

THE LOCATION SPECIALISTS



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TRUEPOSITION LOCINT®

Mobile phones have become the standard communication method across the globe. Unfortunately, mobility has also made it easier for criminals and terrorists to plan, coordinate and execute attacks on persons or property.

TruePosition wireless location and intelligence solutions include sophisticated capabilities to counteract the modern criminal, helping to protect lives and enhance safety. TruePosition solutions help:

- Bolster national security
- Enhance public safety
- Suppress crime and terrorism

TRUEPOSITION'S LOCATION INTELLIGENCE PLATFORM

At the core of TruePosition's solutions is the TruePosition® LOCINT® mobile location and intelligence platform. The LOCINT platform enables law enforcement, intelligence, public safety or national defense agencies to protect citizens and suppress crime through two primary subsystems:

- The **TruePosition® Location Platform** (TPLP), which locates mobile devices on GSM, UMTS, CDMA and LTE networks
- The **TruePosition® Location Intelligence Management System** (LIMS), which provides analytical and surveillance capabilities

Add-on systems and solutions are integrated into the core solution to provide additional functionality as needed.

ADD-ON SOLUTIONS

- Intelligence Applications
- Off-Air Devices
- Tactical Systems
- Angle of Arrival (AOA) Sensors
- C4IS
- Enhanced Mapping
- PSAP Software
- Location Information Server (LIS)

INDUSTRY-LEADING LOCATION CAPABILITIES

The TruePosition Location Platform (TPLP) locates mobile phones and devices via a suite of location technologies that can be deployed individually or in combination to provide the optimal solution for the customer's needs and budget.

Supported location methods include:

High accuracy – Uplink Time Difference of Arrival (U-TDOA) or Assisted Global Positioning System (A-GPS)

Medium accuracy – Enhanced Cell ID (ECID) or Enhanced Cell ID+

Low accuracy – Cell ID (CGI) or CGI plus Timing Advance (CGI+TA)

TruePosition's location system has been refined over more than 10 years of large-scale deployments. No other system can claim the footprint or volume of locations processed. Technological advantages include:

Yield • Latency • Throughput • System uptime • Accuracy

Law Enforcement or Public Safety officials can use the system to:

- Locate distressed callers who cannot provide their location
- Find the current or last known location of missing persons
- Actively track known or suspected criminals
- Trace other criminal mobile activities such as threatening calls or text messages
- Locate ransom calls made via mobile phone

DEPLOYMENT OPTIONS

NETWORK EMBEDDED	NETWORK INDEPENDENT	HYBRID
Components installed into the network of the wireless operator(s) Cost and reach advantages	Stand-alone location measurement and network monitoring components utilized Advantages in security and mobility	Combination of embedded and independent options



ROBUST LOCATION INTELLIGENCE FEATURES

The LOCINT solution's intelligence capabilities are provided through the TruePosition Location Intelligence Management System (LIMS). The LIMS platform collects mobile network data and location information, enables advanced analysis, tracks designated mobile devices in real time, and issues alerts when security is threatened.

LIMS functionality includes:

INTELLIGENCE

- Collect and archive network activity and location information
- Analyze archived data through sophisticated data retrieval and analysis techniques
- Build detailed profiles of targets' locations, movements, and behaviors to determine patterns and relationships

SURVEILLANCE

- Track targets with high accuracy, in real time, in all conditions
- Collect and archive location data for all phones using medium-accuracy location technology

GEOFENCING

- Create virtual perimeters (geo-fences) to protect sensitive areas such as borders, government buildings, energy facilities, transportation hubs, event sites, and other critical infrastructure
- Receive alerts when devices meeting certain criteria approach or cross a geo-fence

Intelligence and Security authorities can use the system to:

- Analyze data from past criminal or terrorist events to construct a suspect list
- Actively track and receive alerts on known criminals
- Uncover criminal networks by linking mobile and location-related activities
- Determine locations frequented by criminals
- Determine routes of entry employed by illegal border crossers

BENEFITS

The TruePosition LOCINT platform is unique in its ability to:

- Locate all mobile devices, including local subscribers and roamer, regardless of the make, model, or vintage.
- Provide consistent performance over time without extensive recalibration.
- Locate mobile devices anywhere including rural, suburban, and urban environments; indoors, underground and in urban canyons.
- Provide robust location intelligence capabilities via an integrated platform.
- Combine with existing systems or efforts to form an effective layered national defense or public safety strategy.

ARCHIVE AND SEARCH BASED ON:

- Digits dialed by the target phone
- Numbers that called the target phone
- Any subscriber identity including IMSI, IMEI, or MSISDN
- Mobiles in idle state
- Previous locations of the target phone
- Surveillance over wide areas
- Proximity to known locations, events, or persons



THE LOCINT SOLUTION IS THE ONLY INTEGRATED LOCATION AND INTELLIGENCE PLATFORM THAT PROVIDES AN UPGRADE PATH TO TRUEPOSITION'S INDUSTRY-LEADING U-TDOA TECHNOLOGY.

ABOUT TRUEPOSITION, THE LOCATION SPECIALISTS

TruePosition creates mobile geo-location solutions to protect lives and enhance safety. TruePosition solutions combine location with intelligence to:

- Bolster national security
- Enhance public safety
- Suppress crime and terrorism

Since 1992, TruePosition's single focus has been designing and deploying high-performance safety and security-related mobile location solutions. TruePosition has gained unmatched real-world experience through our nationwide public safety location technology footprint in the U.S., and our multiple international security deployments. TruePosition provides a full complement of services to support our technology and solution portfolio including design, deployment, integration and ongoing support.

RELIABLE, ROBUST SOLUTIONS

TruePosition designs custom solutions for the specific needs and budget of our customers. TruePosition solutions are:

RELIABLE – with redundant subsystems and expert support, system uptime exceeds industry standards

SECURE – built with safeguards against external intrusion

COVERT – all sensitive information is contained within a central, secured location

SCALABLE – able to support large or small deployments with varying degrees of performance and autonomy

ROBUST – performance, features and capabilities exceed those of competing solutions

MODULAR – integrates with law enforcement, intelligence, or public safety systems

COMPREHENSIVE – with scalable location accuracy and an integrated intelligence platform

TP SOLUTION FEATURES

COLLECT

- All mobile activities and location information

ANALYZE

- Filter and extract data based on multiple date, network event, or location-based criteria

TRACK

- In real time
- When phones are idle
- Anonymously, without alerting those being tracked
- Issue alerts as suspects approach or cross geo-fences



TruePosition is headquartered in Berwyn, Pennsylvania in the United States. TruePosition is owned by Liberty Media Corporation.

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ENHANCING BORDER SECURITY

National borders must be protected from criminal or terrorist threats, as well as unlawful activities such as illegal immigration or drug trafficking. Securing national borders can be a challenge due to topography, size, or logistics. Adding a wireless phone location, surveillance and analysis system to traditional methods such as guards, patrols, cameras or sensors can form an effective, multi-layered system.

TP SOLUTION

TruePosition designs and deploys mobile location and intelligence solutions to discover, deter and apprehend border security threats by diagnosing, locating and tracking mobile devices that behave suspiciously near national borders. The solution enables authorities to:

- Collect mobile phone and location data in accordance with local laws
- Analyze the data to identify suspects
- Track suspects' movements and mobile activities
- Take action when appropriate



CAPABILITIES

TruePosition custom-designed Border Security Solutions enable authorities to:

Identify phones that exhibit suspicious behavior

- Frequently enter/exit the country
- Enter the country in remote areas
- Enter the country only at odd hours
- Exhibit avoidance tactics such as turning devices on and off quickly or at the same location
- Approach the border then remain stationary for prolonged periods

Track phones once identified as suspicious

- Track phones after they have entered the country
- Determine who they contacted/were contacted by; extend to multiple levels of contacts

Receive alerts when potential threats approach or cross a border

- Known criminals
- Those who have been in contact with or proximity to known criminals
- Phones from certain countries or geographies

Secure and assist border security personnel

- Track friendly forces via cellular signal as a backup to GPS devices
- Alert when foreign or unknown phones are nearby
- Assist in apprehending suspects by providing accurate location

BENEFITS

TruePosition Border Security Solutions provide an additional layer of defense. TruePosition's solution offers:

- Accurate location to enable more precise actions
- Ability to locate mobiles in GPS obstructed or denied environments
- Broad geographic coverage with fewer resources than most solutions such as CCTV, sensors or guards
- Independence from line-of-sight limitations
- Consistent performance in varying environmental conditions such as weather or daylight

THE TRUEPOSITION LOCINT® PLATFORM IS UNIQUE IN ITS ABILITY TO:

- Locate all mobile devices, including local subscribers and roamers, regardless of make, model, or vintage.
- Provide consistent performance over time without extensive recalibration.
- Locate mobile devices anywhere including rural, suburban, and urban environments; indoors, underground and in urban canyons.
- Provide robust location intelligence capabilities, enabling authorities to collect mass amounts of data and pinpoint potential suspects using advanced analysis and surveillance techniques.

ABOUT TRUEPOSITION, THE LOCATION SPECIALISTS

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INDUSTRY-LEADING PRODUCTS

- The **TruePosition® Location Platform™ (TPLP)**, which locates mobile devices on GSM, UMTS, CDMA and LTE networks via multiple location methods including high-accuracy Uplink Time Difference of Arrival (U-TDOA) and medium-accuracy Enhanced Cell ID (ECID).
- The **TruePosition® Location Intelligence Management System™ (LIMS)**, which provides intelligence and surveillance capabilities by collecting and archiving mobile network data and providing tools for advanced analysis.
- Third-party systems and solutions are integrated and deployed as needed.

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PROTECTING CRITICAL INFRASTRUCTURE

Infrastructure that is vital to national security, public safety or the nation's economy can be targeted by terrorists, potentially disrupting the functioning of government, producing loss of life or property, and damaging public morale. Protecting such infrastructure can be challenging due to:

- Lack of funding or focus
- Resistance to change and reliance on old methods
- Location, logistical or geographical issues

Securing these sites requires a layered strategy including manpower, technology and organization. Modern security methods must be employed to neutralize modern terrorists, who often plan and execute attacks using mobile technologies.

TP SOLUTION

TruePosition designs and deploys mobile location and intelligence solutions to discover, deter and apprehend those that threaten critical infrastructure by diagnosing, locating and tracking mobile devices that exhibit suspicious behavior. The solution enables authorities to:

- Collect mobile phone and location data in accordance with local laws
- Analyze the data to identify suspects
- Track suspects' movements and mobile activities
- Take action when appropriate



CAPABILITIES

TruePosition custom-designed Critical Infrastructure Solutions help authorities to:

Receive alerts when potential threats approach or cross a geo-fence

- Known criminals
- Unauthorized individuals
- Those meeting criteria such as frequently contacting a certain country
- Those exhibiting suspicious behavior such as remaining stationary for extended periods or switching SIM cards

Analyze data from past events

- Determine if a mobile was stationary near an incident and if so, identify calls and messages sent and received
- Identify mobiles in the vicinity before, during or after a previous incident

Secure facility workers

- Chronicle employee entry/exit
- Locate employees within a facility

BENEFITS

TruePosition Critical Infrastructure Solutions provide an additional layer of defense. TruePosition's solution offers:

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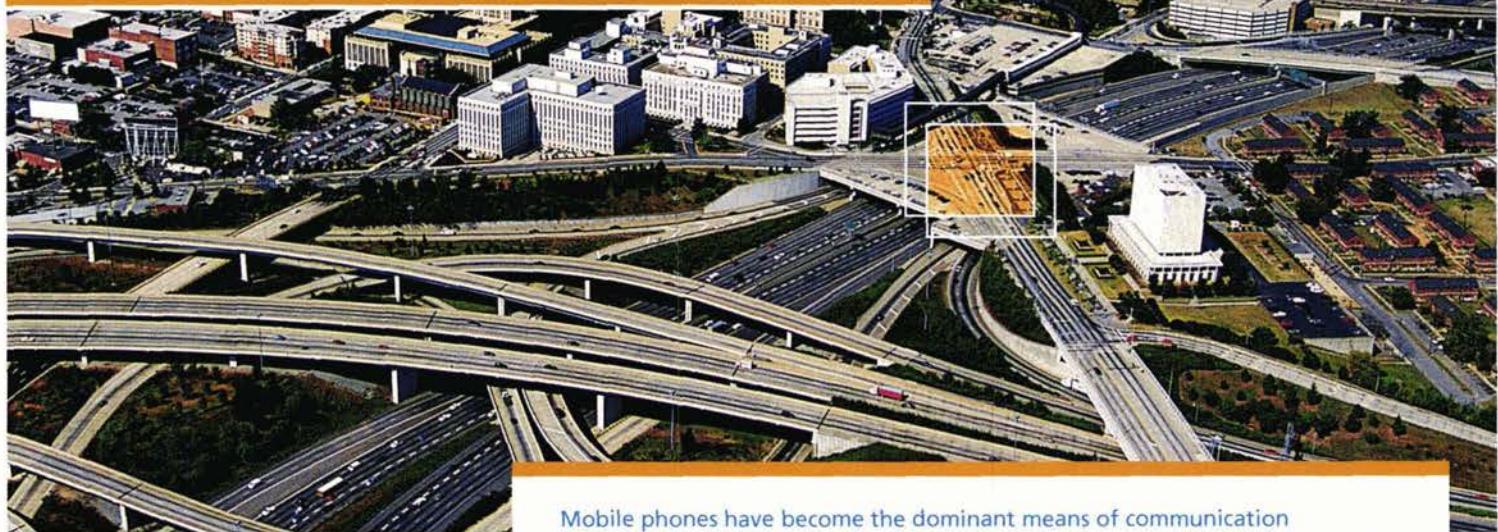
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TRUEPOSITION® EMERGENCY CALL LOCATION



Mobile phones have become the dominant means of communication throughout the world. For this reason, governments everywhere are currently investigating how to process the ever-increasing number of emergency phone calls (112, 999, etc.) coming from mobile phones.

The benefits of TruePosition Emergency Call Location:

- Improve emergency response times
- Increase the number of emergency calls that can be processed
- Maximize valuable public safety resources

The capabilities of the TruePosition Location Platform:

- Locate all mobile phones, even those that are not GPS-enabled
- Locate mobile phones in any environment (indoors, inside vehicles, urban, suburban, rural, etc.)
- Locate mobile phones with very high accuracy and reliability

According to the United States Federal Communication Commission (FCC) records, of the 200 million calls to 911 in the United States last year, about one third were from callers using a mobile phone. In some communities, over half of the 911 calls came from wireless callers. To make matters worse, there is a growing trend of people canceling their landline service in favor of using a cell phone as their only phone.

With mobile phones, the person calling the emergency number could be almost anywhere. Added to this, in emergency situations people are often panicked or disoriented, and cannot provide their exact location. As a result, it is getting more difficult for government agencies to respond to calls coming from mobile phones, and to send the appropriate emergency response resources.

When a mobile phone user is in an emergency situation and dials the emergency number, there is little room for error. They need to be accurately located regardless of their environment or the mobile phone that they are using. Designing and deploying a high-performance wireless location platform allows governments to:

- Improve emergency response times
- Increase the number of emergency calls that can be processed
- Maximize valuable public safety resources

The TruePosition® Location Platform™ (TPLPTM) incorporates a high-performance, network-based location technology called Uplink Time Difference of Arrival (U-TDOA), which is ideal for mission-critical Emergency Call Location applications.

Improve emergency response times.

In emergency situations, every second counts. When someone calls an emergency number, often the person does not know exactly where they are, may not speak the native language, or may not be able to speak at all. For all of these compelling reasons, it is necessary for governments to empower the Public Safety Answering Points (PSAPs) with the ability to quickly and accurately locate mobile phones in emergency situations.

In the emergency responder world, The Golden Hour refers to that first hour after an incident takes place. If critical care is not administered within The Golden Hour, the victim's chance of survival diminishes greatly. In short, the ability to accurately locate the incident improves response times, and as a result, saves lives.

Increase the number of emergency calls that can be processed.

Currently, many emergency dispatchers around the world spend a great deal of time asking a series of questions to try to determine where the caller is. With the caller's location instantly appearing on a map automatically, the dispatcher can immediately start the questions to determine the type of emergency the caller has. This greatly reduces the time that it takes to resolve each call, therefore increasing the number of emergency calls that each call taker can handle.

Now that practically everyone carries a mobile phone, it is easier and therefore more likely that they will report an incident. This has drastically increased the number of calls that a dispatcher receives per incident. For example, a single car crash on a major highway can generate hundreds of emergency calls. Having the location information available, the dispatcher already has a general idea of why the person is calling. The dispatcher must answer every call, but based on the location, they can quickly qualify the call and move to the next call.

Maximize valuable public safety resources.

If an exact location cannot be confirmed, emergency responders often spend precious time aimlessly searching for the correct location. Sometimes, this means that additional vehicles or even costly helicopters must be deployed in order to simply assess where the situation is taking place, rather than getting important personnel at the heart of the incident. U-TDOA location technology can locate as many emergency callers as necessary, so that PSAPs can cross-reference the origins of calls and more easily find the exact site of the emergency.

The ability to quickly and accurately locate emergency callers allows emergency services to be deployed more rapidly and efficiently, saving precious minutes and precious funds.

Leverage lessons learned from the world's largest location-based public safety solution.

In the mid-1990s, the FCC in the United States released a mandate, which stated that all mobile operators needed to employ a wireless location solution to determine the phone number of all mobile callers that dialed 911. Phase II of the E9-1-1 mandate requires that network-based wireless location systems locate 67 percent of calls within 100 meters and 95 percent of calls within 300 meters. TruePosition's U-TDOA wireless location technology has met the requirements in all environments and in all air interfaces.

According to the National Emergency Number Association (NENA), E9-1-1 services currently cover 95 percent of the wireless subscribers in the United States, which translates into hundreds of millions of people.

Furthermore, the E9-1-1 system in the United States is widely regarded as an overwhelming success by the emergency response communities. Thanks to the advances already made in the United States, other

countries have a solid foundation to build on. For one, the technology needed to deploy a standard emergency number service, like 112 or 999, is a proven technology and is readily available. Currently, TruePosition's wireless location platform is deployed across the United States in the AT&T Mobility and T-Mobile networks, as well as several smaller, rural networks.

Today, TruePosition has more than 90,000 TruePosition® Location Measurement Units™ (LMUs™) installed, which locate more than 60 million emergency phone calls every year.

Due to the grave nature of safety-related services, it is absolutely critical to be able to accurately locate the caller every time they need assistance. At the heart of the TruePosition Emergency Call Location solution is the high-performance network-based U-TDOA location technology, which allows the system to:

- Locate all mobile phones, even those that are not GPS-enabled
- Locate mobile phones in any environment (indoors, inside vehicles, urban, suburban, rural, etc.)
- Locate mobile phones with very high accuracy and reliability

TruePosition's U-TDOA technology uses timing data from as little as three and as many as 50 receiving antennas, enabling the highest accuracy for a network-based system. In addition, because it is completely network-based, U-TDOA can locate any mobile phone.

Each TruePosition LMU includes six radio frequency (RF) receivers, which is three-times what alternative TDOA location systems use. This results in superior memory and processing power to calculate locations quickly and accurately. Unlike GPS, U-TDOA works well in all kinds of conditions, from outlying rural areas, to inside dense buildings, to mountainous areas, to cities with tall buildings. Whether a person is in their house or hiking in the middle of nowhere, the caller can be located. According to Ovum, however, the emergency call is more likely going to come from inside a building, since about 60 percent of all cellular phone calls are made indoors.

The technology is revolutionary. The benefits are priceless.

Only TruePosition has the intellectual property, technical expertise, and unparalleled operational experience to provide mission-critical location-based safety and security solutions like Emergency Call Location. Today, TruePosition's U-TDOA location technology keeps millions wireless subscribers safe and secure.

TRUEPOSITION. PIONEERING LOCATION SOLUTIONS FOR A SAFER WORLD.

TruePosition is the leading provider of location determination and intelligence solutions for the safety and national security markets worldwide. TruePosition offers a portfolio of industry-leading location technologies, future-proof platform products, innovative applications, and comprehensive networking and systems services to enable the creation of carrier-grade location solutions for private enterprise and government agencies to protect citizens, combat crime, and save lives.

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TRUEPOSITION® LAW ENFORCEMENT SOLUTION



The benefits of TruePosition LOCINT:

- Enhance the ability to identify criminals and associates
- Improve the efficiency and ability to pinpoint and apprehend suspects
- Expand the power to predict and preempt criminal activities

The capabilities of the TruePosition Location Platform:

- Locate mobile phones with very high accuracy
- Locate mobile phones with very high reliability
- Locate all mobile phones, even those that are not GPS-enabled — the location capability cannot be disabled by the mobile phone user in any way
- Locate mobile phones in any environment (urban, suburban, rural, open country, whether indoors, outdoors, or in-vehicle, etc.)

Law enforcement officials are challenged every day by the sophistication of criminal activities and the limited resources available to deter and solve crimes. Police officers cannot be everywhere at once — and they often have to rely on outdated and inefficient technologies to track and apprehend criminal suspects.

On the other hand, criminals frequently leverage the convenience of their mobile phones to commit crimes — and thus leave an effective trail of their activities that can be exploited by law enforcement.

As part of a layered defense, TruePosition® LOCINT™ can significantly expand current or future tactics, techniques, and procedures (TTP) to fortify and extend law enforcement efforts.

Turn wireless location technology into a crime fighting solution.

TruePosition LOCINT combines powerful mobile phone location technologies with a sophisticated data mining solution that can be used by law enforcement organizations to leverage and extend scarce crime fighting resources to:

- Enhance the ability to identify criminals and associates
- Improve the efficiency and ability to locate and apprehend suspects
- Expand the power to predict and preempt criminal activities

Enhance the ability to identify criminals and associates.

Using TruePosition LOCINT, law enforcement agencies have the ability to actively identify and track the mobile phones of perpetrators engaged in criminal activities. The system provides location intelligence to help officials identify mobile phones of interest that frequently communicate with each other, or that are within close proximity, making it easier to identify criminals and their associates.

Improve the efficiency and ability to locate and apprehend suspects.

Unlike slow and inefficient field-based location methods, TruePosition LOCINT enables rapid and accurate identification of a suspect's location. Using TruePosition LOCINT, law enforcement agents can monitor and track suspects from their offices, and then confidently mobilize apprehension efforts at the most appropriate moment. It is no longer necessary to physically deploy agents with direction finders to track down suspects — a process which is typically time intensive and whose success is uncertain.

Predict and preempt criminal activities.

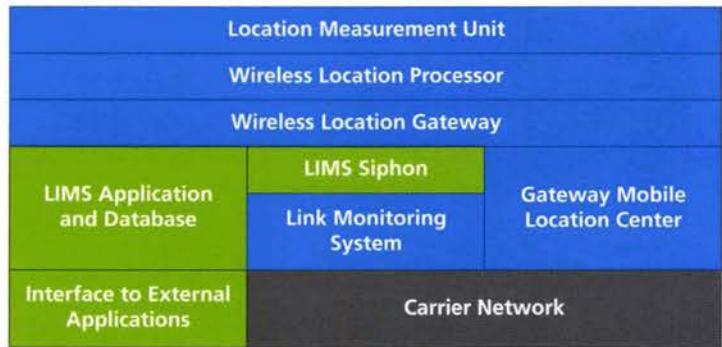
Law enforcement officials can generate insightful and invaluable profiles on the behavioral patterns of suspects using the wealth of mobile network events and location data captured by TruePosition LOCINT. When combined with TruePosition LOCINT's "geofencing" capability — the ability to create a virtual fence around a designated area that monitors mobile phones entering or exiting the area — and its ability to perform highly-accurate, real-time tracking, TruePosition LOCINT provides a powerful array of functions to aid in predicting when criminal activities may take place and allow for measures to prevent them.

Enabling Technology.

TruePosition LOCINT is the combination of the TruePosition® Location Platform™ (TPLP™) and the TruePosition® Location Intelligence Management System™ (TP LIMS™). The TPLP is a comprehensive portfolio of various location technologies, which can be tailored to meet the needs of the particular application. One of the location technologies, which is ideally suited for mission-critical safety and security applications is Uplink Time Difference of Arrival (U-TDOA). U-TDOA uses receivers in the wireless network to compare the times at which a cell signal reaches multiple towers, and then calculates the location of the mobile phone. Because it is network based, U-TDOA consistently locates all mobile phones, existing and future, in any environment.

This location technology allows the system to:

- Locate mobile phones with very high accuracy
- Locate mobile phones with very high reliability
- Locate all mobile phones, even those that are not GPS-enabled — the location capability cannot be disabled by the mobile phone user in any way
- Locate mobile phones in any environment (urban, suburban, rural, open country, whether indoors, outdoors, or in-vehicle, etc.)



■ = TruePosition Location Platform
■ = TruePosition Location Intelligence Management System
■ = Carrier

Complementing the TPLP is the TP LIMS. It retains all wireless activity and location information in a database for an extended period of time to allow for convenient, future data mining of this rich historical information.

The benefits are invaluable. The technology is groundbreaking.

Only TruePosition has the intellectual property, technical expertise, and experience to combine a high-accuracy location platform with a sophisticated data mining system to provide location intelligence and tracking like never before. Our innovative solutions are enhancing the ability of law enforcement agencies to more efficiently identify, track, and apprehend criminals. More importantly, our solutions help predict and prevent crimes before they happen.

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TRUEPOSITION® UPLINK TIME DIFFERENCE OF ARRIVAL



Highly accurate, reliable, and able to work with any phone, TruePosition Uplink Time Difference of Arrival (U-TDOA) provides the performance needed for mission-critical location-based safety and security solutions.

U-TDOA is uniquely suited for mission-critical safety and security applications:

- Locate mobile phones with very high accuracy
- Locate mobile phones with very high reliability
- Locate all mobile phones, even those that are not GPS-enabled — the location capability cannot be disabled by the mobile phone user in any way
- Locate mobile phones in any environment (urban, suburban, rural, open country, whether indoors, outdoors, or in-vehicle, etc.)

U-TDOA Overview:

U-TDOA is a completely network-based location technique (calculating location based on a normal cellular signal) that requires no additional chip or software to be installed on the handset. It relies on multilateration, using cell towers, which makes it well suited for indoor and urban environments. A mobile phone's location is determined by comparing the time difference of a cell signal reaching multiple Location Measurement Units (LMUs) that are typically installed at or near the wireless operator's base stations. The distance can be directly calculated from the difference of the time of arrival because signals travel with a known velocity. The difference in the time of arrival between two base stations (one of them being the reference station) will narrow a position to a hyperbolic curve (i.e. isochron), and the time difference between a third base station and the reference base station will resolve it to the precise position (i.e. intersecting isochrons). Time difference measurements from additional base stations improve the accuracy of the location and reduce uncertainty. By design, the LMUs are extremely sensitive receivers, which allow for many LMUs to participate in a single location.

U-TDOA is uniquely suited for mission-critical safety and security applications.

Simply put, U-TDOA is uniquely suited for mission-critical safety and security applications, because it is able to consistently locate any mobile phone, anytime, with high accuracy, anywhere there is wireless connectivity.

High Accuracy.

U-TDOA is the superior choice for high-accuracy location of mobile phones. It delivers the most consistent and uniform location coverage needed for location-based safety and security applications. High accuracy is important for mission-critical safety and security applications because it allows the system to locate a mobile phone with greater precision, which enables first responders to locate where an incident is taking place, and take the necessary action more quickly and effectively. The reason U-TDOA is more accurate than other location techniques is that the measurements used in a location calculation are more accurate, and there are many more of them. The LMUs are extremely sensitive receivers that are capable of picking up a signal below the noise floor, allowing for many measurements to be included in each location calculation. U-TDOA also takes advantage of signals in which the time of flight is less sensitive to scattering, making the measurements used in the location calculation more accurate than with other network-based location techniques.

High Reliability.

In wireless location, reliability (measured by the term "yield") refers to a location technology's ability to obtain a location fix. U-TDOA provides the highest yield of any location technology, which allows it to deliver the consistency and uniform location coverage needed for mission-critical safety and security applications. High yield is critical to safety and security applications because a failed location may result in a criminal escaping the authorities, further injury, or even death in extreme instances. U-TDOA is able to provide the highest yield because of the many measurements used in the location calculation.

Locates Any Mobile Phone.

The ability to locate all mobile phones is important to mission-critical safety and security applications. Lives are at stake in emergency situations, and criminals may escape authorities if they are unable to be accurately tracked. Because U-TDOA is a completely network-based location technique and the type of mobile phone does not have any effect on its ability to be located, it provides the ability to accurately locate any mobile phone — existing or future — anytime and anywhere there is wireless service coverage. U-TDOA locates on the uplink signals that are transmitted as part of normal use of a mobile phone. Because all mobile phones are covered and it is impossible to disable, U-TDOA is ideal for broad reach safety applications, such as E-911 or E-112 emergency services, or target-specific mobile security applications.

Locates Mobile Phones in Any Environment or Condition.

Wireless subscribers use their mobile phones in all environments — indoors, outdoors, while driving a car, in cities with tall buildings, and in remote areas. Industry analysts now agree that more than 50 percent of the calls made on cellular networks are made indoors. For this reason, it is important for mission-critical safety and security applications to locate mobile phones anywhere they are used. Unlike other high accuracy location technologies, U-TDOA is the only one that consistently works very well in urban, suburban, rural, and indoor environments. For indoor locations, U-TDOA benefits from the mobile phone operating at a higher power level, which is required to maintain its connection with the wireless network. The higher power signal allows U-TDOA to locate a mobile phone indoors, with high accuracy and yield. U-TDOA may be challenged in extreme rural environments where the cell sites are very sparse and there is poor terrain, or when cell sites are arranged in a "string of pearls" configuration. This scenario can be overcome by adding LMUs around key or strategic areas to provide additional measurements. For mission-critical safety and security applications, it is important to locate mobile phones where used which includes all environments. Only U-TDOA is able to locate mobile phones with high accuracy in all environments including indoors.

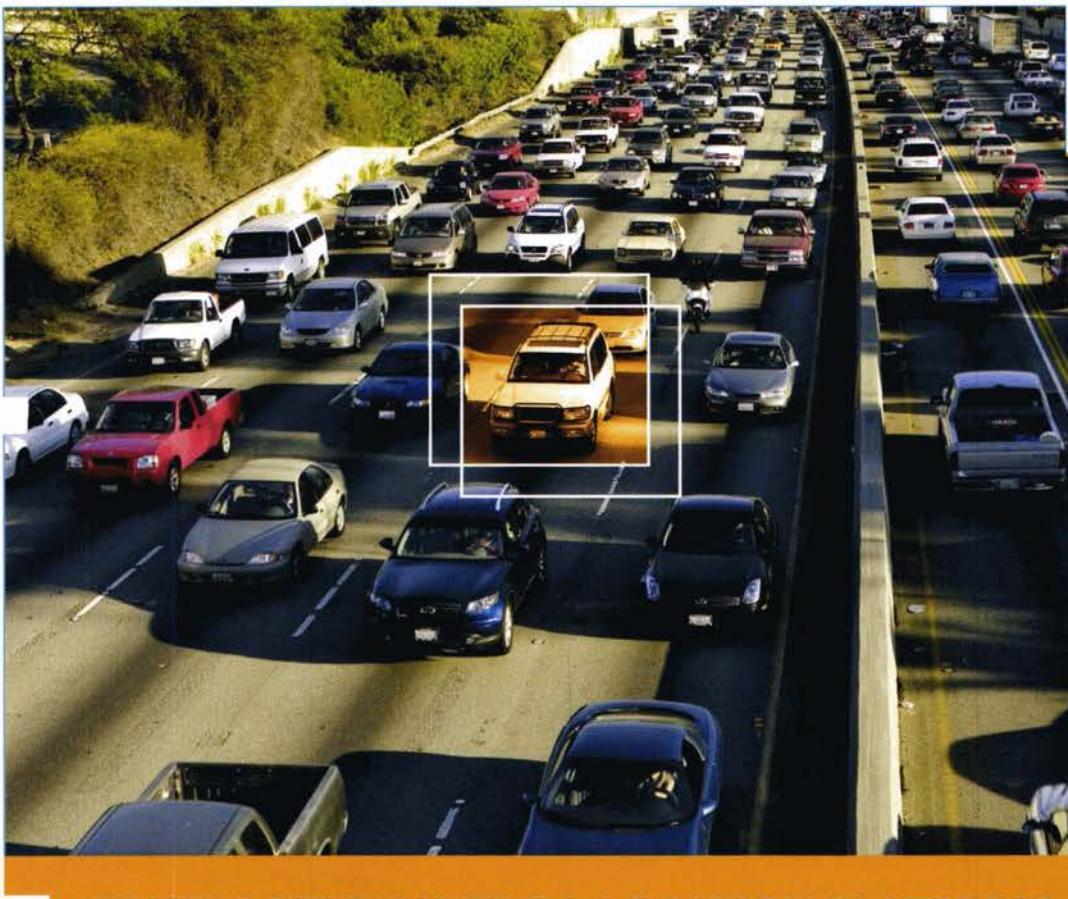
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TRUEPOSITION U-TDOA LOCATION PLATFORM PREVENTS LIFE-THREATENING EMERGENCY

Wireless telecommunications carriers in the United States frequently receive calls from public safety and law enforcement officials declaring a life-threatening emergency and requesting assistance of the carrier. Of these, calls regarding a suspected imminent suicide are among the most prevalent. Given the ever-increasing adoption of wireless communications in the US and the resulting increase in wireless calls to 9-1-1, the number of emergency calls from authorities to carriers will, too, likely increase.

Emergency Call from Victim's Spouse Prompts Authorities to Contact Carrier

In the spring of 2005, the Florida Highway Patrol (FHP) Communications Center in Tallahassee, Florida received a call from a man who claimed that his wife had taken their four-year-old son, with the intent to kill both the boy and herself. She was reported to be armed with a handgun and the man believed her to be unstable and truly suicidal. In his initial call to 9-1-1, the caller stated that he believed his wife may have already shot their son, as she had left home one day prior to that call. FHP officers identified the missing woman's mobile phone number, determined which wireless carrier provided her service, and then contacted the servicing carrier with a request for assistance, declaring an ongoing, life-threatening emergency.

The carrier's records showed that the mobile phone was active and registered, but had not completed any incoming or outgoing calls for several hours. FHP officers feared that without any call activity there would be no way to use the mobile phone as a tool in the search for the woman and her son, given the time passed since her disappearance and her last call.

Within an hour of the initial emergency declaration, the missing woman's exact location was relayed to law enforcement.

In this case, the wireless carrier was using the TruePosition Uplink Time Difference of Arrival (U-TDOA) Location Platform to meet the Federal Communications Commission's E9-1-1 Phase II mandate. This system is designed to provide real-time location information of wireless 9-1-1 calls to Public Safety Answering Points (PSAPs), and was selected for its ability to locate any mobile phone, regardless of the type of phone, in any environment — including indoors, in-vehicle, in cities with tall buildings, in suburbs, etc. — with high accuracy and reliability. This carrier had expanded upon its previous wireless location system to include the ability to manually activate the TruePosition U-TDOA Location Platform in order to locate any mobile phone registered on the network, not just those on active calls to 9-1-1, in order to provide better service to authorities in cases of time-sensitive, life-threatening emergencies.

Limitations of Location Systems Tethered to Active 9-1-1 Call Status

PSAPs that have upgraded in effort to meet the FCC's E9-1-1 Phase II mandate are using wireless location technology systems in order to quickly and accurately locate wireless callers to 9-1-1 and provide assistance to those individuals in a timely manner. However, some of these systems still rely on whether the caller remains on the line or in the area from which they placed their call to 9-1-1. They are also dependent on whether the call to 9-1-1 comes from the suspected suicidal person or comes from a third party reporting the person's alleged intentions. In suicide call scenarios, rescue efforts cannot rely solely on the geographic coordinates of the caller. Instead, a location system is needed that will locate the mobile phone in the possession of the suicidal individual, regardless of active call status or movement of the person after the original call to 9-1-1 is terminated.

High-Performance TruePosition U-TDOA Location Platform Locates Victim

Using such an upgrade to its location system, the carrier in this case was able to determine that the woman's mobile phone was not in the Tallahassee area where authorities were conducting their search. In fact, the mobile phone was not in Florida at all. The TruePosition U-TDOA Location Platform established that the woman's mobile phone was nearly 400 miles away in Tennessee, and produced updates of the mobile phone's location with accuracy of less than 80 meters. FHP officers contacted local law enforcement in Tennessee and requested the assistance of the local police in an intervention.

Within one hour of the FHP's initial emergency declaration to the wireless carrier, information about the missing woman's exact location and a description of her and her vehicle were relayed to law enforcement in Tennessee, and they were able to quickly locate the woman and initiate a traffic stop. Although despondent and indeed armed when apprehended by police, the woman had not harmed herself or her four-year-old son. In this case, the wireless carrier's decision to deploy both the TruePosition U-TDOA Location Platform and the capability to manually activate the system to obtain location information directly helped to defuse a potentially dangerous and life-threatening situation.

TruePosition U-TDOA Location Platform Saves Lives

The TruePosition U-TDOA Location Platform was the key factor in the timely location and rescue of the woman and her son. As evidenced in this case, not all emergency calls come from the individual who the authorities need to locate. In these kinds of mission-critical situations, authorities need to have the most sophisticated technologies and tools available to successfully resolve high-risk emergency scenarios. It is imperative that a wireless location system be able to locate the mobile phone of a victim or person involved in a suspected life-threatening emergency, regardless of call status to 9-1-1 or any other call or text activity. Had this carrier been limited to locating only active 9-1-1 calls, this woman and her son might not have been found in time to prevent a more dangerous and harmful situation.

Success stories like these will continue to become more common as the technology of the TruePosition U-TDOA Location Platform becomes more widely adopted. With proper deployment, more victims can be located and helped in their time of need. The TruePosition U-TDOA Location Platform can play a vital role in revolutionizing emergency services — improving response times, maximizing resources, improving outcomes, and ultimately, saving more lives.

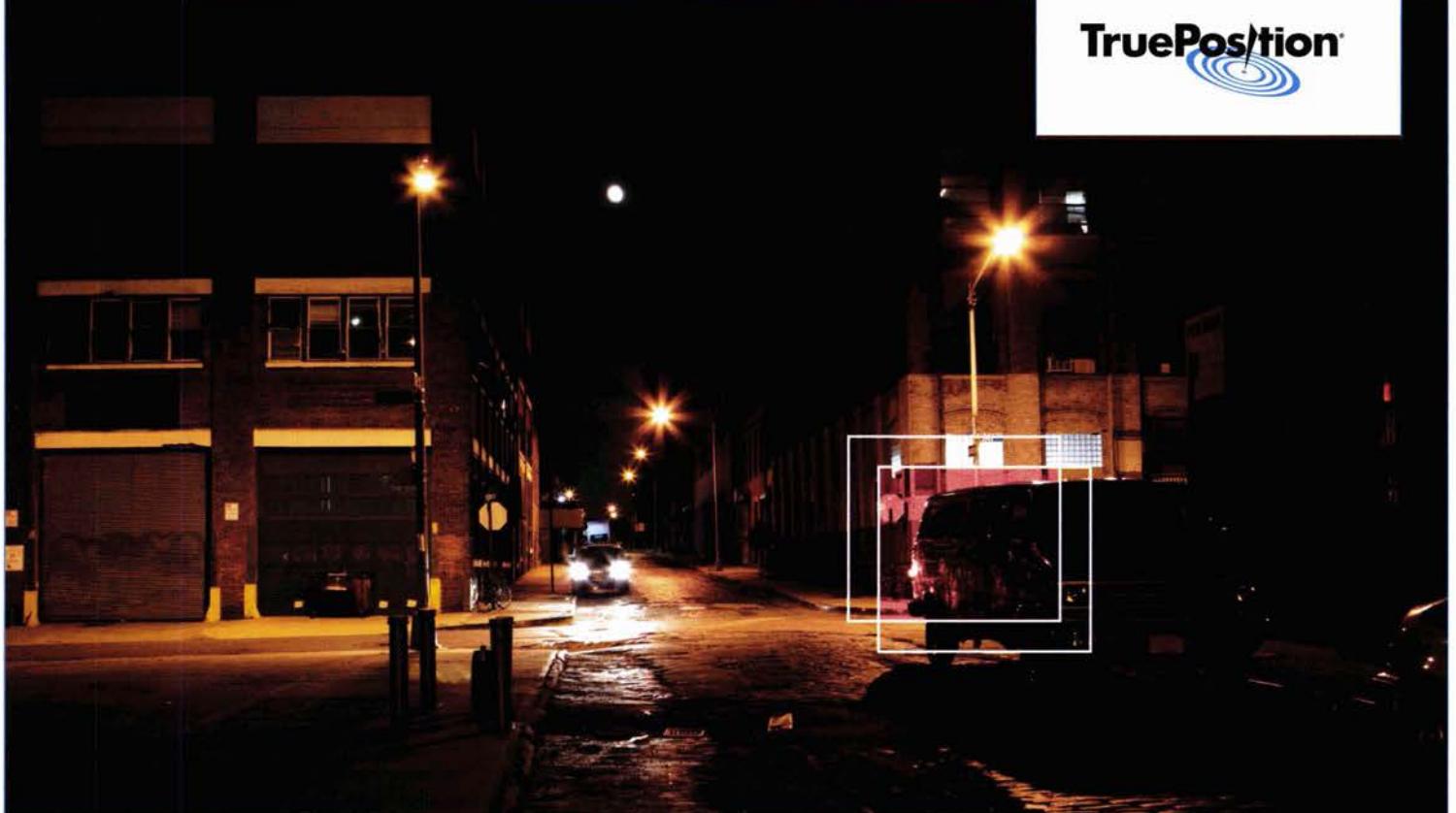
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TRUEPOSITION U-TDOA LOCATION PLATFORM AND POLICE LOCATE KIDNAPPED WOMAN

Since the United States FCC enacted the E9-1-1 Phase II Mandate, emergency search and rescue efforts in the United States have significantly improved, giving Public Safety Answering Points (PSAPs) the ability to quickly identify and locate people in need of immediate assistance. Authorities and emergency responders have also discovered new benefits of the technology — for example, how to resolve an emergency situation when the 9-1-1 call comes from a third party.

Occasionally in violent crimes, a victim's initial calls for assistance are not made to 9-1-1. In panic of the moment, some victims actually call family or friends, or simply redial the last dialed number on their mobile phone. But even if these third parties call 9-1-1, the PSAP's location technology is of no assistance to the actual victim. Such was the case when a patrol sergeant in the Midwest US contacted the emergency services of a Tier 1 wireless carrier for assistance in a life-threatening abduction.

9-1-1 Call Comes from Third Party

A woman called 9-1-1 and reported that she had just received a panicked call from her sister, who claimed to have been kidnapped. The victim had whispered into the phone that she was grabbed by a man, shoved into the trunk of a car, and was in fear for her life — but she did not know her whereabouts. At that point, the call was disconnected and the victim's sister proceeded to call 9-1-1. The servicing PSAP for this call had implemented an E9-1-1 Phase II location system. But because the call for assistance came from a third party, the technology was of no use.

Within one minute of the declaration and description of the emergency, the carrier was able to provide precise geographic coordinates of the victim's location.

Furthermore, there was no description of the abductor's vehicle and no details of the location of the event or direction in which the car was traveling, leaving the local police few leads to go on.

Authorities Seek Assistance in Search from the Wireless Carrier

Armed with the victim's identification, mobile phone number, and the general idea of where the incident occurred, the police sergeant contacted the servicing wireless carrier to aid in the search, hoping the carrier could provide the location of the cell tower transmitting the last call from the victim's mobile phone. Although this information would help decrease the size of the initial search area, police would still be faced with a wide-spanning geographic area in which to deploy a search and rescue force.

Fortunately, the servicing carrier had just completed the deployment of a wireless location system that utilized advanced technology. The TruePosition Uplink Time Difference of Arrival (U-TDOA) Location Platform enables the precise location of any active, registered mobile phone — even those not making calls to 9-1-1. Within one minute of the declaration and description of the emergency, the carrier was able to provide precise geographic coordinates of the victim's location. With specific street and cross-street information, responding officers now had a very specific area of the city to begin the search.

Locating Missing Woman with the TruePosition U-TDOA Location Platform

The TruePosition U-TDOA Location Platform continued to provide location updates as the kidnapper drove through the city with the victim — and her mobile phone — in the trunk, helping to stabilize a location within fifteen minutes. Police headed to that location and noticed a suspicious van. They heard a struggle inside, and found a man holding a knife to a woman's throat. Police seized the man and confirmed that the woman was the victim they sought. After the situation resolved, the police then contacted the wireless carrier to alert them that the situation had been resolved, thanks to the TruePosition U-TDOA Location Platform.

TruePosition U-TDOA Location Platform Succeeds in Complex Emergency Scenarios

E9-1-1 Phase II systems are incredibly helpful in emergency scenarios. However, there are many victims who have not been able to call 9-1-1 that still need assistance. The TruePosition U-TDOA Location Platform can be used to locate mobile phones that have not directly dialed 9-1-1. As long as the carrier receives the required official declaration of a life-threatening emergency, first responders can find the person in need. Officials can use the TruePosition U-TDOA Location Platform to accurately and reliably locate any mobile phone that is turned on, leading to positive outcomes in emergency situations.

In some emergency cases, initial reports of facts can be complicated if either the victim or perpetrator are hidden or shielded, like in the trunk of a car. In these types of situations, a technology like Assisted Global Positioning Systems (A-GPS), which relies on the mobile phone's GPS capability and line of sight to satellites, would likely produce inaccurate location information or no location results at all. The TruePosition U-TDOA Location Platform, is a high-performance, network-based technology. This means it can locate any phone, in any environment — including indoors, outdoors, in-vehicle, or in cities with tall buildings — with high accuracy and reliability. These factors make it the best-suited location technology for mission-critical applications.

With life hanging in the balance, every minute can make the difference of life and death. The location system must be able to generate an accurate location for any mobile device, in any environment. The TruePosition U-TDOA Location Platform has the ability to improve response times and save more lives.

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TRUEPOSITION U-TDOA LOCATION PLATFORM LEADS POLICE TO INTERRUPT ARMED ROBBERY

Of the many calls that are made to 9-1-1, those where the caller is unable to communicate are among the most challenging for emergency responders. When a 9-1-1 caller cannot ask for help or identify the location of the emergency, it is solely in the 9-1-1 call taker's hands to assess the nature of the situation and send the proper emergency response team in a timely manner. When these calls come from mobile phones, the situation is further complicated. By their very nature, mobile phones are mobile, and therefore, when a wireless caller dials 9-1-1, that person could be almost anywhere. This can lead to significant time, resources, and manpower expended to locate an emergency, with every passing minute putting the caller further at risk.

Since the United States Federal Communications Commission (FCC) enacted the Enhanced 9-1-1 (E9-1-1) Phase II mandate, these emergency search and rescue efforts have significantly improved. The Phase II mandate requires that location information for wireless 9-1-1 calls be provided to the Public Safety Answering Points (PSAPs) fielding the calls, giving them the ability to more quickly identify and locate people in need of immediate assistance, even if the person cannot communicate over the phone.

9-1-1 Call from an Open Line

Early one morning in Chester County, Pennsylvania, a hotel manager's shift was interrupted by two armed robbers who had entered the hotel. The men hit the manager in the back of the head with a gun and then tied him up around his hands and ankles. At one point during the altercation, the manager tried to set off the hotel's silent alarm, but it did not work.

The TruePosition U-TDOA Location Platform quickly calculated the location of the hotel manager's mobile phone.

Fortunately, the manager was able to get a hold of his mobile phone, at which point he dialed 9-1-1, and dropped the phone onto the floor to avoid it being seen by the robbers.

Though the hotel manager was unable to speak on the phone, the 9-1-1 call taker heard commotion in the background, and quickly assessed that it was an emergency situation and that someone needed help. Unable to ask the person on the line any questions regarding the location of the emergency, the call taker needed another way to determine the location of the mobile phone in order to direct emergency response teams where to go.

Wireless Operator Using High-Accuracy Emergency Call Location System

The wireless carrier servicing the hotel manager's 9-1-1 call had implemented the TruePosition Uplink Time Difference of Arrival (U-TDOA) Location Platform, a network-based wireless location determination system that calculates, with high accuracy, the location of mobile phones that dial 9-1-1, in compliance with the FCC's E9-1-1 Phase II mandate. This system provides real time location data of wireless 9-1-1 calls to the PSAPs that receive and respond to 9-1-1 calls.

Though there are several location technologies, mobile network operators using the TruePosition U-TDOA Location Platform have selected the network-based system for its ability to locate any type of mobile phone in any environment, including indoors, inside a car, and in urban, suburban, or rural areas, all with high reliability. A handset-based technology like the Assisted Global Positioning System (A-GPS) not only requires a switch to GPS-enabled mobile phones for all subscribers, but it has difficulty obtaining a location fix if the line of sight from the phone to the satellites is blocked. In this situation, it would have been difficult or perhaps even impossible for the manager's mobile phone to be located using A-GPS, since the phone was not only indoors, but on the floor, and likely further obstructed by other objects in the room.

Locating the 9-1-1 Caller with the TruePosition U-TDOA Location Platform

The TruePosition U-TDOA Location Platform quickly calculated the location of the hotel manager's mobile phone and produced latitude and longitude coordinates, which appeared on a map on

the 9-1-1 call taker's computer screen. As a result, even without verbal communication with the caller, the 9-1-1 call taker was able to identify the actual location of the hotel manager's mobile phone within a few meters and pass that information to a police dispatcher. Based on the information provided, law enforcement officials were able to determine that the site of the emergency was at the hotel.

Upon arriving at the hotel shortly after the 9-1-1 call came in, police discovered the robbery in progress. Police confronted the robbers, and an altercation ensued that resulted in the eventual death of one suspect and the apprehension and arrest of the other. Because the officers were able to arrive so quickly, the hotel manager was spared of any further harm, the stolen money was recovered, and a life-threatening event was avoided.

The TruePosition U-TDOA Location Platform is Critical

The critical factor leading to the quick resolution of the life-threatening situation at the hotel was the implementation of the TruePosition U-TDOA Location Platform by the wireless operator. Because the 9-1-1 call taker could not communicate with the caller, it would have been nearly impossible to dispatch law enforcement in a timely manner had the wireless location information been inaccurate or unavailable. If the wireless location technology implemented by the carrier been limited to producing general cell site and sector information, the data likely would not have been accurate enough to quickly determine the mobile phone's actual location. Moreover, if the carrier had relied on A-GPS for location data, the mobile phone's location might not have been calculated at all. Because authorities had access to the location information from the TruePosition U-TDOA Location Platform, a quick, successful resolution was brought about.

In many emergency call scenarios, the callers are unable to communicate or simply cannot identify their location. However, with the implementation of the TruePosition U-TDOA Location Platform, individuals can be located quickly in their time of need, regardless of the type of mobile phone they are using or what type of environment they are in. The TruePosition U-TDOA Location Platform plays a crucial part in improving response times and maximizing valuable manpower and resources in emergency scenarios, resulting in better outcomes and ultimately, saving more lives.

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TRUEPOSITION U-TDOA LOCATION PLATFORM AND LAW ENFORCEMENT RESCUE ABDUCTED OFFICER

One morning, a corrections officer in Hamilton County, Ohio had completed her night shift and was headed home. As she neared her car, she was approached by a man with a gun, whom she recognized as a recent parolee of the prison. Keeping her at gunpoint and slicing her repeatedly with a box cutter, the man bound her with duct tape and forced her into the trunk of a car. The man, later described by police as a violent career criminal, fled the premises and headed for the interstate highway. When the corrections officer did not arrive home at her normal time, and calls to her mobile phone went unanswered, her family called the prison. Prison officials also tried to contact the guard with no success. Officials then issued an "officer needs assistance" call to state and local authorities.

Law Enforcement Collaborates with the Wireless Carrier

Deputies of the Hamilton County Sheriff's Department quickly determined the wireless carrier servicing the abducted officer's mobile phone, and contacted the emergency support line for assistance. Investigators needed to know if any incoming or outgoing calls had been completed on the officer's phone, in hopes that the carrier could identify the cell towers servicing those calls. While the wireless carrier's account record details showed no incoming or outgoing calls had been completed since the officer was last seen, it did show that her phone was turned on and registered to a network in southeastern Kentucky.

Fortunately, the wireless carrier had implemented the TruePosition Uplink Time Difference of Arrival (U-TDOA) Location Platform, a network-based location determination system that provides high-accuracy location of wireless 9-1-1 calls in support of the United States Federal Communications Commission's E9-1-1 Phase II mandate.

It is impressive that law enforcement officials were able to find and rescue the officer so quickly with very few leads.

The system locates any mobile phone in any environment, even if the phone is not currently making a call or sending a text message.

TruePosition U-TDOA Platform Provides Key Leads for Law Enforcement

The TruePosition U-TDOA Location Platform quickly calculated the precise location of the officer's mobile phone on a highway, and produced repeated location updates showing the direction of travel. Law enforcement officials contacted their counterparts in Kentucky and, although still unaware of the exact nature of the officer's disappearance, Kentucky officials immediately set up a roadblock and apprehended the vehicle.

The abductor was taken into custody and the officer was rescued without further injury. Because she was taken quite far from the initial location of the abduction, it is impressive that law enforcement officials were able to find and rescue the officer so quickly with very few leads. There were a few factors that, when combined, led to her speedy rescue. First, the phone had gone unnoticed by her abductor. More importantly, however, the officer was a mobile phone subscriber of a carrier that had deployed the TruePosition U-TDOA Location Platform.

Why U-TDOA was Selected for the Emergency Call Location System

The carrier had selected the TruePosition U-TDOA Location Platform for use in its emergency call location system after extensive and careful evaluation of handset-based versus network-based solutions. Handset-based technologies, such as Assisted Global Positioning System (A-GPS), require costly and time-consuming handset upgrades for all subscribers. A-GPS also has difficulty getting a location fix if the line of sight to the satellites is blocked. For instance, it would have trouble determining location if a call was made indoors, in a vehicle, or in a city with tall buildings, making it inadequate for mission-critical applications like locating emergency calls.

The TruePosition U-TDOA Location Platform was selected because it can locate any mobile phone with no upgrades needed. It can locate mobile phones in any environment, including indoors, in cities with tall buildings, in-vehicle, suburban, and rural conditions, all with high reliability. These factors made the TruePosition U-TDOA Location Platform the ideal choice for the carrier's emergency call location system.

TruePosition U-TDOA Location Platform Makes the Difference

The TruePosition U-TDOA Location Platform was the key factor in the timely rescue of the officer. For mission-critical applications, it is imperative that the mobile phone be quickly and accurately located, regardless of brand, environment, or whether the phone is in use. Had the carrier been limited to location-based technologies that rely on first and last cell sites servicing completed calls, there would have been no data indicating the officer's true location. Or, if the carrier had relied on A-GPS for location calculation, the mobile phone's location might not have been calculated, since the mobile phone was shielded in the trunk of the car.

As evidenced in this case, not all victims with mobile phones are physically able to call 9-1-1 for assistance. However, with proper deployment of the TruePosition U-TDOA Location Platform, these victims may still be located in their time of need. This system can play an integral part in optimizing outcomes, especially in emergency and other mission-critical scenarios, while maximizing manpower and resources, and ultimately saving more lives.

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