

Figure 2 Locating places in the National Capital Region with USNG geoinformation. The FDR Memorial is in vicinity of (IVO) grid 2205, and the motorcycle accident was IVO grid 2004.

unambiguously communicates the surface location at which a feature, organization, or person can be reached. They serve as universal map index values for properly gridded street, highway, topographic, and general-purpose large-scale maps. Geoinformation synergistically complement one-dimensional street addresses but do not replace them in most cases. Away from the road network, or in the event of major disaster, geoinformation may be the only type of address available. Geoinformation provide us with a user-friendly national standards-based *language of location*. Geoinformation methodologies provide major efficiencies in public safety and commerce and are essential for enabling the widespread use of low cost Global Positioning System (GPS) technology in society.

If you say it's just a coordinate, you may be right, but it represents a much more powerful concept than just a coordinate. It is a specific application involving the use of coordinates across a broad swath of society.

Surveyors use coordinates at the centimeter level of precision and accuracy. Coordinates as such are not intended for routine use by the general public and in public safety—geoinformation, on the other hand, are. Unlike surveying,

geoinformation typically only require a spatial accuracy of several meters, and a precision of a meter to 100 meters.

With a USNG gridded \$10 street atlas, officers could have easily determined Ms. Conlon's location for the dispatcher, but this was not possible. **Figure 1** illustrates the problem with the Washington, DC commercial street maps. These 35 different maps use 31 different grids. These do not harness our national standards based language of location, the USNG. Accordingly, none of these maps enable use of consumer Global Positioning System (GPS) receivers or The National Map that now use the Federal Geographic Data Committee's (FGDC) USNG standard. The cost of helicopter flight time for this incident alone would purchase several \$100 GPS receivers. It can be observed that geoinformation today remain an unknown concept in much of the public safety sector. In the mid-1990s, when efforts to develop procedures for locating wireless callers began, the phrase, "*Bubba don't do lat/long*" was coined. This did not mean that public safety personnel found lat/long difficult to use with precision on maps, which is true, just as it is for the general population, and

to be honest, most surveyors. It meant that coordinates could not be used to locate an incident unless a computer depicted the coordinate location on a digital map. It conveyed the idea that people cannot use even a plane coordinate directly with a map, like a street address, to locate an incident or point of interest. This perception seems pervasive among civil authorities. In July 2003, the Urban and Regional Information Systems Association (URISA) Board of Directors issued a letter in response to the proposed Federal Geographic Data Committee's (FGDC) Address Data Content Standard (ADCS) that, in regard to the use of coordinates as an address, stated in part:

"The draft standard defines three address types: 'geographic (coordinate position), postal (mailing), and physical (site, delivery).' The first should be dropped, and the other two are oversimplified.

Geographic coordinates are address locators, not addresses. Coordinates locate addresses on the face of the earth in a way that can be processed readily by computers. They do not reference any system of thoroughfares—that is, they give no clue how to travel to that point—and they do not indicate postal delivery points. A GIS consultant once gave out business cards with his name, latitude, and longitude, but it was a joke, and his address was on the other side of the card. Coordinates and addresses are defined and created by radically different processes for very different purposes. Neither in popular nor expert usage does "address" denote coordinate values, and geographic data processing creates no need to expand the definition."

Coordinates of cell phone callers will be provided to Enhanced 9-1-1 Public Safety Access Points (PSAP) in Phase II wireless location efforts. Rhode Island was the first state to achieve this capability. Its 9-1-1 operators can rapidly locate cell phones equipped with GPS chip sets to within 15-m of true position. Unfortunately highly accurate coordinates have not proved to be the panacea once expected. Operational protocols and public policies fail to fully exploit this powerful information. In Rhode Island, by 2003, only about a fifth of the street addresses had been correlated to an earth-referenced coordinate. Without a street address/coordinate correlation,

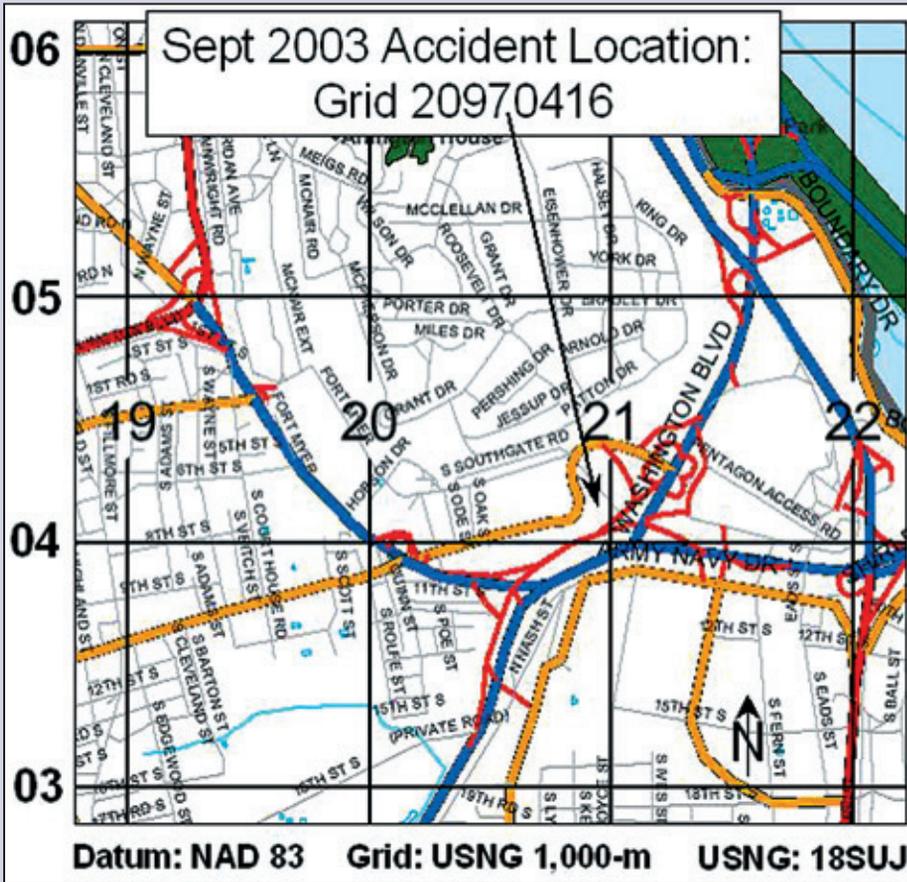


Figure 3 Paramedics could have used the grid 209041 with paper maps to rapidly identify the motorcycle accident location. Optimally street addresses and USNG geoadresses are used synergistically.

Rhode Island procedures (like other states), allow no standard way to clearly communicate a location to first responders who can only use street addresses to find places. As the Rhode Island 9-1-1 Director Ray LaBelle stated, “If I give an ambulance driver latitude and longitude coordinates, he’s going to tell me where to go.” To be clear, Director LaBelle is not referring to the use of lat/long so much as the fact that he and his staff do not appreciate that earth referenced coordinates can be used directly by responders to locate an incident.

On September 10, 2003, as I was walking across a large parking lot in Arlington County, Virginia I heard a loud crash. A motorcyclist on an adjacent freeway overpass had crashed into the guardrail. Catapulted over the rail, he broke several bones and was badly injured (IVO: 18S UJ 2097 0416). Immediately I placed a cell

phone call to 9-1-1. Being located at several merging freeways, the formal names of which were not apparent to me, I could not come up with an address. After making several fumbled attempts to describe the location by bounding roads and freeways, a government building and major shopping center, the 9-1-1 operator asked if I was at a location several miles away. In frustration I asked, “Can you take a coordinate from a GPS receiver?” To which she replied, “No, I can’t use that.” (Fortunately, someone else who knew the intersecting roads called and an ambulance soon arrived.) Next time I was on the Web, I did what the 9-1-1 operator couldn’t do. I mapped the accident site for the cost of a few keystrokes. This capability is free to every 9-1-1 PSAP in the nation with Web access. You can map the location yourself. Use *The National Map* sponsored by U.S.

Geological Survey (nmviewogc.cr.usgs.gov/Run.htm). Or use the Northern Virginia/Washington, D.C. map in **Figure 2** and see the general location at grid 2004. Optimally you want both a street and geaddress to cross check against. Even so, paramedics would have clearly understood the accident location (at grid 20970416) by using a properly gridded paper street atlas (see **Figure 3**).

The good news is things are beginning to change. Phase II wireless location capabilities are slowly coming on line. This debuted recently in the National Capital Region (NCR). Geoadresses are now all the more necessary. People with cell phones are not always near a convenient street address. In heavily urbanized Fairfax County, Virginia, a recent cell phone caller to 9-1-1 had been stung by a bee and was having trouble breathing. The 9-1-1 operator could clearly see his location on her digital map. The only problem—how to describe to paramedics where to find the victim in the heavily wooded 493-acre park he was visiting. Incidents such as this have spurred the U.S. Fire Administration Interoperability Advisory Team to recommend that fire departments implement and use the USNG. The National Park Service will incorporate it in a new Incident Management Analysis and Reporting System. With innovative leaders in government like these, USNG geoadresses are becoming a cost-effective way to help reduce the loss of lives and improve public safety. †

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