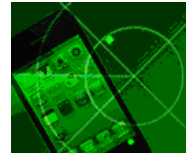




Cell Phones: Location Tracking & Sharing



How Does the Technology Work?

There are many ways a cell (aka mobile) phone's location can be tracked or shared.

- All U.S. cell phones are required to have some type of location-based technology to enable an emergency dispatch centers to find a 911 caller's real-time location and number. Thus, geographic location tracking capabilities have been integrated into all U.S. cell phones, as well as several international ones.
- Phone carriers tend to use one of two methods to find a mobile phone's location in their network: some cell phones contain **Global Positioning System (GPS)** receivers that connect with GPS satellites to provide the cell phone's location. Cell phones without a GPS device send signals to nearby network cell towers, and use that information to triangulate the cell phone's location.
- Additionally, some cell phones, are designed to be able to connect to the Internet via a **cellular broadband network** and/or via **Wi-Fi network** (aka a local wireless Internet access point). If a cell phone connects via a Wi-Fi network, that connection can also disclose more or less precise information about a cell phone's location depending upon how the Internet Service Provider provides the wireless Internet connection.
- Some cell phones also keep a temporary file of nearby cell phone towers and Wi-Fi hotspots (places that offer local wireless Internet access), to potentially make the cell phone user's connectivity more efficient.

There are many applications and **location-based services (LBS)** available for cell phones that can or might reveal a location, especially if installed or enabled on feature-rich cell phones such as smart phones (e.g., iPhone, Android, Blackberry). Some cell phones come preloaded with such applications and other phones require someone to install the application onto the cell phone, and create a user name and password in order to begin accessing the location-based service. Some applications may not need a location to function, but may be set to access the cell phone's location anyways (e.g. a dictionary or gaming application). Depending upon the service's or phone's current location privacy settings, a cell phone's location might get shared only with the owner, with multiple cell phones, with the computer the owner sync's the phone to, or even online via a location sharing service's website.

There are different types of location-based services (LBS) available for cell phones, for example:

A. Optional Services Within A Phone Plan. Some wireless carriers offer customers an add-on option to location track any phone that is part of their *family phone plan*. Some providers require that each cell phone in the plan receive and return a text to *allow* the tracking. Other wireless carriers or cell phone makers offer options to remotely locate, lock, or even delete all information on your cell phone, if stolen or lost.

B. Cell Phone Applications. Now a days, people can easily and cheaply install extra cell phone applications that use the phone's current location to obtain directions, nearby places or meetings of interest, weather, or, to even share a location as part of a status update, for example:

- **Navigation, Directions and Mapping.** Some applications use location-based information to provide, log or store real-time directions and maps. Most display a map that tracks the cell phone's turn-by-turn location. Some let you preload maps and directions, others pull in maps as you need them using the cellular broadband network or a Wi-Fi connection, and, others enable you to log or save routes taken and view them later via a phone or website. Some applications are designed to log things like your run, bicycle ride or hike and offer the option for you to share location-based details (route, speed, distance, date, time, name, age, etc.) with others in one or more social networks.

- **What's Nearby?** Many applications use your cell phone location to tell you what's around you. They let you search for nearby hospitals, grocery stores, restaurants, gas stations, drug stores, coffee shops with free Wi-Fi, deals and discounts, the times movies are playing at local theatres, the times buses or trains leave from nearby stations, current weather, and more.
- **Social Networking & Location Sharing.** Many social networking applications use the phone's current location to find nearby activities or people, and offer to share a location as part of a status update.
 - Some social networking services let people create or join interest-based groups to plan activities and meet up offline and then use the cell phone's location to alert users to nearby and upcoming activities.
 - Some services focus primarily on getting people to do social location sharing (e.g. Foursquare, Loopt, Gowalla). They encourage users to check into nearby spots, post comments or journal entries, upload photos, earn points or badges, receive discounts, or, simply let others know "I'm here now".
 - Even popular social networking services (e.g. Facebook, MySpace, Twitter) that did not initially offer a real-time location sharing, now offer a more specific location options as part of a status update.
 - Many location-based services and applications also make it very easy to share your location across several social networks. For example, a user of one social network can set it to automatically post a status and location update simultaneously to several other social networking sites.
 - Several social location-based services allow the user to make choices about what location is shared. Some offer options such as "exact, city, country" or let individuals choose their own location either from a list of "what's nearby" or by manually entering any location. Some applications, particularly social location sharing applications, allow people by default to share a location for someone else using the same service unless some privacy settings are changed.
- **Cell Phone Cameras & Location Data.** If you use a cell phone camera that has location-tagging enabled, the images might have geolocational data (latitude and longitude) embedded as part of the image file. In most cell phones there is a setting that can turn this feature on or off.

In a majority of cell phones, there are application-level or/and phone-level settings that allow someone to turn location-based features on or off or set portions of a user's social location profile or status updates to public, restricted, or private. Some phones make it easy to find a list of all currently installed applications requesting the cell phone's real-time location and then change their settings; other cell phones make it more difficult for a user to find and change location privacy settings for a particular application or service.

How is it Relevant to Agencies and Partnerships?

- Many staff and volunteers at agencies and partnerships use cell phones with active location-based services and applications. For example, some staff or volunteers map directions between places or take a geo-tagged photograph to document a situation or potential crime. While some cell phones are owned by the agencies, other phones are personally owned. Since some uses of location-based services can place the privacy and confidentiality of victims at risk, it's important for agencies and partnerships to review all use of cell phone-based location services and establish practical policies around staff and volunteer use that promote safety and privacy for all but don't prohibit all use.
- Some agencies and partnerships create social networking pages or presences on sites that people may access via their cell phones and then post updates that include location-based information (e.g. Facebook, Twitter, Flickr). Agencies need to have a policy on how to respond under these circumstances.
- Victims and other visitors to agency buildings bring cell phones with location-based applications and use them while sitting in waiting rooms or visiting other areas of the building or grounds. Some agencies or collocated partnerships can share their location, while others must work hard to keep their agency's location hidden for legal and/or confidentiality reasons. For agencies with confidential locations, such as

some domestic violence shelters or transition houses, it is particularly important to inform visitors and residents about privacy settings they might use to prevent accidental location-sharing.

- Some victims and their children may need specific information about privacy risks and safety strategies regarding each location-based application on their cell phone.
- Location-based services on cell phones may be misused to stalk and track victims. Some perpetrators may add optional location tracking services to their family phone plan to secretly track others on the plan. It is not uncommon for perpetrators to misuse social location sharing networks to find places a victim has checked into recently or sometimes even to impersonate a victim on a social location sharing service. Some perpetrators search online for photos of the victim and check to see if it's geo-tagged with a place the victim hung out. In order to hold perpetrators accountable, agencies need to understand what the perpetrator is doing and how to collect timely evidence.
- Cell phone location information can be a vital part of a criminal investigation and used to hold a perpetrator accountable; this may require the court to issue a subpoena or search warrant to the cell phone company provider.

Benefits & Risks

Many victims (their children, family and others they spend time with) use cell phone location-based services.

- Location-based cell phone services can help a victim access needed services and/or support. If a victim is fleeing violence or in the process of relocating, being able to use their cell phone to map directions or look up information can make it easier to navigate a new town or find needed resources and services.
- However, if the victim or her children (or others the victim spends time with) don't know enough about the location privacy or sharing settings of every application or service on their cell phone, they might post status or location updates or photos that accidentally include the victim's location, thus possibly making it easier for the perpetrator to track the victim down.
- There are also safety risks if any of the cell phones used by a victim (or those with her/him) have location tracking enabled as a part of a family phone plan that the perpetrator controls and views. Or, if the perpetrator can access recently used map or direction files on the phone or a computer that the phone's data has been synced with.
- Perpetrators can find the location of buildings many ways; perpetrators can also hide location tracking devices in any belongings or vehicles and a computer's connection to an agency or nearby Wi-Fi network can provide information that discloses some information about location. While some shelters and agencies worry about victims bringing their cell phones with them when they stay at the shelter or come in for services, the solution is not to create rules that prohibit cell phone use, but be prepared to discuss all the risks and benefits with victims and to make new free cell phones available for victims to use if necessary for safety reasons.
- A victim's cell phone may be necessary for her safety. For example, some perpetrators may demand that she must answer her phone, no matter when or where. Not being able to answer her phone may be dangerous to her or those she loves.
- If a victim is in hiding, she may need a cell phone to keep in contact with others via texts, calls or social networking sites. Some victims may have medical issues and need to carry a cell phone in case they need to call for emergency services.

Agencies and partnerships can help victims figure out if the location of their cell phone is somehow being tracked by a perpetrator and then discuss safety strategies and options including changing settings or deleting applications. For example, if the perpetrator is locating a victim through her teenager's social location status updates, the teenager can learn how to increase privacy settings or manually set different locations for future status updates.

Things to Consider

- How is the victim's location being tracked? Is it via a cell phone, or not? Discuss with the victim the circumstances where a perpetrator seems to know location information. For example, it could be that there is a GPS device hidden in the victim's vehicle or a belonging. Or, it could be that geo-tagged photos of the victim are being posted online by well-meaning acquaintances.
- Is it safe for the victim to turn off the location-based services on the cell phone? Or is it safe for the victim to temporarily remove the battery if she/he is planning secret travel? Is it safe to do so? Discuss risks with victims before they travel to your agency or other secret place.
- Is the victim comfortable contacting the cell phone carrier to ask if a location tracking service is activated on the cell phone or how to disable all location services but 911 calls?
- Some cell phones allow the user to turn "Location On / Off" under Menu Settings or Options such as "GPS Services" or "911 only" or "Privacy > Location" or "Location Services". A few phones even list all applications that want to use the phone's location services and allow the user to turn location services on or off for each individual application, such as the phone's camera.
- If the cell phone's location sharing is hard to disable and the perpetrator can somehow see the cell phone's location, could the victim get another cell phone, and get rid of the tracked phone?
- Is the victim (or any children) using any social networking or location sharing applications on their cell phones? Can these be set to share a more private or different location? Sometimes the cell phone application will clearly describe how to turn on or off location tracking or how to change privacy settings to specify who is allowed to see the location; other times, the victim will need to call the phone provider or search online to learn how that application's location tracking settings might be changed on their specific phone.
- Is there a benefit to simply uninstalling the location-based application from the cell phone? Most phones list applications somewhere (under a menu such as Options or Settings). Most applications can be uninstalled but some preloaded applications cannot. When preloaded applications cannot seem to be removed from the cell phone, the victim can learn about the application's location-based tracking or sharing settings options and decide whether to disable location settings for that application. If it is unclear whether an application is on the phone, where its' setting are, and whether it can be uninstalled, victims can search for an answer online or contact the phone maker (e.g. Apple makes iPhones, Google makes Android) or phone carrier (e.g., AT&T, Verizon Wireless, Sprint) and ask them to walk her through how to find this information in the phone.
- If the victim's location privacy has been compromised, does the victim want or need to relocate? What steps might be taken with respect to cell phones and location based-service to increase the victim and her children's safety during and after relocating?
- Depending upon the location-based application or service used, how will law enforcement best document and collect evidence about the perpetrator's misuse? What charges might be appropriate? (e.g. stalking, electronic surveillance).
- If an agency or partnership is using or considering creating pages or profiles on social networking sites it should consider creating policies or interim practices to address situations where an online visitor shares location-based information on its page. Policies should consider how to best address posts with location information, how to provide information to victims about the ways their location might be shared, and, how to discuss emerging ways that location sharing may impact the safety and privacy of victims, their families and friends, as well as agency staff and volunteers.

See NNEDV's tipsheets on: "[Social Networking and Privacy Tips for Domestic and Sexual Violence Programs](#)", "[Online Privacy and Safety Tips](#)" and "[Finding Laws To Charge Perpetrators Who Misuse Technology](#)".