



*Civilization is the progress toward a society of privacy. The savage's whole existence is public, ruled by the laws of his tribe. Civilization is the process of setting man free from men.*

Ayn Rand, *The Fountainhead*, 1943

## GPS Technology

One of the biggest issues being discussed among tech people these days is the issue of point of presence. Increases in tracking technologies combined with decreases in physical characteristics of the chips necessary for tracking devices has made the personal tracking device a technical reality.

The United States government is pushing the E911 mandate (accurate location detection of cell phone callers) which will boost the use of GPS technology. By 2005, all cell phones sold must be able to report their location. Cell phones companies are developing new phones with embedded GPS chips as well as GPS attachments for the existing cell phones.

Concern has been raised regarding the use of these chips. Privacy groups are concerned about "Big Brother" tracking their every move. While they recognize the potential safety benefits (i.e. tracking a kidnapped person, the ability for 911 to locate a victim unable to respond by voice), the question of whether the chips are an invasion of privacy (i.e. can tracking be turned off by the user) has yet to be determined.

## Applications

We spoke above about the U.S. initiative to add tracking chips to cell phones by 2005. However, other uses of the technology are already in place. A few examples include:

- OnStar<sup>®</sup> Technology. Available on most GM vehicles, OnStar<sup>®</sup> provides the vehicle owner with 24/7 monitoring of the vehicle. Should the user of the vehicle have an emergency, simply pushing the blue OnStar button connects them with a real person who can help them. Services range from remotely unlocking doors to tracking stolen vehicles.
- Commercial trucking industry. Companies are extensively using the Global Positioning System to track their vehicles in real time and get data in case of any emergency. Con-way NOW, a trucking company has leveraged GPS technology to develop aggressive business policies. Con-way guarantees any shipment in the North American continent within the time promised. Their policies are to refund 50% of the amount if the delivery is two hours late and deliver it free if the delivery is delayed by four hours.



- Qualcomm is testing a GPS truck-trailer locking system that would allow cargo to be unloaded only at the correct location. The product development has been supported by manufacturers of large consumer items (Refrigerators, Plasma screen TVs).
- Farmers and Agriculture Researchers are utilizing GPS-linked yield monitors to give the yield of crops on a geographical map. Farmers can now get an accurate reading of the yield of a particular crop per square yard. This not only makes decision making easier in terms of selecting of crop but also helps in calculating the exact fertilizer, seed and nutrients required. Utilizing a simple PDA loaded with the GPS software, farmers can collect this data and use it to develop income and expense statements for their crops.

## **Issues and Challenges**

The biggest issue with the GPS technology is that it can easily become a tool to do individual tracking and espionage. The newer versions of GPS receivers are growing smaller in size and they are becoming easily affordable too. These new devices can be easily slipped into a car or an individual's bag or briefcase. Every movement of the person can then be tracked without their knowledge or consent.

Another issue is the vulnerability of the signals to interference and jamming from disruptive elements in society, resulting in delays, accidents and failures.

## **Future Trends**

Currently the process of making the 0.25-micron silicon germanium chips is in the early stages. This size is necessary in order to enable the chips to be implanted in cars, laptops, and other items of value.

As the technology evolves, we will be able to program the chips for specific geographic references. For example, a laptop can be programmed to find itself only at an owner's office or home. If it finds itself in an unknown place it would send a message to the owner's cell phone indicating its location on a map.

Auto insurance companies are studying the GPS data obtained from vehicles and are trying to link it to the pricing of the policies. In future, insurance companies will offer policies based on where and how you use your car.

Governments are considering tracking technologies for tax initiatives. A current initiative to tax automobiles based on the amount of miles they travel is under consideration in the state of Oregon.

Location-based commerce - targeting advertising and promotions to mobile devices based on the user's specific whereabouts - could come full circle with location-based reverse auctions for services. An individual could post various service needs tied to a GPS-specific location. Local providers could respond with their bids. For example, upon arrival at a particular train station, a



vacation traveler could post reverse-auction requests for hotel and car-rental offers and select from instant bids from local vendors.

## **Summary**

With the integration of Global Positioning System technology with the mobile networks and Global Information Systems (GIS), the realms of possibilities are large. But as with every technology which benefits us, there is a risk of its misuse too. Next generation tracking technology will bring in new legal issues of personal privacy and tracking.

Mihir Jani

[mihirjani@hotvoice.com](mailto:mihirjani@hotvoice.com)

Michael J. Savoie, Ph.D

Director, CITM

[msavoie@utdallas.edu](mailto:msavoie@utdallas.edu)

## **Additional reading and sources**

<http://www.trimble.com/gps/>

<http://www.zdnet.com/anchordesk/stories/story/0,10738,2913976,00.html>

<http://www.csa.com/hottopics/gpscars/overview.html>

<http://www.sciencedaily.com/releases/2002/11/021111065854.htm>

<http://www.reeusda.gov/success/impact98/98hitec.htm>

*FASTCOMPANY July 2003 edition*