time to incidents.

The present platform supports real-time situational awareness with the communications equipment and GIS data available in the field today. The platform is scalable to thousands of assets reporting at 30-second intervals. CompassCom provides secure and reliable deployment of these systems for the DOD, State Department, Department of Interior, and Department of Energy.

3.0 How it is done today and why this is insufficient.

CONUS base security and OCONUS operations globally have Motorola or other land mobile radio systems that are used for voice communications. Many of these devices do not have GNSS (global navigation satellite system) location technology (commonly referred to as GPS), so these radios do not transmit their location and cannot be utilized for mission coordination. If bases are using any radios with GNSS, the technology probably exists in separate multiple systems and divergent workflows that do not integrate and provide a common operational picture (COP) for the base or remote operations.

Location of incident and coordinating response is difficult and challenging without accurate and reliable real-time location of the handset or in vehicle assets. Dispatch and command posts routinely rely on voice radio traffic to respond to "where are you" and "what is your status.' This is unreliable even in day-to-day operations and even more so in the face of great-power competition nor is it scalable when multiple incidents are happening that need a response and decision now. Except for voice recording of these conversations (should that even be performed) there is no record of what happened and when.

Many base and remote locations use Motorola handsets and in vehicle radios today. Traditionally defense-only solutions are developed but those often to take years to recognize and field and require multiple funding cycles at great expense. The alternative is identifying a COTs solution with a proven track record that can be deployed today and off the flexibility to allow innovation and scale for the future. That is the opportunity at hand.

4.0 Proposed Innovation Project

Despite the depth and capability of the present CompassCom solution, there are always nuances between how the System is designed and how users actually work or want to work with the System. Based upon experience, CompassCom proposes conducting an Operational Capability Requirements Study, resulting in an Operational Capabilities Requirements Document (OCRD) that can be used to rapidly tailor CompassCom's solution to better meet USAF specific operational needs. These studies are designed with the user organizations and explore not only the desired capabilities but also determination of the present system's Strengths, Weaknesses, Affordability to Enhance, Time to Enhance and Urgency to Enhance (SWAT-U). The outcome is a cross-matrix that results in a Prioritization of the Capabilities to Enhance and a decision on those that are determined to be most necessary to tailor to the user and when should that effort begin.

Data in these studies can be gathered in 90 to 120 days based upon the collaboration with users and their availability and another 60 days to deliver the Final Report and recommendations for any customization required to tailor the solution specifically to the needs of the USAF Security Forces.

7.0 Project Evaluation and Success Criteria – Mid-Term and Final Exams to Check for Success

The performance of the CompassCom system, with current Mobility and Global Strike installations, will demonstrate its effectiveness for the US Air Force.

8.0 About the Company

CompassCom has a proven 30-year company history and of providing customized commercial off-the-shelf (COTS) real-time situational software systems, designed for secure and flexible deployment both on-premises and in mobile environments. The system offers an interoperable

solution that supports Motorola land mobile radio, broadband, and satellite communications (satcom) wireless networks in a single deployment and an architecture which supports new hardware releases on these networks with upgrades to existing software. CompassCom leverages Esri-compatible GIS and remotely sensed data provided by the Command, or it can supply current and accurate data on demand.

CompassCom has a proven track record of providing mission-ready solutions to:

- The U.S. Department of Energy
- Authority to operate with the Mobility and Global Strike Commands
- Authority to operate with the U.S. Army
- Authority to operate with the U.S. Navy
- Provider of TAK server interface for SOCOM
- Qualified and operational for U.S. State Department international deployments
- Qualified and operational with the U.S. Department of the Interior
- Qualified and operational for the statewide Michigan Public Safety Commission

CompassCom is an authorized developer and integration partner with Esri (30-years) and Motorola (11 years). The secure, on-premises deployment for Motorola infrastructure, utilizing Esri-based COTs software solutions, positions CompassCom to deliver and support USAF systems both domestically and internationally.

Testimonial references are available upon request. Additional data sheets on CompassTrac Enterprise and CompassRespond are also available.

Our software is implemented on standard Microsoft Windows IT platforms using a SQL professional database, accessible as needed by the client. Secure, hardened deployments have been utilized for years by US government agencies.

As we celebrate our 30th year in business, we are ready to provide a standard solution that serves the best interests of the US Air Force. The ultimate testimonials come from CompassCom clients, who gladly report that the CompassCom system has saved lives, reduced response and command decision times, and enabled cost savings for operations.

Contact Brant Howard, Founder and CEO, CompassCom Software Corporation (a Woman-Owned Small Business, Denver, CO) at branth@one-compass.com +1-303-522-1908 (mobile) for comments, questions, and next steps.