

Preliminary thoughts; comments solicited!

These comments are based on use of MapStar 911 call mapping software (admittedly an older, now “legacy” product. But the comments will hopefully be of value to 911 mapping vendors, 911 authorities, and PSAPs in the designing and acquiring of next generation 911 mapping software functionality.

A. The 911 map display should behave VERY differently to the call taker, depending on whether the call is wireline, VOIP, “Phase 1” (WPH1), “Phase 2” (WPH2), a rebid, or another kind of wireless call (e.g., MOBL).

B. When a 911 call is received the system must VERY QUICKLY pop up the large nearly full screen map with the location of the caller at the center. Time is quite important; location display on a map with all info ought to be returned in a max of 2 seconds to the call taker. If the map display is too slow, call takers have shown they will not use it.

C. In Massachusetts PSAP usage, the E911 CPE map display is not principally interactive, it is not interfaced to CAD (and thus knows nothing about units/AVL. etc.), and it is not generally used for internet mapping type viewing and direction finding (Google, Bing, and Mapquest are far better and more up-to-date). Thus its main function is to quickly and automatically popup and display maximum information of use to call takers at the moment of call receipt without requiring any mouse or keyboard interaction by the user (they are busy enough with the E911 phone display, their CAD, and their radio console).

It will also be used to quickly click on any recent past call and see that call displayed on the map.

D. In the all-important case of Phase 2 wireless calls (billions of dollars have been spent to get this location information, let’s make maximum use of the information):

1. clearly show in LARGE letters in a special place/box key DECISION ASSIST information such as:
  - a. The name of the municipality in which the lat-long point is located (e.g., BOSTON)
  - b. The name of the PSAP(s) that service that location (e.g., BOSTON POLICE); this is the most important information if the caller needs help at this location and the call taker is deciding whether or not to transfer the call, and if to transfer, to which PSAP or dispatch center to transfer.

IT IS NOT SUFFICIENT TO SIMPLY PLACE SUCH LABELS IN A MAP LAYER and hope the user can either see them or force the user to scroll/pan to see them (they won’t).

- c. A clear message to the call taker saying "This is a Phase 2 call"
- d. Other configurable key information such as the County of the location, the State of the Location and the State Police dispatch area of the location.

Example of poor display, almost totally lacking in PSAP call taker decision assist functionality:

	<ol style="list-style-type: none"> <li>1. What municipality is this?</li> <li>2. If I want to transfer this call to a local PSAP, which PSAP covers this location?</li> <li>3. Is this a Phase 1 cell call or a Phase 2 call.</li> <li>4. If a Phase 1 call is this confusing me by displaying the tower's location or some artificial construct such as a centroid of a cell sector?</li> <li>5. Is this a rebid? If a rebid, what did I learn about the caller's movements?</li> <li>6. What is that red box and what does it mean for this call by this carrier?</li> <li>7. How near is this to any neighboring jurisdiction (or is it on a jurisdictional line that I need to see)?</li> </ol>
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2. If the call location lat-long is within a pre-set measure (e.g., within 500 meters) of a neighboring municipality and/or PSAP coverage area boundary, optionally list that municipality name on the map saying “NEAR [Municipality] | [PSAP] BOUNDARY by nnnn METERS”.

3. Start a pre-set carrier-specific configurable count-down timer with a message display showing when it is permissible (and optionally optimal) to REBID that call to get an updated location. For example if carrier Orange only allows a rebid every 30 seconds, show: “Carrier Orange rebid to get updated location can be made in N seconds”

4. In the case of a rebid capture, process and display derived data such as:

“THIS REBID at 14:20:12 indicates the caller appears to have moved Southeast at 36 MPH and is now in the municipality of NEWTON” or

“THIS REBID at 12:34:12 indicates the caller appears to have moved only 5 meters North at 2 MPH and is still in the municipality of BROOKLINE” or

In support of this, the map display should show:

- a. dots for the original and all rebids so the call taker can view the movement of the caller – and all intermediate rebid locations - when rebids are made.
- b. Capture the rebids for any call for later retrieval and review

E. In the often confusing case of Phase 1 wireless calls:

1. clearly show in LARGE letters in a special place/box key DECISION ASSIST information such as:
  - a. A clear message to the call taker saying “This is a Phase 1 call with only information about the cell tower handling the call”
  - b. Prompt them to rebid for Phase 2 location; “Rebid [in n seconds] to try to get Phase 2 CALLER location information”
  - c. Provide the name of the PSAP(s) that service that SECTOR of that TOWER (e.g., “SE SECTOR SERVED BY ASHLAND PSAP”); this is the most important information if the caller needs help at this location and the call taker is deciding whether or not to transfer the call, and if to transfer, to which PSAP or dispatch center to transfer.

IT IS NOT SUFFICIENT TO SIMPLY PLACE SUCH LABELS IN A MAP LAYER and hope the user can either see them or force the user to scroll/pan to see them (they won't).

- d. Since carriers appear to differently handle Lat long information that is presented for a Phase 1 (e.g., WPH1) calls, set up some configuration parameters for each carrier to handle this. For example, if T-Mobile provides the lat long of the centroid of their cell sector's coverage area, then explicitly state that while being VERY CAREFUL NOT TO CONFUSE the call taker that the symbol for the centroid (almost totally useless information for a 911 call taker) is the location of the caller. Likewise, if Verizon Wireless always shows a different lat-long for callers connected to a specific cell sector of theirs, explain that as well.

One might reasonably ask why a call taker would ever need to see the centroid of some hidden cell sector coverage area. If the carrier's provide a GIS layer that will show the default/computer-derived sector RF coverage area (e.g., a pie-shaped wedge) then show that AREA but NOT any centroid dot because the dot is an incorrect and misleading representation of a caller's location anywhere inside or near the predicted normal coverage area (especially given the frequency of cell sector overloading).

- e. NEVER use the same symbol to show the location of a Phase 1 call as is used for the symbol of a Phase 2 call's location. For example, if a Phase 2 call's location is symbolized by a dot with a circle or box (denoting its area of uncertainty), use a small tower symbol to denote the tower's location.

2. Start a pre-set carrier-specific configurable count-down timer with a message display showing when it is permissible (and optionally optimal) to REBID that call to get an updated – now hopefully Phase 2 - location. For example, if carrier Orange only allows a rebid every 30 seconds, show: “Carrier Orange rebid to get updated location can be made in N seconds”

3. In the case of a rebid capture, process and display data such as:

“THIS REBID now has Phase 2 caller location at 14:20:12 indicating the caller appears to have moved Southeast at 36 MPH and is now in the municipality of NEWTON served by REGIONAL SOUTH PSAP”.

In support of this, the map display should show:

- a. dots for the original and all rebids so the call taker can view the movement of the caller – and all intermediate rebid locations - when rebids are made.
- b. Capture the rebids for any call for later retrieval and review

F. [Go through similar logic with wireline, VOIP and PBXB class of service calls].

G. Deal with map layers and the need for aerial photography.

H. more...